Testing the Action-Based Model of Cognitive Dissonance: The Effect of Action Orientation on Postdecisional Attitudes

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Two experiments were designed to test the prediction, derived from the action-based model of cognitive dissonance, that facilitation of an action-oriented mindset would increase cognitive discrepancy reduction. In Experiment 1, following an easy or difficult decision, a manipulated action-oriented mindset (thinking about implementing the decision) caused persons who made a difficult decision to change their evaluations of the decision alternatives in favor of the decision (spreading of alternatives) more than other participants. Experiment 2 conceptually replicated the effects of Experiment 1, even when an action orientation was induced by having persons write about implementing a different decision. Discussion focuses on the implications of these findings.

Cognitive dissonance theory is considered one of the most influential theories in psychology (Jones, 1985). The explanatory, predictive, and generative power of the theory resulted from its concern with the dynamic interplay of cognition, emotion, and motivation (for recent reviews, see Draycott & Dabbs, 1998a, 1998b; Harmon-Jones & Mills, 1999). Although the theory has revealed novel ways of inducing cognitive, behavioral, motivational, and emotional change in individuals, several basic questions regarding the mechanisms producing these outcomes have not been satisfactorily answered.

Why do individuals experience dissonance? And why are they motivated to reduce it? Much research has demonstrated that individuals do indeed experience dissonance and that they are motivated to reduce it. But the questions of why individuals experience dissonance and are motivated to reduce it are two of the most important questions for contemporary research on cognitive dissonance (see Harmon-Jones & Mills, 1999).

Several answers have been offered (Aronson, 1968, 1999; Cooper & Fazio, 1984; Steele, 1988). For instance, the self-consistency revision posits that the motivation results from the need to reduce the inconsistency between a behavior and the self-concept of competence, morality, or rationality (Aronson, 1968, 1999). The self-affirmation revision posits that the motivation results from the need to restore a threatened global self-image (Steele, 1988), and the aversive consequences revision posits that the motivation results from the need to avoid feeling personally responsible for producing aversive consequences (Cooper & Fazio, 1984).

However, recent research has challenged each of these perspectives (see Beauvois & Joule, 1996, 1999; Harmon-Jones, 1999, 2000a; Harmon-Jones, Brehm, Greenberg, Simon, & Nelson, 1996; McGregor, Newby-Clark, & Zanna, 1999; Simon, Greenberg, & Brehm, 1995). In a return to the heart of the theory of cognitive dissonance, several theorists have suggested that cognitive inconsistency is the motivating force (Harmon-Jones, 1999, 2000a, 2000b, 2001; Harmon-Jones et al.,

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1996; McGregor et al., 1999; Simon et al., 1995). But why is inconsistency motivating?

In an attempt to explain the underlying motivation behind dissonance processes, Harmon-Jones (1999, 2000b) recently proposed an action-based model of cognitive dissonance that accepts the original theory's (Festinger, 1957) proposition that the magnitude of dissonance, a negative emotive state, is a function of the number and importance of dissonant (inconsistent) relative to the number and importance of consonant (consistent) cognitions. Festinger was clear that cognitive inconsistency (as defined above) and the negative affect that it produces prompt the cognitive adjustments known as discrepancy reduction. However, Festinger was silent regarding the underlying reasons why individuals find cognitive inconsistency aversive.

The action-based model extends the original theory by explaining why cognitive inconsistency produces this state. The model begins with the assumption that cognitions (broadly defined) can serve as action tendencies, an idea espoused by several theorists (e.g., Cacioppo & Berntson, 1994; James, 1890/1950). According to the model, the cognitions that are most likely to evoke dissonance are those that provide information useful for action. When other information inconsistent with cognitions that guide action is encountered, negative emotion (dissonance) is aroused because the dissonant information has the potential to interfere with effective and unconflicted action.[1] The factors that have been shown to affect the magnitude of dissonance, such as importance, aversive consequences, salience, and self-relevance, all could be viewed as factors that increase the likelihood that a particular cognition will carry significant implications for action.

Beginning with Brehm and Cohen (1962), most dissonance-inducing situations can be analyzed as decision situations (Beauvois & Joule, 1996, 1999; Brehm & Cohen, 1962; Festinger, 1964). In these situations, individuals have committed themselves to an action, and dissonance results because there is information that is inconsistent with the chosen course of action. In the induced compliance paradigm, the individual has chosen one course of action and the pre-existing attitude is inconsistent with the action. In the free-choice paradigm, the individual has chosen one option over another, and the positive aspects of the rejected alternative and the negative aspects of the chosen alternative are inconsistent with having chosen that option.

Numerous experiments have demonstrated that individuals reduce dissonance aroused by commitment to a course of action by processing information in a biased manner in which they view their chosen course of action more positively or less negatively; that is, individuals change their attitudes to be consistent with their behavior. In the free-choice paradigm, the tendency to view the chosen alternative more favorably and the rejected alternative less favorably has been referred to as spreading of alternatives. According to the action-based model, this biased information processing is necessary and functional. It serves the essential function of transforming the decision into effective and unconflicted action. Instead of continuing to experience regret, individuals are able to follow through with their decision and act on it (cf. Walster, 1964).

From the current perspective, the proximal motivation to reduce cognitive discrepancy stems from the need to reduce the negative affect associated with dissonance, whereas the distal motivation to reduce discrepancy stems from the requirement for effective action. When the potential for effective action is threatened by information that is sufficiently discrepant from the commitment, a negative emotive state results, which prompts attempts at the restoration of cognitions supportive of the commitment (i.e., discrepancy reduction); that is, the negative affect provides a signal that effective behavior has been undermined and provides energy and arousal. The overarching distal motivation for effective action is triggered by the negative affect and provides the direction (e.g., action orientation) that causes the organism to support the commitment.

By "effective action," we mean actions that constitute effectively following through on a decision; for example, if students are accepted to two schools, they must make a decision of which school to attend. If both schools are fairly equal in attractiveness but differ in their positive and negative characteristics, this decision will evoke dissonance because the positive aspects of the rejected school and the negative aspects of the chosen school will provide cognitions dissonant with their choice. If students continue to hold these dissonant cognitions, and to experience regret about not choosing the rejected school, this may impede their ability to do course work, conduct research, and so forth. However, if they reduce dissonance by viewing the chosen alternative more positively and the rejected alternative more negatively than prior to their decision, they may have a higher chance of engaging in actions that lead to success in the chosen school.

When dissonant information is encountered, a negative emotive state causes the person to engage in cognitive work to support the commitment. The support and protection of the commitment can be maintained and enhanced through mechanisms that increase motivational and cognitive processes that assist in following through with the commitment. For instance, the commitment can be supported and protected by increasing the value of the chosen course of action. Research has demonstrated that increases in value can increase moti-

vation by increasing effort and persistence in goal-directed action (e.g., Feather, 1982). In addition, the commitment can be maintained and enhanced by decreasing the value of the rejected course of action because the suppression of the desirable aspects of the rejected alternative reduces the likelihood that the regret regarding the rejected alternative will distract one from effectively enacting the commitment.

From the action-based model's view, the state in which a person engages in dissonance reduction is similar to an action-oriented state (Gollwitzer, 1990; Heckhausen, 1986; Kuhl, 1984). Although the negative affect produced by cognitive discrepancies provides the motivation to reduce dissonance, it may not be sufficient in itself to cause discrepancy reduction to occur. The person experiencing the negative affect might not reduce dissonance but continue to experience the negative affect (in this case, effective action may be impeded). The person might deal with the negative affect in another way besides discrepancy reduction, such as by distraction or forgetting or trivializing the decision. An action orientation should assist in discrepancy reduction, not by increasing the amount of negative affect but by assisting the individual to more strongly commit to the decision and follow through with it. The action orientation guides the organism toward effectively engaging the intention (i.e., commitment).

The action-based model should not be seen to promote the view that individuals will always change their attitudes in the direction of their decision, however. The direction that attitude change will take depends on which cognitions are most resistant to change. In many cases, the decision that the individual has made is the cognition most resistant to change, and the individual will attempt to engage in discrepancy reduction that supports the decision. However, in some cases, the cognitions dissonant with the decision are more resistant to change. When this is the case, the negative emotive state of dissonance may cause the person to discontinue supporting the commitment.

Thinking about dissonance-reduction processes in terms of the resistance to change of the various cognitions helps to make it understandable that the degree of attitude change does not necessarily directly correspond to the degree of negative affect that the individual experiences following a decision. The negative affect motivates the individual to reduce the discrepancy between cognitions. However, if the dissonant cognitions are highly resistant to change, the individual may find it difficult to change his or her attitude, even when the negative affect and, therefore, motivation to do so are high. In fact, if the dissonant cognitions are sufficiently resistant to change, the individual may change his or her attitudes in the opposite direction—by disengaging from the decision (e.g., Batson, 1975; Sherman & Gorkin, 1980).

Theoretical Perspectives Consistent With the Action-Based Model

The present model is consistent with views that have been presented previously but have not been given due consideration. One reason for the lack of consideration of these conceptual ideas may be the difficulty of understanding how the effects observed in the laboratory experiments would be produced by a concern over effective action. We propose that the dissonance process constitutes a mechanism that survived because of its adaptive value. Such a mechanism may be able to produce effects in conceptually similar situations that do not have obvious adaptive significance. In some situations, the dissonance process may, in fact, be maladaptive and dysfunctional, such as when persons maintain and bolster a commitment to a decision that clearly harms themselves or others. However, we propose that the dissonance process has survived because it is adaptive in the majority of situations in which it operates.

Other scientists have advanced similar, but not identical, conceptions (see Harmon-Jones, 2000c). For instance, Lewin (1951) discussed the organism's capacity to "freeze" on an action tendency following a decision. Later, Jones and Gerard (1967) discussed the concept of an unequivocal behavior orientation that was an adaptive strategy that forced the individuals to bring their relevant cognitions into harmony with each other. The unequivocal behavior orientation "represents a commitment to action in the face of uncertainty. Such a commitment involves the risks of acting inappropriately, but such risks are assumed to be less grave on the average than the risks of hesitant or conflicted action" (p. 185). They further posited, "When the time comes to act, the great advantage of having a set of coherent internally consistent dispositions is that the individual is not forced to listen to the babble of competing inner forces" (p. 181).

Another perspective consistent with the present model is Kuhl's (1984, 2000) theory of action control. He has proposed that to ensure that the intended action rather than a competing action tendency will be executed, the intended action tendency has to be selectively strengthened and protected against interference until the action is executed. The postdecisional spreading of decision alternatives may serve the function of putting the decision into action (Beckmann & Irle, 1985). He proposed that the efficiency of action control would be determined by whether the individual is in an action-oriented or state-oriented frame of mind. An individual in a state orientation focuses excessively on the past, present, or future without attending to plans that would

implement the action. In contrast, an individual in an action orientation would seek to implement a plan of action and would focus simultaneously on the present state, the intended future state, the discrepancy between the present and future state, and the alternative plans that may transform the present state into the future state (see also Gollwitzer, 1990; Heckhausen, 1986). When one considers that dissonance is primarily a theory about postdecisional processing (Brehm & Cohen, 1962; Festinger, 1964), it is easy to see how these nondissonance theories fit with the present conception of the function of the dissonance process.

The Present Research

The action-based model generates predictions regarding both the arousal and reduction of dissonance. The present research was designed to test a hypothesis concerning the reduction of dissonance. According to the model, once a decision has been made, processes should be devoted to assisting with the execution of the decision. Dissonance reduction (e.g., the spreading of alternatives) may be one of the processes that assists with successful execution of the behaviors that follow from the decision; therefore, processes that facilitate an action orientation should increase the extent to which persons will reduce cognitive discrepancy. An action orientation can be facilitated when persons plan to implement actions that follow from a decision. The planning of goal-directed actions typically occurs during the postdecisional phase, and this postdecisional phase is characterized by an implemental mindset (Gollwitzer, 1990; Gollwitzer & Kinney, 1989). The implemental mindset is assumed to cause persons to "muster motivation, resources, and cognitions in the service of goal-directed action" (Taylor & Gollwitzer, 1995, p. 213). The implemental process is, in fact, a process of discrepancy reduction.

Consistent with this hypothesis, Beckmann and Kuhl (1984) found that individuals who were dispositionally high in action orientation increased the attractiveness rating of a tentatively preferred decision more than did individuals who were dispositionally low in action orientation (i.e., state oriented). In other words, increased action orientation was associated with increased justification of the decision. Although this study is consistent with predictions derived from the action-based model, it was correlational and therefore it is difficult to infer that action orientation caused the effects on spreading of alternatives.

The present experiments were designed to test the hypothesis that an action-oriented mindset would cause increased spreading of alternatives in the free-choice paradigm developed by Brehm (1956). In our view, an action-oriented mindset typically occurs following a decision, and this mindset facilitates dissonance reduction. We predict that manipulations that strengthen this action-oriented state will cause enhanced dissonance reduction. Although this prediction follows directly from the action-based model, it is not easily anticipated by the other dissonance models—Festinger's or the revisionists.

EXPERIMENT 1

Method

Overview. Participants made a decision between two equally valued alternatives (difficult decision) or between a highly valued alternative and lowly valued alternative (easy decision). Then, they wrote about implementing the decision (action-oriented mindset) or a typical day (neutral mindset). Next, they re-rated the decision alternatives. Following predictions derived from dissonance theory, persons should evidence more spreading of alternatives after a difficult decision than after an easy decision. Moreover, according to the action-based model, the spreading of alternatives should be exaggerated in the action-oriented mindset condition as compared to the control condition in the difficult-decision condition where dissonance exists.

Participants. Eighty students (47 men, 33 women) participated in the experiment in exchange for extra credit in introductory psychology class. Participants were randomly assigned to one of the four conditions of the 2 (decision difficulty: easy vs. difficult) × 2 (mindset: action oriented vs. neutral) design. One additional woman expressed suspicion and her data were not analyzed.

Procedure. Participants were run one at a time. After greeting the participants, the experimenter explained that the study was designed to examine the relation of personality traits to health habits and fitness. The experimenter informed participants that following the completion of some questionnaires, they would perform a brief physical exercise. Participants were told that exercise clothing was not required and an electrocardiogram (EKG) would be used to monitor cardiovascular activity. Participants also read an introduction that reiterated these points.

The laboratory was designed to appear as a workout facility. The laboratory contained exercise equipment, a towel, a TV and VCR, and physiological amplifiers. Participants were given a notebook that contained descriptions of eight different exercises (abdominal exercises, working out with a martial arts video, Harvard step test, jumping rope, working out with an aerobic exercise video, miniature basketball, lifting weights, using exercise bands). Each description was approximately six to

eight sentences long. Each exercise had positive and negative characteristics, and the exercises varied according to type of task, length of time, whether breaks would be given, and so on. Participants read the descriptions of the exercises and rated how much they would like to perform each exercise on 9-point scales (1 = *not at all*, 9 = *very much*). After rating the exercises, participants completed a 29-item health habits questionnaire, which bolstered the cover story. While participants did this, the experimenter selected the two decision alternatives for the participants.

After completing the questionnaire, participants received written descriptions of two exercises they had rated and were told that they could choose which exercise they would perform. In the easy-decision condition, participants were presented with one exercise they rated highly (approximately 7 on the 9-point scale) and one exercise that they rated lowly (approximately 3 or 4). In the difficult-decision condition, participants were presented with two equally rated alternatives (approximately two 7s). Participants were then asked to write the name of the chosen exercise on a separate questionnaire that contained space for performance results and EKG readings. This questionnaire was intended to bolster the cover story.

After choosing which exercise to perform, participants received the mindset induction questionnaire, which was presented to the participants in an envelope and allowed the experimenter to remain blind to the mindset condition. The questionnaire began by explaining that it was important for all participants to begin the exercise in the same mentality. In the neutral mindset condition, participants were asked to write "at least seven things that you normally do during a typical day." Previous research using the free-choice paradigm has often had control condition participants complete questionnaires concerning neutral topics in the period between the decision and the reevaluation of the alternatives (e.g., Steele, Spencer, & Lynch, 1993). In the action-oriented mindset condition, participants were asked to write "at least seven things you can do to improve your performance" on the chosen exercise.[2] Both groups were given 4 minutes to write.

Next, participants were given descriptions of the exercises and another exercise-rating questionnaire. They were told that evaluations of exercises sometimes change after a few minutes, whereas at other times evaluations do not. They were then told that, therefore, we assess evaluations a few times during experiments. They were asked to read the exercise descriptions again and rate their current preferences. After the second rating, the experimenter probed for suspicion and explained the purpose of the study.

Results and Discussion

Two independent raters read and evaluated each response to the mindset manipulation. They agreed completely. All participants correctly followed the instructions for their mindset condition.

To test the effects of decision difficulty and mindset on attitudes, we conducted a 2 (decision difficulty) × 2 (mindset) between-participants × 2 (predecision vs. postdecision) × 2 (chosen vs. rejected alternative) within-participants ANOVA. It produced the predicted four-way interaction, $F(1, 76) = 6.41$, $p = .01$ (see Figure 1). We first decomposed this interaction by conducting a 2 (mindset) between-participants × 2 (predecision vs. postdecision) × 2 (chosen vs. rejected alternative) within-participants ANOVA within the difficult decision condition. It produced the predicted three-way interaction, $F(1, 38) = 4.17$, $p = .05$. To further decompose the four-way interaction, we examined a 2 (predecision vs. postdecision) × 2 (chosen vs. rejected alternative) within-participants interaction within each of the between-participants conditions. Within the easy decision/neutral mindset condition, the interaction was not significant, $F(1, 19) = 0.03$, $p = .87$. Within the easy decision/action-oriented condition, the interaction was significant, $F(1, 19) = 7.12$, $p = .02$, but in a direction opposite to predictions for the difficult decision conditions. Within the difficult decision/neutral condition, the interaction was significant, $F(1, 19) = 6.33$, $p = .02$. Within the difficult decision/action-oriented condition, the interaction was significant, $F(1, 19) = 12.67$, $p = .002$. These analyses reveal that spreading of alternatives occurred within the neutral mindset/difficult decision condition, replicating past research. More important, these analyses reveal that spreading of alternatives occurred with the action-oriented mindset condition.

To assess whether these latter two conditions differed in discrepancy reduction, we created another dependent variable because there is no unambiguous choice for an appropriate error term for comparisons involving mixed designs (Winer, Brown, & Michels, 1991). This variable, an index of spreading of alternatives, was computed by taking the difference between the predecision ratings of the chosen and rejected alternatives and subtracting it from the difference between the postdecision ratings of the chosen and rejected alternatives. Then, we performed a 2 (decision difficulty: easy vs. difficult) × 2 (mindset manipulation: action-oriented vs. neutral) between-participants ANOVA with spreading of alternatives as the dependent variable. The analysis produced the predicted interaction, $F(1, 76) = 6.41$, $p = .01$. Consistent with predictions derived from the action-based model, the interaction indicated that the action-oriented mindset/difficult-decision condition evoked more spreading of alternatives ($M = 1.40$, $SD = 1.76$) than

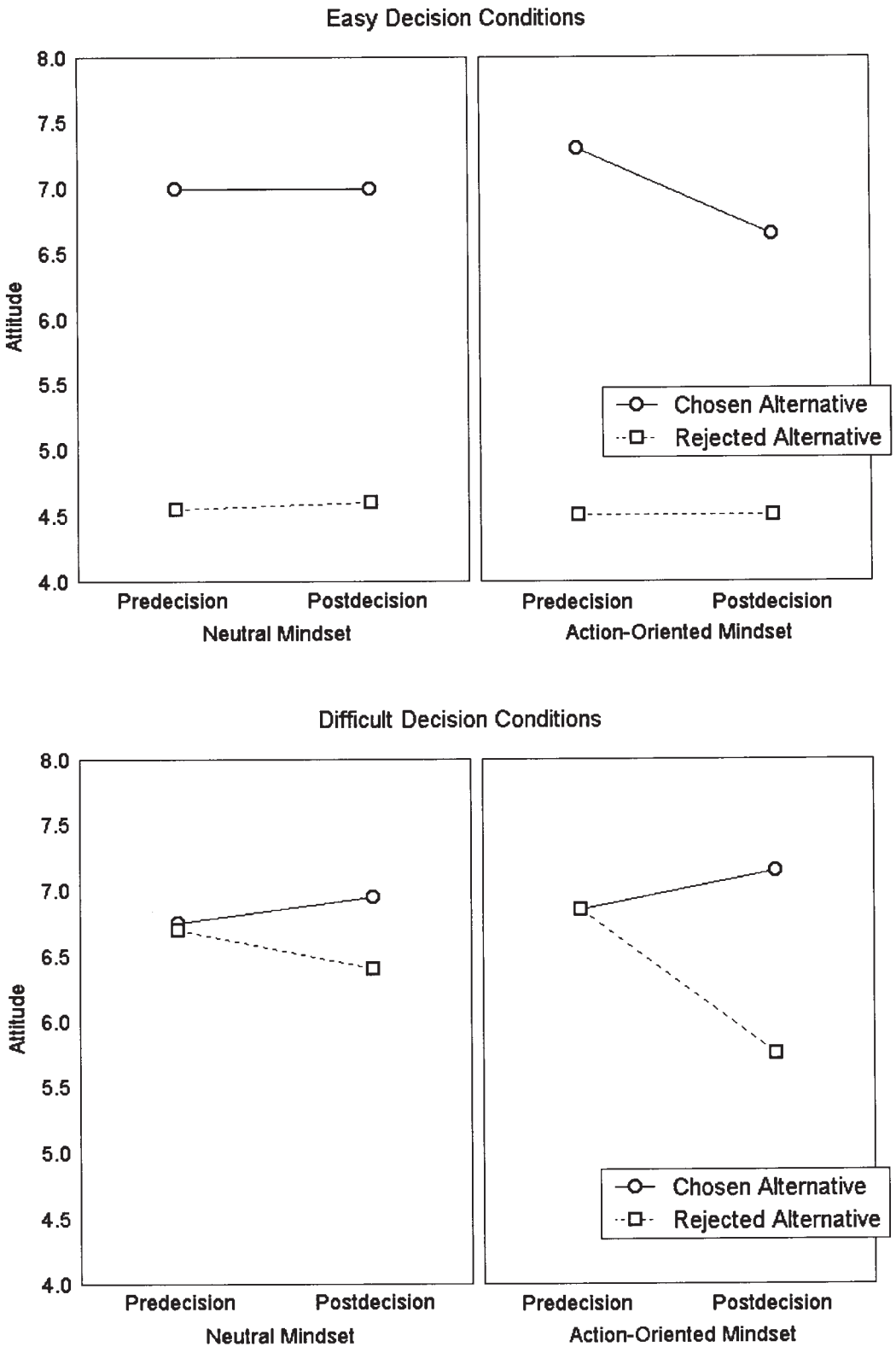

Figure 1 Attitudes toward chosen and rejected alternatives as a function of time (predecision or postdecision), decision difficulty (easy or difficult), and mindset condition (neutral or action oriented)—Experiment 1.

any of the other conditions (easy/neutral $M = -.05$, $SD = 1.39$; easy/action $M = -.65$, $SD = 1.09$; difficult/neutral $M = .50$, $SD = 0.89$), all $ps < .04$.

The results of Experiment 1 provide initial experimental evidence in support of a core prediction of the action-based model. The evidence suggests that an action-oriented mindset can increase cognitive discrepancy reduction, thus supporting a prediction derived from the action-based model of cognitive dissonance. It is worth noting that the effects of the mindset manipulation interacted with the difficulty of the decision in the predicted manner, indicating that the action-oriented mindset increased the spreading of alternatives only in the difficult decision condition. This result is important because it demonstrates that action-oriented processing increased the spreading of alternatives only in the condition in which dissonance was aroused—the difficult decision condition. In line with predictions derived from the action-based model, this result suggests that the action orientation effectively assisted with the discrepancy reduction process.

It could be argued that action orientation caused spreading of alternatives by some other means than dissonance processes. However, if action orientation effects were separate from dissonance processes, we would have expected them to operate in the easy decision condition as well as in the difficult decision condition. Instead, spreading of alternatives did not occur in the easy decision condition, regardless of whether participants were in an action orientation.

EXPERIMENT 2

We conducted a second experiment to further test the hypothesis that an action-oriented mindset would facilitate discrepancy reduction following a decision. Specifically, we tested the hypothesis that the effects of an action-oriented mindset could transfer to another decision context. Research has found that after making a decision and thinking about steps needed to implement it (action-oriented mindset), persons are more likely to have positive illusions and more of an illusion of control in domains unrelated to the decision about which they thought (Gollwitzer & Kinney, 1989; Taylor & Gollwitzer, 1995); that is, the effects of the action-oriented mindset can transfer to unrelated actions and cognitions. In the second experiment, we tested whether thinking about implementing one decision would affect the spreading of alternatives for a different decision.

In addition, we included a manipulation of a deliberative mindset. Past research suggests that manipulations that encourage persons to deliberate the pros and cons of competing goals (deliberative mindset) may hinder individuals from engaging in thinking that would support the action associated with the decision. If this were to occur, then spreading of alternatives might be reduced. However, it is also possible that the deliberation would increase discomfort, which could be misattributed to the decision and increase the spreading of alternatives. Because these likely effects on spreading of alternatives contradict each other, no specific predictions were made for the effects of deliberative mindset on spreading of alternatives.

The design and predicted results for Experiment 2 would rule out alternative explanations for Experiment 1. According to one alternative explanation, more spreading of alternatives might have occurred in the difficult decision/action-oriented condition because persons in this condition thought more about the chosen alternative and this increased thinking about the chosen alternative produced more spreading of alternatives; that is, the discrepancy reduction process could have been enhanced because the action-oriented mindset, which asked participants to think about how they planned to follow through with their decision, enhanced the salience of consonant cognitions and/or the decision and it enhanced the importance of the decision. By demonstrating that more spreading of alternatives would occur even when persons engage in action-oriented thinking unrelated to the specific decision, the predicted results of Experiment 2 would eliminate this alternative explanation.

Another alternative explanation for the results of Experiment 1 is that the control condition, which asked participants to think about activities unrelated to their decision, could have reduced the amount of discrepancy reduction by distracting participants from their decision or by trivializing it. However, this type of control condition has been used in past dissonance research and most of our participants simply listed seven activities (see Note 2). Experiment 2 is intended to rule out this explanation because the action-oriented and deliberative mindsets in Experiment 2 should be at least as distracting as the control condition manipulation. Both the action-oriented and deliberative mindset manipulations in Experiment 2 induce participants to think about decisions that are more important than the one made in the current experiment, so they should be more likely to trivialize the current decision than the control condition if trivialization is, indeed, an issue.

In Experiment 2, we also assessed reported positive affect, negative affect, and state self-esteem in the period of time after the action-oriented manipulation and before the assessment of spreading of alternatives. Negative affect was assessed to examine whether the action-oriented mindset increased negative affect, which led to the increased spreading of alternatives. If the action orientation affected other theoretically relevant variables (e.g., salience or importance of dissonant cognitions),

then most versions of dissonance theory would predict that action orientation would increase negative affect. However, according to the action-based model, the action orientation is predicted to increase spreading of alternatives not because the action orientation increases negative affect but because it engages processes that assist in translating decisions into actions.

Method

Overview. Participants made a decision between two equally attractive alternatives (difficult decision). They were then randomly assigned to complete a questionnaire that induced an action-oriented, deliberative, or neutral mindset. Next, reported affect and self-esteem were collected. Then, participants re-rated their decision alternatives. We predicted that greater spreading of alternatives would occur in the action-oriented condition as compared to the other conditions.

Participants. Forty-three (21 men, 22 women) students participated in exchange for extra credit in their introductory psychology course.[3] Participants were randomly assigned to one of three conditions: action oriented, deliberative, or neutral mindset.

Procedure. After the experimenter greeted participants, she explained that the study would examine the relationship between personality characteristics, brain activity, and preferences for different types of psychological research. She also explained that we conduct lots of research in the department but have never asked students how much they would like to participate in such research. She explained that students' preferences for the research may affect their responses in the experiments so we need to know students' preferences and how personality characteristics related to these preferences. The experimenter then said that because the study is short and will last only 20 minutes, she would have them participate in another study. Then, the experimenter gave participants the opportunity to read and sign a consent form describing the studies.

The experimenter explained that in the first study, participants would complete short questionnaires that assess preferences for different types of psychological research and personality characteristics. The experimenter then shuffled a set of index cards that contained descriptions of nine research projects (attention, attitudes and values, economics, health, law, linguistics, perceptual cognitive, perceptual motor, person perception).

The participants were given the cards and asked to read them in the order in which they were presented and to then rate each project in terms of how desirable it would be to participate in a study similar to the one described on a 9-point scale (1 = *not at all desirable,* 9 = *very desirable*). Participants were left alone to rate the projects. When the participants informed the experimenter over the intercom that they had completed the ratings, the experimenter returned to the participants' room and asked the participants to rank order the projects on a separate questionnaire. While the participants ranked the projects, the experimenter, who was in the adjacent room, examined the participants' ratings questionnaire and found which two projects had been rated equally and relatively positively (approximately 7 on the 9-point scale).

When the participants completed the rankings questionnaire, the experimenter returned to the participants' room and explained that some of the studies that were just rated were being conducted now. She then gave them a choice to participate in one study.

After the participants made the decision, the experimenter explained that she needed to prepare the materials and computer for the next study and that the participants should complete the personality questionnaires, which were part of the first study on personality and preferences for different types of research. The experimenter handed the participants an envelope that contained the personality questionnaires and asked the participants to return them to the envelope when the questionnaires were completed. The personality questionnaires constituted the mindset manipulation and were presented in an envelope to keep the experimenter blind to condition.

After the questionnaires were completed, the experimenter asked participants to sit still and think about the information they gave in the questionnaires. Then, the experimenter asked the participants to complete another questionnaire, which assessed mood and state self-esteem.

The experimenter returned to the participant's room with the cards containing the research project descriptions. She explained that we also were interested in how familiarity with the research descriptions might affect ratings of the research projects. She explained that the psychology department was considering posting sign-up sheets that contain more information about the experiments. She explained that if this change occurred, by the end of the semester, students may have read the names and descriptions of some research projects many times. She further explained that the psychology department wanted us to assess how reading the research descriptions repeatedly affects evaluations of the research. She then asked participants to rate their current preferences for the research projects again.

Following the re-rating, the experimenter collected the cards and ratings, questioned participants about suspicion, and explained the purpose of the experiment.

Mindset manipulation. For the mindset manipulation, participants were randomly assigned one of three questionnaires. Each questionnaire, labeled "The Projective Life Attitudes Assessment," explained that the assessment was an innovative personality assessment and that descriptions about aspects of life tell us a considerable amount about personality. It was explained that the responses to this survey would be content analyzed to assess dimensions of personality.

In the neutral mindset condition, participants were told to think about an ordinary day in their life. They were asked to describe the day in enough detail so as to cover the space allotted. They were asked to select a typical day in which an extremely positive or negative event did not occur.

In the action-oriented mindset condition, participants were instructed to think about an intended project, defined as a project that has a goal that they intend to realize someday. They were informed that the intended project should be one in which they have decided to take action. They were asked to write about a project that was complex but could be achieved within the next 3 months. They were to list the project; the five most important steps to bring about this project; and when, where, and how each step will be performed (Taylor & Gollwitzer, 1995).

In the deliberative mindset condition, participants were instructed to describe an unresolved problem, which was defined as a problem characterized by the fact that they were not yet sure whether to take action to change things. They were asked to describe a problem where they had not decided to take action but where they had not decided against it either. They were told that the problem should be complex and along the lines of a, "Should I ____ or not?" problem. They were then asked to list the problem and to list the immediate and long-term consequences of making a decision that involves change. After listing each consequence, they were asked to indicate whether it was positive or negative and rate the likelihood that it would occur. Then, they were asked to list the expected difficulties that might arise in trying to carry out the decision involved. Furthermore, they were asked to list the same information they listed for the decision that resulted in change if they were to decide not to change (Taylor & Gollwitzer, 1995).

Affect and state self-esteem questionnaire. Items were included to assess discomfort (bothered, uneasy, uncomfortable; Cronbach's alpha = .86), activated positive affect (enthusiastic, excited, interested, proud; Cronbach's alpha = .78), activated negative affect (distressed, irritable, nervous, tense; Cronbach's alpha = .74), decision-related negative affect (indecisive, regretful, unsure; Cronbach's alpha = .71), and happiness and relaxation. Happiness and relaxation were included to assess positive affects that are not activated. The self-esteem items were the social (Cronbach's alpha = .84) and appearance (Cronbach's alpha = .82) state self-esteem subscales (Heatherton & Polivy, 1991).[4]

Results and Discussion

Two independent raters read and evaluated each response to the mindset manipulation. They agreed completely. All participants correctly followed the instructions for their mindset condition.

To test the effects of mindset manipulation on attitudes, a 3 (mindset) between-participants × 2 (predecision vs. postdecision) × 2 (chosen vs. rejected alternative) within-participants ANOVA was performed. It produced the critical three-way interaction, $F(2, 40) = 4.91$, $p = .01$ (see Figure 2). To decompose this interaction, 2 (predecision vs. postdecision) X 2 (chosen vs. rejected alternative) within-participants ANOVAs were conducted within each between-participants condition. First, it is important to note that the spreading of alternatives occurred within the neutral mindset condition, as demonstrated by a marginally significant 2 (predecision vs. postdecision) X 2 (chosen vs. rejected alternative) interaction, $F(1, 13) = 3.95$, $p = .07$. Second, spreading of alternatives also occurred within the action-oriented mindset condition, as demonstrated by a significant 2 (predecision vs. postdecision) X 2 (chosen vs. rejected alternative) interaction, $F(1, 13) = 24.88$, $p = .0002$. Finally, nonsignificant spreading of alternatives occurred within the deliberative mindset condition, interaction, $F(1, 14) = 1.00$, $p = .33$.

As in Experiment 1, we next analyzed the spreading of alternatives index using a one-way ANOVA, with the three levels of the mindset manipulation as the independent variable. It was significant, $F(2, 40) = 4.91$, $p = .01$, and indicated that more spreading of alternatives occurred in the action-oriented mindset condition ($M = 2.86$, $SD = 2.14$) than in other conditions (neutral, $M = 1.07$, $SD = 2.02$; deliberative, $M = 0.53$, $SD = 2.07$), all ps $< .03$. The latter two conditions did not differ from each other on spreading of alternatives, $p = .48$.

Affect. The effects of the mindset manipulation on each affect index were tested in separate one-way ANOVAs. No effects were significant. However, there was a trend, $F(2, 40) = 2.35$, $p < .11$, that suggested that the action-oriented ($M = 2.02$, $SD = 0.85$) and deliberative mindsets ($M = 1.96$, $SD = 0.79$) evoked more discomfort and activated negative affect (added together) than did the neutral mindset condition ($M = 1.48$, $SD = 0.48$).

State self-esteem. The effects of the mindset manipulation on each state self-esteem index were tested in separate one-way ANOVAs. No effects were significant, ps $> .17$.

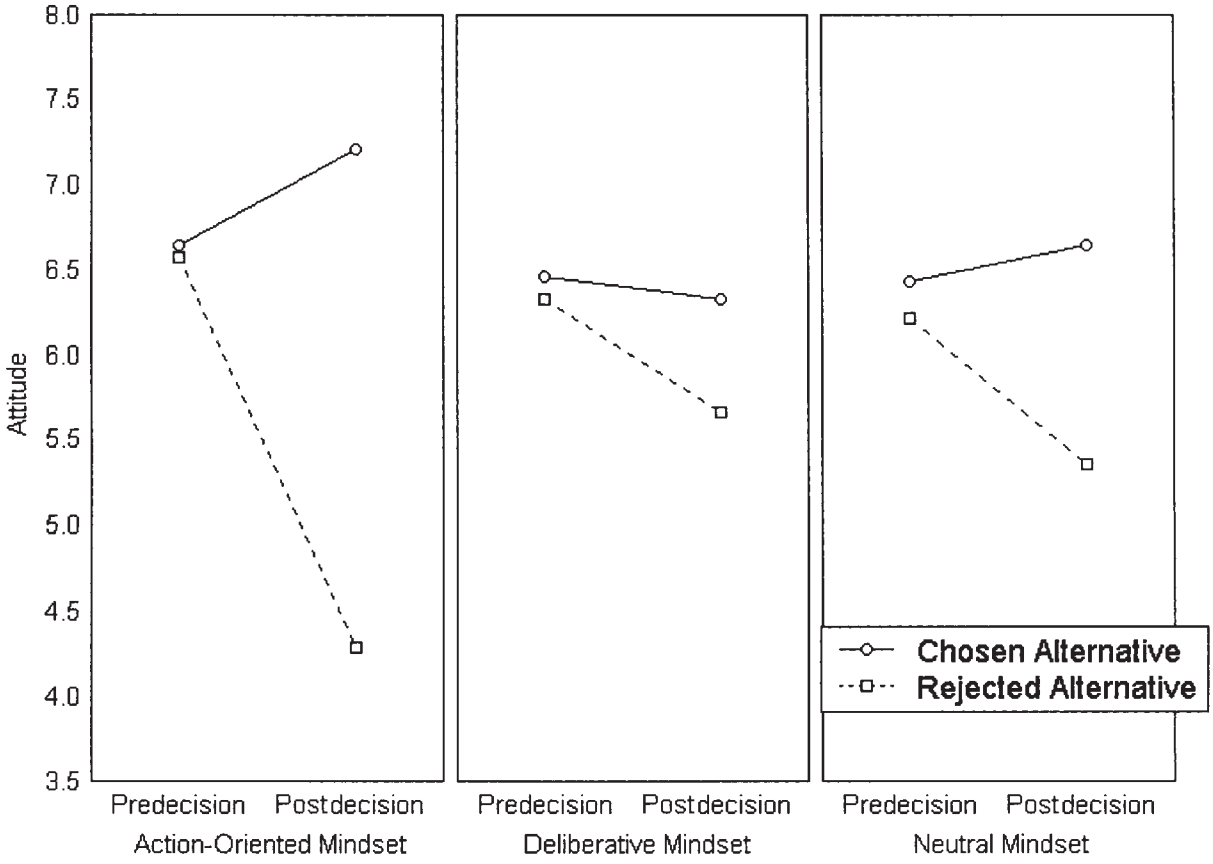

Figure 2 Attitudes toward chosen and rejected alternatives as a function of time (predecision or postdecision) and mindset condition (neutral or action oriented)—Experiment 2.

Testing the mediating role of affect and state self-esteem on spreading of alternatives. As discussed earlier, the action-based model predicts that the action-oriented mindset increases spreading of alternatives in the absence of changes in negative affect. However, other dissonance concepts such as importance of cognitions, salience of cognitions, or aversive consequences might predict that negative affect should mediate the effects of mindset. Thus, we tested for mediation. To demonstrate mediation, three effects should be tested (Baron & Kenny, 1986). First, the predictor, manipulated mindset, should affect the outcome variable, spreading of alternatives. Second, the predictor, manipulated mindset, should affect the mediator, negative affect. Third, the mediator should affect the outcome when controlling for the effects of the predictor. The first effect was demonstrated in the ANOVAs reported above. The second effect was not demonstrated. However, we tested the third effect in a regression analysis in which the mindset manipulation was entered as a contrast coded vector resembling the predicted effects (action-oriented mindset = 1; the other two conditions = –.5). The criterion was the spread of alternatives. The results of the simultaneous regression indicated that negative affect was not a significant predictor, $\beta = .05$, $p = .75$, when the mindset manipulation was included as a predictor, $\beta = .42$, $p = .005$. In addition, the mediating effects of other affects and state self-esteem also were tested in similar regression analyses and none was significant, $ps > .20$, and the mindset manipulation remained a significant predictor in each regression, $ps < .01$.

The results of Experiment 2 conceptually replicated the results of Experiment 1 and provide further support for the action-based model. The replication occurred with a different type of decision and a different manipulation of the action-oriented mindset. In Experiment 2,

the manipulation of the action-oriented mindset was not related to the decision that was made in the experiment. Results suggested that negative affect or state self-esteem did not mediate the relationship between action orientation and spreading of alternatives.

GENERAL DISCUSSION

The results of the experiments supported the hypothesis derived from the action-based model of cognitive dissonance that the facilitation of action-oriented processing would increase the extent to which individuals reduced cognitive discrepancy. According to the action-based model, the effect of action orientation on cognitive discrepancy reduction occurred because the action orientation assists individuals in transforming their decisions into effective and unconflicted action. By increasing the value of the chosen alternative and/or decreasing the value of the rejected alternative, individuals should be more able to effectively engage in actions that follow from their decision. These changes in valuation thus should result in more ease in successfully enacting the decision-related behavior, which may then lead to more efficient and unconflicted behavior. The effects of action orientation should be most likely to exert these effects in situations in which there is much behavioral conflict as in dissonance-arousing situations.

The present research tested one prediction generated by the action-based model of dissonance. As mentioned earlier, the action-based model bears some similarity to recent self-regulation theories. Although some of these theories may have generated similar predictions regarding the effects of action orientation on spreading of alternatives, it is important to note that the action-based model generates predictions that may not be easily generated by these other theories (e.g., see Harmon-Jones, Peterson, & Vaughn, in press).

Considering Alternative Explanations

Action orientation as compared to affective state. Some research has suggested that positive affect facilitates the degree to which intentions are translated into behavioral output (e.g., Kuhl & Kazén, 1999). Thus, one possible explanation for the present results is that the action-oriented mindset increased positive affect and this increase in positive affect might have caused the increase in the spreading of alternatives. A number of findings from the past and the present research suggest that this explanation is not valid. First, dissonance research has supported the opposite prediction; that is, increased positive affect has been found to be associated with decreased dissonance reduction, whereas increased negative affect has been found to be associated with increased dissonance reduction (for a review, see Harmon-Jones, 2000c). Second, in Experiment 2, the action-oriented mindset did not increase reported positive affect, and if anything, it tended to increase reported negative affect, relative to the control condition.

Misattribution of interest and enjoyment. Another explanation for the present results is that the action orientation manipulation could have increased feelings of interest and enjoyment and these feelings may have infused evaluations of the chosen option, resulting in increased valuing of it. According to this explanation, then, feelings of interest should be greater in the action-oriented mindset condition, and these feelings should mediate the relationship between mindset manipulation and spreading of alternatives. Experiment 2 included assessments of interest, excitement, and enthusiasm, and these did not differ as a function of mindset manipulation ($ps > .44$). In addition, according to this explanation, these feelings of interest created by the action-oriented mindset should infuse evaluations of the chosen alternative, but this explanation has no basis for predicting the observed decrease in evaluations of the rejected alternative. Finally, according to this explanation, feelings of interest should infuse evaluations of the chosen alternative regardless of the difficulty of the decision, but Experiment 1 demonstrated that spreading of alternatives did not occur in the easy decision/action-oriented condition.

Other revisions of dissonance theory. The self-consistency view might posit that the action orientation increased the positivity of the self-concept and increased dissonance, which would produce more spreading of alternatives. However, in Experiment 1, participants did not list activities that were self-defining, suggesting that the positivity of the self was not increased. The aversive consequences revision might posit that the action orientation affected the perception of aversive consequences and increased dissonance, which should produce more spreading of alternatives. The negative affect indexes suggested that the action orientation did not increase dissonance relative to the deliberative condition, rendering both of these alternative explanations less plausible. Because the affect findings are based on null effects, future research should assess the validity of these explanations.

Conclusion

The present experiments provide support for the action-based model of cognitive dissonance theory, a recently proposed model that extends the original theory of cognitive dissonance by specifying why cognitive inconsistency produces a negative emotive state that

causes cognitive and behavioral changes and the function of the cognitive and behavioral changes. Support for predictions derived from the action-based model was demonstrated across two experiments. The action-based model suggests a new way of thinking about cognitive dissonance processes—it suggests that dissonance processes may serve the necessary and vital function of assisting in the execution of effective and unconflicted behavior.

NOTES

1. For the present model, effective behavior can occur in the absence of consciousness; that is, effective behavior can be produced automatically. The present model does not propose that cognitive consistency is necessary for effective behavior. It only proposes that cognitive inconsistency can interfere with effective behavior.

2. A typical response to the neutral mindset was "get up and take a shower, go to chem. lab, go to lunch with a friend, go to class, come back to dorm, check e-mail, go for run, eat dinner, study, go to bed." A typical response to the action-oriented mindset was "breathing properly, using the ab-roller properly, not starting off too fast, finish strong, relax during rest periods, think positive about exercise, prepare properly for each set." Only one participant mentioned anything self-defining. He was in the easy decision/action-oriented condition and he wrote, "I will set a record for the most times pulled."

3. Participants were right-handed and reported no history of psychiatric disorder, neurologic disorder, or brain trauma. These characteristics were important for electroencephalogram (EEG), which was recorded but is not reported in the present report because it did not differ as a function of condition.

4. Social (e.g., social = I am worried about whether I am regarded as a success or failure; I feel displeased with myself) and appearance (e.g., appearance = I feel good about myself) self-esteem were used because they seemed more relevant to the experimental context than did performance self-esteem (e.g., I feel confident that I understand things; I feel frustrated or rattled about my performance). A one-way ANOVA on the above items revealed a significant effect, $F(2, 40) = 3.13$, $p = .05$, which indicated that the deliberative mindset ($M = 3.49$, $SD = 0.97$) reduced self-esteem relative to the action-oriented ($M = 4.19$, $SD = 0.53$) and neutral mindsets ($M = 4.07$, $SD = 0.86$). Regression analyses revealed that scores on this index did not mediate the effects of mindset on spreading of alternatives.

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