Self-Awareness, Self-Evaluation, and Creativity

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Abstract:
The present research examined when self-evaluation influences creativity. Based on objective self-awareness theory, the authors predicted that feeling able to improve would buffer against the detrimental effects of self-evaluation on creativity. Two experiments manipulated self-evaluation (varying self-awareness, Study 1; providing objective performance standards, Study 2) and perceived ability to improve potential failure on the creativity task. Self-evaluation reduced creativity (generating remote associates, finding unusual uses for a knife) in both experiments, but only when people did not expect to improve. When people felt able to improve, self-evaluation did not affect creativity. Connections between self-motives, creativity, and defensiveness are discussed.
Keywords: self-evaluation; creativity; self-awareness; expectancies; self-motives

Article:
Unlike most other species, humans can represent the self conceptually and take the self as an object of attention (Povinelli &Prince, 1998). The capacity for self- awareness enables, among other things, self-evaluation (Duval & Silvia, 2001). People can judge the self against standards, appraising whether the self is sufficiently smart, beautiful, friendly, or whatever is seen as correct and good (Duval & Wicklund,1972) . The ability to judge the self, although essential for identifying progress toward goals (Carver & Scheier, 1998) and for targeting areas for self-improvement (Sedikides & Strube, 1997), can be a source of problems (Silvia &O'Brien, in press). By enabling people to recognize the possibility of failing, self-evaluation can disrupt task performance and make people defensive, as shown by numerous self-serving biases in social perception and attribution (Dunning, 1999; Duval & Silvia, 2002).

Creativity is one area in which the dynamics of self- evaluation have been explored. Research to date has found negative effects of judging the self—increased self-evaluation reduces creativity, whereas diminished self-evaluation enhances creativity (Amabile, 1996; Hennessey, 2000; Szymanski & Harkins, 1992). Although the detrimental effects of self-evaluation on creativity are well-documented, researchers in the area of self-evaluation point out the need to go beyond main effects (Sedikides &Strube, 1997). Experiments should identify variables that moderate whether self-evaluation has defensive or constructive effects. In this article, we present two experiments that examine when self-evaluation impairs creativity. We assume that self-evaluation has circumscribed effects on creativity and that moderators of self-evaluation processes determine when self-evaluation impairs creative responses. Clarifying the effects of self-evaluation on creativity not only advances an important issue in the study of creativity but it also contributes to the broader problem of how motives connected to self-evaluation influence cognitive processes.

SELF-EVALUATION AND CREATIVITY
The social psychology of creativity emphasizes how creative activity is affected by contextual and motivational influences (Amabile, 1996; Hennessey, 1999, 2000; Russ,1993), such as rewards, mood states, and conditions that promote intrinsic motivation. One contextual variable is the momentary level of self-evaluation. Many situational factors promote self-evaluation, such as being observed, feeling self-conscious, and having objective performance standards. Factors that arouse self-evaluation have detrimental effects on creativity (Amabile, 1996). In an experiment by Szymanski and Harkins (1992), for example, participants generated unusual uses for

a knife, which were coded for creativity. Self-evaluation was manipulated by having some participantswork under an objective standard of performance. High self-evaluation decreased the creativity of the uses for a knife, relative to low self-evaluation.

Self-evaluation may reduce creativity because it disrupts the divergent thinking processes needed for generating creative ideas (Runco, 1991). Thinking about how well one is doing can interfere with doing well (see Baumeister & Heatherton,1996) . Expansive cognition is impeded when the person focuses narrowly on how the self stands in relation to personal and social standards. Furthermore, worrying about whether the self will live up to important standards reduces intrinsic motivation, a critical element in creativity (Amabile, 1996; Hennessey, 2000). For example, Plant and Ryan (1985) found that self-evaluation brought about by self-awareness reduced intrinsic motivation by promoting an externally controlled motivational orientation.

The creativity experiments are consistent with the defensive effects of self-evaluation (Sedikides &Strube, 1997; Silvia &Duval, 2004) . Judging the self can increase defensiveness because people will inevitably fall short of their standards, particularly because people's standards are often unrealistic, vague, or perfectionistic (Carver & Ganellen, 1983). Increasing self-evaluation, such as by focusing attention on the self (Scheier &Carver, 1983), exaggerates defensiveness in response to failure. For example, people are more likely to make self-serving attributions (Duval & Silvia, 2002), to blame a standard as being unreasonable (Duval & Lalwani, 1999), and to blame another person for their own failure (Silvia & Duval, 2001b) when they are self-focused and hence evaluating how self compares to standards.

Nevertheless, self-evaluation does not always promote defensiveness or interfere with other psychological processes. Rather than equate self-evaluation with defensiveness, it seems more fruitful to examine when self-evaluation promotes defensiveness and when it does not (Silvia &Duval, 2004) .One theory of self-evaluation processes, objective self-awareness theory (Duval & Silvia, 2001; Duval & Wicklund, 1972; Silvia &Duval, 2001a), predicts that several factors moderate the effects of self-evaluation. In particular, the person's positive expectancies for future performance play an important role in the outcome of self-evaluation (Carver & Scheier, 1998; Duval, Duval, & Mulilis, 1992) .Feeling able to succeed and to improve buffers against the defensiveness that self-evaluation can engender (see Silvia &Duval, 2004). In a classic experiment, high self-awareness enhanced persistence when people expected to succeed but enhanced avoidance when people did not expect to succeed (Carver, Blaney, & Scheier, 1979). Similarly, high self-awareness promoted external, self-serving attri-butionswhen people felt unable to improve failure but it promoted internal, self-blaming attributions when peo ple expected to improve (Duval & Silvia, 2002; Silvia & Duval, 2001b).

In short, self-evaluation can have diverse effects on activity, depending on moderating variables such as expec-tancies. The question thus shifts from *if* self-evaluation affects creativity to *when* self-evaluation affects creativity. If self-evaluation reduces creativity because it increases concerns with the self's performance and thus interferes with divergent thinking, then ability to improve may minimize the detrimental effect of self-evaluation. Many experiments find that feeling able to improve buffers against defensiveness (Carver & Scheier, 1998; Silvia & Duval, 2004) and mitigates against negative effects of failure and self-evaluation (Dunning, 1995). Moreover, the divergent thought processes necessary for producing creative responses would no longer be constricted by a preoccupation with how the self matches up to standards, to the extent that expecting improvement reduces defensive thoughts (Dunning, 1995; Silvia & Duval, 2004) .

THE PRESENT EXPERIMENTS

In two experiments, we tested whether the effects of self-evaluation on creativity are moderated by expectations regarding future improvement. Each experiment manipulated whether people felt they could improve potential failure. Before working on a creativity task, people learned that those who do poorly the first time nearly always or nearly never improve in the future. People thus began the task believing that, should they fail, they could or could not improve. Manipulating this variable, as opposed to measuring expectations or selecting optimistic people (e.g., Snyder, 2002), offers stronger inferences about the causal role of improvement beliefs.

Furthermore, each experiment manipulated self-evaluation, either byvarying objective self-awareness (Experiment 1) or by providing objective performance standards (Experiment 2) .

People then worked on a task that measured creative thought. Given the complexities of measuring creativity (see O'Neil, Abedi, & Spielberger, 1994), each experiment used a different measure of creativity. The first experiment used the Remote Associates Task (Mednick, 1962), which requires generating a word that is associated with several other words. The second experiment used an unusual-uses task (Guilford,1967) in which people generate creative uses for a common object. We predicted that self-evaluation would significantly reduce creativity, but only in certain conditions. When people feel unable to improve potential failure, high self-evaluation should reduce creativity. When people feel able to improve, however, high self-evaluation should not reduce creativity.

EXPERIMENT 1

Experiment 1 was the first test of our hypotheses. Selfevaluationwas manipulated with objective self-awareness. A large literature shows that focusing attention on the self increases the degree of self-evaluation with salient standards (see reviews by Carver, 2003; Carver & Scheier, 1998; Duval & Silvia, 2001; Silvia & Gendolla, 2001). As self-focused attention increases, people evaluate how the self compares to salient standards of correctness. This is abasic assumption of theories of self-awareness (Duval & Wicklund, 1972) and theories of self-regulation (Carver & Scheier, 1998) . Many experiments directly support this relationship (e.g., Baldwin &Holmes, 1987; Scheier & Carver, 1983), and dozens of other experiments demonstrate self-regulatory dynamics that can be explained only by assuming that self-awareness increases self- evaluation (e.g., Carver, 1975; Gibbons,1978; Gibbons & Wicklund, 1976; Silvia, 2002a, 2002b) . Furthermore, a benefit of manipulating self-evaluation through self- awareness is that the standard procedures for manipulating self-awareness, such as mirrors and video cameras, have been extensively validated (see Carver & Scheier, 1978).

Method

PARTICIPANTS AND DESIGN

Thirty-six people—27 women and 9 men—enrolled in general psychology participated as part of a research option. Each person was randomly assigned to condition in a 2 (level of self-awareness: low, high) x 2 (ability to improve: likely, unlikely) between-subjects factorial design. Each condition had similar proportions of men and women.

PROCEDURE

All persons participated individually. Upon entering the lab, the participants were greeted by a male experimenter and led to a private room. The experimenter explained that the study concerned the dynamics of creative problem solving. Participants expected to work on a creative problem-solving task and to give their impressions, thoughts, and reactions related to the task. The experimenter introduced participants to the creativity task, a version of the Remote Associates Task (Mednick, 1962). In this task, the respondent generates a fourth word that completes each of three "trigram" words. For example, the trigram basket:room:base is solved by ball, as in basketball:ballroom:baseball. The Remote Associates Task is awidely used measure of creativity (e.g., Isen, Daubman, & Nowicki, 1987; Runco, 1991). We used the standard scoring system of correct and incorrect responses (see Mednick, 1962) rather than code for degree of association between the response and the trigram.

Self-awareness manipulation. The experimenter explained that some sessions were randomly chosen to be videotaped so the researchers could see if the procedure was standard for each participant. In the high-self-awareness condition, the experimenter turned on a video camera that was connected to a monitor on the participant's desk—the participant's face appeared in the monitor. This is a common (Duval & Silvia, 2002; Silvia &Duval, 2001b) and well-validated (Davis &Brock, 1975; Geller &Shaver, 1976) self-awareness manipulation. In the low-self-awareness condition, the experimenterstated that the present session had not been randomly chosen to be videotaped. The camera and monitor remained off and the camera faced a wall.

Ability to improve manipulation. Before the participant began the task, the experimenter explained that extensive past research had revealed whether people can improve their performance in the future. In the high ability to improve condition, the experimenter explained that people who do poorly the first time nearly always do better the second time. In the low ability to improve condition, the experimenter explained that people who do poorly the first time nearly always do just as poorly subsequent times. To avoid implying attributions for possible failure, the experimenter did not explain why people did or did not typically improve (e.g., practice, effort). He simply emphasized that past research had convincingly shown that people have a high or low ability to improve (see Duval & Silvia, 2002) .

Before beginning the task, the participant completed a Pretask Questionnaire ostensibly designed "to get impressions of the task before people get started." This questionnaire contained a check of the ability to improve manipulation ("If you do poorly on the task, how likely is it thatyou would do better in the future?"), a measure of expected performance ("How well do you expect to do on the creativity task?"), and some filler items intended to disguise the central measures. The measure of expected performance was included to see if the improvement manipulation inadvertently affected perceptions of the likelihood of success. Both questions were answered on 7-point scales.

The participant had 10 min to complete 30 trigrams. The main dependent variable was the number of trigrams solved correctly. After finishing the task, the experimenter probed for suspicion, explained the true nature of the experiment and the need for deception, answered questions about the study, and thanked the participant for contributing to the research.

Results and Discussion

MANIPULATION CHECK

A 2 (self-focus: low, high) x 2 (improve: likely, unlikely) analysis of variance (ANOVA) conducted on responses to the item "If you do poorly on the task, how likely is it that you would do better in the future?" found a sole main effect for the improvement manipulation, $F(1, 36) = 24.9, p < .001$. As expected, people who believed that they could improve in the future had higher scores ($M = 5.83$) than people who did not expect future improvement ($M = 3.72$).

A factorial ANOVA on responses to the item "How well do you expect to do on the creativity task?" found no significant main effects or interactions, all Fs < 1. Overall, people were somewhat optimistic ($M = 4.78$, $SD = 1.38$). This suggests that the ability to improve manipulation did not confound improvement beliefs with perceptions of the task's difficulty or of the likelihood of success.

CREATIVITY

To test ifself-awareness and ability to improve affected creativity, we analyzed the number of trigrams answered correctly. We had predicted that self-evaluation would impair creativity only when self-focused people felt unable to improve potential failure. This prediction was tested with a 3 versus 1 contrast, which was significant, $t(32) = 2.96, p < .006$. The predicted between-condition differences were then tested with one-tailed, directional tests. Table 1 shows the descriptive statistics and confidence intervals. The pattern supported our predictions. When self-awareness was low, improvement beliefs had no effect, $t < 1$. When self-awareness was high, however, people who felt able to improve performed better on the creativity task than people who did not feel able to improve, $t(16) = 2.17, p < .023$, $d = 1.02$. Moreover, when people felt unable to improve, high self-awareness significantly reduced creativity relative to low self-awareness, $t(16) = 2.79, p < .007$, $d = 1.31$.[1]

Experiment 1 thus supported the hypotheses. High self-evaluation, in some circumstances, reduced creativity. This replicates past research (Szymanski &Harkins, 1992). Moving beyond replication, however, Experiment 1 found that expectations regarding the probability of improving moderated the effect of self-evaluation on creativity. People who believed that poor performance could be improved did not show impaired creativity in the face of high self-evaluation. Given positive expectations, people high in self-evaluation showed as much

creativity as did people low in self-evaluation, as indicated by scores on the Remote Associates Task. Positive expectations thus buffered against the detrimental impact of self-evaluation on creativity.

EXPERIMENT 2

Experiment 2 was conducted to extend the first experiment in several respects. First, we wanted to replicate the pattern of results with a different manipulation of self-evaluation. Many experiments demonstrate that self-awareness induces self-evaluation (see Carver & Scheier, 1998; Duval & Silvia, 2001), although self-awareness is certainly not the only source of self- evaluation. Aconceptual replication with a different manipulation of self-evaluation would provide convergent validity for our predictions. In Experiment 2, we manipulated self-evaluation by telling some participants that they would receive objective standards with which they could compare their performance. Other participants did not expect to receive comparison information. Some people, therefore, began the task knowing that they would later judge their responses against reliable standards for creativity (see Szymanski & Harkins,1992) .

Second, we wanted to conceptually replicate Experiment 1 with a different measure of creativity. The Remote Associates Task, although widely used, is a test with right and wrong answers. One could argue that creative responses, by definition, diverge from expected, modal responses (see O'Neil et al., 1994) .Experiment 2 thus used an open-ended measure of creativity, in which no responses were right or wrong. Participants were asked to generate creative uses for a common object (a knife).Each use was later coded for the degree of creativity. This procedure is a common method of measuring creativity (e.g., Csikszentmihalyi, 1975; Eisenberger & Armeli,1997; Guilford,1967; Szymanski & Harkins,1992) . As in Experiment 1, we manipulated self-evaluation and ability to improve. We expected to replicate the first study's findings: Self-evaluation would reduce creativity, but only when people felt unable to improve.

Method

PARTICIPANTS AND DESIGN

Fifty-nine women enrolled in general psychology participated and received credit toward a research participation option. Participants were randomly assigned to conditions in a 2 (self-evaluation: low, high) x 2 (ability to improve: likely, unlikely) between-subjects factorial design.

PROCEDURE

People participated in groups of two to six. The experimenter greeted the participants and seated them at individual tables in a large room. She explained that the study was about the psychology of brainstorming. In particular, participants would be asked to generate truly creative uses for a common, everyday object. The experimenter handed out detailed written instructions for the task; this enabled the experimenter to remain unaware of each person's condition assignment. Participants received one of four versions of the instructions, which contained the manipulations of self-evaluation and perceived ability to improve. All participants' instructions began by describing the experiment and the brainstorming task, with an emphasis on the task's ostensible validity and accuracy as a measure of creativity.

TABLE 1: Effects of Self-Awareness and Improvement Beliefs on Creativity: Experiment 1

	Level of Self-Awareness			
	Low		*High*	
	Can Improve	*Cannot Improve*	*Can Improve*	*Cannot Improve*
M	13.56	13.56	13.00	8.67
SD	3.75	4.30	5.17	3.00
95% CI	10.68 to 16.43	10.25 to 16.86	9.02 to 16.98	6.36 to 10.97

NOTE: $n = 9$ per condition. Creativity scores indicate the number of trigrams solved correctly; the scores range from 0 to 30.

Furthermore, the instructions emphasized the anonymity of the participants' responses. Participants expected to seal their completed questionnaires in an envelope and place it in a box filled with similar envelopes.

Self-evaluation manipulation. The manipulation of self- evaluation was modeled after a procedure used by Szymanski and Harkins (1992). People in the high self- evaluation conditions learned that they would be evaluating their creative abilities. Specifically, participants read the following:

Over the years, norms were developed so that people's scores can be compared to existing standards. We have a set of norms that apply to college students, so that they can evaluate how well or how poorly they did on the brainstorming task. Today, you will get these norms—a list of 40 uses for your object, ordered from *not creative* to *very creative* by expert judges. We'll give you these norms after the task, so you can judge your ideas and see how well or poorly you did. This lets you evaluate the quality of your performance.

People in the low-self-evaluation conditions learned that they would not be evaluating their creativity. Specifically, participants read the following:

Unfortunately, we do not have norms for this task, so you will not be able to judge your responses in relation to a set of standards. In the future we hope to have norms available, but at this point people will not be able to get feedback on how well or poorly they performed.

Ability to improve manipulation. After the self-evaluation manipulation, participants read a paragraph that included the ability to improve manipulation. The improvement information was based on past manipulations of favorable and unfavorable expectancies (Carver et al., 1979). People in the high ability to improve condition read the following:

Furthermore, researchers using the creativity task have examined people's ability to improve their score with repeated testing and with practice. Many studies show that performance is basically fixed and stable. Very few people improve their performance with time and practice. So, people who don't do well the first time rarely do much better in the future.

People in the low ability to improve condition read the following:

Furthermore, researchers using the creativity task have examined whether people can improve their score with repeated testing and with practice. Many studies show that most people can improve their score over time. So, people who don't do well the first time almost always do better after practice.

Measure of creativity. The experimenter distributed the brainstorming task, which asked participants to generate creative uses for a common object (a knife). This task, sometimes referred to as the "unusual uses task" (Guilford,1967), is widely used as a measure of creativity. The instructions emphasized that the creativity of each use was more important than the number of uses. Participants were given 6 min to complete the task. Creativity of responses to the brainstorming task was the primary dependent variable.

After completing the task, participants completed a brief questionnaire that asked for "impressions and reactions" related to the task. The questionnaire included, among filler items, a manipulation check of perceived ability to improve. People responded to two items, using 7-point scales: "If you did the task again, would you expect to do better?" and "Do you think you would improve if you had a chance to practice?" (anchors: *no, not at all* and *yes, definitely*). After participants completed this questionnaire, the experimenter thanked them for their participation and explained the study's true purposes. Participants then placed their responses in an

TABLE 2: Effects of Self-Evaluation and Improvement Beliefs on Creativity: Experiment 2

	Level of Self-Evaluation			
	Low		*High*	
	Can Improve	*Cannot Improve*	*Can Improve*	*Cannot Improve*
M	2.86	3.01	2.89	2.41
SD	0.69	0.75	0.78	0.59
95% CI	2.46 to 3.26	2.59 to 3.43	2.46 to 3.33	2.08 to 2.73
n	14	15	15	15

NOTE: Creativity scores range from 1 to 5.

envelope, sealed it, and put it in a box with other participants' responses before leaving.

Results and Discussion

MANIPULATION CHECK

The two items measuring perceived ability to improve were averaged to form asingle improvement score. Afactorial ANOVA found a main effect for improvement, $F(1, 55) = 10.69, p < .002$, and no other significant effects. As expected, people who believed that they could improve in the future had higher scores ($M = 5.22$) than people who did not expect future improvement ($M = 4.06$).

CREATIVITY

Coding open-ended responses for creativity, unlike other types of coding, requires coders with some expertise relevant to the creativity of the responses. The uses for a knife generated by the participants were coded by two people. The first coder was the editor of ajournal of poetry and language art, and the second coder was an undergraduate research assistant with a background in visual art. Both coders were unaware of the participant's conditions and the other coder's responses. Each rater coded all of the uses; their ratings agreed within 1 point of each other 88% of the time. The creativity of each use was coded on a 1 to 5 scale, with higher numbers indicating greater creativity. A creativity index was computed by adding each person's creativity scores (averaged across coders) and dividing by the number of uses.

To test if self-evaluation and ability to improve affected creativity, we analyzed the average creativity of the uses for a knife. As in Experiment 1, we predicted that self-evaluation would impair creativity only when people felt unable to improve potential failure. This prediction was tested with a 3 versus 1 contrast, which was significant, $t(55) = 2.42, p < .019$. The predicted between- condition differences were then tested with one-tailed, directional tests. Table 2 shows the descriptive statistics and confidence intervals. The pattern of results replicates the pattern obtained in Experiment 1. When self- evaluation was low, improvement beliefs had no effect, $t < 1$. When self-evaluation was high, however, people who felt able to improve performed better on the creativity task than people who did not feel able to improve, $t(28) = 1.91, p < .033, d = .69$. Moreover, when people felt unable to improve, high self-evaluation significantly reduced creativity relative to low self-evaluation, $t(28) = 2.45, p < .011, d = .89$.[2]

Experiment 2 thus conceptually replicated Experiment 1. As before, self-evaluation did not always reduce creativity. When people expected to improve possible failure, high self-evaluation had no effect on creativity. The replication of this pattern bolsters our confidence in the validity of the predictions because Experiment 2 used a different manipulation of self-evaluation as well as a different measure of creativity. Taken together, then, the two experiments provide converging evidence for our hypotheses.

GENERAL DISCUSSION

Self-evaluation processes have broad effects on motivated cognition, including attribution, social comparison, trait definition, and social perception (Dunning, 1999; Sedikides &Strube, 1997) . Creativity, although not as widely researched, is another area that demonstrates the intersection of self-evaluation motives and cognitive

processes. Several experiments find that self-evaluation impairs creativity (Amabile, 1996; Szymanski &Harkins, 1992). This finding is congruent with theories of divergent thinking, which assert that producing creative ideas stems from expansive cognition (Runco,1991).Narrowingone's attentional focus on the self's performance will constrict the range of thought and thus reduce creativity (Runco, 1991; Russ, 1993).

Nevertheless, self-evaluation should not inevitably reduce creativity. Theories of self-evaluation, such as objective self-awareness theory (Duval & Silvia, 2001), emphasize the role of moderating variables in determining the complex effects of self-evaluation. In particular, expectations regarding future improvement moderate many effects of self-evaluation. Feeling able to achieve goals, improve deficiencies, and deal with failure acts as a buffer against defensiveness. When people feel able to improve, self-focused attention makes people try harder, take responsibility for improving, and approach their problems (Carver et al.,1979; Duval et al.,1992; Duval & Silvia, 2002) . If self-evaluation reduces creativity because people focus on how they compare to their standards, then self-evaluation may not impair creativity when people have positive expectancies about improving possible failure at the task.

Two experiments tested whether feeling able to improve moderated the effects of self-evaluation on creativity. Self-evaluation was manipulated with two methods. The first study varied self-focused attention, which induces self-evaluation (Scheier &Carver, 1983). The second study varied whether people anticipated getting objective standards for judging the creativity of their responses. Before working on the task, perceived ability to improve was manipulated. People were told that, should they fail, they would or would not be capable of improving in the future. To avoid problems associated with any particular measure, we used two measures of creativity (O'Neil et al., 1994). In the first experiment, people generated words that were associated with several criterion words (Mednick, 1962). In the second experiment, people generated unusual uses for a common object (Guilford, 1967). Both experiments supported our hypotheses. Self-evaluation reduced creativity, thus replicating past research (Szymanski &Harkins, 1992), but only when people felt unable to improve. When people felt able to improve potential failure, self-evaluation did not affect creative performance. This demonstrates a critical boundary condition for the detrimental effect of self-evaluation on creativity. If self-evaluation does not always reduce creativity, then it should not be viewed as being necessarily antagonistic to the creative process.

The findings of the present experiments suggest that other situational factors also may be moderated by expectations regarding improvement. Many contextual factors studied in the social psychology of creativity seem to influence self-evaluation. For example, being observed during the creative process and anticipating rewards for generating creative products can reduce creativity (Amabile, 1996; Hennessey, 2000) . Being observed is a well-known inducer of self-focused attention (e.g., Carver & Scheier,1978) and is thus an obvious source of self-evaluation. Expecting performance- contingent rewards also may increase self-evaluation, inasmuch as people realize that their work will be judged against a standard of worth. Perhaps these two factors affect creativity because they affect self-evaluation processes. If so, then the moderators of self-evaluation processes should moderate the effects of observation and rewards on creativity. For example, perhaps observers do not impair creativity when people feel that possible failure could be quickly improved. These speculations, if supported by research, would indicate that the dynamics of self-evaluation are more central to creativity than has been recognized thus far.

If improvement beliefs are a key moderator of selfevaluation's effect on creativity, as the present experiments suggest, then why did past research find significant main effects without manipulating improvement beliefs? Past experiments may have inadvertently reduced the participants' perceived ability to improve. First, the evidence for adverse effects of self-evaluation comes from laboratory studies with students. College students, as a group not sampled for a history of creative successes, may have felt relatively less confident in their ability to improve poor creative performance. Sampling creative artists, a group with a history of success and hence higher expectancies (Maddux &Gosselin, 2003), may have shown a different pattern of results. Second, Duval and Silvia (2002) argued that tasks that are novel, unusual, or arcane—such as the Remote Associates Task and unusual-uses tasks—reduce improvement expectancies because the participants do not expect to encounter such

tasks in the future. Eliminating pathways to improvement, such as opportunities to practice, is known to reduce optimism (Snyder, 2002) . As a result, if improvement beliefs are not explicitly manipulated, a sample of students may on average have low expectancies regarding improvement.

Similar to past research on self-evaluation, the present experiments did not assess the full range of creative activity. Our measures of creativity assessed creative production, the ability to generate creative responses. Equally important to creativity, however, is the selection, revision, and modification of creative responses. Theories of creativity point out that early stages of the creative process require divergent thought, whereas later stages of the creative process require critical judgment and evaluation (Csikszentmihalyi, 1996; Martindale, 1999; Rathunde,1999) .People must decide whether an idea is worth pursuing, whether something should be revised, or whether a finished product is worthy of public display. The possible intersections between these aspects of the creative process and self-evaluation are intriguing. Judging the worth of a creative product and identifying ways of improving it seem like they would involve evaluation processes, such as appraising the product in relation to personal standards relevant to creativity. Perhaps self- evaluation facilitates creativity in some circumstances, such as by influencing the standards people use when judging the self's productions (cf. Silvia & O'Brien, in press). These issues, although outside the scope of the present research, are promising topics for future research on self-evaluation and creativity.

These experiments are part of a broader emphasis on the interactive dynamics of self-evaluation (Sedikides & Strube, 1997). The study of self-motives finds many examples of defensive, self-serving, and self-enhancing activity. Given the ubiquity and reliability of these findings, the next step for research on self and motivation is to understand when people are defensive and when they are constructive (Silvia &Duval, 2004). For example, sometimes people blame their failure on other people or on external factors, whereas other times they blame failure on the self (Duval & Silvia, 2002; Silvia &Duval, 2001b). If people are not always self-enhancing and defensive, then the task is to represent the complex dynamics of self-evaluation. The present studies showed how general processes of self-evaluation—self-focused attention, standards for performance, and expectations regarding improvement—can inform the dynamics of creativity. These experiments thus demonstrate underlying conceptual continuities between creativity and more widely studied aspects of motivated cognition, such as self-serving biases and self-regulation.

NOTES

1. Effect sizes were computed using Minsize 2 (Morse, 1999).
2. Some studies of divergent thinking analyze each person's most creative response in addition to average creativity (Michael &Wright, 1989; Mouchiroud & Lubart, 2001) . In our data, this analysis found no significant differences. Unlike past research, however, we had instructed participants to emphasize the creativity of their responses rather than the number of responses. This increased the reliability of the index of average responses (by reducing within-person variability) but reduced the between-person variability in high-point scores. Our instructions thus limited the power for finding effects in high-point scores, and an analysis of extreme responses is already low in power—it is based on only 14% of the data and it lacks the reliability that can come with aggregation (see Epstein, 1990).

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