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# Self-Doubt and Self-Esteem: A Threat From Within

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*The impact on self-esteem of activating self-doubt was investigated in three studies. Individuals with enduring high self-doubt were expected to be more threatened by an experimental induction of self-doubt (modeled on the ease of retrieval paradigm) than individuals low in enduring self-doubt, and their self-esteem was predicted to decline. The predictions were supported when self-esteem was measured postexperimentally (Experiment 1) and when it was measured both pre- and postexperimentally (Experiment 2). There was no comparable loss in self-esteem for individuals low in self-doubt. A third experiment explored the phenomenology of low-self-doubt individuals and replicated the finding that their level of self-esteem was unaffected by the induction designed to produce doubt.*

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**U**ncertainty about one's ability in performance situations suggests the prospect of failure and can prompt defensive, protective behavior. Self-handicapping is a good example of this class of self-protective actions (e.g., Arkin & Baumgardner, 1985; Arkin & Oleson, 1998; Berglas & Jones, 1978, Higgins, 1990). In the landmark study, Berglas and Jones (1978) found that individuals who faced doubts about their ability sought a handicap to their performance, protecting themselves from the attributional implication that a failure, if it occurred, would reflect a clear lack of ability.

More recently, it has been found that some individuals who harbor doubts about their abilities, but who also have particularly strong concerns about performing successfully, adopt a related but opposite strategy of overachieving (Arkin & Oleson, 1998; Oleson, Poehlmann, Yost, Lynch, & Arkin, 2000). The Subjective Overachievement Scale (SOS) was recently developed (Oleson et al., 2000) to assess both individual differences in self-doubt and concern with performance outcomes. The Self-Doubt Subscale was designed to "capture a general sense of feeling uncertain about one's competence" (p. 500). For subjective overachievers, who score high on

both subscales (self-doubt, concern with performance), self-doubt and fear of failure inspires the expenditure of effort to ensure successful outcomes. While exhibiting quite different behaviors, self-handicappers and overachievers share the experience of self-doubt, which is thought to inspire their distinct, but related, coping styles. In sum, the evidence suggests that people such as self-handicappers and overachievers engage in behaviors designed to protect themselves from failure, or at minimum the self-attributional implications of failure, when motivated by feelings of self-doubt about ability.

## *The Link Between Self-Doubt and Self-Esteem*

A typical assumption is that these protective behaviors are linked to notions of competence and self-worth. As Jones and Berglas (1978) put it, "Each [the handicapper and the overachiever] is fearful that failure will implicate competence. Each has an abnormal investment in the question of self-worth" (p. 205). More recently, research has shown that engaging in a protective behavior, such as self-handicapping, appears to be associated with self-esteem maintenance. For instance, after a failure, participants who claimed self-handicaps had higher self-esteem than those who did not claim self-handicaps (Feick & Rhodewalt, 1997). Thus, feelings of self-worth do appear

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to be at stake when facing the prospect of failure (if it can be attributed to oneself). More generally, this research is consistent with conclusions made elsewhere; namely, that as doubt associated with one's important abilities increases, global self-esteem decreases (e.g., Pelham, 1991; Pelham & Swann, 1989).

Self-doubt and self-esteem are moderately (and negatively) correlated (e.g., correlations range from  $-.44$  to  $-.68$ ; Oleson et al., 2000). However, it is important to keep in mind that although low self-esteem tends to accompany self-doubt, the two are conceptually distinct: Self-doubt refers to how certain a person feels about important abilities, whereas self-esteem refers to a global evaluation of oneself as a person. For example, an individual can have a negative global evaluation of his or herself (e.g., low self-esteem) but either be certain or uncertain about specific and global competencies. Threat to one's basic self-esteem should emerge when one has uncertainty about abilities that are important and favorably evaluated (e.g., Pelham, 1991; Pelham & Swann, 1989).

Thus, the evidence suggests that feelings of self-doubt pose a threat to self-esteem. Indeed, it seems likely that those chronically high in self-doubt, as evidenced by their greater propensity to engage in self-protective behavior, are especially likely to interpret self-doubt as threatening. It also follows that unless steps are taken to set aside or alleviate the feelings of doubt, self-esteem may be damaged and decline. The question posed here is whether this threat to self-esteem, and any ensuing damage and decline in self-esteem, is actually greater for individuals who are enduringly high in chronic feelings of self-doubt about their competence.

#### *Internal and External Threats to Self-Esteem*

It is important here to distinguish globally between two sources of threat to self-esteem. Often, individuals see threats to their self-worth as originating from external sources. The prospect of a public failure is prototypical: it looms as a threat because its implications signify not only to one's self but also to others that the individual is incompetent (Jones, 1989). Both self-handicapping and overachievement, and other protective mechanisms (e.g., withdrawal from the situation), can deflect the signifying implications of the outcome and protect and maintain self-esteem. One long-term cost, however, is an enduring feeling of self-doubt. Doubts sustained by such protective steps set aside the threat but also undermine the diagnosticity of one's performance. Similarly, the shy individual can avoid social rejection by making no overtures but remains enduringly dubious about his or her social acceptability. However, this is the cost that self-doubters seem willing to absorb to ensure that the immediate, short-term threat to self-esteem is neutralized.

A threat that is self-generated and strictly internal presents a different set of alternatives for the self-doubter. Introspection (Duval & Wicklund, 1972), recall of past experiences (e.g., Bem, 1967), prediction of future performance (Bandura, 1997), meta-cognitions (e.g., Mischel, 1998), and other self-generated cognitions that elicit self-doubt cannot be deflected behaviorally. Thus, the usual protective steps taken by the individual high in self-doubt are rendered ineffective and the threat cannot be dismissed and ultimately may affect self-esteem.

Meta-cognitions, those judgments we make about our judgments (Jost, Kruglanski, & Nelson, 1998), are capable of having a potent impact on self-evaluation. To illustrate, consider a person's certainty in his or her self-evaluation as a musician. If heroic effort is spent to generate support for that self-evaluation, and the effort is salient and weighted heavily in one's judgment, it is plausible that features of the self-evaluation as a musician (e.g., talented, gifted, enjoying potential) may be undermined by the meta-cognitive cues. The present research is concerned with such meta-cognitive sources of information, particularly those associated with self-reflection while performing a task. The prediction is that because it may be difficult or impossible to set aside or alleviate feelings of doubt stimulated by meta-cognitive cues, self-esteem is likely to be damaged or decline, at least temporarily, when meta-cognitive cues to feelings of self-doubt are elicited.

#### *Retrieval Difficulty: An Internal Threat to Self-Esteem?*

One particularly subtle and compelling meta-cognitive cue, recall difficulty, has recently been investigated by Schwarz and his colleagues (Schwarz, 1998; Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, & Simons 1991). The essential finding is that the experience of recall difficulty exerts an effect on self-judgments even when the content of the information recalled exerts its own influence in an opposite, contrary direction. Specifically, Schwarz et al. (1991) used a clever methodology to investigate the psychological processes underlying the use of the availability heuristic (Tversky & Kahneman, 1973). The availability heuristic is a mental shortcut people often use in which a judgment is based on "the ease with which instances or associations come to mind" (Schwarz et al., 1991, p. 208). Schwarz et al. (1991) noted that the literature has been unclear whether "ease" refers to the number of instances available in memory or to the perceived difficulty of recalling them and argued that the latter matters most. They maintained that this is particularly so when the two types of information are in conflict. In the study, participants rated themselves less assertively after they were instructed to recall 12 examples of their own assertive behavior than after recalling 6 exam-

ples. Conversely, participants rated themselves as more assertive after they were instructed to recall 12 examples of unassertive behavior than after recalling 6. Participants in these experiments tended to neglect a great deal of relevant information in their memories in favor of paying attention to a meta-cognitive cue, the difficulty retrieving that information.

Applied to self-doubt, the Schwarz et al. (1991) finding suggests that retrieval of instances of self-confidence should, ironically, lead individuals to feel less confident (more doubtful) when they have difficulty in retrieving the examples. This effect of the meta-cognitive cue might be equally potent for individuals predisposed to experience self-doubt and those not so predisposed. However, consistent with our theorizing, an alternative hypothesis is that individuals with high levels of enduring self-doubt might be hypersensitive to retrieval difficulty compared to those low in self-doubt and thus find it more threatening. Therefore, we expected that after an experience of retrieval difficulty, the self-esteem of individuals high in self-doubt would decrease, whereas the self-esteem of individuals low in self-doubt would not.

#### EXPERIMENT 1

The following experiment was designed to test this hypothesis and consisted of a retrieval condition (two examples, eight examples)  $\times$  self-doubt (continuous) between-participants design. An interaction was predicted: The self-esteem of individuals high in self-doubt was expected to be lower after recalling eight examples of self-confidence than after two examples, whereas the self-esteem of individuals low in self-doubt was expected to be unaffected by the number of examples recalled. Such an interaction would be consistent with the idea that individuals high in self-doubt are threatened by retrieval difficulty but individuals low in self-doubt are not (even when the perceptions of recall difficulty are the same for individuals high and low in self-doubt). That is, all participants, regardless of their level of self-doubt, should find the eight-example task to be more difficult than the two-example task, even though only individuals high in self-doubt will be threatened by it. However, a second possible explanation for the interaction on self-esteem exists: Perhaps retrieval condition could affect the perceptions of difficulty for individuals high in self-doubt but not for individuals low in self-doubt. Here, a Retrieval Condition  $\times$  Self-Doubt interaction would be evident not only on self-esteem but also on difficulty. The following experiment was designed to test both hypotheses by including measures of self-esteem and perceived difficulty.

#### Method

##### PARTICIPANTS

The study included 123 students who participated in a computer administered study titled "Confidence Training" and received partial credit in their introductory psychology class. Data from three participants were discarded because they failed to follow instructions.

##### PROCEDURE

Participants were randomly assigned to recall either two or eight examples of self-confidence. Afterward, they completed self-report measures. All materials were presented via a software program designed to conduct psychological experiments (Jarvis, 1998). In each of 15 sessions, between 6 and 12 participants sat at individual computer stations. Participants were informed that the purpose of the experiment was to develop materials for use in a counseling program designed to train clients to build self-confidence. Ostensibly to help develop realistic training scenarios, participants were asked to "list two (eight) events in your life, which led you to feel confident about your ability to perform in some important area of your life." A screen with either two or eight text boxes then appeared and participants were instructed to type a brief description of no more than 250 characters for each event.<sup>1</sup>

Next, students were asked to complete some general questions, purportedly to explore students' interest in the training program. First, they were prompted to rate themselves on confidence and uncertainty using 10-point scales (e.g., 1 = *not at all uncertain*, 10 = *extremely uncertain*). Following Schwarz et al.'s (1991) procedure, these ratings were included to verify that retrieval difficulty was influencing ratings of confidence. Participants then completed the Rosenberg Self-Esteem Scale (RSE) (Rosenberg, 1965), the Self-Doubt Subscale of the Subjective Overachievement Scale (SOS-SD) (Oleson et al., 2000), and a manipulation check that involved rating how difficult it was to generate the requested number of examples (1 = *not difficult at all*, 10 = *extremely difficult*). Finally, participants were thoroughly debriefed.

*RSE.* This 10-item scale (Rosenberg, 1965) is designed to measure global self-evaluation (e.g., "On the whole, I am satisfied with myself"). Participants responded to these items on a 6-point Likert scale (1 = *disagree very much*, 6 = *agree very much*). After reversing the scores for the negatively worded items, ratings were summed yielding a potential range of scores from 10 (*very low self-esteem*) to 60 (*very high self-esteem*). Internal consistency was strong ( $\alpha = .90$ ).

*Self-Doubt Subscale.* This eight-item subscale of the SOS-SD (Oleson et al., 2000) is designed to measure

chronic individual differences in self-doubt about one's ability to perform important tasks (e.g., "As I begin an important activity, I usually feel confident in the likely outcome"). Participants responded to these items on the same 6-point scale used for the RSE. After reversing the negatively worded items, ratings were summed yielding a potential range of scores from 8 (*very low self-doubt*) to 48 (*very high self-doubt*). The scale exhibited adequate internal consistency ( $\alpha = .84$ ).

### Results

Hierarchical regression analyses were conducted to determine whether scores on the Self-Doubt Subscale moderated the impact of retrieval condition (i.e., the number of self-confidence examples recalled) on self-esteem. Following standard procedures (Cohen & Cohen, 1983), self-doubt scores and retrieval condition were entered first (to test for main effects) and the product of the two was entered next (to test for interaction effects). To simplify interpretability of the regression analysis (Aiken & West, 1991), self-doubt scores were centered (i.e., the sample mean was set equal to zero). Retrieval condition was dummy-coded: 0 for two examples and 1 for eight examples (Aiken & West, 1991). The interactions were plotted using the predicted means for each retrieval condition at levels of self-doubt one standard deviation above and below the mean of the Self-Doubt Scale for high and low self-doubt participants, respectively. All analyses were conducted and all graphs were constructed in this manner, unless specified otherwise.

#### MANIPULATION CHECK

Analyses of participants' ratings of retrieval difficulty yielded a predicted main effect of retrieval condition ( $\beta = .30, p < .001$ ), as well as a main effect of self-doubt ( $\beta = .37, p < .001$ ), but no interaction ( $\beta = .03, p = .80$ ). As expected, recalling eight examples of past self-confidence was judged as more difficult ( $M = 4.87, SD = 2.59$ ) than retrieving two examples ( $M = 3.37, SD = 2.15$ ). In addition, as level of chronic self-doubt increased, so did perceived difficulty of retrieving examples.

#### SELF-ESTEEM

Analyses of participants' scores on the RSE revealed main effects of self-doubt ( $\beta = -.76, p < .001$ ) and retrieval condition ( $\beta = -.13, p = .03$ ), but these effects were qualified by the predicted interaction ( $\beta = -.23, p = .01$ ). As illustrated in the first panel of Figure 1, retrieval condition had little effect on the self-esteem scores of those participants with relatively low self-doubt but those high in self-doubt reported lower self-esteem after having to recall eight examples. Simple effect analyses conducted to assess retrieval condition differences for those high and low in self-doubt separately (Aiken & West, 1991) confirmed this interpretation; these analyses revealed

no difference in retrieval condition for low-self-doubt participants ( $\beta = .02, p = .79$ ) but a reliable difference among high-self-doubt participants ( $\beta = -.28, p < .01$ ). After recalling eight examples, the self-esteem of individuals high in self-doubt was lower than after recalling two examples.

*Difficulty ratings and self-esteem.* To verify that perceived difficulty was associated with the observed changes in high-self-doubt participants' self-esteem, we performed similar analyses on participants' self-esteem scores but substituted difficulty ratings for the retrieval condition variable. Self-esteem scores were again submitted to a hierarchical regression analysis, but with the following predictors: self-doubt, difficulty, and the Difficulty  $\times$  Self-Doubt interaction term. Analysis yielded a significant self-doubt main effect ( $\beta = -.72, p < .01$ ), which was qualified by a significant Difficulty  $\times$  Self-Doubt interaction on self-esteem ( $\beta = -.26, p = .03$ ). Simple slope analysis (Aiken & West, 1991) indicated that at low self-doubt, perceived difficulty was uncorrelated with self-esteem ( $\beta = .06, p = .50$ ) but that at high self-doubt, perceived difficulty was negatively correlated with self-esteem ( $\beta = -.19, p = .02$ ). As shown in the right panel of Figure 1, much like retrieval condition, perceived difficulty only had an impact on the self-esteem of those high in self-doubt; those high-self-doubt participants who reported high difficulty also reported lower self-esteem.

#### SELF-RATINGS

*Confidence.* Analyses of participants' self-ratings on the dimension of confidence yielded only a main effect of self-doubt ( $\beta = -.57, p < .001$ ) and no interaction. As participants' self-doubt scores increased, they rated themselves as less confident.

*Uncertainty.* Analyses of participants' self-ratings of uncertainty, however, yielded a main effect of self-doubt ( $\beta = .34, p < .001$ ) and a marginally significant interaction of self-doubt and retrieval condition ( $\beta = .24, p = .08$ ). Simple effect analyses indicated that at low self-doubt, uncertainty decreased as number of examples increased ( $\beta = -.12, p = .35$ ), but at high self-doubt, uncertainty increased as number of examples increased ( $\beta = .20, p = .12$ ), although neither simple effect was significant. Simple slope analyses revealed that self-doubt scores predicted uncertainty self-ratings in the eight-example condition ( $\beta = .46, p < .001$ ) but not in the two-example condition ( $\beta = .15, p > .25$ ). Uncertainty increased as self-doubt increased but only after participants recalled eight examples of past self-confidence (see Figure 2).

#### CONTENT QUALITY: AN ALTERNATIVE EXPLANATION

Although it is clear that difficulty was associated with the effects found on self-esteem, an alternative explanation is possible. Perhaps the Retrieval Condition  $\times$  Self-

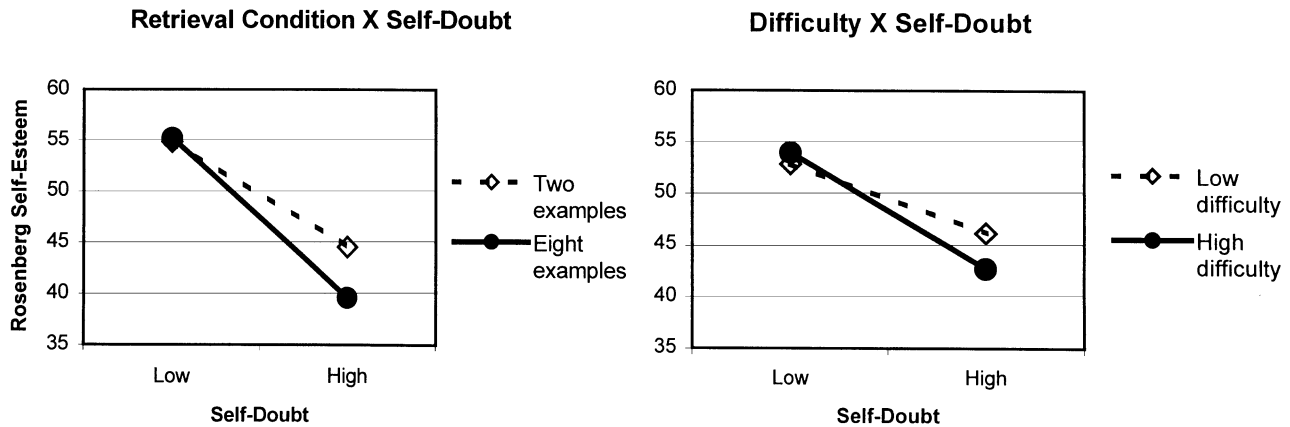


Figure 1 Predicted means of self-esteem as a function of retrieval condition and self-doubt (left panel) and difficulty and self-doubt (right panel): Experiment 1.

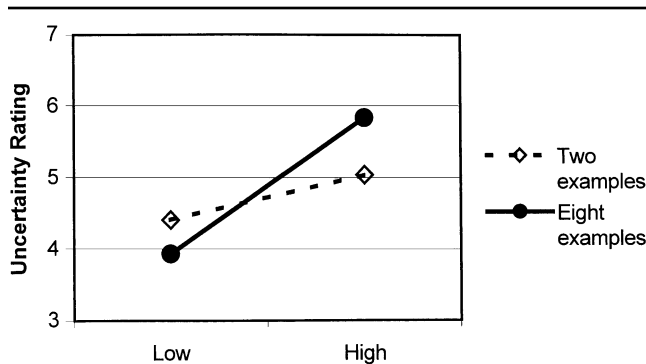


Figure 2 Predicted means of the uncertainty ratings as a function of retrieval condition and self-doubt: Experiment 1.

Doubt interaction could be explained by differences in the quality of the content recalled (Schwarz et al., 1991). Individuals high in self-doubt who recalled eight examples may have reported relatively lower self-esteem because their examples were less convincing than those they produced in the two-example condition than the examples produced by low-self-doubt participants.

*Coding for content quality.* Schwarz et al. (1991) ruled out the possibility that decreasing quality of example content could account for the effect by having independent judges rate the content quality of the last two examples (p. 198). Following Schwarz et al.'s procedure, this alternative explanation was examined by first having two independent judges rate the last two examples generated by all of our participants. Specifically, judges rated the events on "the level of confidence about abilities each event exhibits" (i.e., the two examples in the two-example condition and the last two examples in the eight-example condition) using a 9-point scale (1 = *not at all confident*, 9 = *extremely confident*). Interjudge reliability was much lower than expected,  $r(119) = .54, p = .001$ . As a

result, each judge's ratings were submitted separately to regression analysis. However, because analysis revealed no differences on judges' ratings, only the analysis of average judges' ratings will be presented to simplify presentation.

*Content quality analyses.* First, regression analyses were conducted to determine if self-doubt and retrieval condition interacted to predict the judges' ratings. Analyses yielded only a significant retrieval condition main effect ( $\beta = -.33, p < .001$ ). The judges' rating of confidence in the last two examples recalled in the eight-example condition ( $M = 6.64, SD = 1.17$ ) was lower than the content quality ratings of the two examples recalled in the two-example condition ( $M = 7.31, SD = .67$ ).

Because retrieval condition had an impact on the judges' perceptions of the examples' quality, a new set of analyses was conducted to investigate whether the quality of the examples also interacted with self-doubt to predict participant's self-esteem. Thus, self-esteem scores were again submitted to a hierarchical regression analysis, but with the following predictors: self-doubt, judge's content quality ratings, and the Content Quality  $\times$  Self-Doubt interaction term. Analyses revealed only a main effect of self-doubt ( $\beta = -.75, p < .001$ ). The interaction term was not significant ( $\beta = .01, p = .82$ ). Recalling more examples led to poorer examples, but this decline in quality due to retrieval condition was not moderated by self-doubt. Thus, although recalling more examples led to both higher difficulty ratings and poorer examples for all participants, the drop in self-esteem observed in high-self-doubt participants was associated only with the perceived difficulty of the task.

*Discussion*

Participants high in self-doubt appeared to have been particularly sensitive to recalling eight examples of self-confidence. They appear to have taken the retrieval diffi-

culty they experienced to heart, and their self-esteem dropped. This, of course, transpired despite the fact that they were engaged in an activity that ostensibly could have boosted their self-regard. Under the same conditions, however, participants low in self-doubt appeared not to generalize any difficulty they may have experienced with the retrieval task to an evaluation of their core self, even though they reported that it was harder to recall eight than two examples of confidence. Indeed, there was no indication that low-self-doubt participants were adversely affected by recalling eight examples at all.

Altogether, the evidence is consistent with the hypothesis that people high in self-doubt are more threatened by retrieval difficulty than are individuals low in self-doubt. The evidence on self-esteem and perceived difficulty was inconsistent with the two alternative hypotheses. First, the interaction on self-esteem was inconsistent with the notion that the retrieval condition would influence the self-esteem of all individuals, regardless of level of self-doubt. Second, all individuals reported relatively greater difficulty after recalling eight than two examples, and this effect was not moderated by self-doubt. Thus, this retrieval condition main effect is inconsistent with the notion that the retrieval condition produced the experience of difficulty only for participants high in self-doubt. Together, then, the evidence on these measures supports the idea that participants high in self-doubt find self-doubt more threatening than participants low in self-doubt.

#### ALTERNATIVE EXPLANATIONS

Analysis, however, also revealed a self-doubt main effect on difficulty; the task was more difficult for individuals high in self-doubt than for individuals low in self-doubt. Plotting the predicted means on the difficulty ratings revealed that low-self-doubt participants, on average, rated recalling eight examples well below the midpoint of the 10-point scale ( $M = 3.8$ ). This main effect suggests an alternative explanation for the Retrieval Condition  $\times$  Self-Doubt interaction on self-esteem. Perhaps participants low in self-doubt did not experience a sufficient level of difficulty to affect their judgments and, in turn, their self-esteem was not affected. To address this concern in the second study, the difficulty of the "difficult condition" was raised by increasing the number of examples participants were asked to recall from 8 to 12. In this way, we could examine whether a more difficult task would produce a similar drop in self-esteem for low-self-doubt participants.

In addition, attempts were taken in the second experiment to clarify the nature of the interaction. We argue that recalling eight examples of confidence for high-self-doubt participants resulted in a drop in their self-esteem. It is important to note, however, that it remains a possi-

bility that the observed interaction is the result of an increase in self-esteem for those recalling two examples instead of a decrease in self-esteem for high-self-doubt participants recalling eight examples. Recalling two examples may affirm self-worth for high-self-doubt individuals, but recalling eight examples may induce multiple processes, such as self-affirmation and difficulty in retrieval, which cancel each other out, resulting in no change in self-worth. In Experiment 2, we sought to replicate our basic findings and to address this alternative interpretation. The RSE was, therefore, administered in Experiment 2 both before and after the manipulation to assess change in self-esteem and shed additional light on our findings.

#### EXPERIMENT 2

This experiment consisted of a retrieval condition (2 examples or 12 examples)  $\times$  self-doubt (continuous) between-participants design. We predicted that individuals high in self-doubt would show no change in their self-esteem after recalling two instances of their confidence but would experience a decrease in their self-esteem after recalling 12 instances of their confidence. However, because participants low in self-doubt are not threatened by issues regarding their level of competence, we predicted that their self-esteem would not drop even in the face of the subjective experience of retrieval difficulty.

#### Method

##### PARTICIPANTS

The study originally included 122 students but 1 individual was dropped for completing the materials incorrectly (resulting  $N = 121$ ).

##### PROCEDURE

The procedure was identical to that of Experiment 1 with the following five exceptions. First, the SOS-SD ( $\beta = .86$ ) was administered (as part of a survey supposedly given for another researcher) shortly before the experimental variable was manipulated. This provided for a measure of chronic self-doubt that was truly independent of the experimental manipulation. Second, the RSE was administered both before (as part of the same survey;  $\beta = .90$ ) and after ( $\beta = .91$ ) the induction, and third, the self-ratings of uncertainty and confidence were eliminated. This provided the opportunity to analyze self-esteem change in the most direct and maximally sensitive way and to determine under which conditions self-doubt was associated with such change. Fourth, participants were asked to recall 12 examples of self-confidence rather than 8 to increase the subjective experience of difficulty in that condition, especially for the low-self-doubt participants. Last, the quality of the examples was assessed

not only by independent judges but also by the participants themselves. This enabled us to determine whether the participants' subjective ratings of quality, as well as the objective quality, of the examples were associated with self-doubt and changes in self-esteem.

### Results

#### MANIPULATION CHECK

As in Experiment 1, hierarchical regression analysis was used to determine the impact of self-doubt and retrieval condition on the manipulation check and our dependent measure. Analyses of participants' rating of retrieval difficulty yielded a main effect of retrieval condition ( $\beta = .31, p < .001$ ) and a main effect of self-doubt ( $\beta = .18, p = .04$ ) but no interaction ( $\beta = .17, p = .18$ ). On average, retrieving 12 examples of past self-confidence was perceived as more difficult ( $M = 6.5, SD = 2.2$ ) than retrieving 2 examples ( $M = 5.1, SD = 2.5$ ). As in Experiment 1, self-doubt had an independent impact on difficulty ratings; as level of chronic self-doubt increased, so did perceived difficulty of retrieving examples.

#### SELF-ESTEEM CHANGE

RSE pretest scores were subtracted from RSE posttest scores, and this difference score was used as a measure of self-esteem change. The difference score was submitted to the same hierarchical regression analyses as were the other dependent measures. Analysis revealed a marginally significant main effect of self-doubt ( $\beta = -.30, p = .06$ ). As self-doubt increased, self-esteem decreased. However, the predicted interaction of retrieval condition and self-doubt qualified the effect ( $\beta = -.32, p = .02$ ). The predicted means are plotted in the left panel of Figure 3.<sup>2</sup>

For individuals high in self-doubt, retrieval condition produced a marginally significant difference ( $\beta = -.24, p = .06$ ). As is evident in the left panel of Figure 3, individuals high in self-doubt reported lower self-esteem after retrieving 12 examples of past confidence than after retrieving 2. This difference was reversed for individuals low in self-doubt who reported marginally higher self-esteem after retrieving 12 examples than after 2 ( $\beta = .19, p = .12$ ).

Of primary interest, however, was whether self-esteem changed from baseline (i.e., if change was different from zero). After recalling two examples, no self-esteem change was evident for individuals either high or low in self-doubt ( $t_s < .73, t_s > .46$ ). After recalling 12 examples, however, individuals high in self-doubt experienced a decrease in self-esteem, and it was significantly different from zero,  $t(116) = -1.95, p = .05$ . Furthermore, individuals low in self-doubt experienced an increase in self-esteem after recalling many examples, and this increase was also different from zero,  $t(116) = 2.67, p < .01$ . Clearly, the interaction between self-doubt and retrieval

condition on self-esteem stems from changes in self-esteem subsequent to recalling 12 examples of past confidence.

*Effects unique to self-doubt?* Although we had already controlled for preexperimental self-esteem scores when we calculated our change scores, because measures of self-doubt and self-esteem are correlated, it is possible that the effects on postexperimental self-esteem are explained equally well by participants' preexperimental self-esteem scores as by their level of self-doubt. To verify that the Retrieval Condition  $\times$  Self-Doubt interaction on posttest self-esteem was associated uniquely with self-doubt, we created a new individual difference predictor. We retained the residuals when predicting SOS-SD scores with the RSE (which represents the unique variance of self-doubt: USD) and then submitted the variables to our standard set of regression analyses to determine whether USD interacted with retrieval condition to predict postexperimental self-esteem. Analyses for USD revealed only the predicted interaction ( $\beta = -.30, p = .01$ ), indicating that the effect holds for self-doubt with the variance associated with self-esteem partialled out.

*Difficulty ratings and self-esteem.* As with Experiment 1, we explored the role of perceived difficulty. In Experiment 1, an interaction between difficulty and self-doubt indicated that the self-esteem of individuals high in self-doubt decreased as difficulty increased but that difficulty was unrelated to self-esteem of individuals low in self-doubt. To determine whether this interaction was replicated, self-esteem difference scores were submitted to analysis, with difficulty and self-doubt as main effect predictors and Difficulty  $\times$  Self-Doubt as the interaction predictor. The predicted means presented in the second panel of Figure 3 indicate a pattern similar to the Retrieval Condition  $\times$  Self-Doubt interaction on self-esteem change. At low self-doubt, self-esteem increased as difficulty increased; at high self-doubt, self-esteem decreased as difficulty increased. Analysis revealed, however, that the interaction was not significant ( $\beta = -.10, p = .28$ ).

To gain more power in detecting the effects of self-doubt and perceived difficulty on participants' self-esteem, the data from Experiments 1 and 2 were combined and reanalyzed. A dichotomous study factor was included in the analysis to examine whether some difference other than statistical power (Cohen, 1988) could account for the difference between Experiments 1 and 2. Posttest self-esteem scores were submitted to analysis in a full-factorial three-way hierarchical regression analysis, with perceived difficulty and self-doubt as continuous between-participant predictors and the study factor as a categorical predictor. Self-esteem scores, instead of difference scores, were analyzed because only posttest self-esteem scores were collected in the first experiment.

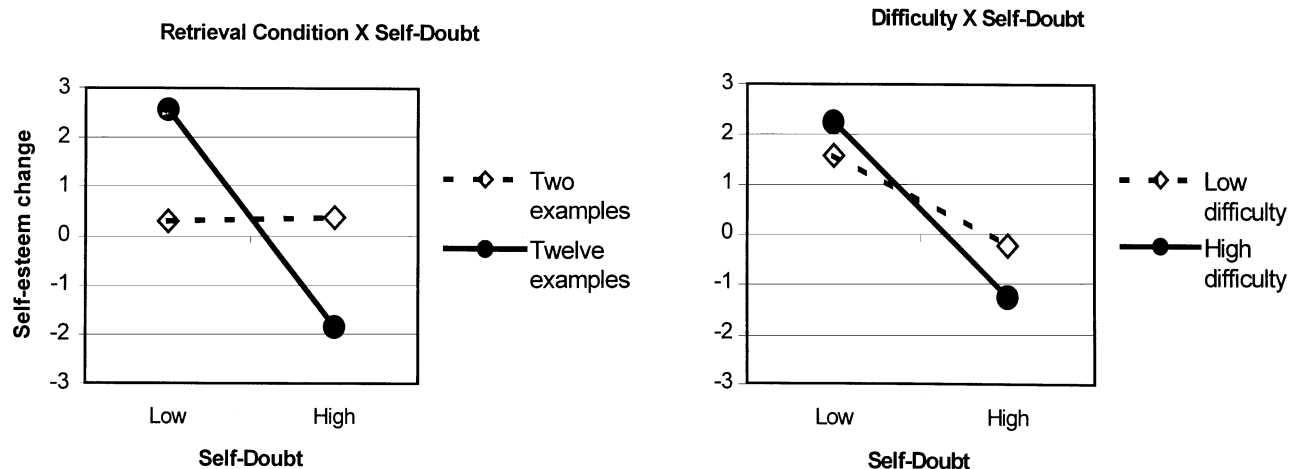


Figure 3 Predicted means of self-esteem change, adjusted for pretest self-esteem, as a function of retrieval condition and self-doubt (left panel) and difficulty and self-doubt (right panel): Experiment 2.

Analysis yielded a significant self-doubt main effect ( $\beta = -.74, p < .001$ ), which was qualified by a Difficulty  $\times$  Self-Doubt interaction ( $\beta = -.10, p = .02$ ). Simple effects tests indicated that at low self-doubt, difficulty was uncorrelated with self-esteem ( $\beta = .06, p = .31$ ); however, at high self-doubt, difficulty was negatively correlated with self-esteem ( $\beta = -.13, p = .04$ ). No significant effect of the study factor was evident, whether alone or as a moderator of some other factor.

#### CONTENT QUALITY

*Judges' ratings.* In Experiment 1, judges' ratings of quality did not interact with self-doubt to predict participants' self-esteem. For this study, we again examined judges' perceptions of the examples' quality and followed the same procedures to do so. Interjudge reliability was higher than in the first study,  $r(121) = .77, p < .001$ ; the two judges' ratings were thus averaged together to create one measure. Analyses revealed, as in Experiment 1, a marginally significant main effect of retrieval condition ( $\beta = -.17, p = .07$ ). The judges rated the last two items in the 12-example condition as exhibiting lower confidence ( $M = 6.56, SD = 1.29$ ) than the 2 items in the two-example condition ( $M = 7.00, SD = 1.37$ ). This main effect was, however, qualified by a marginally significant interaction of self-doubt and retrieval condition ( $\beta = -.23, p = .09$ ). Simple effects tests revealed that for individuals high in self-doubt, judges' ratings of confidence decreased as number of examples recalled increased ( $\beta = -.32, p = .01$ ); however, for individuals low in self-doubt, judges' ratings of confidence were not associated with number of examples recalled ( $\beta = -.01, p = .94$ ).

This interaction on judges' content quality ratings was not observed in Experiment 1 but may be the result of a harder task used in the "difficult" retrieval condition in

this study (i.e., using 12 examples instead of 8). Given this marginal interaction, it seems more likely that in this study, poorer examples in the difficult condition may have been responsible for the interaction between retrieval condition and self-doubt on self-esteem change. Support for this alternative explanation requires that the judges' ratings of quality be positively correlated with self-esteem change if content quality is truly accounting for the Retrieval Condition  $\times$  Self-Doubt interaction on self-esteem change. However, content quality was uncorrelated with self-esteem change,  $r(121) = .09, p = .33$ . Thus, judges' ratings of content quality could not account for the Retrieval Condition  $\times$  Self-Doubt interaction.

*Participants' ratings.* In this study, in addition to the judges' ratings after the fact, participants also rated their own examples. Specifically, participants rated the level of confidence they experience in the last two examples they generated using a 9-point scale (1 = *not at all confident*, 9 = *extremely confident*) after completing the dependent measures. There was some evidence that judges' and participants' ratings of quality differed; correlation of the two quality ratings indicated only a moderate relationship between the two ratings,  $r(121) = .31, p < .01$ . Thus, it is possible that subjective ratings of quality would be associated with participants' change in self-esteem, where judges' ratings were not.

Analysis of participants' ratings of quality yielded only a main effect of self-doubt ( $\beta = -.23, p = .01$ ). Regardless of the retrieval condition participants were in, the perceived quality of the examples recalled decreased as self-doubt increased. No other effects emerged. Thus, participants' perceptions of quality could not account for the interaction between retrieval condition and self-doubt.

### Discussion

As observed in Experiment 1, participants high in self-doubt reported lower self-esteem after recalling a relatively difficult number of examples of past self-confidence. In addition, this effect was observed to be an actual decrease in self-esteem, clarifying the nature of differences observed among high-self-doubt participants in Experiment 1. Rather than receiving a boost from recalling 2 examples, those high in self-doubt suffered a loss in self-regard after recalling 12. Furthermore, regression analyses indicated that this drop in self-esteem was not the result of a decline in the quality of the examples high-self-doubt participants recalled; rather, the interaction of difficulty and self-doubt on self-esteem substantiates the notion that individuals high in self-doubt are threatened by difficulty produced by recalling examples of one's confidence.

In sharp contrast to high-self-doubt participants, individuals low in self-doubt reported higher self-esteem after recalling 12 examples of their confidence. Moreover, recalling a large number of examples served to consolidate and boost their already positive self-regard. This boost for low-self-doubt participants was not observed in Experiment 1 and may result from the increased sensitivity in measurement afforded by a pretest/posttest design or from the larger number of examples (up from 8 to 12) that participants recalled in this study. Regardless, it is an indication that under some conditions, the self-esteem of those low in self-doubt may be bolstered by recalling memories of self-confidence.

#### POSSIBLE ALTERNATIVE EXPLANATIONS

One alternative explanation to our assertion that low-self-doubt participants did not experience threat when recalling a difficult number of examples stems from what is known about self-affirmation among those high in self-esteem. Those high in self-esteem (by definition) have more positive self-concepts and are also better able to fend off threats to the self by affirming their positive attributes and values (Steele, Spencer, & Lynch, 1993). It may be that those low in self-doubt (who are also likely to be high in self-esteem) experienced a threat when recalling 12 examples but were better able to cope with this threat through affirming themselves by focusing on their positive attributes. Although this notion of "self-affirmation after a threat" is consistent with the boost in self-esteem observed in low-self-doubt participants, this explanation seems unlikely given that the interaction of retrieval condition and self-doubt remained when self-esteem was partialled out of the self-doubt predictor. Furthermore, we observed no indication of a threat in any post-experimental dependent measures for those low in self-doubt, all of which suggests that the observed effects on self-esteem were uniquely related to self-doubt and that

those low in self-doubt were not threatened by the manipulation.

However, a nagging possibility remains that loss of self-esteem after difficulty recalling examples of self-confidence may be a universal sort of phenomenon, and a retrieval task of sufficient difficulty could induce individuals low in self-doubt to feel less confident and thus experience decreased self-worth. The predicted means for the difficulty ratings made by participants high and low in self-doubt suggest that participants high in self-doubt found recalling 12 examples to be very difficult ( $M = 7.3$ ), whereas those low in self-doubt still rated the task below the midpoint of the 10-point scale ( $M = 5.3$ ). If this task was made more difficult (i.e., if the number of examples of individuals had to recall was increased), then individuals low in self-doubt may begin to experience retrieval difficulty, feel their level of self-confidence drop, and experience a self-esteem drop as well.

At the other extreme, individuals low in self-doubt might be immune to the effects of retrieval difficulty on their self-concept. When retrieving examples of self-confidence, they may always give greater credence to the content of the examples retrieved regardless of the difficulty involved. If the content of events recalled is indicative of what these individuals value and experience (i.e., their self-confidence), then retrieving examples of past confidence may affirm their self-concept and boost self-esteem. The number of examples recalled might then have a linear relationship with the self-regard for low-self-doubt participants despite the difficulty that may be involved; as the number of examples increases, so does their self-esteem until some asymptotic level is reached.

A third prediction—one that stems more directly from our notion that retrieval difficulty is a threat only to high-self-doubt individuals—would be that when retrieval difficulty is sufficiently strong, it affects the specific self-judgments of low-self-doubt individuals but does not generalize to their global self-evaluation. It may be that the self-concept of low-self-doubt participants is indeed malleable, but because they lack the investment in preserving perceptions of their abilities, they do not interpret undesirable self-concept shifts as implicating their core self. In this case, low-self-doubt participants would be expected to rate themselves as less confident after recalling a difficult number of confidence examples but their self-esteem would not change.

A third experiment was designed to focus exclusively on low-self-doubt participants and to explore the impact of retrieval cues on their self-esteem by using a parametric extension of the experimental manipulation used in Experiments 1 and 2. Participants in the following study were asked to retrieve 8, 12, 16, or 20 examples of past self-confidence. As such, we could attempt to find a point at which the task became difficult for low-self-doubt par-

ticipants and to assess the impact of this difficulty on their self-esteem. Extending the manipulation this way also afforded the opportunity to treat the independent variable as a continuous variable, increasing the power of the analysis and creating the opportunity to test for linear and curvilinear (i.e., quadratic and cubic) trends.<sup>3</sup> Experiment 3, then, was designed to investigate the phenomenology associated with low self-doubt.

### EXPERIMENT 3

#### Method

##### PARTICIPANTS

The study included 57 students who participated for partial credit in an introductory psychology class. Participants were selected to participate based on their score on the SOS-SD administered as part of a mass prescreening 6 to 8 weeks prior to the experiment. Only those participants in the lowest quartile of the Self-Doubt Scale distribution (scores < 22) were recruited. Participants also completed the Self-Doubt Scale again at the end of the experiment. Two participants were removed from the data set because their postexperiment self-doubt scores were more than one standard deviation above the mean of the entire population ( $M = 25.6$ ,  $SD = 7.2$ ); thus, they could no longer reasonably be considered in the low-self-doubt category.

##### PROCEDURE

The procedure was essentially the same as that used in Experiment 2, the primary difference being the number of examples participants were asked to recall and describe. Participants were randomly assigned to one of four conditions in which they had to recall 8, 12, 16, or 20 examples of confidence. The following dependent measures were included: (a) a self-rating of confidence, (b) a self-rating of uncertainty, and (c) the Rosenberg Self-Esteem Scale, which was measured both before and after the retrieval manipulation ( $\alpha_{pre} = .64$ ,  $\alpha_{post} = .68$ ).

#### Results

##### MANIPULATION CHECK

As expected, perceived difficulty increased as the number of examples recalled increased; mean difficulty ratings for 8-example ( $M = 3.8$ ,  $SD = 2.3$ ), 12-example ( $M = 4.5$ ,  $SD = 2.8$ ), 16-example ( $M = 4.4$ ,  $SD = 2.5$ ), and the 20-example ( $M = 5.9$ ,  $SD = 2.2$ ) conditions were consistent with predictions. Trend analysis yielded a significant linear trend of retrieval condition on difficulty,  $t(50) = 2.03$ ,  $p = .02$ ; quadratic and cubic trends were not significant. In addition, the 20-example condition was finally successful in leading individuals low in self-doubt to report average difficulty ratings above the midpoint of the scale (i.e.,  $5.9 > 5.5$ ). In sum, the manipulation was

successful at increasing the perceived difficulty of the task for individuals low in self-doubt to a point at least exceeding the midpoint of the 9-point scale.

##### SELF-ESTEEM CHANGE

To determine whether low-self-doubt participants' self-esteem changed as a function of the retrieval condition, pretest self-esteem was subtracted from posttest self-esteem, and this difference score was submitted to trend analysis, with retrieval condition as a between-participants factor.<sup>4</sup> Neither linear nor curvilinear trends yielded significant differences on self-esteem change,  $ps > .66$ . However, difference scores for the whole sample were significantly different from zero,  $F(1, 49) = 63.17$ ,  $p < .001$ . Self-esteem increased ( $M_{change} = 5.4$ ,  $SD = 11.0$ ), but the number of examples did not moderate this increase (see Figure 4).

##### SELF-RATINGS

On confidence ratings, trend analysis indicated a significant linear trend of number examples,  $t(50) = 2.29$ ,  $p = .01$ . The ease of retrieval effect was evident; as number of examples increased, individuals reported that their self-confidence decreased (see Figure 4). On uncertainty, no effects were significant,  $ps > .10$ .

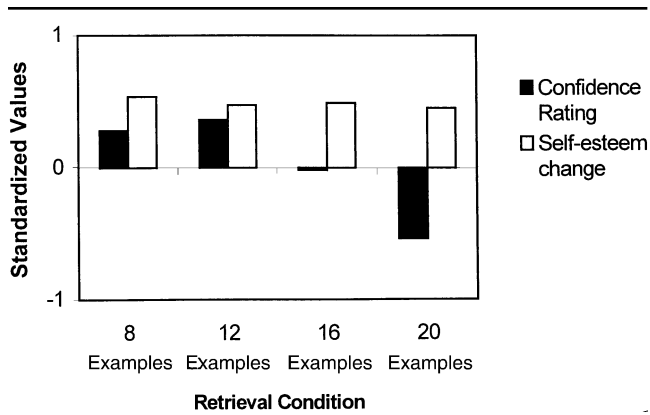
##### CONTENT ANALYSIS

Two independent judges rated the last two examples every participant generated following the procedure used in previous studies. Interjudge reliability was adequate,  $r(54) = .64$ ,  $p < .001$ ; ratings were thus averaged together and then submitted to trend analysis. No trend was significant. Instead, the confidence exhibited by examples across conditions ( $M = 5.8$ ,  $SD = 1.3$ ) was slightly higher than the midpoint of the 9-point scale. The quality of the last examples in each condition was equivalent and the confidence expressed in the examples remained relatively high overall.

#### Discussion

The results of Experiment 3 yield insight into the phenomenology of low-self-doubt individuals who confront both fairly easy and fairly difficult retrieval tasks. The evidence shows clearly that it was difficult for them to recall 20 examples of self-confidence. Furthermore, this magnitude of subjective difficulty was sufficient to produce the ease of retrieval effect (Schwarz et al., 1991). Specifically, these low-self-doubt participants did experience a decrease in confidence but did not when the task was less difficult (e.g., eight instances).

It is interesting to note that self-ratings of confidence were influenced by retrieval condition in this study but uncertainty self-ratings were influenced by retrieval condition in Experiment 1. One possible reason for this difference across studies is that individuals high and low in



**Figure 4** Predicted means for standardized self-esteem change and standardized confidence ratings, adjusted for pretest self-esteem, as a function of retrieval condition for individuals low in self-doubt: Experiment 3.

NOTE: Standardized self-esteem change scores have been adjusted so that 0 equals no change.

self-doubt are schematic (Markus, 1977) on different dimensions. Whereas individuals high in self-doubt may be schematic about uncertainty, individuals low in self-doubt may be schematic about confidence. As a result, ratings of confidence and uncertainty may have been differentially affected because these groups differ on dimensions in which they typically evaluate themselves.

Nonetheless, the self-esteem of individuals low in self-doubt was unaffected by the retrieval condition. As observed in Experiments 1 and 2, the self-esteem of low-self-doubt participants did not decrease under the conditions that produced a decrease for those low in self-doubt (e.g., recalling 8 and 12 examples). Indeed, there was an overall increase, regardless of experimental condition, in the self-esteem reported by these low-self-doubt participants. Together, the confidence ratings and the self-esteem findings suggest that individuals low in self-doubt may be better at deflecting threats to their positive self-regard. Even when they experience a decrease in confidence, albeit a small one, this does not translate into any loss in feelings of self-worth.

#### GENERAL DISCUSSION

Collectively, the findings in these three experiments show that the self-worth of individuals high in self-doubt is more vulnerable to the threat posed by a situational induction of doubt than is the case for individuals low in self-doubt. In the first two experiments, the task of retrieving a large number of examples of past self-confidence, ironically, produced a decline in reports of global self-esteem. Yet, this loss in self-esteem was present only for individuals high in self-doubt at the outset. The irony, of course, is that those with high self-doubt could have taken advantage of the content of the information embedded in the 8 (Experiment 1) or 12 (Experiment 2) exam-

ples of self-confidence they generated. Had they focused on the content, instead of the properties of the retrieval experience, their self-esteem might have been shored up rather than assaulted. Their self-doubts might have been assuaged rather than fueled. Instead, it appears that individuals high in self-doubt are quite sensitive to cues that contribute to furthering feelings of doubt and which in turn threaten self-esteem.

Individuals low in self-doubt exhibited the opposite tendency; that is, they appeared to be affected by the content of the examples they generated and their self-esteem was unaffected by other properties of the retrieval experience. Specifically, individuals low in self-doubt reported an increase in self-esteem after recalling many examples of their confidence and they rated themselves as more certain, not less certain (Experiment 1), after recalling many examples. Even when the ease of retrieval effect was clearly produced successfully among individuals low in self-doubt (Experiment 3), they still experienced an increase in self-esteem. In short, the self-regard of low-self-doubt individuals showed no signs of being threatened by the very same procedures that posed a clear threat and had a clear detrimental impact on the self-regard of participants high in self-doubt.

#### *The Relationship Between Self-Doubt and Self-Esteem*

The present findings shed light on the dynamic relationship between self-doubt and self-esteem. It has been observed that people who experience self-doubt chronically may have an "abnormal investment in the question of self-worth" (Jones & Berglas, 1978, p. 205). To use Crocker's terminology (Crocker & Wolfe, 2000), their feelings of self-worth are contingent. Those with self-doubt about competence (Jones, 1989) may find that their feelings of self-worth are often called into question because of the centrality of that dimension to their everyday lives. And their feelings of overall self-worth appear to be contingent on information that bears on their judgments of competence (Crocker & Wolfe, 2000). As a result, those high in self-doubt are likely to find that their self-worth hinges on cues that either (a) contribute to their feelings of doubt or (b) tend to set self-doubts aside.

Consequently, in circumstances where cues to competence are not present, or are irrelevant, doubt about one's overall worth should not be piqued and no threat to self-esteem is present. Self-esteem should remain fairly stable. However, where cues to competence abound, which is probably quite often, people who characteristically experience doubt are likely to experience a threat to self-esteem. Often, the threat can be managed. In the case of self-handicapping and many other self-esteem maintenance ploys, one's self-esteem is protected when the threat, inspired by the arousal of self-doubt, is set

aside. However, when this is not possible, a temporary decline in self-esteem should be observed. This is what was found in the present experiments.

By contrast, individuals with little or no self-doubt appear to lack that abiding over-investment in the question of self-worth. Their judgments of self-worth are stable, less contingent on temporary events, and they should, therefore, find it easier to shrug off information that is negative and that, otherwise, might be damaging to self-esteem. Individuals low in self-doubt simply do not seem to entertain the idea that their ability is in question. Consequently, it is exceedingly rare to draw them into questioning their feelings of self-worth. A subtle cue, such as the properties of the retrieval experience, may simply go unnoticed. Or, if noticed, the properties of the retrieval experience (i.e., ease or difficulty) receive little or no weight. Persons low in self-doubt appear to focus their attention squarely on the content of their thinking rather than on these other cues. Unlike high-self-doubt individuals, who are quite sensitive to cues that contribute to furthering feelings of doubt, low-self-doubt individuals are oblivious to them.

#### *The Self-Perpetuating Nature of Self-Doubt*

Although more speculative, the present findings suggest reasons why feelings of self-doubt might be self-perpetuating. The meta-cognitive processes that serve as a cue to feelings of self-doubt are probably a common experience. Individuals high in self-doubt may spend a good deal of time thinking about their level of confidence, recalling both past and present illustrations. One item on the SOS-SD scale is, "I often wish that I felt more certain about my strengths and weaknesses." Endorsing that statement may mean that much time in ones' daily life is spent considering one's level of ability, driven by feelings of uncertainty about it. The positive correlation between a recent scale measuring ruminative tendencies (Trapnell & Campbell, 1999) and the SOS-SD suggests this may be the case.<sup>5</sup>

Intuitively, it would be no surprise if individuals high in self-doubt were found to spend inordinate amounts of time dwelling on their competence shortcomings. More interesting, though, effort spent trying to think of themselves possessing strengths in ability could have precisely the same effect. The intrusion of feelings of doubt, thoughts about the properties of the retrieval process, and so forth all could contribute to exacerbating self-doubt and damaging feelings of self-esteem. And, when self-esteem erodes, even temporarily, this too might contribute directly to feelings of self-doubt.

In sum, a maladaptive cycle of self-doubt may be inspired both by the behavioral and thinking styles of individuals with high self-doubt. Self-doubt is implicated

in a wide array of self-esteem maintenance strategies, such as self-handicapping (e.g., Harris & Snyder, 1986), where the goal of the act is to obscure the causes of behavior. Rather than risk the certainty that one's lack of ability is the cause of failure, it is preferable to obscure the link between performance and behavior by introducing causal ambiguity. The causal ambiguity should sustain self-doubt. The present findings suggest that people high in self-doubt also may contend with another, internal source of ambiguity in their lives. Even when thinking about one's strengths, rather than shortcomings, self-doubt may make cues about properties of the thinking process salient. This too would seem to contribute to sustaining self-doubt.

#### *The Breadth of the Impact of Meta-Cognitive Cues*

The present findings raise questions about the specificity versus generality of the impact of meta-cognitive cues. In the present studies, difficulty in retrieval had a more far-reaching and global impact than research has been designed to reveal to date. Until now, research using this paradigm has shown how retrieval difficulty affects an individual's judgment in the same domain in which the information is recalled (Schwarz, 1998). For instance, in the original study, recalling examples of assertiveness or unassertiveness affected participants' self-judgments on the same dimension, assertiveness-unassertiveness (Schwarz et al., 1991). Recalling many health risk behaviors can affect perceptions of risk (Rothman & Schwarz, 1998), generating many reasons to use public transportation affects attitudes about public transportation (Waelenke, Bless, & Biller, 1996), and so forth. In the present studies, recalling examples of self-confidence not only affected the self-perception of uncertainty but also influenced global feelings of self-worth. That retrieval difficulty can influence not only specific self-evaluations but global ones as well opens the door to considering how properties of one's thinking can play a role in forming and sustaining identity beyond specific judgments, on specific dimensions, where the self-evaluation change is temporary. To illustrate, a belief about the effectiveness of one's memory for certain events could have either no impact, an impact on a restricted range of similar events that require recall (e.g., Strack & Forster, 1998), or might generalize to judgments about one's capacity for recall in general. Consider the absent-minded professor trying to recall where his or her car is parked. If youthful, the professor's lapse might be taken simply as an indication of a specific instance of being lost in thought. If much older, however, the professor's lapse might lead him or her to question his or her capacity for recall and, perhaps, overall mental functioning.

## Conclusion

The present studies shed some light on the experience of self-doubt and suggest some interesting hypotheses about how it might be sustained in daily life. There is already evidence that self-doubt is implicated in behavioral strategies (e.g., self-handicapping) that are designed to protect self-esteem but that do so at the cost of sustaining self-doubt. It is particularly problematic to manage a threat to self-esteem when it is generated internally, however. Meta-cognitive cues that provoke feelings of self-doubt may be more readily noticed by high-self-doubt individuals, who are particularly sensitive to such cues, than by low-self-doubt individuals, who are not. The result is that their feelings of doubt are underscored. Ultimately, their feelings of self-worth are shaken, at least temporarily. In turn, losses in self-esteem may contribute to feelings of self-doubt about one's competence. These dynamics help explain the co-occurrence of self-doubt and shaky levels of self-esteem already reported in the literature.

## NOTES

1. Pretesting revealed that students could spontaneously and without extraordinary effort generate a median of five confidence examples from their past. Consistent with Schwarz's procedures (personal communication, May 26, 1998), the easy and difficult conditions were set at the median minus 50% and the median plus 50%, respectively.

2. Because posttest scores have a tendency to regress toward the mean of the distribution, difference scores are typically negatively correlated with the pretest scores (Cohen & Cohen, 1983). To correct for this artifact, pretest Rosenberg Self-Esteem Scale (RSE) scores were entered as a covariate and were found to be negatively correlated with the difference score ( $\beta = -.22, p < .05$ ). The predicted means presented in Figure 2 are adjusted for the variance accounted for by pretest self-esteem.

3. Curvilinear versions of the first two hypotheses are also possible. Perhaps self-esteem may increase but will asymptote or begin to decrease. The following design provided a test for these curvilinear predictions.

4. As in Experiment 2, pretest self-esteem was entered as a covariate to control for regression to the mean (see Note 2). As expected, it accounted for a significant portion of the variance,  $F(1, 50) = 184.86, p < .001$ .

5. A recent correlational study of 646 student participants (Leonardelli, 1997) indicates that the Self-Doubt Subscale of the Subjective Overachievement Scale (SOS-SD) and the rumination subscale of Trapnell and Campbell's (1999) Rumination-Reflection Questionnaire are positively correlated ( $r = .50, p < .001$ ).

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