Mood as Input: People Have to Interpret the Motivational Implications of Their Moods

Leonard L. Martin, David W. Ward, John W. Achee, and Robert S. Wyer, Jr.

It was hypothesized that moods have few, if any, motivational or processing implications, but are input to other processes that determine their motivational implications. In Experiment 1, Ss read a series of behaviors in forming an impression. When told to read the behaviors until they felt they had enough information, those in positive moods (PMs) stopped sooner than did those in negative moods (NMs). When told to stop when they no longer enjoyed reading the behaviors, NMs stopped sooner than PMs. In Experiment 2, Ss generated a list of birds from memory. When told to stop when either they thought it was a good time to stop or they simply felt like stopping, PMs stopped sooner than NMs. When told to stop when they no longer enjoyed the task, NMs stopped sooner than PMs. The findings extend work by others (e.g., D. M. Mackie & Worth, 1991; N. Murray, Surjan, Hirt, & Surjan, 1990; N. Schwarz & Bless, 1991; R. C. Sinclair & Mark, 1992).

Have you ever had to do something, but simply not felt like doing it? Perhaps you were just not in the mood. In two experiments, we explored the processes by which people's moods motivate their behavior and their cognitive processing.

Moods and Processing

Most of the recent work on the motivating effects of moods has been centered on the role of moods in determining the kind of cognitive processing in which people engage (for a review, see Sinclair & Mark, 1992). Bless, Bohner, Schwarz, and Strack (1990), for example, presented subjects who were in either positive or negative moods with either strong or weak persuasive messages. They found that subjects in positive moods were equally persuaded by the weak as by the strong messages, whereas subjects in negative moods were persuaded more by the strong than the weak messages. Bless et al. took these results as evidence that people in positive moods process information heuristically, whereas people in negative moods process information systematically. Conceptually related results have been obtained by others (e.g., Mackie & Worth, 1989; Murray, Surjan, Hirt, & Surjan, 1990; Sinclair & Mark, 1992).

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Several explanations of these kinds of effects have been forwarded. Bless et al. (1990; Schwarz & Bless, 1991) argued that people try to eliminate negative moods and the situations that brought them about, but try to maintain positive moods and the situations that brought them about (Clark & Isen, 1982). Success in an avoidance situation entails the avoidance of all possible links to the undesired outcome, whereas success in an approach situation can result from obtaining even one path to the desired outcome. This means that success in an avoidance situation may necessitate a more elaborate processing style than may success in an approach situation. Consequently, when people are in negative moods (i.e., an avoidance situation), they may habitually adopt a more analytic processing style than when they are in positive moods (i.e., an approach situation).

According to Mackie and Worth (1991), being in a positive mood causes people to bring more information to mind than does being in a negative mood (cf. Isen, Daubman, & Nowicki, 1987; Isen, Johnson, Mertz, & Robinson, 1985). In this crowded cognitive environment, people may attend to many different aspects of the material active in working memory, thus broadening and diffusing their attentional focus. One implication of this diffuse attention is that people in positive moods may process information less efficiently than may people in negative moods.

Note that each of the explanations just described (see also Fiedler, 1988; Murray et al., 1990; Sinclair & Mark, 1992) are based on the assumption that specific moods are associated with specific kinds of processing. We are told that being in a positive mood causes shallow processing (Bless et al., 1990; Fiedler, 1988), diffuses attention (Mackie & Worth, 1989), causes broader categorization (Sinclair & Mark, 1992), or causes people to become more cognitively flexible (Murray et al., 1990). Being in a negative mood, on the other hand, causes deeper processing, does not diffuse attention, causes narrower

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categorization, or causes people to become less cognitively flexible.

In two experiments, we tested a view of the motivational effects of moods that differs from the views just discussed. We do not believe that moods have stable motivational implications. Rather, moods have different implications depending on people's interpretations of their moods. The interpretations we are talking about here are not the kind that involve the labeling of a diffuse arousal state (Schachter & Singer, 1962). Rather, what we are suggesting is that even when people's feelings are clear, people still need to know what it means to be having those feelings. Thus, the process we are proposing is more analogous to the process assumed to occur in the dissonance paradigm with regard to negative affect.

It has been shown (e.g., Zanna & Cooper, 1974) that it is not the negative affect per se that causes attitude change; rather, it is people's interpretations of the affect. When people interpret the affect that arises from their counterattitudinal behavior as their response to a pill, for example, they do not change their attitudes. In the same way, we are arguing that it is not people's mood per se that causes them to engage in different types of processing; rather, it is people's interpretations of their moods. With different interpretations, the same mood can have different motivational effects. Of course, Schwarz and Clore (1983) have shown that attributions can make people perceive their moods as more or less relevant to their evaluations. We are arguing, however, that interpretations can determine the motivational implications of moods even when perceived relevance is held constant.

Stop Rules and the Interpretation of Moods

There are two general classes of rules that tell people when they have attained their goal: objective and subjective. People may stop eating a meal, for example, when their plates are empty or they may stop when they feel full. Similarly, people may stop watching a movie when the movie is over or they may stop when they feel bored.

With some tasks, however, there are no clear objective stop rules. When people are forming an impression, for example, or responding to a persuasive communication, how do they know when they have processed sufficiently? The answer is they do not. They stop when it feels right. As Chaiken, Liberman, and Eagly (1989) suggested, people stop processing when they have attained "a sufficient degree of confidence that they have accomplished their processing goals" (p. 221). If they feel confident with shallow processing, then they stop there. If shallow processing leaves them nonconfident, however, then they move on to systematic processing. But, what determines confidence?

There is evidence that attainment of a goal or approach to a goal is associated with positive affect, whereas nonattainment or lack of approach is associated with negative affect (Carver & Scheier, 1990; Hsee & Abelson, 1991). Interestingly, the converse relation may also hold. That is, people in positive moods may be more likely than those in negative moods to judge that they have attained or made progress toward their goals (Heady & Veenhoven, 1989; Johnson & Tversky, 1983; Kavanagh & Bower, 1985). This latter finding suggests that people may interpret their positive affect as a sign that they have attained or made progress toward their goals and may interpret their negative affect as a sign that they have not attained or made progress toward their goals (Frijda, 1988; Schwarz & Bless, 1991). To the extent that this is true, people in positive moods should be more likely than those in negative moods to cease their current goal-directed behavior (Carver & Scheier, 1990).

This finding makes sense if one assumes that in the course of performing a task, people (either implicitly or explicitly) ask themselves a question such as "Have I reached my goal?" If so, then those in positive moods would answer with a yes, whereas those in negative moods would answer with a no. In other words, people may evaluate their decisions to stop striving toward a goal more favorably when they are in positive, as compared with negative, moods. Under these conditions, people in positive moods would appear to process information less systematically than would people in negative moods.

Suppose, however, that in the course of performing a task, people ask themselves a different question. Suppose they ask (either implicitly or explicitly), "Am I enjoying this task?" Again, people in positive moods would answer with a yes, whereas people in negative moods would answer with a no. This time, though, the motivational implications of these answers are different. If people take their positive moods as evidence that they are enjoying a task and their negative moods as evidence that they are not enjoying a task, then people in positive moods would persist longer than would people in negative moods, assuming people continue doing what they enjoy (Murray et al., 1990). Under these conditions, people in positive moods would appear to process information more systematically than would people in negative moods.

In sum, if people's interpretations of their moods change the motivational implications of those moods, then either positive or negative moods may be able to cause people to continue or cease processing. We tested this general hypothesis in two experiments.

Experiment 1

In Experiment 1, we placed subjects in positive or negative moods and then presented them with a stack of cards. On each card was a single behavior that a target person had ostensibly performed. The subjects' task was to read the behaviors and form an impression of the target person. Half of the subjects were told to read the behaviors until they felt they had enough information on which to base their impression. Half were told to read the behaviors until they no longer enjoyed reading them.

If the motivational implications of people's mood depend on the stop rule in effect, then when subjects are asked to stop when they have enough information, those in positive moods should stop sooner than those in negative moods, whereas when subjects are asked to stop when they no longer enjoy the task, those in negative moods should stop sooner than should those in positive moods.

Method

Subjects and design. Fifty-one men and women from introductory psychology classes at the University of Georgia participated in this

study. They were given partial course credit for their participation. They were randomly assigned to one of four between-groups conditions created by the factorial combination of valence of mood (negative vs. positive) and stop rule (*stop when you have enough information* vs. *stop when you no longer enjoy the task*).

Stimulus materials. To induce the appropriate moods, we had subjects watch clips from three films. In both the positive and the negative conditions, the first clip subjects watched was a car-chase scene from the movie *Bullit*. Although high in excitement, this clip was relatively neutral in valence for most subjects. It was included primarily to draw the subjects' attention away from the overall emotional tone of the film clips and thus lessen the chances that the subjects would guess that the film clips were designed to influence their moods. It was also possible that the excitement level of the clip would increase the subjects' arousal and thus strengthen the effect of the mood manipulations.

After watching the car-chase scene, subjects in the positive condition watched humorous clips from *Splash* and *Stripes*, whereas subjects in the negative condition watched sad clips from *Galipoli* and *Sophie's Choice*. Together, the clips in both conditions were about 20 min in length.

The behaviors for the impression-formation task were taken from previous person-memory experiments (e.g., Hamilton, Driscoll, & Worth, 1989; Wyer & Martin, 1986). Some were positive, some were negative, and some were neutral. The first three behaviors, for example, were (a) locked himself out of his own house, (b) watched the neighbors' kids while their mother ran an errand, and (c) graduated valedictorian of his college class.

There were 69 behaviors altogether, each printed on a 3 × 5 index card (male characters were used for all the behaviors). The cards were placed in a stack in the same mixed order for all subjects.

Procedure. Subjects reported to the experiment in groups of 2 to 4. They were assigned to private booths so that they could work independently. They were told that the experiment was about rating movies, but that they would also be performing a number of other, unrelated tasks. They were told that the full reason for performing the different tasks would be explained to them at the end of the experiment.

As the first task, subjects were asked to complete the Need for Cognition Inventory (Cacioppo, Petty, & Kao, 1984). This inventory measures the extent to which people engage in and enjoy effortful cognitive processing. The subjects were told that the inventory measured aspects of their personality and that this was being done so that the experimenter could examine the relationship between people's enjoyment of movies and various personality traits.

After subjects completed the Need for Cognition Inventory, they were shown the film clips. All subjects in a given experimental session saw either the humorous clips or the sad clips. Between each clip, we asked them to fill out a questionnaire labeled *Pilot Movie Ratings*. The questionnaire asked routine questions about the film clip, such as whether the subjects had seen the movie from which the clip was taken, if they knew the movie's title, if anything in particular stood out in the film clip, and if they thought someone could tell what the movie was about solely on the basis of the clip they saw.

After the subjects viewed and rated the last film clip, they were asked to rate their moods. They did this by indicating the extent to which a series of positive and negative adjectives reflected their current feelings (Watson, 1988). The ratings were made on 5-point scales from *not at all* to *very much*. The positive adjectives were *happy, satisfied, gloomy, pleased, delighted, content,* and *glad*. The negative adjectives were *annoyed, depressed, miserable, sad,* and *frustrated*.

After subjects completed their mood ratings, they performed a 1-min distractor task. They were told that the experimenter was interested in the way in which people represent information about their environment. To test for this (ostensibly), the experimenter asked subjects to draw a map of their college campus. The actual purpose of this task was to put some time between the subjects' mood ratings and their performance of the impression-formation task. Pilot studies indicated that subjects discounted their moods as the basis for their behavioral decisions if they rated their moods immediately before proceeding to the impression-formation task (see also Berkowitz & Trocolli, 1990).

After subjects had drawn the map for 1 min, they were told that the experimenter was also interested in the way people form impressions of other people. The experimenter then placed face down on each subject's desk the stack of cards on which the behaviors were printed and gave the subjects one of two sets of instructions. The instruction sheets were handed out in a counterbalanced order, and the experimenter was blind to which subjects received which instructional set.

Before the subjects read the instructions, the experimenter gave some general instructions on how to perform the behavior reading task. The subjects were told to read one card at a time and to not turn back to cards that they had already read. They were told to form two piles on their desk: one from which they were reading and one for cards that they had already read. The subjects were also instructed that when they had finished reading as many of the cards as they wanted, they were to indicate their impression of the target person. They were told to take down the sheet of rating scales that had been placed on the shelf above their desks. After subjects heard this general information, they were asked to read the specific instructions that had been passed out to them.

Subjects in the sufficient information condition were told "as you read each card, ask yourself 'Can I make up my mind about Bob on the basis of the information I have read so far?' If the answer is 'yes,' then stop. If the answer is 'no,' then continue reading the behaviors. There is no right or wrong time to stop. Stop when you feel you have enough information." Subjects in the enjoy condition were told "as you read each card, ask yourself 'Do I feel like continuing with this task?' As long as the answer is 'yes,' then continue reading the behaviors. When the answer becomes 'no,' then stop. There is no right or wrong time to stop. Read the behaviors until you no longer enjoy it. We are interested in people's enjoyment of different tasks."

After all of the subjects had read their instructions, they were told to begin reading the behaviors. At this time, the experimenter discreetly started a timing program on a nearby personal computer. Then, as each subject reached for the rating sheet to indicate his or her impression, the experimenter recorded the time. Thus, the amount of time each subject spent looking at the cards served as one measure of processing effort. When all of the subjects had finished with the impression-formation task, they were debriefed, thanked, and excused. When the subjects left the experiment, the experimenter counted the number of cards the subjects had read, and this served as a second measure of processing effort.

Results

Preliminary analyses. Before we debriefed our subjects, we asked them to speculate on the nature of the experiment. Most of the subjects were reluctant to do so, apparently not knowing what the experiment was about. Of those who did guess, not one guessed the hypothesis correctly, and not one made any reference to the instructions they had been given for the impression-formation task. A few subjects suggested that the experimenter was interested in seeing how watching movies influenced people's moods. But, even these subjects did not draw a connection between their moods and their performance of the impression-formation task. Therefore, we feel confident

that our results are not due to the subjects' compliance with demand characteristics.

We also had to establish that our mood manipulation was successful. We did this by reverse scoring the subjects' self-ratings on the negative-mood adjectives and averaging these with their ratings on the positive-mood adjectives. Then, we submitted these scores to a 2 (positive vs. negative mood) × 2 (sufficient information vs. enjoy) analysis of variance (ANOVA). This analysis yielded only a main effect for mood, $F(1, 47) = 49.23$, $p < .001$. Subjects seeing the funny movies reported feeling significantly more positive ($M = 3.91$) than did subjects seeing the sad movies ($M = 2.64$). Thus, our manipulation of mood was highly successful.

Test of main hypotheses. If the motivational implications of people's moods depend on the stop rule in effect, then when subjects are asked to stop when they have enough information, those in positive moods should stop sooner than those in negative moods. When subjects are asked to stop when they no longer enjoy the task, those in negative moods should stop sooner than those in positive moods. As can be seen in Figure 1, this is precisely what happened.

A 2 (positive vs. negative mood) × 2 (sufficient information vs. enjoy) ANOVA on the amount of time subjects spent on the task revealed the predicted interaction between mood and stop rule, $F(1, 47) = 9.46$, $p < .003$. When given the sufficient information stop rule, subjects in negative moods persisted longer than did those in positive moods (191.70 s vs. 149.63 s, respectively). When given the enjoy stop rule, subjects in positive moods persisted longer than did those in negative moods (206.82 s vs. 133.39 s, respectively). Both of these pairwise comparisons were significant in planned contrasts ($p < .05$).

A similar pattern was observed when we analyzed the number of cards the subjects read (see Figure 2). Subjects in positive moods took less cards than did subjects in negative moods when they were given the sufficient information stop rule (24.08 vs. 43.46, respectively), but subjects in positive moods

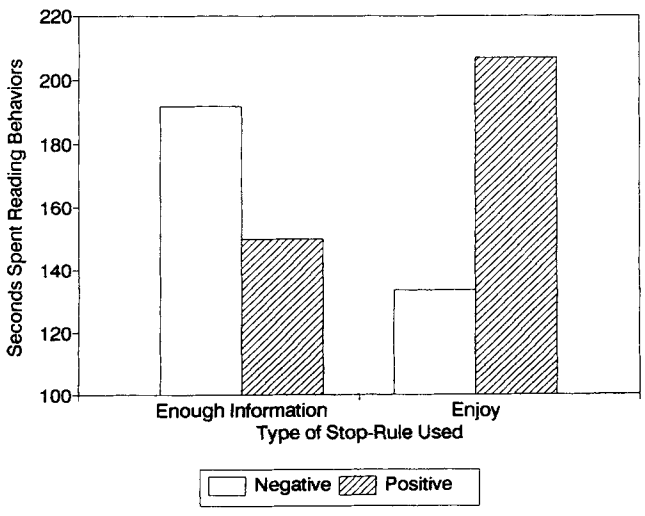

Figure 1. Time spent reading behaviors as a function of mood and stop rule.

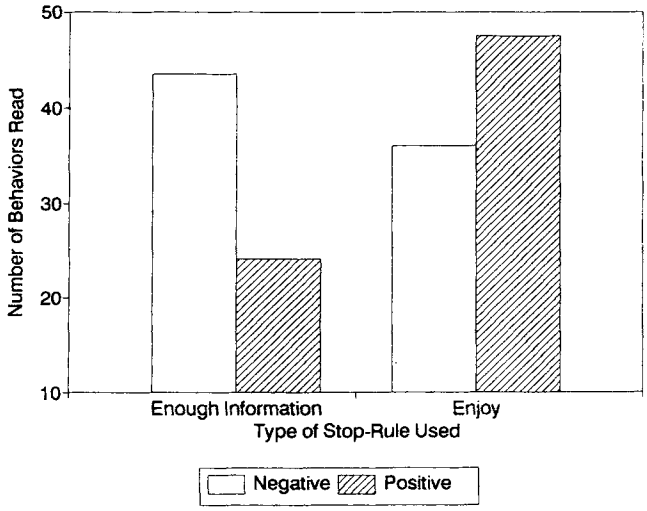

Figure 2. Number of behaviors read as a function of mood and stop rule.

took more cards than did those in negative moods when given the enjoy stop rule (47.36 vs. 35.92, respectively). This was supported by an interaction between mood valence and stop rule, $F(1, 47) = 16.66$, $p < .001$. And, again, the pairwise comparisons were significant in planned contrasts ($p < .05$). The analysis also yielded a main effect for stop rule, $F(1, 47) = 19.43$, $p < .001$. Subjects took more behaviors when given the enjoy stop rule than when given the sufficient information stop rule.

Role of need for cognition. Before our subjects underwent the experimental procedures, they were asked to complete the Need for Cognition Inventory. This was done mainly as a precautionary measure. In previous work (Martin & Harlow, 1990), we found that high-need-for-cognition subjects were less likely than those low in need for cognition to use their moods in processing. In this paradigm, however, need for cognition did not contribute to any significant results. We performed a median split on each subject's average score ($M = 6.15$, $SD = 1.01$, range 3.22 to 7.89 on 9-point scales) and entered high and low need for cognition as another factor in our analyses. There were no significant effects associated with need for cognition (all Fs < 1.5). Similar results were obtained when we tried a tertiary split. We also examined the within-cell correlations between need for cognition and each of our dependent measures. Again, there were no significant effects. In short, we obtained the same pattern of data for subjects who tend dispositionally to exert effort as for those who tend dispositionally to not exert effort.

Impression ratings. Subjects rated the target person in terms of his intelligence, adventurousness, friendliness, kindness, and likableness. Because these five ratings were highly correlated with one another (all ps $< .01$), they were averaged to yield a single impression rating. This rating was submitted to an analysis of covariance using stop rule and mood as the factors and number of behaviors read (or amount of time) as the covariate. The only effect to emerge was a marginal main effect for mood, $F(1, 46) = 1.92$, $p < .17$, when behavior was the covariate and $F(1, 46) = 2.75$, $p < .10$, when time was the covariate. Generally,

subjects formed more favorable impressions when in good moods than when in bad moods. There were no significant effects associated with stop rule (all Fs < 1.5).

We do not find this lack of an effect for stop rule surprising. Qualitative differences in judgments may be most likely to arise when there are qualitative differences in the kind of information to which subjects could attend. In the persuasion paradigm, for example, subjects can base their judgments on either peripheral cues (e.g., the number of arguments) or central cues (the quality of the arguments). If people feel confident after using heuristic processing, then their judgments reflect the impact of peripheral cues. If people do not feel confident with heuristic processing, then they move on to systematic processing, and their judgments reflect the impact of central cues. In this way, qualitative differences in judgments can arise from quantitative differences in processing effort (Chaiken et al., 1989).

Our impression task, however, did not include analogues to central and peripheral cues. All subjects were presented with the same set of mixed behaviors in the same order. So, no matter how much or how little effort subjects exerted in processing, they could not attend to qualitatively different kinds of information. They merely got more or less of the same. So, in our paradigm, differences in amount of processing cannot be reflected in qualitative differences in judgment, as they can in the persuasion paradigm.

Discussion

The results of Experiment 1 are consistent with the hypothesis that people's stop rules can determine the motivational implications of their moods. All subjects performed the same impression-formation task, and (within the positive and negative conditions) subjects were in equivalent moods. Yet, the amount of time subjects spent on the task and the number of behaviors they considered differed as a function of their stop rules and their moods.

If we had included only one stop rule in our experiment, then we might have concluded either that people in negative moods process more effortfully than do people in positive moods (sufficient information condition) or that people in positive moods process more effortfully than do people in negative moods (enjoy condition). A consideration of both rules, however, reveals that the motivational implications of moods are mutable.

Experiment 2

In Experiment 1, we explicitly gave our subjects a stop rule. We told them in no uncertain terms the question they were to ask themselves while forming their impression. We did this so that we would know for sure how subjects were interpreting their moods. This procedure left unexplored, however, what subjects' stop rule by default might be. What stop rule do subjects use when they are not explicitly given one? To answer this question, we included in Experiment 2 a condition in which subjects were told merely to "stop whenever you feel like stopping." This instruction allowed them to use any rule they wanted. For example, they could stop when they no longer enjoyed the task, when they thought they had done enough, or when they had reached the limits of their ability (e.g., they could recall no more).

Experiment 2 also differed from Experiment 1 by exploring the role of mood in memory-based, as opposed to stimulus-based, processing. In Experiment 1, subjects read different numbers of cards and spent different amounts of time reading these cards, depending on their moods and their stop rule. It is difficult to be sure with this task, however, whether the mood and stop rule influenced the subjects' processing of the information or only their overt card-turning behavior. So, in Experiment 2, we used a task that was a more direct reflection of cognitive activity but that still allowed us to assess whether subjects were stopping or continuing their processing.

In Experiment 2, we placed subjects in either positive or negative moods and asked them to generate a list of birds from memory. Subjects were told to stop generating the birds when they (a) thought it was a good time to stop, (b) no longer enjoyed the task, or (c) felt like stopping. The first two rules were considered the experimental conditions, whereas the third was considered the control, or default, condition.

With the "is this a good time to stop?" rule, subjects may make a tentative decision to stop and then evaluate that decision. Those in good moods will evaluate the decision more favorably than those in negative moods. Thus, subjects in positive moods should stop sooner and generate fewer birds than should subjects in negative moods. On the other hand, when subjects ask themselves "am I enjoying this task?" those in positive moods should judge themselves to be enjoying the task more than those in negative moods. So, with this stop rule, positive-mood subjects should stop later and generate more birds than should negative-mood subjects.

Without knowing the nature of the subjects' default stop rule, it is difficult to make a prediction for the control group (i.e., stop when you want). They might use an enjoy, a sufficient information, or an "I can't come up with any more" rule. Depending on which of these they chose, we would either see subjects in positive moods generating more, less, or the same number of birds as subjects in negative moods. We speculated, however, that the results in this condition might parallel those in previous investigations of mood and processing. In those experiments (e.g., Bless et al., 1990), positive-mood subjects appeared to process heuristically, whereas negative-mood subjects appeared to process systematically. In terms of our dependent measure, this means that subjects in positive moods would stop sooner and generate fewer birds than would subjects in negative moods.

Method

Subjects and design. Seventy-three men and women from introductory psychology classes at the University of Georgia participated in this study. They were given partial course credit for their participation. They were randomly assigned to one of six between-groups conditions created by the factorial combination of valence of mood (negative vs. positive) and type of stop rule (*good time to stop* vs. *enjoy* vs. *stop when you want*).

Procedure. Until the final task, Experiment 2 was identical to Experiment 1. Subjects participated in an experiment that they thought

was about rating movies. They completed the Need for Cognition Inventory, watched and rated three film clips, rated their moods, and then drew a map of the campus. After subjects had drawn the map, they were given the instructions for the item-generation task. They were told very generally that in this task the experimenters were interested in "the things that come to peoples' mind." The experimenter also told the subjects to pay no attention to the behavior of the subjects in the other booths because each subject had a different set of instructions. The experimenter then placed facedown on each subject's desk one of three sets of instruction packets. The first sheet of each packet described the stop rule subjects were to use during the task.

Subjects in the time-to-stop condition were told "as you are making your list, keep asking yourself 'Do I think this is a good time to stop?' If the answer is 'yes,' then stop. If the answer is 'no,' then keep listing. There is no right or wrong time to stop. Stop when you feel it is a good time to stop." Subjects in the enjoy condition were told "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 making the list. 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. We are interested in people's enjoyment of different tasks." Subjects in the control condition were told "there are no right or wrong answers and we are not concerned with how many of these things you can come up with. We just want to see which ones come to your mind. You can stop listing them whenever you feel like stopping."

These different instructional sets were passed out facedown in a counterbalanced order to the subjects in each experimental session. Thus, these different stop rules were included within each experimental session, and the experimenter remained blind to which stop rule each subject had received.

The subjects were asked to read the first page of the instruction booklet (describing the stop rule), and then turn the booklet facedown again when they had finished reading. When everyone had turned their booklets facedown, the experimenter instructed them to turn to the second page and begin their listing task. The second page told all subjects to generate a list of birds from memory.

As subjects began to generate their list, the experimenter discreetly started a timing program on a nearby personal computer. When the subjects finished the listing task, they placed their list on the shelf above their desks, and the experimenter recorded the time. So, one measure of processing effort was the amount of time the subjects spent generating birds. When all of the subjects had finished the generation task, they were debriefed, thanked, and excused. When the subjects left the experiment, the experimenter counted the number of birds the subjects had generated, and this served as a second measure of processing effort.

Results

Preliminary analyses. As in Experiment 1, we asked the subjects to speculate about the nature of the experiment. Again, not one guessed correctly, and not one made any reference to the instructions they had been given for the item-generation task. Most subjects suggested that the experiment was concerned with the things that people remember. This is a plausible interpretation given that they were asked about movies they may have seen, to draw the campus from memory, and to generate a list of birds from memory. A few subjects suggested that the experimenters were interested in seeing how watching movies influenced people's moods. But, even these subjects did not draw a connection between their moods and their performance on the listing task. So, as in Experiment 1, we feel confident that our results are not due to the effects of demand characteristics.

To determine whether our mood manipulation was successful, we reverse scored the subjects' self-ratings on the negative-mood adjectives and averaged these with their ratings on the positive-mood adjectives.[1] We then submitted these averages to a 2 (positive vs. negative mood) × 3 (good time to stop vs. enjoy vs. want to stop) ANOVA. This analysis yielded only a main effect for mood, $F(1, 62) = 39.78$, $p < .001$. Subjects seeing the funny movies reported feeling significantly more positive ($M = 3.95$) than did subjects seeing the sad movies ($M = 2.95$). So, as in Experiment 1, our manipulation of mood was highly successful.

Test of main hypotheses. We predicted that when subjects were asked to stop when they thought it was time to stop, those in positive moods would stop sooner than would those in negative moods, whereas when subjects were asked to stop when they no longer enjoyed the task, those in negative moods would stop sooner than would those in positive moods. We also speculated that the performance of subjects given the freedom to stop whenever they wanted would parallel the performance of subjects in previous mood and processing research (Bless et al., 1990). That is, subjects in positive moods would stop sooner than would subjects in negative moods.[2] As can be seen in Figure 3, all three hypotheses were supported.

The number of seconds the subjects spent on the listing task was submitted to a 2 (positive vs. negative mood) × 3 (good time to stop vs. enjoy vs. want to) ANOVA. The only effect to emerge was the predicted interaction between valence of mood and type of instruction, $F(2, 67) = 6.23$, $p < .003$. When subjects were asked to stop when they thought it was a good time to stop, those in positive moods stopped sooner than did those in negative moods (140.20 s vs. 218.65 s, respectively). However, when subjects were told to stop when they no longer enjoyed the task, those in negative moods stopped sooner than did those in positive moods (139.63 s vs. 240.21 s, respectively). In the control condition, subjects stopped sooner when they were in positive (145.05 s) as compared with negative moods (196.78 s). Thus, when subjects were allowed to stop whenever they wanted to, their performance paralleled that of subjects instructed to evaluate their decision to stop. All three pairwise comparisons were supported by significant planned contrasts ($p < .05$).

The same general pattern was observed when we analyzed the number of birds the subjects generated (see Figure 4). The interaction, however, was only marginally significant, $F(2, 67) = 2.75$, $p < .07$. Generally, subjects in positive moods generated fewer birds than did those in negative moods when given the time to stop instructions (13.90 vs. 18.25, respectively), but generated more birds when given the enjoy instructions (17.00 vs. 13.43, respectively). Subjects in the control condition generated

[1] Mood ratings were unavailable for 5 of our 73 subjects. The experimenter forgot to hand the ratings out in two of the experimental sessions.

[2] We also coded the uniqueness of the birds generated by the subjects and analyzed this as a function of mood and stop rule. This analysis yielded no significant differences.

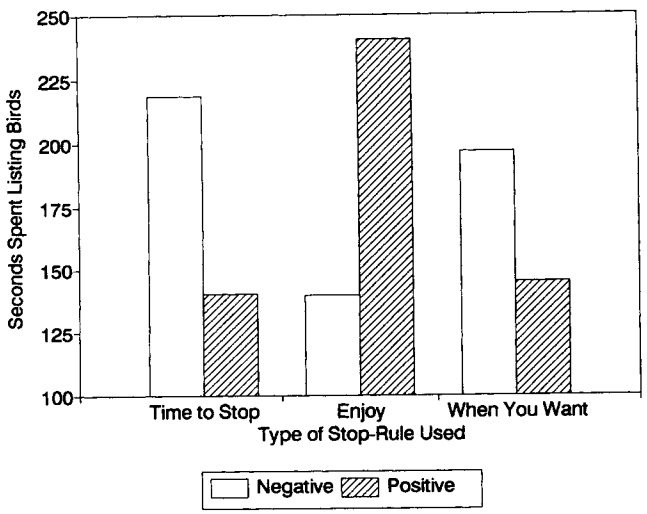

Figure 3. Time spent listing birds as a function of mood and stop rule.

fewer birds when they were in a positive mood (11.00) as compared with a negative mood (14.08). The reason for the marginal significance of this interaction seems to involve the amount of effort needed to generate items from memory. This became clear when we entered need for cognition as a factor into our analysis.

Role of need for cognition. As in Experiment 1, we performed a median split on subjects' average need-for-cognition scores ($M = 5.94$, $SD = 1.18$, range = 1.70 to 8.11 on a 9-point scale) and included these scores as a factor in our analysis. Again, analysis revealed that need for cognition did not contribute to any significant effects with regard to the amount of time subjects spent generating birds (all Fs involving need for cognition < 1.5). The within-cell correlation between need for cognition and amount of time subjects spent on the task, however, did reveal one significant effect. When subjects were in negative moods and told to stop when they had enough information, those high in need for cognition spent more time on the task than did those low in need for cognition ($r = .56$, $p < .05$). This finding should be interpreted with caution, however, given that the ANOVA and the other within-cell correlations were nonsignificant.

On the other hand, the ANOVA on the number of birds revealed two significant effects. There was a main effect of need for cognition, $F(1, 57) = 9.55$, $p < .003$, and an interaction among need for cognition, valence of mood, and stop rule, $F(2, 57) = 3.73$, $p < .04$. The main effect indicated that subjects high in need for cognition generated more birds than did subjects low in need for cognition. The three-way interaction indicated that our predicted two-way interaction between mood and stop rule occurred for subjects high in need for cognition but not for subjects low in need for cognition. In fact, a separate ANOVA on the high-need-for-cognition subjects yielded a significant interaction between valence of mood and stop rule, $F(1, 29) = 5.12$, $p < .01$, whereas an analysis of the number of birds generated by low-need-for-cognition subjects yielded no significant effects, all Fs < 1.

Why did need for cognition influence the number of birds generated when it did not influence the number of behaviors read in Experiment 1 nor the amount of time subjects spent on the task in either experiment? We think the answer lies in the amount of cognitive effort associated with these different tasks. Generating birds from memory is more cognitively demanding than is reading behaviors, and people low in need for cognition may be reluctant to engage in this effortful behavior regardless of their mood.

Evidence consistent with this hypothesis was obtained by Petty, Schumman, Richman, and Strathman (in press). They placed subjects who were either high or low in their need for cognition in either positive or negative moods. Then, they exposed these subjects to a persuasive message and asked them to express their attitudes and to list their thoughts. Petty et al. found that for subjects low in need for cognition, being in a positive mood increased the favorableness of their attitudes but did not influence the thoughts they generated. For subjects high in need for cognition, on the other hand, being in a positive mood increased the number of positive thoughts they produced, and these thoughts, in turn, influenced their attitudes. These results, like ours, suggest that moods may be more likely to influence the performance of low-need-for-cognition subjects when simple as opposed to effortful processing is involved.

Discussion

The results of Experiment 2 replicate and extend those of Experiment 1. All subjects performed the same listing task, and (within the positive and negative conditions) subjects were in equivalent moods. Yet, the extent to which they performed the task differed as a function of both their mood and their stop rule. It is important to remember that these results were observed with memory-based, as opposed to stimulus-based, pro-

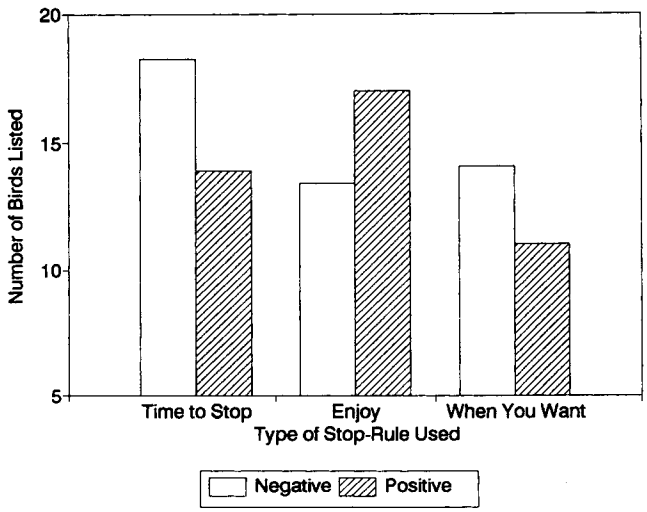

Figure 4. Number of birds listed as a function of mood and stop rule.

cessing. Thus, the combination of peoples' moods and stop rules can affect cognitive processing as well as overt behavior.

It is interesting that moods did not influence the number of birds generated by subjects low in need for cognition. This prompted us to speculate on other limitations on our effect. We suspect that our pattern of results would not be observed when subjects perform tasks that have clear objective stop rules. If our subjects had been asked to name five birds, for example, then they would have presumably run these names off very quickly regardless of whether they had been told to stop when they no longer enjoyed the task or told to stop when they thought it was a good time to stop. In addition, if mood is operating as a source of information, as we believe, then our effects would not be observed when subjects attribute their moods to an irrelevant source (Schwarz & Clore, 1983). We should also note that we have consistently used examples in which positive moods provided people with yes answers, whereas negative moods provided them with no answers. This need not always be the case. Suppose, for example, that people in positive moods and people in negative moods ask themselves whether they should aggress (for a more complete discussion of this issue, see Martin, Achee, Ward, & Harlow, in press). With this question, it is likely to be the people in negative moods who will answer with a yes and the people in positive moods who will answer with a no. Aggression can be motivated by negative affect (e.g., Berkowitz, 1988).

General Discussion

The results of both experiments are consistent with the hypothesis that the motivational implications of people's moods are mutable. In both experiments, subjects in equivalent moods and working on the same tasks exerted more or less effort depending on the stop rule they were using. We have explained our results in terms of subjects' using their moods as answers to different questions (i.e., different stop rules). Other explanations of the effects of mood on processing have been forwarded. In the next section, we consider the implications of our data for these models.

Implications for Other Models

Mackie and Worth (1991) suggested that positive moods cause people to bring more information to mind than do negative moods (cf. Isen et al., 1987; Isen et al., 1985). If we assume that this additional material is related to the task at hand (e.g., recalling birds), then it is possible that the positive mood would facilitate performance. So, for example, subjects in positive moods would generate more birds than would subjects in negative moods. If we assume, on the other hand, that the material brought to mind is unrelated to the task at hand, then we might expect the material to interfere. Thus, subjects in positive moods would generate less birds than would subjects in negative moods. Either way, the diffusion-of-attention model predicts a main effect. As such, our crossover interactions are difficult for the model to explain. The model, in its present form, does not allow us to understand how different stop rules can cause effects that are mirror images of one another.

A similar problem is encountered with models that suggest that people in positive moods are able to process more flexibly than are people in negative moods (Murray et al., 1990; Sinclair & Mark, 1992). These models might allow an understanding of how subjects in positive moods continue or stop processing, depending on the situation, but it does not allow an understanding of why our effects were just as pronounced for subjects in negative moods. If our negative-mood subjects had been inflexible in their processing, then the different stop rules would have had little or no effect on them.

The model proposed by Schwarz and his colleagues (e.g., Schwarz, 1990; Schwarz & Bless, 1991; Schwarz & Clore, 1988) comes closest to our own account. There is a subtle but important difference between the two, however. Schwarz suggested that people in negative moods, but not those in positive moods, attempt to eliminate their moods and the situations that brought the moods about. To do this, they adopt an analytic, problem-solving mode of processing and also activate procedural knowledge useful in effortful, analytic thinking. They may also apply this processing mode and procedural knowledge to any other applicable task they encounter while in a negative mood. The end result is that, in general, people in negative moods tend to use effortful, detail-oriented, analytical processing strategies, whereas people in positive moods tend to use simple heuristics in processing information.

Schwarz (1990) acknowledged, however, that people in negative moods do not always process more systematically than do people in positive moods. These default effects will not occur when either the moods are seen as irrelevant (e.g., they are attributed to the weather, Schwarz & Clore, 1983) or the motivational implications of the mood are overridden by current goals. To use Schwarz's (1990) example, an author who is trying to meet the deadline for a chapter revision may attempt to remain in an analytic processing mode, despite being in a good mood as a result of other events.

We do not believe, however, that our stop rules led to an override of the motivational implications of our subjects' moods. We believe instead that our stop rules changed those implications. With different stop rules, the same moods provided subjects with different information. Bless et al. (1990) induced their positive-mood subjects to process systematically by explicitly telling them to pay attention. In contrast, our instructions did not explicitly direct our subjects toward a type of processing. In fact, our subjects were explicitly told that there was no right or wrong time to stop. It is unclear, therefore, why they would continue if they did not want to. What our instructions did was direct the subjects toward an interpretation of their moods, and this, in turn, directed them toward different types of processing. Put another way, positive-mood subjects given the enjoy stop rule continued processing because their moods told them to, not because the experimenters told them to.

It should also be noted that an override view predicts an asymmetric effect for positive and negative moods. Positive moods inform people that no action is needed, so, overriding this message poses no problem. Negative moods, on the other hand, inform people that their current situation is problematic, so, ignoring this message would not be adaptive. Accordingly,

an override view predicts that "the impact of negative feelings on processing style will be more immune to the influence of other variables than the impact of positive feelings" (Schwarz, 1990, p. 553). Our crossover interactions were inconsistent with this expectation.

Interpreting Mood Implications

Although our results do not fit easily with Schwarz's override hypothesis, they are compatible with his more general view that moods operate as a source of information (see Clore, 1992; Frijda, 1988; Kaplan, 1991; Martin, Harlow, & Strack, 1992; Schwarz, 1990; Schwarz & Bless, 1991; Schwarz & Clore, 1983, 1988; Strack, 1992; Wyer & Carlston, 1979). We assume that people draw information from their moods in much the same way that they draw information from their overt behavior, through a self-perception process. According to Bem (1972), people infer that they like coffee if they observe themselves frequently drinking coffee. According to the mood-as-information perspective, people can infer that they like coffee if they observe themselves experiencing pleasant sensations when they drink coffee.

Schwarz and Clore (1988) have suggested that moods influence evaluations because people often use a "how do I feel about it?" heuristic. That is, people hold the object of their evaluation in consciousness and assess the attendant affect. If the affect is positive, then they render a favorable evaluation; if it is negative, then they render an unfavorable evaluation—provided they do not attribute the affect to a judgment-irrelevant source.

Although we are in general agreement with this view, our results suggest that some clarification is needed. More specifically, our results suggest that moods are not by themselves answers to evaluative questions. Neither do positive moods, by themselves, tell us that everything is fine with the world, nor do negative moods, by themselves, tell us that the world needs attending to. Rather, moods are input to evaluative, decisional, and inference-making processes, and these processes determine the effects that one's mood will have on one's evaluations, motivations, and behaviors. Thus, positive moods tell us to continue when they reflect our level of enjoyment but tell us to stop when they reflect our level of goal attainment. Negative moods tell us to stop when they reflect our level of enjoyment but tell us to continue when they reflect our level of goal attainment. More generally, it appears that a complete model of the effects of mood on processing may have to consider more than a single type of processing being motivated by a given mood.

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