The Role of Mood in Quantitative and Qualitative Aspects of Performance: Single or Multiple Mechanisms?

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Previous research by Hirt, Melton, McDonald, and Harackiewicz (1996) found that mood effects on creativity were not mediated by the same mechanisms as were mood effects on quantitative measures of performance and evaluations of performance, suggesting that mood may simultaneously be working through different processes (dual process view). However, other research (Martin & Stoner, 1996; Sinclair, Mark, & Clore, 1994) supports a single process, mood-as-information model for similar effects of mood on processing. In the present research, we hypothesized that if a single, mood-as-information process accounts for mood effects on both creativity and quantitative performance, then all mood effects should be eliminated if participants are cued that their mood is irrelevant to the task (cf. Schwarz & Clore, 1983). We manipulated participants’ moods prior to task performance and presented them with either an enjoyment-based or a performance-based stop rule; half of the participants were cued to the true source of their moods, half were not.

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Cueing participants eliminated mood effects on quantitative measures of performance (e.g., number generated). However, consistent with a dual-process view, the cueing manipulation did not affect creativity; happy participants generated the most creative responses regardless of stop rule or cue.

In recent years, it has become increasingly clear that moods have powerful effects on cognitive processes and performance. However, the nature of these effects has been shown to vary considerably. Several studies demonstrate facilitative effects of positive mood on performance. For example, people in positive moods have been shown to be more efficient in decision making (Isen & Means, 1983), more creative in problem solving (Isen, Daubman, & Nowicki, 1987; Isen, Johnson, Mertz, & Robinson, 1985), and to categorize more broadly (Isen & Daubman, 1984) and flexibly (Murray, Sujan, Hirt, & Sujan, 1990) than those in neutral or negative moods. On the other hand, a number of studies demonstrate adverse effects of positive mood on performance. For example, participants in positive moods have also been shown to respond more to peripheral cues and less to argument strength in persuasion settings (Bless, Bohner, Schwarz, & Strack, 1990; Worth & Mackie, 1987), to rely more on stereotypes in making judgments (Bodenhausen, 1993), and to be less accurate at a variety of social and nonsocial judgments (Sinclair, 1988; Sinclair & Mark, 1995). In many of these same studies, negative mood (more specifically, sad mood) led to greater accuracy of judgments and decreased reliance on peripheral cues or stereotypes.

Several theorists (Schwarz, 1990; Sinclair & Mark, 1992) have attempted to account for this diverse set of findings. To date, the dominant view has been a processing strategy account: Happy mood is associated with a more carefree, heuristic processing style, whereas sad mood is associated with a more analytic, systematic processing strategy. Thus, on tasks that require more analytic processing (e.g., solving physics problems), being in a sad mood facilitates performance and being in a happy mood inhibits performance. On the other hand, on tasks that require more playful, carefree processing (e.g., free association), happy mood facilitates performance. This view has integrated the mood–performance literature considerably. However, a number of recent studies challenge the view and present data that are difficult to reconcile with a processing strategy account (Hirt, Melton, McDonald, & Harackiewicz, 1996; Martin, Ward, Achee, & Wyer, 1993; Sanna, Turley, & Mark, 1996; Wegener & Petty, 1996). These studies suggest that moods are not invariantly associated with particular processing styles; rather, mood effects are context-dependent to a considerable extent. For example, people focused on their interest in and enjoyment of a task put more time and energy into it when they are happy, because happy people perceive the task as more enjoyable; in contrast, people focused on meeting a performance standard expend more time and effort when they are sad, because sad people are more likely to perceive their performance as inadequate at any given time (Martin et al., 1993).

On the other hand, Hirt et al.’s (1996) research appears to suggest that the effects of moods on quantitative measures of performance (time spent on the task, quantity of production) are distinct from those that underlie more qualitative
indices of performance (creativity). Indeed, Hirt et al.’s research questioned the assumption that a single mechanism can account for the effects of mood, and raised the possibility that mood may simultaneously be having multiple effects. However, research by Martin and Stoner (1996) appears to support a single-process model. The present research is designed to test the notion that multiple mood effects may occur simultaneously.

**Mood as Input**

We begin with a brief outline of a model of context-dependent mood effects (mood as input) that served as a basis for the present research. The mood-as-input model (Martin & Stoner, 1996; Martin et al., 1993) asserts that “there are few, if any, effects that follow directly from the mere fact that one is experiencing a certain mood” (Martin & Stoner, 1996, p. 279). Rather, the effects of a given mood depend on the context in which the mood is experienced. This argument follows from the more general assumption that moods have their effects on performance, judgment, and processing by way of the information the moods convey (Schwarz & Clore, 1983, 1988).

The assumption that one’s experienced mood is a form of information is common to several theoretical models (e.g., Frijda, 1988; Schwarz & Clore, 1983, 1988; Wyer & Carlston, 1979). The mood-as-input model differs from these, however, in its emphasis on the context-dependent nature of mood information. According to the model, if one’s mood really is a form of information, then, like other forms of information, it can carry different implications in different contexts (Anderson & Ortony, 1975; Asch, 1946; Higgins & Rholes, 1976; Woll, Weeks, Fraps, Pendergrass, & Vanderplas, 1980). The implications of a happy mood, for example, are quite different if one experiences this mood at a party as opposed to at a funeral. Similarly, one’s positive mood carries different implications for assessment of task enjoyment than for assessment of task completion. If this is true, there is no reason to expect invariant relationships between specific moods and specific judgments, performances, or processing tendencies.

A number of recent studies have obtained findings consistent with this context-dependent view of mood (Martin et al., 1993; Sanna et al., 1996). These studies indicate that a given mood can have different effects on performance of the same task in different contexts. Martin et al. (1993, Experiment 1), for example, induced either a happy or a sad mood and assessed the amount of time participants spent studying behavioral information to form an impression of a target person. Some participants were instructed to stop when they no longer enjoyed the task, whereas others were instructed to stop when they felt they had examined enough information to make a decision. Participants given the “enjoyment” stop rule persisted longer and examined more information if they were in a happy mood, whereas participants given the “enough information” (performance-based) stop rule persisted longer and examined more information if they were in a sad mood. Thus, consistent with the mood-as-input model, the motivational implications of participants’ moods depended on the context within which they experienced these moods.
The Hirt, Melton, McDonald, and Harackiewicz (1996) Study

Hirt et al. (1996) extended Martin et al. (1993) by examining some critical assumptions underlying the mood-as-input model. The model implies that happy participants persist longer than sad participants under an enjoyment stop rule because happy participants judge the task to be more enjoyable. Similarly, happy participants stop sooner under a performance-based stop rule because they judge their performance more favorably. To test these assumptions, Hirt et al. (1996) included measures of pretask interest as well as posttask performance satisfaction. They found that happy participants did indeed perceive the task as more interesting than did sad participants (validating the assumption underlying the enjoyment-based stop rule) and also perceived their performance as better (validating the assumption underlying the performance-based stop rule). More important, their results indicated that although happy participants judged the task to be more interesting regardless of stop rule (cf. Pretty & Seligman, 1984), differences in perceptions of task interest affected task performance only when the participants were given an enjoyment-based stop rule. Similarly, although happy participants judged their performance more favorably regardless of stop rule, differences in perceptions of the quality of task performance influenced task performance only if the participants were given a performance-based stop rule. In other words, the participants’ moods influenced their judgments, but these judgments had motivational implications only when they were relevant to the participants’ performance (cf. Millar & Tesser, 1986, 1992; Strack, Martin, & Stepper, 1988, Experiment 2). This outcome is consistent with the assumption that moods serve as input to other processes (e.g., judgments about enjoyment or quality of performance) that then determine the motivational implications of the moods (Martin & Stoner, 1996).

However, Hirt et al. (1996) included both quantitative (time spent on the task and number of items generated) and qualitative (creativity of participants’ responses) performance measures and found very different patterns of results on each. For the quantitative measures (time spent and number generated), they found significant Mood × Stop Rule interactions, consistent with Martin et al. (1993). Moreover, mediational analyses revealed that participants’ pretask interest partially mediated the effects of mood and stop rule on quantitative task performance. Participants spent more time and generated more responses to the task to the extent that they anticipated the task to be fun and interesting.

However, the same pattern did not hold for creativity. On this measure, a mood main effect, but no Mood × Stop Rule interaction, was observed: Happy participants were more creative than sad or neutral mood participants regardless of stop rule. Mediational analyses revealed that pretask interest did not influence the effects of mood on creativity; thus, being interested in the task did not make participants more creative. Instead, Hirt et al. found that creativity significantly influenced participants’ posttask interest. Mediational analyses revealed that creativity partially mediated the effects of mood and stop rule on posttask interest;
quantitative performance (number generated) did not affect posttask interest. Thus, it appears that being creative at the task promoted greater subsequent interest. Based on these results, Hirt et al. suggested the possibility that the mechanisms underlying qualitative aspects of performance (creativity) are different from those underlying quantitative aspects (time spent, number generated).

Several different mechanisms have been proposed to account for the facilitative effects of positive mood on creativity. Isen (1993) has argued that happy mood “cues positive material in memory, and positive material is more extensive and diverse than other material (e.g., Cramer, 1968). Thus, the cognitive context is more complex when a person is feeling happy, as a broader range of ideas is cued” (pp. 262–263). This view argues that differences in the content of information activated in memory while in a happy mood are the primary mechanism responsible for the enhanced creativity of happy participants. An alternative view has been offered by Schwarz (Schwarz, 1990; Schwarz & Bohner, 1996). Schwarz’s cognitive tuning view argues that moods carry motivational implications for action. Negative moods signal danger or distress and evoke systematic, effortful problem-solving strategies to remedy the situation. Positive moods, on the other hand, indicate that all is well, and evoke a more carefree, playful approach to tasks. According to Schwarz’s view, the enhanced creativity of happy participants is the result of their playful exploration of novel procedures, greater risk taking, and preference for simpler, more heuristic problem-solving strategies. Thus, in contrast to Isen’s view, which emphasizes content differences, Schwarz’s view emphasizes process differences in the way happy participants approach tasks.

A third mechanism is derived from a mood management perspective (Isen & Simmonds, 1978; Wegener & Petty, 1994, 1996). According to this perspective, happy individuals are interested in maintaining their positive mood state, whereas sad individuals are interested in mood repair (cf. Cialdini & Kenrick, 1976). Wegener and Petty’s hedonic contingency model further argues that, because more potentially mood-threatening tasks exist for individuals in happy moods, happy individuals are even more vigilant about the hedonic qualities of tasks they are contemplating performing than are sad subjects. This view would maintain that the mood management efforts by individuals in happy moods might involve deliberately setting out to generate creative or unusual responses to the task as a means of making the task more fun and interesting (and thereby maintaining their positive mood). Thus, a hedonic contingency perspective argues that the enhanced creativity of happy subjects derives from their motivated efforts to maintain their happy mood state.

The Hirt et al. (1996) research could not distinguish between these different mechanisms for the effects of mood on creativity. Clearly, an important step in being able to claim that mood may simultaneously be operating via different mechanisms would be to specify more clearly the mechanism by which mood is affecting creativity.
An Alternative, Single-Process View

Recent evidence by Martin and Stoner (1996) has suggested an alternative view. In their research, Martin and Stoner placed participants in either happy or sad moods and asked them to perform a word association task (cf. Isen et al., 1985). In this task, participants were presented with a sequence of common words (e.g., dog) and were given 3 s to generate the first word that came to mind. After each first response, participants were given the opportunity to generate a different response if they so desired. Half of the participants were instructed to ask themselves “Can I come up with a better response?”, whereas the other half were instructed to ask themselves “Is my initial response a good one?” Based on the mood-as-input model, Martin and Stoner predicted that happy participants given the “Can I come up with a better response?” question would be more likely to respond affirmatively and would choose to make a new response than would sad participants. Conversely, happy participants given the “Is my initial response a good one?” would be likely to judge their answers more favorably and stick with their initial response, whereas sad participants would try to generate a new, better response. Martin and Stoner’s results supported these predictions, with happy subjects generating more creative second responses with the “Can I come up with a better response?” question, but sad subjects generating significantly more creative second responses with the “Is my initial response a good one?” question.

Martin and Stoner (1996) argue that these results suggest that mood effects on creativity are subject to the same context-dependent effects as are quantitative measures of performance. To the extent that participants use their mood as a basis for judgments of creativity (as they argue was the case with the stop rules), the effects of mood vary according to the specific question asked: In one condition, happy mood led to greater creativity, whereas in the other condition, sad mood led to greater creativity. Thus, their results seriously call into question the need for multiple mechanisms (cf. Hirt et al., 1996) and argue instead that a single model can account for mood effects on both qualitative and quantitative measures.

How might one distinguish between these two possibilities? It is important to note that Martin and Stoner’s arguments are consistent with the more general “mood as information” view proposed by Schwarz and Clore (1983, 1988). This view argues that individuals “may use their current feelings as a basis of judgment unless the diagnostic value of their feelings for the judgment at hand is called into question” (Schwarz & Bohner, 1996, p. 127). Indeed, a great deal of evidence has shown that cueing participants to the source of their mood eliminates the effects of mood on many types of judgments (see Clore, Schwarz, & Conway, 1994, for a review). For example, a recent study by Sinclair, Mark, and Clore (1994) found that participants in positive moods were more likely than those in negative moods to respond to peripheral (rather than central) persuasion cues, unless the participants had the source of their moods called to their attention. Under these conditions, there were no differences in the type of persuasion exhibited by happy and sad participants. This finding suggests that a similar misattribution of mood may underlie the mood-as-input effects obtained in
previous research (e.g., Hirt et al., 1996; Martin et al., 1993; Sanna et al., 1996). The present research sought to test this hypothesis, specifically examining whether this misattribution effect would hold for qualitative as well as quantitative measures of task performance.

Based on Martin and Stoner’s (1996) formulation, it seems likely that the Mood × Stop Rule interactions obtained on quantitative measures of performance would be eliminated by a mood source cue. Cued participants would no longer use their current mood as a basis for their answers to the stop rule questions. However, the effects of the mood source cue on creativity provide an opportunity to critically test the single versus multiple mechanism accounts: If the mood source cue eliminates any effects of mood on creativity as well as the quantitative measures of performance, it supports Martin and Stoner’s (1996) single-process account and suggests that mood influences creativity through a mood-as-information process. If, on the other hand, the mood source cue does not influence the effects of mood on creativity (but does eliminate mood effects on the quantitative measures), it renders a mood-as-information account for the creativity findings implausible and supports Hirt et al.’s contention that another mechanism is producing the effects of mood on creativity.

**Why Is Creativity So Important?**

A better understanding of the mechanism underlying mood effects on creativity is important for a number of reasons. Creativity in performance is highly valued in society (cf. Sternberg & Lubart, 1996), and efforts to encourage creative performance have met with mixed success. In addition, Hirt et al. (1996) found that greater creativity enhanced participants’ posttask interest. However, the phenomenology behind this mood → creativity → interest link is not altogether clear. Is it that participants perceive their own performance as more creative (and qualitatively better), resulting in greater satisfaction and subsequent interest in the task? This question raises an important distinction between *objective* assessments of creativity and *subjective* perceptions of one’s own creativity. In our earlier work (Hirt et al., 1996; Murray et al., 1990), the measure of creativity was derived from ratings by independent judges; that is, we have included only an objective index of creativity. However, it would be important to (1) assess whether happy participants perceive themselves to be more creative, and (2) examine whether it is the subjective perception of being creative (over and above the objective creativity of one’s responses) that leads to greater subsequent task interest. Thus, in the present research, we included both objective and subjective measures of creativity.

**THE PRESENT RESEARCH**

The experiment followed the same procedure used in Martin et al. (1993, Experiment 2). Participants watched movie clips that induced either a happy or sad mood, and then performed a category generation task under one of two stop rules (enjoy and time-to-stop). Enjoy condition participants were instructed to
stop listing items when they no longer enjoyed the task, whereas participants in
the time-to-stop condition were told to stop listing items when they felt it was a
good time to stop (cf. Martin et al., Experiment 2). The latter instruction
encourages participants to consider the adequacy of their task performance as
opposed to their enjoyment of the task (and is roughly analogous to the
performance-based stop rule [enough information] used in Martin et al., Experi-
ment 1).

Immediately following the stop rule manipulation and prior to beginning the
experimental task, half of the participants were provided with a cue indicating that
they still might be feeling effects of the movie clips; the other half were not given
this cue. We hypothesized that participants would be most likely to interpret their
movie-induced mood as their appraisal of their performance (or as their enjoy-
ment of the task) when their attention was not drawn to the source of their moods
(Swartz & Clore, 1983; Sinclair et al., 1994). Following the cue manipulation,
participants performed the generation task and both quantitative (time spent,
number generated) and qualitative (objective ratings of creativity of responses)
measures of performance were assessed. After the generation task, participants
completed posttask interest and subjective creativity measures.

On the measures of quantitative task performance (time spent and number
generated), we expected to find the typical Mood × Stop Rule interaction (Hirt et
al., 1996; Martin et al., 1993; Sanna et al., 1996) among the no cue participants.
Participants in the cue condition, on the other hand, were not expected to show
this interaction, because they would not be using their mood as input in deciding
whether to stop or continue with the task. This pattern of results would thus
support a mood-as-information process underlying the effects of mood and stop
rule on quantitative measures of performance.

On the objective creativity measure, we expected to find a mood main effect
and no Mood × Stop Rule interaction, replicating Hirt et al. (1996). However, we
were particularly interested in the effects of the cue manipulation on this measure.
If a single mood-as-information view is correct, we would expect the mood main
effect to be eliminated by the cue, resulting in a Mood × Cue interaction. If the
multiple mechanisms view is correct, we would expect no Mood × Cue
interaction, evidence against a mood-as-information account for the effects of
mood on creativity.

On the subjective creativity measures, we expected that participants would use
their mood as information in judging the creativity of their responses (cf. Swartz
& Clore, 1983). Thus, consistent with Schwarz’s view, we predicted a Mood ×
Cue interaction on this measure, such that happy participants would perceive
themselves as more creative than sad participants in the no cue condition, but that
happy and sad participants would not differ in the cue condition. This finding
would also fit with the Martin and Stoner (1996) data, which indicated that happy
participants tended to believe their first responses were “better” on a free
association task than did sad participants.

On the posttask interest measure, we expected to find a mood main effect and a
Mood × Stop Rule interaction, replicating Hirt et al. (1996). However, if mood serves as input to perceptions of task interest, these effects should be obtained only in the no cue condition; the posttask interest of participants in the cue condition should be unaffected by mood or stop rule. Further, we expected to replicate the observed mood → creativity → interest pathway through path analyses. However, we predicted that when both subjective and objective measures of creativity were included in the prediction equation, subjective perceptions of creativity (rather than objective creativity) would predict posttask interest and mediate the observed effects of mood on posttask interest.

**METHOD**

**Participants.** One hundred twenty-two Indiana University students were recruited through an ad in the campus newspaper. They were paid $5 for participating.

**Stimulus materials.** As in Martin et al. (1993), participants watched three film clips, each approximately four mins in length. Participants in both the happy and sad mood conditions first saw a car-chase scene from the movie *Bullitt.* This affectively neutral clip was included primarily to reduce participants’ suspicion about the true purpose of having them watch the film clips. Participants in the happy mood condition then viewed humorous clips from the movies *Pretty Woman* and *Mrs. Doubtfire,* whereas those in the sad mood condition viewed sad clips from the movies *Ordinary People* and *Sophie’s Choice.*

**Procedure.** Participants were run in groups of up to four, and groups were randomly assigned to mood conditions. Subjects within groups were randomly assigned to stop rule and cue conditions. Multiple sessions of each condition were run to minimize group and session effects. Participants were seated in cubicles separated by partitions. As a cover story, subjects were told they would be participating in a number of different tasks, the first of which involved rating movies.

As in Martin et al., prior to the first film clip, participants were given the 18-item Need for Cognition Inventory (Cacioppo, Petty, & Kao, 1984), which measures people’s tendency to engage in and enjoy effortful cognitive processing. This measure was included primarily as a precaution. Previous research (Martin et al., 1993, Experiment 2; Petty, Schumann, Richman, & Strathman, 1993) has shown that people differing in need for cognition sometimes differ in their reactions to moods.

After all participants had completed the need for cognition scale, the experimenter started the first film clip. All participants within any given session were randomly assigned to watch either the happy or sad film clips. After each film clip, participants were presented with several questions assessing their familiarity with the specific clip and the movie from which it came, their liking for the clip/movie, and their current feelings about the clip. After participants completed their ratings for a given clip, the experimenter then started the next clip.

After the participants rated the last clip, they were presented with the following 12 adjectives: annoyed, happy, depressed, miserable, satisfied, gloomy, pleased, sad, delighted, content, frustrated, and glad. Participants rated on 5-point scales (anchored at 1 [not at all] to 5 [very much]) the extent to which each adjective reflected their current feelings (Watson, 1988).

After completing their mood ratings, participants were given a 1.5 min filler task that involved drawing a map of the campus (cf. Martin et al., 1993). As a cover story for this task, participants were told that we were interested in the way people represent in memory information about their environment.

After completing the map-drawing task, participants were given a packet that introduced the next experimental task. Participants were told that the purpose of this task was to explore “the things that spontaneously come to peoples’ minds.” For all participants, the next part of the instructions read:

> In this task, you will be given a category of objects. Your task will be to think about and list members of that category. There are no right or wrong answers; the examples you generate can be as commonplace or as creative and out of the ordinary as you like.
For participants in the enjoy stop rule condition, the instructions continued:

As you go through the task, you may ask yourself how you should decide when to stop. We would like you to stop listing items when you no longer enjoy the task. In other words, as you are making your list, keep asking yourself “Do I feel like continuing with this task?” As long as the answer is yes, then continue. When the answer becomes no, then stop. There is no right or wrong time to stop. List the items until you no longer enjoy it. Please follow this rule as you complete the listing task that follows.

For participants in the time-to-stop condition, the instructions continued:

As you go through the task, you may ask yourself how you should decide when to stop. We would like you to stop listing items when you feel it is time to stop. In other words, as you are making your list, keep asking yourself “Do I think it is a good time to stop?” If the answer is yes, then stop. If the answer is no, keep listing. There is no right or wrong time to stop. Stop when you think it is a good time to stop. Please follow this rule as you complete the listing task that follows.

Participants were told to pay no attention to the behavior of others, as each participant had been given a different set of instructions for this part of the study. Participants in the cue condition were also told the following:

Research has indicated that the films you saw earlier have emotional and physiological effects that persist for longer periods of time than people are aware of. Thus, as you are working on this task, you should bear in mind that you might still be feeling the effects of the film clips.

Then, all participants were instructed to list members of the indicated category of objects (modes of transportation). Participants were given unlimited time to complete this task. The experimenter noted the time the participants began the task. In addition, the instructions following the task requested that participants record their time of completion (in h, min, and s) according to the clock in the room. Thus, we were able to record unobtrusively the amount of time each participant spent on the task.

Participants then completed a second mood measure, identical to the one they had completed following the film clips. Participants also completed two items (cf. Schwarz & Clore, 1983) asking about the extent to which they were happy (on a 1–7 scale ranging from 1 [not at all happy] to 7 [very happy]) and satisfied with their life as a whole (on a 1–11 scale ranging from 1 [not at all satisfied] to 11 [very satisfied]). These life satisfaction ratings served as a check for our cue manipulation. Following the life satisfaction measures, participants were given a five-item posttask interest measure (e.g., “Thinking about different modes of transportation was interesting”). Participants then answered questions concerning the amount of effort they had expended on the task, their estimated performance on the task, their satisfaction with their task performance, and the creativity of their responses. This latter measure served as our first index of subjective creativity (overall rating). The specific questions were as follows: (1) “How much effort did you put into the task of listing moods of transportation?” on a 1 (very little) to 7 (very much) scale; (2) “How well do you think you performed at this task?” on a 1 (very poorly) to 7 (very well) scale; (3) “How satisfied are you with your level of performance on
this task?” on a 1 (very unsatisfied) to 7 (very satisfied) scale; and (4) “Overall, how creative do you think your set of responses to this task were?” on a 1 (not at all creative) to 5 (very creative) scale. Finally, as a second measure of subjective creativity, participants were asked to go back and rate the creativity of each of their individual responses on the same 1 (not at all creative) to 5 (very creative) scale.

After participants had responded to these questions, they were asked their opinion concerning the purpose of the experiment. They were then asked four questions concerning how much they were affected emotionally by the film clips and their awareness of the effects of their emotions on their task performance. These measures served as additional indices of the effectiveness of both the mood and cue manipulations. The specific questions were as follows: (1) “To what extent were you emotionally affected by the film clips?” on a 1 (not at all) to 5 (very much) scale; (2) “Estimate in minutes how long you think you were emotionally affected by these clips”; (3) “Were you aware of experiencing emotions during the other tasks (the listing task and the map task)?” (1 = yes; 2 = no); (4) “How much do you think your performance on the other tasks was affected by your emotional responses to the clips?” on a 1 (not at all) to 5 (very much) scale. Participants were then debriefed and paid $5.

RESULTS

Mood Manipulation Check

A total score for each administration of the mood assessment was created by summing each subject’s ratings for the 12 items (with 6 items reverse scored as appropriate). Possible scores on each of these mood assessments thus ranged from 12 to 60, with higher numbers indicating more positive moods. A Mood × Stop Rule × Cue × Need for Cognition ANOVA performed on the initial mood measure revealed that our mood manipulation was very effective. A significant main effect of mood condition was obtained, $F(1, 103) = 96.04$, $p < .001$. As expected, participants exposed to the happy film clips reported more positive mood ($M = 47.6$) than did participants exposed to the sad film clips ($M = 32.5$).

A similar four-way ANOVA conducted on the posttask mood measure indicated that participants’ moods continued to be influenced by the mood manipulation. Again, a significant mood main effect was observed, $F(1, 103) = 9.77$, $p < .01$, with happy participants reporting more positive mood ($M = 45.2$) than sad participants ($M = 40.8$).

Cue Manipulation Check

We used the measures of happiness and life satisfaction as indices of the effectiveness of the cue manipulation. These measures have proven sensitive to other misattribution cues in the past (cf. Schwarz & Clore, 1983). The analyses

2 On the posttask mood measure, we also obtained a Mood × Cue interaction, $F(1, 103) = 4.56$, $p < .05$. This interaction revealed that the moods of participants in the happy and sad conditions differed significantly in the cue conditions ($t = 3.33$, $p = .001$), but not in the no cue conditions ($t = .80$, ns). This interaction is not particularly surprising given that the cue instructions told participants that the effects of the movie clips persist longer than people think. Thus, participants receiving the cue might be compelled to report (or may in fact believe) that they are still experiencing the effects of the mood manipulation.

In addition, on both pre- and posttask mood measures, we obtained significant main effects of need for cognition (NFC), both $F$s > 5.5, $p$s < .05. High NFC participants reported significantly more positive mood than did low NFC participants.
revealed main effects of Cue, $F(1, 104) = 3.82, p = .05$, and Mood, $F(1, 104) = 5.99, p < .05$, on the satisfaction measure. More important, though, both the happiness and the satisfaction measure revealed the expected Mood $\times$ Cue interaction: for happiness, $F(1, 104) = 6.67, p = .01$ and for satisfaction, $F(1, 104) = 8.35, p < .01$. In both cases, the no cue participants showed the standard misattribution effects, with happy participants reporting greater happiness and life satisfaction than sad participants (both $ts > 3.0$, $ps < .01$). However, the cue participants did not differ on these measures as a function of their mood (both $ts < 1$, ns). Thus, these ratings demonstrate the cue manipulation was effective in alerting participants to the source of their mood.$^3$

Quantitative Measures of Performance

Next, we assessed the effect of the cue on our two main quantitative performance measures, time spent and number of items generated. A Mood $\times$ Stop Rule $\times$ Cue $\times$ Need for Cognition ANOVA performed on the time spent measure revealed a Mood $\times$ Stop Rule interaction, $F(1, 96) = 5.88, p < .05$, and a Mood $\times$ Stop Rule $\times$ Cue interaction, $F(1, 96) = 7.81, p < .01$. Figure 1 presents these data. To interpret the three-way interaction, we performed separate Mood $\times$ Stop Rule ANOVAs in each of the cue conditions. In the no cue condition, we found a significant Mood $\times$ Stop Rule interaction, $F(1, 52) = 11.51, p = .001$. Happy participants spent significantly more time on the task ($M = 235.9$ s) than sad participants ($M = 130.5$ s) when given the enjoyment stop rule ($t = 2.29, p < .05$), but spent significantly less time ($Ms = 117.6$ and 193.7, respectively)

$^3$ Several additional measures were included to assess cue effectiveness. On the final questionnaire, participants were asked to estimate the extent to which they were emotionally affected by the film clips ("extent"), how long these effects lasted ("how long"), their awareness of their mood as they performed the listing task ("awareness"), and how much their task performance was affected by their mood ("affect performance"). No differences were obtained on the extent and awareness measures. On the other hand, the how long measure revealed a main effect of Cue, $F(1, 103) = 18.10, p < .001$, a main effect of Mood, $F(1, 103) = 5.03, p < .05$, and a Mood $\times$ Cue interaction, $F(1, 103) = 4.32, p < .05$. As expected, cue participants estimated that their moods were affected longer ($M = 9.53$ min) than no cue participants ($M = 5.08$ min). However, these effects were much more pronounced in the sad as opposed to happy mood conditions. Similarly, the affect performance measure also indicated a Cue main effect, $F(1, 103) = 9.66, p < .01$, and a Mood $\times$ Cue interaction, $F(1, 103) = 5.69, p < .05$. Again, cue participants believed that their moods had affected their task performance to a greater extent than did no cue participants, particularly in the sad mood condition. These results, along with the effect of the cue on the posttask mood measure, suggest that the cue manipulation worked as expected.

We also found some effects of NFC on these cue manipulation check measures. On the awareness measure, we found a main effect of NFC, $F(1, 102) = 5.40, p < .05$, such that low NFC participants overall reported greater awareness of their mood as they performed the task ($M = 1.50$) than did high NFC participants ($M = 1.29$). However, Cue $\times$ NFC interactions were obtained on both the extent measure, $F(1, 103) = 4.59, p < .05$, and the affect performance measure, $F(1, 103) = 6.84, p = .01$. In both cases, only the high NFC participants were significantly influenced by the cue manipulation.

Finally, we obtained a main effect of NFC on the life ratings, $F(1, 104) = 9.54, p < .01$ for happiness; $F(1, 104) = 11.21, p = .001$ for satisfaction. High NFC participants reported greater happiness and greater satisfaction with their life than did low NFC participants.
when given the performance-based rule ($t = 3.09, p < .01$). This replicates the pattern observed in earlier research (Hirt et al., 1996; Martin et al., 1993; Sanna et al., 1996). In the cue condition, however, no significant effects were observed; the Mood $\times$ Stop Rule interaction did not even approach significance, $F(1, 52) = .12$, ns.

A similar analysis performed on the number of items generated also revealed significant Mood $\times$ Stop Rule, $F(1, 104) = 4.73, p < .05$, and Mood $\times$ Stop Rule $\times$ Cue interactions, $F(1, 104) = 5.57, p < .05$. Figure 2 presents these data. Simple effects analyses indicated that the Mood $\times$ Stop Rule interaction was obtained in the no cue condition, $F(1, 51) = 8.99, p < .01$. Happy participants generated significantly more items ($M = 20.3$) than did sad participants ($M = 12.6$) with the enjoy rule ($t = 2.55, p < .05$), but generated significantly fewer ($M = 13.8$) than did sad participants ($M = 17.9$) with the time-to-stop rule ($t = 2.11, p < .05$). However, the Mood $\times$ Stop Rule interaction was not significant in the cue condition, $F(1, 53) = .01$, ns. Thus, on both quantitative performance measures, providing participants with a cue that reminded them of the source of their mood eliminated the mood-as-input effect. These results support the general mood-as-information view that participants do not use their moods as a basis for judgments when these moods are invalidated as a useful source of information (Schwarz & Clore, 1983; Sinclair et al., 1994).

**Creativity of Participants’ Generations**

Our primary interest here was to examine the extent to which the cue manipulation might influence qualitative as well as quantitative measures of
performance. Recall that Hirt et al. (1996) found that regardless of stop rule, happy participants were more creative than sad participants. A single-process view (cf. Martin & Stoner, 1996) would predict that the cue would eliminate any differences in creativity as a function of mood. A multiple-process view (cf. Hirt et al., 1996) would predict no effect of cue on creativity, implying that a different mechanism (other than mood as information) is producing the observed differences in creativity.

We assessed creativity in two ways. As in our earlier work (Hirt et al., 1996; Murray et al., 1990), we had independent raters assess the creativity of the examples of modes of transportation participants generated using consensually agreed-upon criteria. The creativity of each response generated was rated along a 5-point scale with 1 indicating the most common set of responses and 5 indicating the most novel and creative responses. The rating given to each response was decided upon by extensive discussion followed by a consensus vote of the seven independent raters. Examples of the kinds of items in each category are as follows: (1) car, boat; (2) skateboard, camel; (3) parachute, bobsled; (4) pogo stick, mail; (5) LSD, imagination. Once these ratings were determined, raters then went back to each participant’s list and summed the overall creativity of the generated list of items. However, this total creativity score was highly correlated with number generated ($r(118) = .97, p < .001$). To obtain an index of creativity independent of number generated, we performed a regression analysis on the total creativity score using number generated as the sole predictor variable. As expected, the regression equation was highly significant, $F(1, 118) = 1840.9, p < .001$ ($R^2 = .94$). We then used the standardized residuals from that regression as our index of objective creativity.

![Fig. 2. Mean number of items generated as a function of Mood, Stop Rule, and Cue condition.](image-url)
In addition, we assessed participants’ perceptions of their own creativity. After completing the generation task and the posttask measures, participants were asked to judge the overall creativity of their set of responses on a 1 (not at all creative) to 5 (very creative) scale. Then, they were asked to go back to their lists and rate each item on the same 1–5 scale. As with the objective creativity measure, we calculated a total subjective creativity score for each subject and submitted those scores to a regression using number generated as the sole predictor variable. Again, the regression equation was highly significant, $F(1, 116) = 789.9, p < .001$ ($R^2 = .87$). We then used the standardized residuals from that regression as an additional index of subjective creativity.

On the objective creativity measure, an ANOVA revealed only a main effect of mood, $F(1, 103) = 10.71, p = .001$. Happy participants generated more creative items ($M = .29$) than did sad participants ($M = -.30$). No other effects were observed on this measure; the Mood × Cue interaction did not approach significance, $F < 1$, ns. This is consistent with the findings of Hirt et al. (1996) that the effects of mood on objectively defined creativity are independent of the stop rules that influenced the quantity of responses. The present findings extend the earlier work, however, by showing that even the discounting of one’s mood as a relevant source of information concerning performance decisions does not diminish the main effect of mood on creativity. Thus, the results on this measure are contrary to the mood-as-information view and are consistent with both the affective priming and hedonic contingency views regarding the effects of happy mood on creativity.

On the subjective creativity measures, a somewhat different pattern emerged. On the measure of overall creativity, we obtained a main effect of mood, $F(1, 104) = 5.76, p < .05$, but there was also a Mood × Cue interaction, $F(1, 104) = 5.91, p < .05$. In the no cue condition, happy participants perceived their responses as more creative ($M = 3.57$) than did sad participants ($M = 2.67$), $t = 3.32, p = .002$. In the cue condition, however, happy and sad participants did not differ in their perceptions of their creativity ($M$s = 2.84 and 2.86, respectively), $t = -0.6, ns$. On participants’ ratings of the individual items, we found main effects of mood, $F(1, 101) = 8.19, p < .01$, cue, $F(1, 101) = 7.25, p < .01$, and stop rule, $F(1, 101) = 8.07, p < .01$, as well as a Mood × Cue interaction, $F(1, 101) = 5.75, p < .02$. Again, differences in subjective creativity as a function of mood state were obtained in the no cue conditions ($M$s = .70 and -.25 for the happy and sad conditions, respectively, $t = 3.80, p < .01$), but not in the cue conditions ($M$s = -.18 and -.27, $t < 1$, ns). Thus, the results on these subjective creativity measures suggest that people use their mood as information in (subjective) judgments of their own creativity (cf. Martin & Stoner, 1996).4

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4 Even if the production and subjective assessment of creative responses arise from different mechanisms, the two should still be related. It seems likely that participants who generate objectively creative responses would, quite accurately, assess their responses as more creative. To investigate this issue, we conducted an analysis of covariance on the subjective creativity measure, using the objective creativity index as a covariate. The results of this analysis indicated that objective creativity

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Thus, it appears that the answer to the question of what mechanism produces mood effects on creativity depends on what measure of creativity is considered. The production of creative responses (i.e., as rated by the judges) did not show an effect of cue, indicating that it does not arise from a mood-as-information mechanism; instead, these results are consistent with the hedonic contingency and affective priming views. Subjective assessments of creativity, on the other hand, did show an effect of cue, consistent with the mood-as-information view.

Intrinsic Interest

In our earlier work (Hirt et al., 1996), we found that pretask interest was enhanced by happy mood, but that posttask interest was a function of both mood and stop rule. Namely, happy participants’ interest in the task they had just performed was enhanced by an enjoy stop rule, but decreased by a time-to-stop rule. Thus, we expected to replicate this pattern of results in the no cue condition. However, given the effects of the cue manipulation on quantitative task performance, we expected that the cue might undermine these effects of mood and stop rule on task interest as well.

An ANOVA on the posttask interest measure revealed a main effect of mood, $F(1, 104) = 8.27, p < .01$. Overall, happy participants ($M = 23.8$) found the task more interesting than sad participants ($M = 20.5$). We also found significant Mood $\times$ Cue, $F(1, 104) = 4.07, p < .05$, and Mood $\times$ Stop Rule $\times$ Cue interactions, $F(1, 104) = 4.15, p < .05$. Figure 3 presents these data. Simple effects analyses revealed that both the mood main effect ($F(1, 51) = 15.88, p < .001$) and the predicted Mood $\times$ Stop Rule interaction ($F(1, 51) = 6.55, p < .05$) were obtained in the no cue conditions, but not in the cue conditions, both $F$s $< 1$, ns. The results suggest that posttask interest is at least a partial function of participants using their moods as information. 5

significant predicted both the global and the individual measures of subjective creativity (both $F$s $> 20, ps < .001$), and the addition of this covariate eliminated the mood main effects observed on both. Despite the inclusion of the covariate, however, the Mood $\times$ Cue interactions remained significant, both $F$s $> 6.0, ps < .02$. Thus, positive mood may enhance creativity relative to negative mood, and this, in turn, may lead participants to see themselves as more creative. In addition, however, the participants’ moods seem to add to (in the case of happy mood) or subtract from (in the case of sad mood) their assessments of their own creativity.

5 As in Hirt et al. (1996), we also examined participants’ responses to the posttask questions regarding the amount of effort they put into the task, their estimated performance, and their satisfaction with their performance. On the self-reported effort measure, we obtained only a main effect of stop rule, $F(1, 104) = 3.88, p = .05$. Participants given the time-to-stop rule reported expending greater effort ($M = 4.25$) than did participants given the enjoy rule ($M = 3.74$).

For the estimated performance measure, we obtained main effects for both mood ($F(1, 104) = 4.37, p < .05$) and stop rule ($F(1, 104) = 6.28, p < .05$). As in Hirt et al. (1996), happy participants estimated their performance to be greater than did sad participants. In addition, participants given the time-to-stop rule estimated their performance as better than did participants given the enjoy rule. However, we also obtained a Mood $\times$ Cue interaction, $F(1, 104) = 4.56, p < .05$. This interaction revealed that mood affected participants’ estimates of task performance in the no cue condition ($t = 3.37, p = .001$), but not in the cue condition ($t = -.08, ns$).
The Mediating Role of Performance on Task Interest

However, given that the posttask interest measure followed participants’ performance of the task, it is quite possible that these differences in task interest are mediated by differences in task performance. Indeed, Hirt et al. (1996) examined the mood → performance → interest causal path using regression-based path models. These analyses revealed that the creativity of participants’ task performance (rather than the number of responses generated) mediated the link between mood and subsequent task interest: namely, it was those who were more creative who tended to find the task more fun and interesting. Yet in the Hirt et al. study, only objective measures of creativity were assessed. Thus, it remains an empirical question whether objective measures of creativity will predict task interest to a greater extent than subjective perceptions of the creativity of one’s performance. Because the present experiment included both objective and subjective measures of creativity, we were able to examine this issue.

In order to do this, we constructed regression-based path models of the data, following the guidelines set by Judd and Kenny (1981a, 1981b). These authors

A similar pattern was obtained on the satisfaction with performance measure. Again, we found a main effect of mood (F(1, 104) = 4.06, p < .05) and a Mood × Cue interaction (F(1, 104) = 6.26, p < .05). Happy participants were more satisfied with their performance than were sad participants, but this pattern held true only in the no cue condition (t = 3.80, p < .001). Thus, it appears that participants’ estimates and satisfaction with their own task performance were subject to the same misattribution effects as were perceptions of task interest, results entirely consistent with the mood-as-input model.

FIG. 3. Mean posttask interest as a function of Mood, Stop Rule, and Cue condition. Note. Higher numbers indicate greater task interest. The scale ranged from 5 to 35.
proposed that data are congruent with a mediational model when (a) the independent variables significantly predict the final outcome measure, (b) these variables also predict the hypothesized mediating variable, and (c) the mediator significantly predicts the outcome measure when the independent variables are controlled. In these regressions, we trimmed interaction terms not significant in any of the models from all three. In any one analysis, however, we retained nonsignificant interactions if they proved significant in another regression (Judd & Kenny, 1981a).

Our regression models included three independent variables (mood, stop rule, and cue) as well as the three two-way interaction terms and the three-way interaction term involving the three independent variables. Thus, seven terms were included in the basic independent variables model. We first regressed the posttask interest measure on our basic independent variables model. The overall model was significant, $F(7, 110) = 2.58, p < .001$ ($R^2 = .14$). In this model, the only significant terms were the mood main effect, $t = 2.99, p < .01$ ($\beta = .26$), the Mood $\times$ Stop Rule interaction, $t = 1.90, p = .06$ ($\beta = .17$), and the three way (Mood $\times$ Stop Rule $\times$ Cue) interaction, $t = 1.98, p < .05$ ($\beta = .18$).

We next performed a set of regressions on each of the hypothesized mediating variables (number generated, objective creativity, both measures of subjective creativity). Consistent with the ANOVA results, the independent variables model significantly predicted the number generated, $F(7, 113) = 2.57, p < .05$ ($R^2 = .14$). In this model, the Mood $\times$ Cue ($t = 2.40, p < .05, \beta = .21$) and Mood $\times$ Stop Rule $\times$ Cue interaction terms ($t = 2.47, p < .05, \beta = .22$) were the only individually significant terms. The independent variables model significantly predicted both indices of subjective creativity as well. For the measure of overall creativity ($F(7, 113) = 2.37, p < .05, R^2 = .13$), the mood main effect ($t = 2.34, p < .05, \beta = .21$) and the Mood $\times$ Stop Rule interaction terms ($t = 2.51, p < .05, \beta = .22$) were individually significant. For the measure derived from individual items ($F(7, 110) = 3.62, p < .01, R^2 = .19$), the mood main effect ($t = 2.05, p < .05, \beta = .18$), cue main effect ($t = 3.14, p < .01, \beta = .27$), and Mood $\times$ Stop Rule interaction terms ($t = 2.31, p < .05, \beta = .20$) were individually significant. However, the objective creativity measure was not significantly predicted by the independent variables model, $F(7, 112) = 0.79$, ns ($R^2 = .05$). Thus, in the present study, objective creativity is clearly not serving as a mediator in the mood-interest relationship.

We then performed a final analysis to examine the mediating role of these performance measures on posttask interest. Given that both number generated and subjective creativity could serve as potential mediators of posttask interest, we entertained several possible models. In one, the two hypothesized mediators act independently to influence task interest; we tested this model by entering both mediators simultaneously into the regression equation. Alternatively, we hypothesized a sequential model whereby the effects of number generated on task interest are mediated through subjective perceptions of creativity; thus, we tested a sequential model in which mood $\rightarrow$ number generated $\rightarrow$ subjective creativity $\rightarrow$
task interest. These analyses provided support for the hypothesized sequential model; thus, we present only these analyses below.

To test the hypothesized sequential model, we next tested whether number generated mediated the effects of the independent variables on the global measure of subjective creativity. Judd and Kenny (1981a) identified two ways that an intervening variable can mediate the effects of independent variables on outcome variables: simple or interactional. When mediation is simple, the relation between mediator and outcome is the same across experimental conditions. When mediation is interactional, the independent variables and the mediator interact in affecting the outcome, and the relation between mediator and outcome varies across experimental conditions.

The mediational model was tested by adding the main effect of the hypothesized mediator (number generated), and seven interaction terms between the mediator and the independent variable terms (i.e., Number × Mood, Number × Cue, Number × Stop Rule, the three three-way interactions, and the four-way interaction term). None of these additional interaction terms proved significant in this model, indicating simple mediation. Thus, the final trimmed model consisted of only eight terms, including the seven terms from the independent variables model and the main effect of number generated. The final mediational model accounted for significantly more variance ($R^2 = .19$) in subjective creativity than did the independent variables model ($R^2 = .13$), $R^2 \Delta = .06$, $F(1, 112) = 7.87, p < .01$. In this model ($F(8, 112) = 3.18, p < .01$), the main effect of number was highly significant, $t = 2.81, p < .01$ ($\beta = .26$), showing that number generated was positively related to subjective perception of creativity with the independent variables controlled. However, both the main effect of mood ($t = 2.38, p < .05, \beta = .20$) and the Mood × Cue interaction terms ($t = 2.19, p < .05, \beta = .19$) remained significant, indicating that number generated partially mediated the effects of these variables on subjective creativity.

The final step in testing the hypothesized mediational model was first to regress posttask interest on the full (15-term) mediational model used above. The trimmed model consisted of 9 terms, including the 7 terms from the independent variables model, the main effect of number generated, and the Number × Cue interaction. This model accounted for significantly more variance ($R^2 = .32$) than did the independent variables model ($R^2 = .14$), $R^2 \Delta = .18$, $F(2, 108) = 14.62, p < .001$. In this model, the main effect of number generated was significant, $t = 4.81, p < .001$ ($\beta = .41$). However, this main effect was qualified by a Number × Cue interaction, $t = -2.88, p < .01$ ($\beta = -.24$), supporting an interactional mediational model. This effect indicates that number generated predicted posttask interest more strongly in the cue condition ($\beta = .65$) than in the no cue condition ($\beta = .17$). In addition, although the main effect of mood remained significant ($t = 3.72, p < .001, \beta = .30$), the addition of these variables reduced the Mood × Cue and Mood × Cue × Stop Rule interactions to nonsignificance ($\beta$s = .12 and .13, respectively, $ts < 1.6, ns$).
As a final step, we added the main effect for the mediator (subjective creativity) and all interactions between the mediator and the other terms. In this final model, none of the additional interaction terms was significant. Thus, the final trimmed model consisted of 10 terms, the 7 terms from the independent variables model, the main effects of number generated and subjective creativity, and the Number × Cue interaction. This model accounted for significantly greater amount of variance in posttask interest ($R^2 = .43$, $R^2_D = .10$, $F = 18.94$, $p < .001$). In this model, the main effect of subjective creativity was significant, $t = 4.35$, $p < .001$ ($\beta = .36$), indicating that subjective creativity led to greater posttask interest. The main effects of mood ($t = 2.85$, $p < .01$, $\beta = .22$) and number generated remained significant ($t = 3.90$, $p < .001$, $\beta = .32$), although both were reduced in magnitude (by .08 and .09, respectively). The Number × Cue interaction was also significant ($t = 2.49$, $p < .05$, $\beta = .20$). Thus, it appears that subjective creativity

![Diagram](image)

**Fig. 4.** Final mediational models predicting posttask interest for each of the Cue × Stop Rule conditions: (a) No Cue/Enjoy Stop Rule Condition; (b) No Cue/Time to Stop Rule Condition; (c) Cue/Enjoy Stop Rule Condition; (d) Cue/Time to Stop Rule Condition. Solid lines reflect significant paths; dashed lines reflect nonsignificant paths.
is partially mediating the effects of both mood and number generated on posttask interest.

Taken together, these analyses support a sequential model in which mood → number generated → subjective creativity → posttask interest. However, the observed interactions as a function of mood and stop rule indicate that the nature of these relationships varies across experimental conditions. Figure 4 illustrates the results of these path analyses for each of the four cue × stop rule conditions. These diagrams illustrate that within the no cue conditions, the entire sequential model is observed: Mood significantly influences number generated, which in turn leads to greater subjective perceptions of creativity, which leads to greater subsequent interest. However, in the cue conditions, mood no longer significantly contributes to the prediction of posttask interest. It appears that when participants were cued to discount their mood as a basis for judging task interest, they primarily used quantitative performance (number generated) to make this judgment: Participants who came up with more responses judged themselves as more interested in the task than those who generated fewer responses. Although
perceptions of subjective creativity continued to mediate some of the effects of number generated on posttask interest, number generated continued to exert a strong direct influence on subsequent interest.

**DISCUSSION**

The primary goal of the present study was to test a single- versus multiple-process account for the effects of mood on quantitative and qualitative measures of performance. Based on their results, Hirt et al. (1996) argued that mood effects on quantitative measures of performance (time spent, number generated) and mood effects on creativity appear to derive from different processes. Alternatively, Martin and Stoner (1996) argue that a single, mood-as-information process can account for mood effects on both quantitative and qualitative measures of task performance. In the present research, we used a cue manipulation, similar to that used in other studies (e.g., Schwarz & Clore, 1983; Sinclair et al., 1994), to test the single-process account. Based on Martin et al.’s (1993) mood-as-input formulation, we expected that the cue manipulation would successfully eliminate any mood effects on the quantitative measures of performance. Indeed, our results supported this hypothesis. For participants who were unaware of the true source of their moods, the Mood × Stop Rule interaction pattern obtained in earlier research (Hirt et al., 1996; Martin et al., 1993; Sanna et al., 1996) was replicated. However, for participants who were made aware that the true source of their moods were the film clips they had watched, this Mood × Stop Rule interaction was completely absent; time on task and number generated were approximately the same regardless of condition. These results support Martin et al.’s contention that mood must be interpreted as relevant to the task to influence task motivation (cf. Schwarz & Clore, 1983).

Whereas we fully expected a single-process, mood-as-information model to account for the effects of mood on quantitative measures, we were considerably less certain of the outcome for qualitative aspects of performance. The results on the objective measure of creativity support Hirt et al.’s multiple mechanisms account. Happy participants generated more creative responses than sad participants in both cue and no cue conditions, evidence contrary to a mood-as-information account. These results suggest that the effect of mood on creativity occurs through a different process than does the effect of mood on quantitative measures of task performance. Indeed, the notion that multiple processes may be operating simultaneously has been explicitly incorporated into some recent models of mood effects (Forgas, 1992, 1995; Sinclair & Mark, 1992).

The Effects of Mood on Objective Creativity

By what mechanism, then, is mood affecting objective creativity? In the introduction, we discussed three accounts for the effects of mood on creativity and suggested that the introduction of the cue manipulation might allow us to differentiate among these different views. The fact that the cue manipulation did not alter the effects of mood on objective creativity argues against the mood-as-
information view and is consistent with either mood management or affective priming views. Thus, it seems that independent of the source of one’s mood, simply being in a positive or happy affective state led participants to generate more creative responses to the experimental task.

Thus, the present research suggests that the enhanced creativity of people in happy moods is either the result of mood management efforts, the result of the cognitive material primed by the mood state, or some combination of the two. However, more direct evidence in support of this argument would be obtained by manipulating the hedonic qualities of the task. Wegener and Petty’s (1994, 1996) hedonic contingency model argues that happy participants scrutinize the hedonic consequences of their actions more carefully when making choices of activities than do sad subjects. As a result, happy participants are more likely to manage their moods by choosing not to perform tasks that they believe would be detrimental to their mood (cf. Isen & Simmonds, 1978). Thus, the hedonic contingency view might suggest that happy participants might disengage from a negatively valenced task (cf. Kraiger, Billings, & Isen, 1989) and fail to display greater creativity of responding when performing an unpleasant or mood-threatening task. Consistent with that view, Isen et al. (1985) have found that happy participants came up with more unusual and creative first-associates to both positively valenced and neutral but not negatively valenced words. We are currently investigating these questions in our lab.

Objective versus Subjective Creativity

We have been arguing that the obtained pattern of findings supports a multiple mechanisms account for the effects of mood on quantitative and qualitative performance. Then how can we account for the results obtained by Martin and Stoner (1994), in which mood effects on creativity varied as a function of stop rule? We would argue that their research is dealing with subjective perceptions of creativity rather than objective creativity. Specifically, participants in their research were asked whether they were satisfied with their initial responses or whether they could come up with a better one. We might expect that subjective perceptions of one’s own creativity, like other subjective judgments (e.g., judgments of life satisfaction or task interest), would follow a mood-as-information process.

To examine this question, we included measures of subjective creativity. The results obtained on these measures indicated that mood influences on subjective perceptions of creativity derive from a mood-as-information process: Happy participants perceived their responses as more creative than sad participants in the no cue but not in the cue conditions. Thus, the present research provides support for the Martin and Stoner (1996) position as well: Mood effects on both subjective perceptions of creativity and quantitative measures of performance follow from a single, mood-as-information process. This finding highlights the importance of
distinguishing between subjective and objective measures of creativity and suggests the need to be careful about making global statements about the effects of mood on creativity.

**Subjective Creativity and the Mood-Performance-Interest Link**

Much of the past work examining mood effects on creativity (e.g., Isen et al., 1985) has compared responses to some objective standard. Indeed, it is objective changes in the quality of one’s output and responses that we tend to use as an index of creativity. Few studies (Martin & Stoner, 1994) have examined subjective perceptions of one’s creativity. Thus, one might wonder how important subjective perceptions in creativity are relative to objective changes in the quality of one’s output. The present research makes a compelling case that changes in subjective perceptions of creativity (over and above any objective differences in creativity) are critical to task motivation and interest.

Recall that Hirt et al. (1996) found that the objective creativity of participants’ performance partially mediated the effects of mood on subsequent task interest. However, the mechanism underlying this mood → creativity → interest link was not clear. We hypothesized that it may be that participants’ subjective perceptions of the enhanced creativity (i.e., quality) of their own performance led them to become more interested in the task. To test this hypothesis, the present study included both objective and subjective measures of creativity. Path-based regression analyses revealed evidence for a sequential model in which mood → number generated → subjective creativity → posttask interest. However, consistent with a mood-as-information account, the precise nature of this mediational process varied as function of cue condition. In the no cue conditions, we obtained support for the entire mediational sequence. Importantly, in these conditions, the effects of quantitative performance (number generated) on posttask interest were fully mediated by changes in subjective creativity. Thus, in the no cue conditions, it appears that the perception that one has generated creative, qualitatively better responses mediates participants’ posttask interest. On the other hand, in the cue conditions, the effects of mood were effectively eliminated by the source cue. Although subjective perceptions of creativity continued to mediate posttask interest in these conditions, task interest in these conditions was most strongly predicted by the number of items generated. Thus, it appears that when participants were cued to discount their mood as a basis for judging their task interest, participants instead relied on their quantitative performance to make this judgment: Participants who came up with more responses judged themselves more interested in the task than did those who generated fewer responses.

These results support a great deal of research in the intrinsic motivation literature (see Sansone & Harackiewicz, 1996, for a review) documenting the importance of subjects’ “phenomenal experience” as they perform a task in maintaining and enhancing intrinsic interest. Several studies (Elliot & Harackiewicz, 1996; Sansone, Sachau, & Weir, 1989) have found that being more involved and engaged in a task (as measured through a variety of affective and
cognitive measures) promoted continued interest. Clearly, a number of factors can contribute to task involvement, such as attainment of performance goals, strong desire to achieve competence, or competition from a worthy opponent. The present research emphasizes the importance of subjective perceptions of the quality of one’s task performance—namely, the perception of having generated creative solutions—in producing feelings of task involvement and engagement.

The present research also serves to illustrate the complex relationships among affective state, task performance, and task interest. Past research has demonstrated links between mood and interest (cf. Pretty and Seligman, 1984) and creativity and interest (cf. Amabile, 1983), but the nature of these links has not been established. The present model extends that work by deriving and testing a process model by which mood affects various aspects of task performance which in turn affect subsequent task interest. Our work demonstrates the critical role of one’s initial affective state in affecting task motivation, involvement, and subjective experience. However, what our model does not reflect is the often reciprocal relationships that exist among these same variables. For example, what if our phenomenal experience while working on a task is neutral or unpleasant? Recent research by Sansone, Weir, Harpster, and Morgan (1992) has illustrated how participants might actively engage in behaviors designed to change their phenomenal experience. This self-regulation of phenomenal experience to maintain or enhance task interest suggests a more dynamic model in which affect, motivation, and interest are operating in a more fluid manner than we have characterized them here. We hope the present work motivates future research efforts along these lines.

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@xyserv3/disk3/CLS_jml/GRP_jesp/JOB_jesp97ps/DIV_320z05 jant


