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T his paper breaks ground in decision-making research by, first of all, linking together psychological
research on decision-making with the decision-making research in strategy and organization theory.
The result is a richer perspective on choice. Second and more important, this paper pushes decision-
making research beyond rational-actor models and into the realm of emotions where so much of decision-
making really happens.

Kathleen Eisenhardt

Abstract

This paper begins to answer the call to broaden current theories of individual decision-making by including in them the effects of human mood. Grounding our arguments in psychological literature on the effects of mood on information processing, motivation, and decision heuristics, we develop hypotheses about how mood can significantly affect individuals' use of structured decision protocols. In support of our hypotheses, results from an experimental study of complex decision-making suggest that, in situations where a structured decision protocol is the usual method of decision-making, individuals in moderately negative moods are significantly more likely than those in moderately positive moods to: (1) carefully execute all the steps of a structured decision protocol, (2) execute the steps of a structured decision protocol in the correct order, and (3) rely on the outcome of the structured decision protocol as the primary basis for the decision. We discuss these findings in terms of their implications for both organizational decision models and psychological models of mood and decision-making. In general, our findings help establish mood as an important variable in models of organizational decision-making and help shed light on often conflicting findings about the benefits of positive vs. negative mood for individual decision-making.
(*Mood*; *Decision-Making*; *Protocols*)

Much of the empirical work on decision-making in organizations centers on the degree to which managers are comprehensive and analytical in their decision-making (Dean and Sharfman 1996). This focus stems from the basic economic assumption that individuals will maximize the beneficial outcomes of their decisions through careful and thorough analyses of alternatives. Yet a growing amount of research suggests that cognitive constraints limit the extent to which a decision-maker can be analytically comprehensive (c.f., Eisenhardt and Zbaracki 1992). Decision-makers instead "satisfice" and act in a "boundedly rational" manner (March and Simon 1958).

In response to these findings, decision theorists have proposed that complex decision-making may benefit from use of formal analytical decision protocols that specify the processes individuals should use in generating and evaluating decision alternatives (c.f., Russo and Shoemaker 1989). These theorists have suggested that decision makers require a more formalized or structured process to aid them in examining the many dimensions, preferences, and uncertainties that are inherent to complex decisions (Dixit and Nalebuff 1991, Thomas 1984). Organizational researchers have put forth several prescriptive models of decision-making as appropriate processes for use in making complex and/or nonroutine decisions, including decision trees, expected value analyses, and devil's advocacy protocols (Janis 1982, Raiffa 1968, Schweiger et al. 1986, Schweiger et al. 1989, Thomas 1984). Often referred to as "rational," "synoptic," or "comprehensive" decision processes, these models specify both the tasks to be carried out and their order when undertaking complex decisions. In doing so, such protocols are designed to approximate fully comprehensive decision processes (Thomas 1984). Further, researchers

have shown that careful use of these types of structured decision protocols improves a variety of outcomes for organizations, including outcomes related to profits, organizational image, internal coordination, capacity utilization, and market penetration (Dean and Sharfman 1996).

Despite the apparent usefulness of such decision protocols, ample evidence suggests that organizational decision-makers routinely disregard or misuse such protocols in situations where they may be beneficial (Dean and Sharfman 1993, Fredrickson 1984, Fredrickson and Mitchell 1984). Descriptive studies of how complex decisions are actually made in organizations show that decision-makers often skip steps in the structured decision process, perform steps out of order, ignore the structure altogether, and generally vary in the degree of care with which they follow a structured protocol (Mintzberg et al. 1976, Nutt 1984, Eisenhardt and Zbaracki 1992). Theorists commonly cite both the uncertainty or conflict inherent to decision-making, and the stability or instability of the external environment as reasons why individuals misuse or disregard structured decision protocols (e.g., Dean and Sharfman 1993, Langley 1989). Such arguments suggest that the predictability of the decision-making context affects decision-makers' level of formal and comprehensive analysis.

Nevertheless, these environmental explanations appear incomplete in light of the complexity of human decision processes (Eisenhardt and Zbaracki 1992). In particular, focusing on external environmental conditions downplays the potential impact of human characteristics on organizational decision processes, even though such effects are suggested by psychological research on individual decision processes (Clarke and Fiske 1982).

In this paper, we focus specifically on the effects of one human characteristic—mood—on individuals' use of a structured decision protocol. We are drawn to mood (defined as a person's general and temporary feeling state) as an important variable for explaining individuals' use of formal analytic procedures for two reasons. First, in recent years a growing number of organizational researchers have identified mood as a significant factor in explaining the behavior and effectiveness of organizational actors (Rafaeli and Sutton 1989, Staw et al. 1994, Isen and Baron 1991). Theorists have even suggested that mood (often referred to as *affect* or *affective state*) may be an important variable in models of individual decision-making (Simon 1987). To date, however, organizational research has not looked specifically at the impact of mood on use of formal, analytic decision-making processes. As Langley et al. (1995), note:

Absent from [existing organizational decision] theories is not only insight and inspiration, but affect in its various forms. In contrast, rich accounts of real world decisional processes make clear how critical are these factors to outcomes (p. 269).

Second, an increasing body of psychological research suggests that moods felt and expressed by decision-makers can influence how individuals make decisions (c.f., Isen 1993). Alice Isen and her colleagues have shown, for example, that in contrast to neutral moods, a positive mood can lead individual decision-makers to faster and more efficient decision processes (Isen and Means 1983), a reduction in contentious strategies (Carnevale and Isen 1986), more creative problem solving (Isen et al. 1987), and greater cognitive flexibility in categorization tasks (Isen and Daubman 1984).

Despite the promising findings of this research, it too has been narrowly focused, limiting much of the inquiry to the effects of positive mood on simple decision tasks rather than on examining the types of complex decision processes that are used in formal decision protocols (c.f., Isen 1993). A small number of recent studies have examined the effects of positive and negative mood on more complex tasks that allow for and encourage creativity and innovation by decision-makers (Staw and Barsade 1993, Bless et al. 1990). No studies, however, have examined the effects of positive and negative mood on decision-makers' use of a formally structured decision protocol to make a complex decision.

In summary, while both organizational and psychological research suggest that including mood in models of structured decision-making may improve explanations about when and how individuals carry out formal decision analyses, neither of these theoretical perspectives examines how mood affects individuals' use of formal decision protocols that are commonly recommended for complex decision tasks. The purpose of this paper is to enrich both organizational and psychological theories of decision-making by describing how decision-makers' moods (i.e., their general feeling states at the time of decision-making) affect the vigilance with which they use a structured decision protocol when making a complex decision. Our theory-building (explicated below) is grounded in psychological research that examined the relationship between mood and various information processing approaches and motivations.

Relating Mood to Use of Structured Decision Protocols

In this paper, we use the term *mood,* rather than emotion or affect, to specify the feeling states affecting individual decision-makers. The differences in definition between

these terms are related to the level of specificity and permanence. The term *emotion* most often refers to specific, temporary feeling states (e.g., happy, sad, angry) (Whissel 1989), while *mood* refers to more general but still temporary feeling states (e.g., positive or negative) (Fiske and Taylor 1991), and *affect* refers to more stable, dispositional feeling states (Staw and Barsade 1993). We focused on the concept of mood both to be consistent with previous studies linking general, temporary feeling states to decision-making (to be discussed later) and to provide a more parsimonious framework for feeling states and decision-making.

The most common conceptualizations of mood define it in two dimensions: degree of pleasantness and level of arousal (Watson and Tellegan 1985, Russell et al. 1989). When individuals state that they are in a "good mood" or a "bad mood," they are referring to the pleasantness dimension. By contrast, arousal refers to the stimulation level of the mood (i.e., excited vs. content, or depressed vs. angry). In this paper, we focus on positive and negative mood at a moderate level of arousal (Whissel 1989). We focus on moods at the moderate level of arousal because (1) we assume most business decisions are made at moderate levels of arousal (i.e., emotions involving a high level of arousal, like rage and joy, are not common in most corporate decision-making contexts) (Lazarus 1991); and (2) research suggests that the greatest probability of vigilant information processing and, thus, use of structured decision protocols occurs at moderate levels of arousal (Kahneman 1973, Revelle and Micheles 1976, Lazarus 1991).

Research from three different but related areas of inquiry in the psychology literature (the effects of mood on information processing, motivation, and use of decision heuristics) suggests that negative mood may enhance the likelihood that a decision-maker will use a normative structured decision protocol (i.e., a structured decision process that is known to be commonly used in a given situation) to make a complex decision. Conversely, the same literature suggests that positive mood may decrease the likelihood that an individual will use such a process, especially if the process is viewed as unpleasant (e.g., effortful or uninteresting) (Fiske and Taylor 1991, Lazarus 1982 and 1984, Epstein 1983 and 1984). When reviewing these findings, one must note that most of the studies examined mood at a moderate level of arousal (i.e., frustration/annoyance or happy/pleased) and not at highly distressed or elated levels. Very high or very low levels of arousal have been found to lead to markedly different responses than those resulting from more moderate levels of arousal. Furthermore, in these studies,

mood refers to a transitory affective state and not to an individual's general disposition.

Mood and Information Processing

Studies of the effect of mood on processing of persuasive messages show that individuals in moderately positive moods use a simple approach to analyzing the persuasiveness of arguments and evidence, while those in moderately negative moods are more likely to engage in effortful, analytical information processing (c.f., Schwarz et al. 1991). Moreover, individuals in moderately negative moods are more likely than individuals in neutral moods to carry out effortful analyses of information or arguments (Bless et al. 1990).

In one experiment, for example, Bless et al. (1990) put participants in positive and negative moods (by having them describe a happy or unhappy event) and had them listen to a tape announcing an increase in university fees, followed by weak or strong arguments for the fee increase. In a later recall task, negative-mood participants were significantly more persuaded by the strong arguments than the weak arguments, while there was no difference in persuasion for positive-mood participants. The researchers suggest that the greater persuasiveness of strong arguments for the negative-mood participants indicated a greater elaboration of the message for these participants, and thus more careful and detailed information processing for participants in slightly negative moods. Furthermore, they suggest that negative-mood participants may have engaged in this message elaboration because their mood signaled that their current situation was unacceptable.

> The current results parallel findings in other domains that suggest that the likelihood of effortful analytic processing of information decreases as mood states become more positive. . . . being in a bad mood may inform the individual that his or her current situation is problematic and requires detailed attention. It may thus trigger the careful processing strategies that are adequate for handling problematic situations (Bless et al. 1990, p. 343).

By contrast, experiments on the effects of positive mood on cognitive processing of persuasive statements show that individuals in good moods are not only less likely to engage in effortful analytic processing of a message, but they are more likely to rely on peripheral cues to evaluate the message (Innes and Ahrens 1991, Worth and Mackie 1987). For example, Mackie and Worth (1991) presented positive-mood and neutral-mood participants with a counter-attitudinal speech on controlling acid rain (i.e., a speech incongruent with the participants' attitudes about acid rain). Prior to the speech, some of the participants were told that the speaker was an expert on

the topic of acid rain, while others were told that the speaker was an equally intelligent nonexpert. The results showed that positive-mood participants were less likely than neutral-mood participants to engage in systematic processing of the message (they did not react differently to strong and weak arguments). In addition, positive-mood participants were more persuaded by the message delivered by the individual labeled an "expert," while the neutral-mood participants were equally persuaded by experts and nonexperts. This last finding suggests that, as an alternative to detailed information processing, positive-mood decision-makers may rely on heuristics (i.e., base their decisions on the label of a consultant) to make their decision. Thus, in this case, positive mood may have acted as a cue that "all was right with the world," that cognitive effort was not required, and that a simple approach to information processing (e.g., a heuristic) would suffice.

In summary, the literature linking mood and cognitive processing of persuasive messages suggests that decision-makers in moderately negative moods are more likely than those in moderately positive moods to engage in careful and effortful processing, such as would be required in following a structured decision protocol, because their mood signals that their current situation merits attention and detailed information processing. Furthermore, it suggests that individuals in moderately positive moods may rely on intuitive or heuristic processes as the basis for their decisions because their moods signal that careful processing is not necessary. (In a later section, we provide a more detailed discussion of the relationship between mood and decision heuristics.)

Mood and Motivation

The finding that mood affects how information is processed may also be explained by theories of mood and motivation. Extensive research in this area suggests that people in moderately positive moods are motivated to maintain their moods and to avoid tasks that they perceive as mood-threatening (Isen and Baron 1991, Isen and Simmonds 1978, Smith and Shaffer 1991). For example, individuals in moderately positive moods are less likely than those in neutral moods to voluntarily work hard on a task that they perceive to be difficult or unpleasant but will engage in intrinsically motivating tasks that may protect or enhance that mood (c.f., Isen 1993). Conversely, research shows that people in moderately negative moods are motivated to change their current mood state and are not averse to unpleasant tasks that they believe may improve their situation and mood (Bless et al. 1990, Fiedler 1988).

In related work, researchers have found that individuals

find extended or comprehensive thinking about complex issues or problems to be both effortful and stressful (Janis and Mann 1977). This research suggests that the very thought of carrying out the necessary process for making an informed and thoughtful decision may create discomfort for the decision-maker. In a review of the literature linking stress to decision-making, for example, Janis and Mann (1977) conclude:

> The striking feature in all [this research] is that regardless of the level of difficulty or importance of the decision, autonomic indicators of stress increase as subjects move toward a decision and afterwards gradually return to the level of the resting state (p. 49).

Thus, prolonging the process leading up to the decision itself will prolong the unpleasant state of stress that accompanies decision-making analysis. A detailed structured decision protocol that is not only time-consuming but also specifically focuses on the factors complicating the decision, such as key uncertainties and the potential benefits and losses of each alternative, would be both effortful and unpleasant to decision-makers and would likely be avoided by individuals in moderately positive moods.

It should be pointed out that the motivation to protect a good mood by avoiding effortful and unpleasant situations does not extend to instances in which it is clear that a specific (unpleasant) task must be done. As stated by Isen, "People who feel good prefer pleasant things. . . . [but] they do not shirk, irrationally 'defend against,' or irresponsibly refuse to engage in less pleasant tasks" (1993, p. 268.). We would expect, then, that mood will impact use of a structured decision protocol only when individuals have the option of not using it (Smith and Shaffer 1991).

In summary, the literature on mood and motivation suggests that individuals in moderately positive moods prefer to maintain those moods and are thus motivated to avoid effortful structured decision processes in situations where such a process is not specifically required. Conversely, individuals in moderately negative moods may be motivated to utilize a structured process in an effort to alleviate the negative mood.

Mood and Decision Heuristics

Finally, as noted earlier, psychological research examining the effects of mood on individuals' use of decision heuristics suggests that positive moods may discourage reliance on careful and thorough analysis in favor of cognitive shortcuts or gut feelings. In particular, several studies by Alice Isen and her colleagues (Isen and Means 1983, Isen et al. 1982) show that in relation to neutral moods, moderate positive moods increase participants'

use of simplifying heuristics in complex decision tasks. These researchers suggest that individuals use heuristics as a means of avoiding unpleasant decision processes that may upset their good moods.

Of particular interest for this study is research that suggests that mood may be associated with use of "gut feel" as the basis for decision-making. In particular, evidence from prior research suggests that situations associated with positive mood may lead individuals to rely more heavily on instinct or gut feel for the basis of their decisions. Laboratory research on the conflict between intuitive and rational processing, for example, suggests that individuals prefer intuitive responses when they have an opportunity to gain rather than lose from their choices (Denes-Raj 1994), a scenario consistent with a positive mood. In addition, a recent field study of managerial decision-making showed that intuition was impeded by excessive time constraints, stress, and lack of confidence. This suggests that intuitive responses are unlikely to be relied on if decision-makers are stressed, unsure of themselves, or worried about potential losses—all factors consistent with a moderately negative mood (Agor 1986).

In addition, positive moods have been found to increase individuals' confidence in their own abilities and optimism about the future (Kavanaugh and Bower 1985, Baumgardner and Arkin 1988) and to increase an "illusion of control" (Langer 1975). Ruehlman et al. (1985), for example, found that compared to those in negative moods, individuals in positive moods are unrealistically optimistic about their own abilities (e.g., their instincts regarding a particular decision) and their future circumstances. This suggests that positive moods may encourage individuals to rely strongly on their own gut feel or instincts about a situation, rather than to correctly and completely engage in the detailed analysis required by a structured protocol.

In summary, these results suggest that, in making complex decisions, individuals in positive moods may rely more on initial "gut reactions" as the primary consideration in their decision processes. Individuals in negative moods, on the other hand, are more likely to rely on the results of a careful and complete use of a structured protocol as the basis for their decisions.

Overall, a substantial amount of literature in psychology linking mood to how individuals process information and make decisions suggests the following general proposition:

GENERAL PROPOSITION. *If using a structured decision protocol appears to be an available and viable option for making a complex decision, individuals in moderately negative moods are more likely than those in moderately* *positive moods to vigilantly follow the structured decision protocol.*

Based on this general proposition and on our above discussion about the ways in which individuals fail to use structured decision protocols (i.e., decision-makers skip steps, perform steps out of order, or incorrectly perform steps), we offer three specific and testable hypotheses about the effects of mood on individuals' use of a given structured decision protocol in a situation where the decision protocol is available and known to be a common or normative method of decision-making.

HYPOTHESIS 1. *Individuals in moderately negative moods will be more likely than those in moderately positive moods to carefully execute all the steps of the structured decision protocol in making a complex decision.*

HYPOTHESIS 2. *Individuals in moderately negative moods will be more likely than those in moderately positive moods to carry out the steps of the structured decision protocol in the correct order in making a complex decision.*

HYPOTHESIS 3. *Individuals in moderately negative moods will be more likely than those in moderately positive moods to rely on the results of the structured decision protocol, rather than on "gut feel" in making a complex decision.*

In the following sections, we describe a set of studies we used to test our hypotheses about the effects of mood on use of structured decision protocols.

Methods

Overview

We tested our hypotheses about the effects of mood on individuals' use of a structured decision protocol in two studies. First, we carried out a pilot study to: (1) develop scales measuring moderate arousal/positive and moderate arousal/negative moods, (2) develop positive-mood and negative-mood manipulations, and (3) check for effects of our mood manipulations on perceptions of self-efficacy (to rule out self-efficacy as an alternate predictor of individuals' use of structured decision protocols). Second, we used the manipulations and scales developed in the pilot study in a decision-making experiment that we designed to examine the effects of positive and negative moods on individuals' use of and reliance on a structured decision protocol. We describe our methods for these two studies below.

Pilot Study

Participants and Design. Fifty-nine students enrolled in a Master of Business Administration program at a southeastern U.S. university (38 male and 21 female) participated in the pilot study. Participants' ages ranged from 23 to 40 years and averaged 28.4 years. We randomly assigned participants into three groups: a negative-mood manipulation group, a positive-mood manipulation group, and a control group. Each group received their treatment in isolation from the other groups.

We used anagram tasks and bags of candy as the primary mood manipulators, both of which have been used successfully in prior research (c.f., Isen 1993). All anagrams came from the *Organization Game* (Miles et al. 1993), which specified their level of difficulty. To avoid inducing changes in participants' perceptions of self-efficacy through the mood manipulation, we did not provide feedback about participants' objective or comparative performance on the anagrams. We also gave all participants the following "low ego-involvement" instructions (modified from Sandelands et al. 1988):

> Today we would like to have you solve some anagrams [or rate the difficulty of some anagrams]. We would like to note that solving anagrams is only one of the tasks we are interested in, and your ability to solve anagrams does not predict your ability to perform well on other types of tasks or predict your overall intelligence.

We gave each of the 31 participants in the negative-mood manipulation group two difficult anagrams and two impossible anagrams to solve. The anagram task was designed to induce moderate frustration and/or annoyance in the participants by presenting them with a task that was difficult yet nonthreatening in that participants were not being evaluated and had no personal stake in their performance on the task. Anagrams are engaging and are thus more likely than passive manipulations (e.g., movies) to induce a lasting mood, and are less likely to be discounted by participants as irrelevant (Murray and Dacin 1994).

We gave the 28 participants in the positive-mood manipulation group a small bag of candy. Use of small bags of candy to induce moderately positive moods has been used in previous studies (c.f., Isen 1993) and has been found to be quite effective. To keep the two manipulation groups as similar as possible in terms of task assignment, we gave the participants in this group six solved anagrams and asked them to judge their level of difficulty. The candy was given to the participants before they were asked to complete the anagram task so that it would not be perceived as a reward for good performance. Finally, we asked the 30 participants in the control group, who were not given candy, to judge the difficulty of the same six solved anagrams.

We gave all participants five minutes to solve or rate the anagrams. Participants then filled out a two-part questionnaire designed to measure mood and change in self-efficacy. Pilot study materials are included in Appendix A.

Mood Scale Confirmation. In the first part of the questionnaire, we asked participants to indicate on a five-point scale how each of eight words described their current mood. Responses ranged from 1 = strongly disagree, to 3 = neutral, to 5 = strongly agree. We chose words from the *Dictionary of Affect* (Whissel 1989) that were either evaluatively positive or negative and were of moderate arousal. The positive words were *glad, happy, pleased,* and *cheerful.* The negative words were *annoyed, frustrated, angry,* and *dissatisfied.* Researchers have shown these words to describe emotions of moderate arousal and of high or low pleasantness (Russell et al. 1989). A principal-components factor analysis of members' responses to this mood questionnaire showed the eight mood items to be about equal in value on the arousal dimension and opposite in value on the pleasantness dimension. Within the pleasantness dimension, Chronbach's test of internal reliability showed that the four positive-mood items were strongly related (α = 0.893), as were the four negative-mood items (α = 0.892). Thus, the eight items appeared to be good measures of positive and negative moods of moderate arousal. The factor loadings are displayed in Table 1.

Mood Manipulation Check. We measured overall mood by subtracting the sum of the participants' scores on the negative-mood items from the sum of their scores on the positive-mood items. Thus, mood scores above zero indicate an overall positive mood, while scores below zero indicate an overall negative mood. The mean

Table 1   Factor Loadings For Mood Scale*

Item	Factor 1 (Pleasantness)	Factor 2 (Arousal)
1. CHEERFUL	0.779	0.368
2. PLEASED	0.761	0.341
3. HAPPY	0.751	0.482
4. GLAD	0.724	0.348
5. DISSATISFIED	−0.761	0.383
6. FRUSTRATED	−0.743	0.407
7. ANNOYED	−0.689	0.553
8. ANGRY	−0.628	0.296

*Based on principle components analysis with an Eigenvalue of 1.0.

overall mood scores by group were: -0.774 for the difficult anagram (negative-mood) group, 7.536 for the solved anagram with candy (positive-mood) group, and 3.900 for the solved anagram/no candy (control) group. The last finding is consistent with numerous studies showing that peoples' baseline mood state is positive (Isen 1993). A one-way analysis of variance showed that the three treatment groups differed significantly in their mood ($F = 15.07$, $p < 0.01$). Follow-up Tukey (Neter et al. 1985) comparisons showed that the participants in the solved anagrams/candy (positive-mood) group had significantly higher positive moods than both the participants in the solved anagrams (control) group (7.536 vs. 3.900, $p < 0.05$), and the participants in the difficult anagram (negative-mood) group (7.536 vs. -0.774, $p < 0.01$). Participants in the control group also had significantly higher positive moods than participants in the negative-mood group (3.900 vs. -0.774, $p < 0.01$).

Self-Efficacy Manipulation Check. Despite our instructions to the contrary, participants' performance on the anagram task may have been perceived by them as some indicator of their general problem-solving abilities. Thus, we checked to see if there were significant changes in participants' perceptions of their self-efficacy following the task. The second part of the questionnaire asked participants to indicate on a five-point scale how the anagram task had changed their perceptions of self-efficacy. Participants were asked to indicate if the anagram task had affected: (1) their level of self-confidence, (2) their opinion of their intelligence, (3) their opinion of their problem solving abilities, and (4) their opinion of their complex decision-making abilities. Responses ranged from 1 = significantly decreased, to 3 = remained the same, to 5 = significantly increased. Changes in self-efficacy were computed by summing participants' responses to the four questions. A score of 12.00 indicated no change in self-efficacy. Mean self-efficacy scores by participant group were 11.48 for the difficult anagram group, 12.25 for the solved anagram/candy group, and 12.00 for the solved anagram group. A one-way analysis of variance showed that none of the treatments was significantly different in its effects on individuals' perceptions of self-efficacy ($F = 1.499$). This finding increased our confidence that mood differences, not self-efficacy differences, were responsible for the variance in participants' decision-making processes.

Pilot Study Summary. Overall, results of the pilot study indicated that we could successfully induce negative and positive moods in participants through use of difficult anagrams and solved anagrams/candy, respectively, without significantly changing participants' perceptions of self-efficacy in decision-making.

Structured Decision-Making Experiment

Because this is the first study to test the effect of mood on use of a structured decision-making protocol, we kept the design of the experiment simple and straightforward. Our level of analysis is the individual, and our unit of analysis was the individual's decision process. To test our hypotheses, we used a decision protocol based on commonly used "decision trees" or "expected mean value analysis" because it is the process most closely identified with comprehensiveness and rationality in organizational decision-making literature, and because it is best suited for use by individuals making decisions alone (as opposed to such procedures as devil's advocacy and dialectical inquiry that involve groups) (Thomas 1984). An outline of the structured decision protocol used is included in Appendix B.

Participants. One hundred and twenty students (42 women, 78 men) enrolled in a Master of Business Administration program at a southeastern U.S. university participated in this study. We used graduate students as participants to control for important characteristics that might influence use of a structured decision protocol, such as age, work experience, and familiarity with a specific structured decision protocol. Nearly all participants had professional work experience, and were considered good proxies for individuals at lower to middle levels of management. The age of the participants ranged from 21 to 37 years, with a mean of 27.3 years. Participants' professional work experience ranged from 0 to 17 years, with a mean of 4.4 years. All participants had recently completed the same graduate course on decision processes and were familiar with the specific structured decision protocol used in this experiment.

Variables. The independent variable in this experiment was mood. The two conditions were moderate arousal/positive mood and moderate arousal/negative mood (see Pilot Study, above). The dependent variables in this experiment were related to participants' decision-making processes, including whether or not they: (1) carefully executed all the steps of the structured decision protocol, (2) carried out the steps of the structured decision protocol in the correct order, and (3) relied on the results of the structured protocol vs. gut feelings as the primary basis for their decisions.

Procedure. At the start of a regularly scheduled MBA class, the instructor introduced participants to the experimenters and told them that they would be participating in some exercises designed to test different teaching methods. The instructor indicated to the participants that these exercises were not part of the regular class, but were part of studies being undertaken to redesign another course. Following this introduction, the instructor left the

room. We told the participants that the first method to be evaluated was a lecture on structured decision-making. To ensure that all participants were familiar with the same structured decision-making process, one us gave a 10-minute "lecturette" that outlined an eight-step structured decision protocol. The process followed a basic decision-making analysis procedure (Raiffa 1968, Thomas 1984) in which decision-makers first generate alternatives and standards for evaluation of alternatives and then identify critical uncertainties and their probabilities. Next they generate possible decision outcomes, evaluate those outcomes, and make a decision (see Appendix B).

Following the lecturette, we gave the participants either the positive-mood manipulation or the negative-mood manipulation described in the pilot study. We gave all participants within a given class the same manipulation (in all, five classes were used). We told participants that the anagram task was part of a simulated organization game the experimenters were evaluating for use in another course. Participants followed the same procedure as in the pilot study, except that they did not receive a questionnaire about mood and self-efficacy following the anagram task. We did not want to make participants' mood and self-efficacy salient prior to the decision-making task, and the results of the pilot study indicated that the anagram tasks were effective in inducing mood without affecting self-efficacy.

Immediately following the anagram task, we gave the participants a modified version of the widely-used decision-making case, Carter Racing (Brittain and Sitkin 1989), and a decision worksheet. We instructed participants to read the case and come to a decision. The case asks the reader to take on the role of Pat Carter and decide whether the Carter Stock Car Racing Team should participate in an upcoming race. The case is straightforward in defining the problem and alternatives, but it is complex enough to benefit from use of a structured decision protocol. Detailed information relevant to the decision—including race statistics about performance in previous races and issues related to prize money, sponsorships, weather conditions, potential engine problems, and the instincts and opinions of key racing team members—is presented throughout the case. Further, the decision outcome has implications for the long-term success of the organization, making it an important decision for the decision-maker. To prevent perception of an obviously correct decision, which might dissuade use of the structured decision-making process regardless of mood, we adjusted the information in the case to result in equal expected values for both racing and not racing (Sitkin and Weingart 1995). The final page of the case study outlined

the structured decision protocol that was previously presented during the lecturette and indicated that the protocol was "the usual, but not required, method of decision-making within Carter Racing."

We also told the participants that any notes or calculations related to the decision that they wished to make should be done on the blank pages of the worksheet. We told participants to write their final decision at the bottom of the second page of the worksheet. Finally, we told participants that they would have plenty of time to finish the task and that they would be notified when they had five minutes remaining. We gave participants 20 minutes to make their decisions. This amount of time was given because we were most interested in the decision processes used by the participants, rather than their decision outcomes. Further, a pre-test indicated that most participants could complete their decisions in 20 minutes and that those who could not finish could get highly involved in the decision process within that time.

Immediately following completion of the case task, participants filled out a questionnaire. Participants first answered an open-ended question asking them to describe the basis of their decision. They then answered several questions designed to measure how correctly and completely they used the structured decision protocol. Because the results of scaled response questions (e.g., used to a great extent, used somewhat) may be participant to differences in interpretation, we used only yes/no questions to determine participants' use of *each aspect* of the structured decision protocol (e.g., "Did you consider the key uncertainties?"). In this way, we were able to more accurately measure the extent of participants' use of the entire structured decision protocol. Participants also indicated if their mood had changed during the case exercise or if it was about the same after the case exercise as it was after the anagram task. Finally, participants answered several questions about their personal attributes, including whether they understood the lecturette on the structured decision protocol, whether they had previously been exposed to this form of structured decision process, how familiar they were with auto racing, and their classification on several demographic variables. The questionnaire is included in Appendix B.

Following the exercise, we interviewed 20 volunteer participants (10 from each treatment group) about their decision processes. We asked them to describe how they came to their decisions and why they used the structured decision protocol or some other process (e.g., gut feelings). We also asked them if they felt that their mood had affected their decision processes. All interviews were tape-recorded and transcribed.

To reduce the likelihood that differences in use of the formal decision process across mood groups represent differences in compliance behavior and not differences in

whether one freely elected to use the decision protocol, we took steps to maximize the likelihood that participants believed that they were free to make their decisions as they saw fit (Zimbardo and Leippel 1991). No outcomes (rewards or punishments) hinged on the decision or on the way in which the decision was made. Furthermore, we did not instruct participants to use the protocol; the case instructions simply stated that the structured decision process outlined at the end of the case (i.e., the same process discussed in the lecturette) was the "usual, but not required method of decision-making within Carter Racing." All participants interviewed following the exercise indicated that they did not feel compelled to use the structured process (e.g., "I always use that kind of process" or "using my gut instinct is just my normal way of decision-making ... the tutorial didn't affect me"), which provided some confirmation that our methods did not create strong compliance pressure to use the protocol.

Data Analysis

Operationalization of Dependent Variables. To operationalize general use of the structured protocol, we measured participants' self-reported use of the structured process. To operationalize careful and complete execution of the protocol steps (Hypothesis 1), we first analyzed participants' self-reported use of each and every step of the protocol and analyzed their worksheet notation for evidence that they used all the steps in the protocol (searching for key words that represent each step in the protocol). We also analyzed additional worksheet notation indicating that specific steps were carefully executed, including evidence of math calculations (necessary for steps 6 through 8), and notation about any of the relevant race issues associated with the decision (e.g., payoffs, past performance, potential risks, etc., necessary for steps 2, 4, and 6) (see Appendix C for a list of relevant race issues). To operationalize execution of the protocol steps in the correct order (Hypothesis 2), we measured participants' self-reported use of the correct protocol order and analyzed their worksheet notation for evidence that they used the correct order (i.e., notations that correspond to each step appearing in the correct order on the worksheet). To operationalize reliance upon the protocol outcomes as the basis for the decision (Hypothesis 3), we measured participants' self-reported use of gut feelings and their written explanations about the most important considerations in making their decisions. We also analyzed worksheets for notations that indicated use of gut feel in decision-making.

Analysis of Self-Report Data. We coded participants' written explanations for the primary basis of their decisions (survey question 1) into two categories: (1) decisions based primarily on the structured decision protocol,

and (2) decisions based primarily on gut feelings or instincts. Explanations could not be included in both categories. Two independent individuals who were blind to the study, coded each written response. Inter-rater agreement was measured using Cohen's (1960) Kappa, and was 0.895. The coders then discussed the few explanations on which they disagreed and reached consensus on all items. They coded self-reports about using the structured protocol, using all steps, using the correct order, and using gut feelings as binary, yes/no data. We analyzed the results of all binary-coded data using a chi-square test of homogeneity (Neter et al. 1993). The chi-square tests assess whether two or more multinomial populations are different in a given respect (e.g., whether positive-mood participants and negative-mood participants are different in their use of structured decision protocols).

Notation Analysis. We devised a worksheet coding scheme that asked coders to look for and record notation evidence of: (1) use of each of the eight steps in the structured protocol, (2) use of mathematical calculations, (3) listing of relevant race issues, (4) use of an ordered approach to decision-making that which matched the structured protocol, and (5) use of gut feelings. To verify the unambiguous nature of the entire coding scheme, we had two independent coders code a sample of 20% of the total worksheets. Their inter-coder reliability was 0.90, using Cohen's (1960) Kappa. Based on this analysis, we determined that the coding scheme was highly unambiguous. The first coder then coded the remainder of the worksheets.

We analyzed notation data indicating use of gut feelings, consideration of any relevant race issues, use of mathematical calculations, and use of an ordered approach to decision-making using a chi-square test of homogeneity (see above). We analyzed notation data indicating the number of relevant race issues noted and the number of steps noted using a two-sample t-test.

Mood Dissipation Control. To control for the possibility that participants' induced moods dissipated during the decision-making exercise, we asked participants to indicate whether their mood had changed during the exercise. Based on this criteria, we obtained a subsample of 33 positive-mood participants and 30 negative-mood participants who indicated that their mood had not changed during the exercise. Analysis of this sample (available from the authors) revealed the same pattern of results that we had obtained from analysis of the entire sample. These findings suggest that, despite mood dissipation for some participants during the exercise, participants' decision-making strategy was determined early on and did not change as their mood dissipated. Based on these findings, we report only the results of the full sample below.

Results

Demographic Data.   Data indicated that participants in the positive-mood and negative-mood treatments were roughly equivalent in age (27.2 years vs. 27.5 years) and work experience (4.5 years vs. 4.3 years). Roughly equal numbers of participants in the positive-mood and negative-mood groups had prior job experience with complex decision-making (38 participants vs. 41 participants). All participants reported that they understood the decision-making tutorial, and no participants had language problems that may have confounded the anagram task. No participants reported extensive expertise in autoracing.

Decision Process Data.   Results of the chi-square test of homogeneity and two-sample t-tests provided evidence in support of all three of our hypotheses. Results for all participants are reported in Table 2.

In relation to Hypothesis 1 (i.e., careful execution of every step of a structured decision protocol), positive-mood groups and negative-mood groups showed significant differences in their self-reported use of the structured

decision protocol ($\chi^2 = 6.01$, $p < 0.05$) as well as their use of all eight steps ($\chi^2 = 6.60$, $p < 0.01$). Follow-up confidence interval tests (Neter et al. 1993) indicate, with 90% confidence, that participants in moderately negative moods were 20%–22% more likely than those in moderately positive moods to report that they used the protocol and all eight of its steps. Additional analysis indicates, with marginal significance, that negative-mood participants reported using more steps on average than did positive-mood participants ($\bar{X} = 6.48$ vs. 5.93, $T = 1.85$, $p < 0.10$), suggesting that although some did not perform all the steps in the structured protocol, negative-mood participants performed more of the steps than did positive-mood participants.

Analysis of decision worksheet notations did not show evidence of significant differences between participants' use of all eight steps, but did show evidence of marginally significant differences in the average number of steps used by positive-mood vs. negative-mood participants ($\bar{X} = 3.53$ vs. 4.42, $T = 1.90$, $p < 0.10$). In addition, positive-mood and negative-mood participants showed

Table 2   Effects of Mood on Participant's Use of Structured Decision Protocols

Outcome Variables	Positive Mood	Treatment Variables Negative Mood	Test Statistic	Prob of Error
HYPOTHESIS 1: Carefully Executed All Steps of Structured Decision Protocol				
SELF-REPORT				
Used Structured Protocol	52%	73%	$\chi^2 = 6.01$	p < 0.05
Used All Steps	20%	42%	$\chi^2 = 6.60$	p < 0.01
Number of Steps (8 maximum)	$\bar{X} = 5.93$	$\bar{X} = 6.48$	T = 1.85	p < 0.10
WORKSHEET NOTATION				
Used All Steps	0%	0%	$\chi^2 = 0.00$	
Number of Steps (8 maximum)	$\bar{X} = 3.53$	$\bar{X} = 4.42$	T = 1.90	p < 0.10
Used Math Calculations	57%	72%	$\chi^2 = 2.94$	p < 0.10
Number of Race Issues Noted (24 maximum)	$\bar{X} = 8.13$	$\bar{X} = 11.07$	T = 2.77	p < 0.01
HYPOTHESIS 2: Executed Steps of Structured Decision Protocol in Correct Order				
SELF-REPORT				
Used Correct Order	37%	52%	$\chi^2 = 2.74$	p < 0.10
WORKSHEET NOTATION				
Used Correct Order	33%	52%	$\chi^2 = 4.13$	p < 0.05
HYPOTHESES 3: Relied on Structured Decision Protocol vs. Gut Feel as Primary Decision Basis				
SELF-REPORT				
Gut feel (vs. Protocol) as Primary Decision Basis	30%	10%	$\chi^2 = 6.52$	p < 0.05
Used Gut feel At All	65%	65%	$\chi^2 = 0.00$	
WORSHEET NOTATION				
Used Gut Feel At All	50%	55%	$\chi^2 = 0.37$	

marginally significant differences in their use of numerical calculations ($\chi^2 = 2.94$, $p < 0.10$), and highly significant differences in the number of relevant race issues they noted ($\bar{X} = 8.13$ vs. 11.07; $T = 2.77$, $p < 0.01$). Follow-up confidence interval tests indicate, with 90% confidence, that participants in moderately negative moods were 14%–16% more likely than those in moderately positive moods to carry out mathematical calculations in their use of the structured decision protocol and to note more relevant race issues on their worksheets.

Together, the results of both self-reports and notational data indicate that individuals in moderately negative moods are more likely than individuals in moderately positive moods to use a structured decision protocol when making a complex decision and are more likely to carefully execute all of the protocol steps.

In relation to Hypothesis 2 (i.e., following the decision protocol in the correct order), positive-mood groups and negative-mood groups showed marginally significant differences in their self-reported use of the steps in the correct order ($\chi^2 = 2.74$, $p < 0.10$). Analysis of decision worksheets also showed that positive-mood and negative-mood groups were significantly different in following the correct order of the structured decision process ($\chi^2 = 4.13$, $p < 0.05$). Follow-up confidence interval tests for both the self-report and worksheet data indicate, with 90% confidence, that participants in moderately negative moods were 14%–16% more likely than those in moderately positive moods to follow the decision protocol steps in the correct order.

In relation to Hypothesis 3 (i.e., relying on the decision protocol vs. gut feel as the primary basis for the decision), analysis of the participants' written explanations showed that negative-mood and positive-mood participants differed significantly in their consideration of gut feelings as the *primary* basis for their decision ($\chi^2 = 6.52$, $p < 0.05$). Follow-up confidence interval tests indicate, with 90% confidence, that participants in moderately positive moods were 18%–19% more likely than those in moderately negative moods to report that gut feelings (vs. results of the structured protocol) were the most important considerations in making their decision. As an additional qualitative measure, our 20 post-exercise interviews indicated that participants in the positive-mood group were more likely to base their decision on gut feelings and that they felt more confident in their abilities to make decisions based on gut feelings or instincts about the case. Several positive-mood participants noted that they felt good about their ability to make a judgment call and that they did not feel they needed to use the structured decision protocol.

There were no significant differences between mood groups in reported use of gut feelings as "a part of" decision-making. This suggests that "gut feel" may be an inherent part of making any decision, but that mood may affect the extent to which it is *relied* on as the primary basis for a decision.

Discussion

Structured decision-making protocols have been prescribed as tools to overcome, or at least limit, the effects of bounded rationality when undertaking complex decisions (Dixit and Nalebuff 1991). Yet empirical evidence suggests that decision-makers do not always use these protocols or use them correctly (Dean and Sharfman 1993). While these findings have been attributed to the decision-making context (Langley 1989), little attention has been paid to the effects of individual-level constructs such as mood. We found this weakness in the literature particularly troubling since research in psychology has found significant effects of mood on how individuals approach decision-making tasks.

The research reported here represents an initial inquiry into the relationship between mood and use of a normative, structured decision-making protocol when making a complex decision. Our findings suggest that the effect of mood may be significant in situations where decision-makers have a choice between a structured protocol and a more intuitive approach. In an attempt to be conservative in our research, we designed our study in a manner that "primed" the participants to use the structured protocol, while still giving them the option of choosing their own alternate approaches. Nevertheless, significant differences were found across mood groups in use of the normative protocol and on reliance on the outcomes of the protocol when making a complex decision.

Theoretical Implications

Janis and Mann (1977, p. 46) suggest that "human beings [are] programmed with emotions and unconscious motives ..." that prevent managers from "approximating a state of detached affectlessness ..." when making decisions. Yet much of the current decision-making literature implicitly assumes that managers make decisions in an emotional vacuum. The results of the present study suggest that these "emotions and unconscious motives," as reflected in mood, influence whether an individual will elect to use a well-known, normative decision-making protocol when making a complex decision. Figure 1 models prior research, and illustrates how the findings reported in the current study contribute to this body of literature.

As Figure 1 illustrates, much of the literature on

Figure 1   A Model for Use of a Normative Decision Protocol
          in Making a Complex Decision
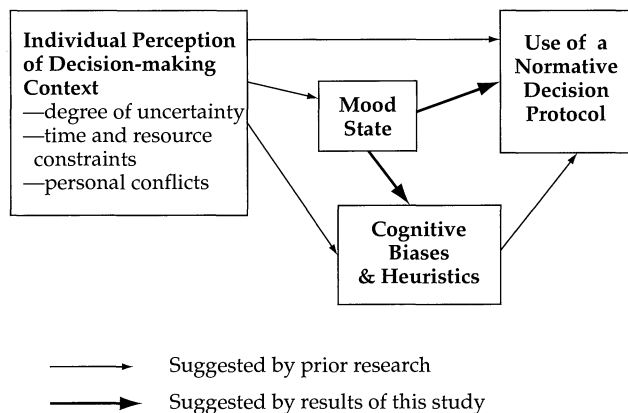
decision-making in organizations focuses on the relationship between decision context and decision-makers' use of formal decision-making procedures (Dean and Sharfman 1993, 1996; Fredrickson 1984; Fredrickson and Mitchell 1984; Eisenhardt 1989), as suggested by the top arrow in Figure 1. Other literature from organizational decision-making focuses on cognitive limitations and use of biases and heuristics in making complex decisions (Cyert and March 1963, Schwenk 1988, Tversky and Kahneman 1981). These findings are represented by the arrows in Figure 1 between context and cognitive bias/heuristics as well as between cognitive bias/heuristics and use of a formal decision process.

The primary contribution of the findings in the present research is that mood might mediate decision processes in two general ways. First, our results suggest that mood may act as an intervening variable between context and careful and complete use of a normative, structured protocol (denoted in Figure 1—the bold arrow between mood and use of a structured decision protocol). Our findings suggest that individuals in moderately negative moods are more likely to completely and carefully use a structured protocol when making a complex decision than are individuals in moderately positive moods. Second, our findings about the reported use of gut feel as a decision-making heuristic suggests that mood may act as in intervening variable between context and use of cognitive shortcuts when making complex decisions (represented in Figure 1 as a bold arrow between mood and cognitive bias/heuristics).

In addition to these general findings, our inclusion of mood in decision models provides indirect evidence for several other specific processes that might occur during decision-making. For example, our findings might suggest that the effects of time on decision-making processes

may be mediated by mood. The amount of time one has to undertake a decision may not have a direct effect on decision-making strategy, as is implicitly suggested by Eisenhardt (1989), but may affect decision-making indirectly through mood (i.e., by inducing positive or negative moods).

Our findings also have implications for the role of intuition in decision-making. Recently, several authors have suggested that gut reaction or intuition plays a major part in decision-making (Behling and Eckel 1991), especially as the decision-maker gains expertise in a particular decision-making arena (Simon 1987). Research in the development of expert systems, for example, indicates that experts are often unable to verbalize decision protocols because they have become so well-learned that they are almost preconscious (Simon 1987). Our results differ from this perspective in that positive-mood participants reported relying more heavily on gut feel than those in the negative-mood group, despite the fact both groups were equivalent in their decision-making and auto-racing expertise. This suggests models of decision-making need to differentiate between use of informed intuition based on expertise, and use of gut reactions based on preconscious hunches (Behling and Eckel 1995).

Finally, our results have implications for the role of cognitive biases, such as "illusions of control" in theories of decision-making (Langer 1975). Illusion of control bias leads decision-makers to downplay potential problems with preliminary choices and to reduce their analysis of alternatives (Langer 1975). The presence of an illusion of control bias in our participants is graphically illustrated by the comments made by positive-mood participants on their questionnaires. The following statement, taken from the questionnaire of a positive-mood subject is typical of the types of statements made by individuals in this mood group:

> No guts no glory. There was strong evidence that higher temperatures meant higher success, but it was not overwhelming. I would need more data to give up a big chance just because of cold temperatures.

This finding suggests that positive moods may encourage an illusion of control by heightening individuals' self-confidence in gut instincts. Further, positive moods may be linked with unrealistic perceptions of control as a means of averting negative emotions that may ruin good moods (Duhaime and Schwenk 1985).

Practical Implications

Though our study represents an initial step toward understanding the effects of mood on how decisions are made, our results suggest some important implications

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managers who wish to improve the effectiveness of decision processes. Success in competitive environments often depends on the quality of the decisions made (Dean and Sharfman 1996), and our findings suggest that mood may affect that quality by affecting use of structured decision protocols.

A review of extant research on mood and decision-making and information processing tasks suggests that different moods are better suited to different types of decisions. This research (summarized in Table 3) suggests that positive moods are best suited for decision-making tasks that are interesting or require creativity or efficiency, while negative moods are best suited for decision tasks that are effortful and/or require careful consideration and analysis of a number of different issues and potential outcomes. In line with these findings, the results of our study suggest that if a complex decision might benefit from use of a formally structured decision protocol, moderately negative moods may be desired.

Intentionally inducing negative moods, however, is at odds with most practical business thinking. Furthermore, it is unlikely that managers could easily manage individuals' moods. As indicated by our study, moods are relatively malleable and may be affected by relatively insignificant events that are not related to the immediate decision. Events outside the control of managers—such as stress at home, commuting to work—or in casual interactions with co-workers all can alter moods. Rather than attempting to manipulate mood directly, then, we would advise managers to manipulate the decision context so that employees follow structured protocols regardless of mood.

In this vein, research from psychology suggests several alternatives for increasing use of structured decision protocols. For example, as stated earlier, several studies have found that when a decision has high personal relevance for the decision-maker the effects of mood are attenuated (Forgas 1989). If decision-makers believe that a decision is both important and personally relevant, they will undertake the same effortful, analytical approach as would decision-makers in mildly negative moods. Therefore, specifically tying rewards and compensation to decision outcomes or making the consideration of potential strategic implications a required part of decision-making (i.e., increasing the importance of the decision) may lead individuals to more closely follow formal decision procedures.

Another finding from psychology is that individuals in good moods process information more carefully if they find the process inherently interesting (Isen 1993, Isen et

Table 3   Findings on the Effects of Positive and Negative Moods on Decision-Making and Related Information Processing Tasks

Mood	Potential Benefits	Potential Costs
POSITIVE	Cues positive material in memory (Isen et al. 1978)	Promotes risk aversion, more negative subjective utility for losses (Isen et al. 1988)
	Promotes creative problem solving (Isen et al. 1987)	Promotes behavior designed to protect positive mood (Isen & Simmonds 1978)
	Promotes more flexible categorization of items (Isen & Daubman 1984)	Promotes use of heuristics and quick decision-making (Isen & Means 1983)
	Promotes efficiency in decision-making (Isen & Means 1983)	Difficulty discerning weak and strong arguments (Smith & Shaffer 1991)
	Promotes thoroughness in interesting tasks (Isen et al. 1991)	Persuaded by peripheral cues (e.g., "expert" label) (Mackie & Worth 1991)
	Promotes effort on pleasant or interesting tasks (Staw & Barsade 1993)	*less likely to use a structured decision protocol completely and correctly (current study)
NEGATIVE	Not affected by distractions and engage in more message elaboration (Bless et al. 1990)	Reliance on well-known decision rules (Mano 1992)
	Less likely to rely on peripheral cues (Worth & Mackie 1987)	Increased pessimism (Wright & Bower 1992) Increased negative judgments of others (Fiske & Taylor 1984)
	Motivated to engage in effortful analysis to change situation & mood (Bless et al. 1990)	Risk-taking when potential benefits/losses are large (Dunegan et al. 1992)
	*more likely to use a structured decision protocol completely and correctly (current study)	

al. 1991). Thus, heightening interest in the decision-making process itself may lead individuals in mildly positive moods to follow the process more carefully. The results of studies on work and play in organizations (Cellar and Barrett 1987, Sandelands 1988, Glynn 1994), for example, are consistent with this line of reasoning and suggest that simple changes in context (i.e., labeling a decision task "work" vs. "play") may be sufficient to motivate positive-mood individuals to use a decision process more carefully and completely.

Limitations

Though our results are significant and have several implications for both research and practice, it is important to highlight the exploratory nature of this research and the resulting limitations of generalizing from it. First and most obviously, this study used an experimental design and, thus, suffers from the limitations of generalization inherent to all experiments. We chose this method of study because it was important to be able to isolate mood from other potential impacts on decision-making, which would be quite difficult in a field setting. However, experiments are by design an artificial environment and care must be taken when attempting to apply experimental results to the more complex "real world."

Second, caution must be used when generalizing the behavior of student participants to managers. Again, because of the exploratory nature of the research and use of an experimental design, student participants were the most practical choice. We made every attempt to select students that were as representative of practicing managers as possible. As noted in the Methods section, the participants were graduate business students with several years of work experience (mean = 4.4 years), and most had experience with complex decision-making (67%). Post-experiment debriefing indicated that all participants became involved with the decision-making task and did not suspect the true intent of the task (to study mood). Despite these precautions, however, we cannot be certain that the results would be exactly the same for practicing managers, and further study with practicing managers is required before these results can be generalized with confidence.

Third, it is important to note that the relationship between mood and use of a formal decision process may be subject to certain environmental conditions. The literature from psychology suggests that the effect of mood may be eliminated if individuals are explicitly told to use the process, or if they anticipate significant personal loss (or gain) from not using (or using) the process (Isen 1993). Therefore, the impact of mood on use of a structured protocol, which this study addresses, should be anticipated

only in conditions where individuals have a choice in how decisions are made and whether they anticipate significant personal loss or gain from the decision outcome.

Finally, it could be argued that the differences we see across treatment groups indicate that individuals in the negative-mood group were simply more compliant than were those in the positive-mood group. Although this explanation cannot be completely ruled out, in an attempt to limit the extent to which compliance could be viewed as an alternative explanation for our results, we carefully designed our study to minimize the contexts that have been linked by prior research to compliance behavior. Cialdini (1987), in a summary of compliance literature, identifies six contexts in which individuals are more likely to exhibit compliance behaviors: (1) when individuals have made a volitional, public commitment to act (public commitment), (2) in cases where the individual feels an obligation to the party who makes the request (reciprocity), (3) when in competition for scarce resources (competition), (4) when attempting to gain or maintain a friendship (friendship), (5) in response to social or peer pressures (social proof), and (6) in response to authority (authority).

In this study, participants did not volunteer to take part in the experiments (public commitment), they were neither given nor promised anything in exchange for their participation (reciprocity), no rewards were promised or given (competition), the experimenters were not friends with the participants (friendship), and participants were not allowed to interact with one another during the experiment, so social pressures were not a factor. We also took care to design the study in a manner that limited the level of any real or perceived authority the experimenters could have had over the participants. The experimenters were not at the time, nor were they previously, the participants' instructors. Furthermore, we gave the participants a clear exit option; the case instructions were clear in indicating that the protocol was the *usual but not required* method of decision-making for the company. In studies of compliance behavior under conditions of authority, research has found that the effect of authority on compliance behavior is markedly lower when the participants are given a clear exit option (Zimbardo and Leippe 1991).

Conclusion

Through an experimental study of the effects of mood on individuals' use of a structured decision protocol we have shown that temporary mood states of decision-makers may significantly affect whether or not they use a formal decision-making protocol when making a complex decision. In relation to theories of organizational behavior,

our findings help to establish mood as an important variable in frameworks of individual decision-making. In terms of psychological theories of mood and information processing, this study helps to clarify theories about the potential costs and benefits of mood in decision-making tasks by defining a situation where negative—not positive—moods may be most advantageous. In short, our findings suggest that, in making complex decisions, mood matters.

Acknowledgment

Appendix A   Pilot Study Materials

A. Difficult Anagrams (negative-mood induction)
Please solve the following anagrams. Sit quietly when finished. Stop work immediately when instructor calls "time".

1. TREALA   ___ ___ ___ ___ ___
2. RCIINO   ___ ___ ___ ___ ___
3. ARUBUE   ___ ___ ___ ___ ___ ___
4. RRPOGA   ___ ___ ___ ___ ___ ___

B. Solved Anagrams (positive mood induction and control)
Please review the following solved anagrams and rate them as too easy, about right, or too hard for MBAs. DO NOT TRY TO SOLVE THEM–Just rate them based on your intuition.

		TOO EASY	ABOUT RIGHT	TOO HARD
1. SEEND	NEEDS	___	___	___
2. RCIINO	IRONIC	___	___	___
3. THWORG	GROWTH	___	___	___
4. NSPAL	PLANS	___	___	___
5. ARUBUE	BUREAU	___	___	___
6. PRGOU	GROUP	___	___	___

C. Mood Questionnaire
Please Describe Your Current Mood. For each item below, please circle the number that indicates how strongly you agree that item describes the way you are feeling.

	Strongly disagree		Neutral		Strongly agree
Glad	1	2	3	4	5
Annoyed	1	2	3	4	5
Frustrated	1	2	3	4	5
Happy	1	2	3	4	5
Pleased	1	2	3	4	5
Angry	1	2	3	4	5
Cheerful	1	2	3	4	5
Dissatisfied	1	2	3	4	5

D. Self-Efficacy Questionnaire
Please describe your current beliefs about yourself. For each item below, please circle the number that best indicates your beliefs about yourself.

	Significantly decreased		Remained the same		Significantly Increased
1. After doing the anagram exercises, my level of self confidence has	1	2	3	4	5
2. After doing the anagram exercise, my opinion of my level of intelligence has	1	2	3	4	5
3. After doing the anagram exercise, my opinion of my problem solving abilities has	1	2	3	4	5
4. After doing the anagram exercise, my opinion of my ability to make decisions in complex situations has	1	2	3	4	5

Appendix B

Decision Process Questions

I. In the space below, please provide a brief statement, 2–3 sentences, explaining the basis for your decision in the Carter Racing Case (the most important considerations and/or information you used in making your decision).

II. Please answer the following questions on your decision-making approach. It is important that we understand the process you *actually used* to make your decision. Please answer all questions carefully and honestly.

1. Did you choose to follow the structured decision-making process? (check one)
   ___ Yes
   ___ No

2. How many of the decision-making steps listed below did you perform? (check all that apply, regardless of your answer to question 1)

A. Structuring the Decision
   ___ 1. Generated alternatives
   ___ 2a. Considered key dimensions upon which alternatives should be judged
   ___ 2b. Considered preferential order of each dimension
   ___ 3a. Considered key uncertainties
   ___ 3b. Considered probabilities associated with the uncertainties

B. Making the Decision
   ___ 1. Considered all likely consequences of each alternative
   ___ 2. Evaluated each alternative based on the identified dimensions
   ___ 3. Considered the impact of uncertainties on preferred alternative

3. Did you perform the steps listed in question 2 above in the order in which they are listed?

_____ Yes
_____ No

4. Did you use gut feel in making the decision?
_____ Yes
_____No

5. Compared to your mood following the anagram exercise, how would you describe your mood following the case exercise?

More positive _____
More negative_____
About the same_____

III. Please provide the following information about yourself.

1. Did you understand the decision-making tutorial given at the beginning of this session?
_____ Yes
_____ No

2. Have you been exposed to the structured decision-making process before today?
_____ Yes
_____ No

3. How familiar are you with the business of auto racing?

Not at all familiar		Somewhat familiar		Very familiar
1	2	3	4	5

Appendix C

Relevant Race Issues
1. Chance for only running luxury events
2. Place in top five
3. Win first place
4. Win prize money
5. Gain Goodstone Tire contract
6. Save oil sponsorship
7. Chance to get out of debt
8. Chance to add new car next season
9. Prestige and recognition of TV exposure
10. Positive team morale
11. Valuable experience
12. Thrill of racing
13. Greater payoffs worth the risk
14. Bad to lose on TV
15. Cost to replace engines
16. Lost entry fees
17. In debt already, can't risk more debt
18. Loss of oil contract
19. Finish out of money
20. Potential of crashing
21. Loss of future prize money
22. Potential of not finishing at all
23. Probability that it's too cold for engines
24. Past engine problems add risk

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