
Cognitive Dissonance and Experienced Negative Affect: Evidence That Dissonance Increases Experienced Negative Affect Even in the Absence of Aversive Consequences

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Research has suggested that the dissonance produced in the induced compliance paradigm is accompanied by experienced negative affect. This research, however, used a paradigm in which participants' counterattitudinal action had the potential to bring about an aversive consequence, thus leaving the question of whether the dissonance produced in the absence of aversive consequences causes increased negative affect. Results from two experiments demonstrated that individuals report more negative affect following freely choosing (high choice) than following being told (low choice) to write a counterattitudinal statement that would produce no aversive consequences. The second experiment also demonstrated that the negative affect is reduced following attitude change and eliminated an alternative explanation of similar, past experiments. Discussion focuses on the implications of these findings.

In the original statement of cognitive dissonance theory, Festinger (1957) proposed that “the existence of dissonance, being psychologically uncomfortable, will motivate the person to try to reduce the dissonance and achieve consonance” (p. 3). Although the idea that cognitive dissonance creates an unpleasant feeling state is a central postulate of the theory, no previous research has tested the idea that cognitive discrepancy per se produces feelings of dissonance. The present research sought to address this lacuna in research on cognitive dissonance theory.

The theory has generated much interest in psychology (Jones, 1985) and has been used to better understand the dynamic interplay of cognition, affect, motivation, and behavior. It also has been used to increase the understanding of a variety of important psychological issues concerning the formation, maintenance, and

change of attitudes, beliefs, and values. Several revisions to the theory have been proposed (for a recent review, see Harmon-Jones & Mills, 1999), and many of these accept the premise that genuine cognitive changes occur as a result of the psychological discomfort known as dissonance and that these cognitive changes are the result of motivational pressures prompted by psychological discomfort. However, only a paucity of research has directly examined the idea that psychological discomfort results from cognitive discrepancy.

The research strategy most often employed in testing predictions derived from revisions to the theory was one in which conditions were created that would intensify or eliminate the attitude change that occurred in the induced compliance paradigm, developed by Festinger and Carlsmith (1959). As such, the induced compliance became one of the most investigated research paradigms in social psychology. In this paradigm, participants are induced to act contrary to a belief or attitude. If the justification for acting in this manner is just barely sufficient to induce the behavior, then persons are likely to experience dissonance. The experienced dissonance may then motivate them to reduce it, and they may reduce it by changing their attitude or belief to be more consistent with their behavior. In this paradigm, the counterattitu-

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dinal behavior is often the generative cognition (Beauvois & Joule, 1996, 1999), and the reasons, pressures, and promises of reward and/or threats of punishment for behaving in this manner (justifications) are cognitions consonant with this behavior, whereas the reasons, and so forth, for not behaving in this manner (e.g., attitude) are dissonant cognitions. Amount of justification has been varied in experiments using manipulations of low as compared to high perceived choice (Brehm & Cohen, 1962; Harmon-Jones & Mills, 1999). The manner in which dissonance will be reduced is probably a function of the resistance to change of the cognitions involved in the cognitive discrepancy and the availability of discrepancy reduction routes (Wicklund & Brehm, 1976). Because experimental settings were designed to ensure that the behavior was more resistant to change than the attitude and because the attitude change opportunity was highly salient, attitude change resulted to reduce the dissonance. However, it is possible for dissonance to be aroused and either not be reduced or be reduced in a manner other than attitude change, making the need for other indicators of the presence of dissonance necessary.

The Affect Associated With Dissonance

Task performance measures (Kiesler & Pallak, 1976) and physiological arousal (specifically, electrodermal activity) (Losch & Cacioppo, 1990) have been used as indirect indicators of dissonance. However, only a few experiments have directly assessed the experienced negative affect associated with dissonance (e.g., Elliot & Devine, 1994; Kidd & Berkowitz, 1976; Rhodewalt & Comer, 1979; Shaffer, 1975; Zanna & Cooper, 1974).

As Elliot and Devine (1994) noted, much of the previous research contained the following problems: (a) dissonance-related negative affect was assessed after participants had been given the opportunity to change their attitudes, (b) conceptually or psychometrically unsound indicators of dissonance were used, and (c) methods that confounded dissonance with other causes of negative affect were used. Elliot and Devine remedied these problems in two induced compliance experiments. However, in their experiments and in every induced compliance experiment that has assessed self-reported affect in response to manipulated levels of cognitive discrepancy, participants have written essays that had the potential to create aversive consequences (e.g., arguing for a 10% increase in tuition at the participants' university and being told that the essay would be sent to a university committee that would consider the essays in their recommendation to the administration regarding whether tuition should be increased).

The Aversive Consequences Revision

Thus, one purpose of the present research was to test whether dissonance created by a cognitive discrepancy per se will increase the subjective experience of negative affect. That is, the past affective response data could be interpreted to indicate that feeling personally responsible for the production of aversive consequences rather than cognitive discrepancy per se will increase psychological discomfort.

The inclusion of the potential for the production of aversive consequences in past induced compliance experiments probably resulted from the influence of one of the most noted revisions of the original theory, which suggested that cognitive discrepancy was neither necessary nor sufficient to produce dissonance. Instead, this revision pointed to the necessity of the production of aversive consequences (Collins, 1969; Cooper & Fazio, 1984; Cooper & Worchel, 1970). This revision posited that for dissonance effects (attitude change) to emerge, individuals must feel personally responsible for producing foreseeable negative consequences. Thus, individuals change their attitudes not because of cognitive discrepancy but because their actions bring about an aversive event. In this model, cognitive changes, such as attitude change, occur because persons are motivated to render the consequences of their behavior nonaversive. This revision has been considered one of the most compelling, leading prominent observers to conclude that dissonance effects only occur when persons freely choose to cause an aversive consequence (Baron, Byrne, & Johnson, 1998; Taylor, Peplau, & Sears, 2000).

A Challenge to the Aversive Consequences Revision

Because the aversive consequences model was based in part on the absence of attitude change in conditions in which participants did not produce aversive consequences—a null effect—there are a number of plausible alternative explanations for these lack of effects (see also Harmon-Jones, 1999; Harmon-Jones, Brehm, Greenberg, Simon, & Nelson, 1996). First, the level of dissonance may not have been of sufficient magnitude to generate dissonance that would produce attitude change, and the addition of the production of aversive consequences was necessary to produce dissonance sufficient to cause attitude change. This low level of dissonance may have resulted because in past research, participants were encouraged to produce lengthy counterattitudinal statements. The lengthy statements may have caused the lack of attitude change in the no-aversive-consequences conditions because research has shown that the length of the counterattitudinal statement relates inversely with

the amount of attitude change (e.g., Beauvois & Joule, 1996; Rabbie, Brehm, & Cohen, 1959). Longer essays produce less attitude change, probably because participants provide their own justifications and hence more cognitions consonant with the behavior in these lengthy essays and therefore they experience less dissonance.

Another possible explanation is that participants in these past experiments may have been provided too much justification for producing the counterattitudinal statement, and the production of aversive consequences may have been necessary to elicit enough dissonance to produce measurable attitude change. The extremely high compliance rates observed in the past research supports this speculation (see Harmon-Jones, 1999). For attitude change to result from dissonance, the person should be offered "*just enough reward or punishment to elicit the overt compliance*" (Festinger, 1957, p. 95). Thus, the past experiments on the necessity of aversive consequences may have had inducing forces that were so great that little or no dissonance was produced, and the addition of feeling personally responsible for producing aversive consequences may have been necessary to produce sufficient dissonance to cause measurable discrepancy reduction (e.g., attitude change).

In addition, a low level of dissonance may have been generated in the past aversive consequences experiments because the preexperimental attitudes held by participants were moderately negative or positive (e.g., Calder, Ross, & Insko, 1973; Nel, Helmreich, & Aronson, 1969). Thus, these attitudes were not extreme and they may have reflected ambivalence or a mix of positive and negative attitudes toward the issues. Because of this, the attitudes were likely not to be extremely resistant to change and thus were likely not to arouse much dissonance when behavior counter to them occurred. In essence, the magnitude of dissonance aroused may have been too small to generate attitude change.

Another set of alternative explanations for the lack of attitude change in the no-aversive-consequences conditions argues that dissonance may have been aroused in participants in the no-aversive-consequences conditions of the past experiments but was not detected. The sole method of detecting dissonance in the experiments testing the aversive consequences model against the original version of the theory was assessment of attitude change. Because no assessments of dissonance per se were obtained in these experiments, it is unknown whether dissonance was aroused in the no-aversive-consequences conditions. The dissonance may have been reduced in a route other than attitude change. Persons whose counterattitudinal actions had no undesired effects may have reduced dissonance by reducing the importance (Simon, Greenberg, & Brehm, 1995) or the perceived

strength (Scheier & Carver, 1980) of the counterattitudinal behavior.

It is unlikely that any one of these possible alternative explanations accounts for all of the nonsignificant effects that have been found in the past no-aversive-consequences conditions. However, given the number of plausible alternative explanations for the null effects produced in the past experiments that had been used to support the aversive consequences revision (see Harmon-Jones, 1999, for a discussion of other alternative explanations), my colleagues and I thought it was premature to abandon the original version of the theory (Harmon-Jones et al., 1996). Therefore, using the paradigm in which most dissonance research has been conducted, the induced compliance paradigm, we designed experiments in which the inducing force for counterattitudinal behavior was just barely sufficient, the attitudes were simple yet extreme and not held with ambivalence, and the counterattitudinal statements were not lengthy.

In the first experiment, participants were given low or high choice to privately and anonymously write a statement saying that an unpleasant-tasting beverage was pleasant tasting. Participants then reported their attitudes toward the beverage. Results indicated that participants in the high-choice condition reported that they liked the beverage more than did participants in the low-choice condition. Two other experiments replicated these findings, using different attitudinal objects and different inductions of the choice manipulation (written as opposed to oral). Because participants' counterattitudinal statements were produced in private and with anonymity and were discarded after they were written, the participants did not cause an aversive consequence because, as Cooper and Fazio (1984) argued, "making a statement contrary to one's attitude while in solitude does not have the potential for bringing about an aversive event" (p. 232). The Harmon-Jones et al. (1996) research suggests that the production of aversive consequences is not necessary to create dissonance-produced attitude change in the induced compliance paradigm and implies that the production of aversive consequences may only intensify the level of dissonance created (Harmon-Jones, 1999). In the experiments of Harmon-Jones et al. (1996), participants did not lose a reward, gain a punishment, tell a lie to another person, or inflict any other kind of injury on other persons. There was simply an abstract benefit of helping in research. The discrepancy between the participants' perception of a stimulus and the participants' knowledge of what they had been induced to state about that stimulus was sufficient to create dissonance.

The present experiments were designed to extend this line of research by testing the hypothesis that dissonance created in an induced compliance paradigm void

of aversive consequences would be associated with increased negative affect. Supportive evidence for the hypothesis would be important in that it would convincingly demonstrate that cognitive dissonance is associated with experienced negative affect.

EXPERIMENT 1

Overview

Using procedures similar to those used by Harmon-Jones et al. (1996), the present experiment tested the hypothesis that dissonance would be associated with increased subjective discomfort even in an induced compliance situation where persons do not produce aversive consequences. Participants were randomly assigned to conditions where they had either low or high choice to privately and anonymously write a statement contrary to their attitudes. They then completed a measure assessing self-reported affect and finally completed a measure assessing their attitudes.

Method

Participants. The study included 23 introductory psychology students who participated to partially fulfill a course requirement. They were randomly assigned to either a high-choice (4 men, 6 women) or low-choice condition (6 men, 4 women). Three of the high-choice participants (1 man, 2 women) did not comply with the request to write a counterattitudinal statement.

Introduction and cover story. Participants were run individually. After greeting the participants, the experimenter explained that she was interested in factors that affect the recall of characteristics of stimuli and that at this point in her research, she was seeing how writing sentences evaluating stimuli would affect recall of the details of the stimuli. She told participants that she would have them read a passage and that they would be asked to recall information from the passage (this actually never occurred). She also informed participants that she was using a variety of passages, that she would not know which type of passage they would receive, and that they should not let her know which type of passage they did receive.

The experimenter gave participants a written introduction that reiterated her oral introduction. The written introduction informed participants that they would write a statement about a passage, complete some questionnaires, wait 5 minutes and talk with the experimenter, and complete a final questionnaire that would assess recall of the passage. The introduction ended with instructions that informed participants of their anonymity.

The boring passage. After the participant read the introduction and signed a consent form, the experimenter entered the participant's cubicle and gave the participant an envelope that contained a passage. Every participant received the same passage, which was a boring description of a tachistoscope taken from an equipment manual (see Harmon-Jones et al., 1996, for evidence of the boring nature of this passage). It took participants approximately 10 minutes to read this passage. The experimenter left the participant alone to read the passage.

Choice manipulation. Once the participant had read the passage, the experimenter entered the cubicle and gave the participant an envelope that contained a set of instructions and a blank sheet of paper. The experimenter told the participant that the envelope included instructions that should be read and a piece of blank paper on which to write. The experimenter left the participant alone to read the instructions and write the sentence. The written instructions were used to induce the choice manipulation—to keep the experimenter unaware of the choice condition to which participants were assigned. The instructions for both low- and high-choice conditions began with a paragraph that reiterated the purpose of the study—to examine how writing a statement evaluating a passage affected recall of the details of the passage.

Participants assigned to the low-choice condition read the following:

We are randomly assigning people to write either a sentence that indicates they thought the passage they read was very interesting or a sentence that indicates they thought the passage was uninteresting. You have been randomly assigned to write that the passage was very interesting. On the blank piece of paper, you are to write one sentence that firmly says that the passage you read was very interesting. When you are finished writing the sentence, throw the piece of paper you wrote on in the trash, because we do not need the piece of paper you write on, we only need you to go through the process of writing the sentences and thinking the thought.

Participants assigned to the high-choice condition read the following:

On the blank piece of paper, we would like you to write one sentence either saying that the passage you read was very interesting—OR—one sentence saying that the passage you read was not at all interesting. The choice of which to do is up to you. When you are finished writing the sentences, throw the piece of paper you wrote on in the trash, because we do not need the piece of paper you write on, we only need you to go through the process of writing the sentences and thinking the thought.

For high-choice participants, another page, titled, "Notice to Research Participant," was stapled to the page with the above instructions. The page read as follows:

We have finished having people write that they thought the passage they read was not interesting. Thus, to finish the study, we need people to write that they thought the passage was very interesting. Therefore, although it is your choice, we would really appreciate it if you would write one sentence that firmly says that the passage you read was very interesting.

Dissonance affect questionnaire. The experimenter returned after the participant finished writing and gave the participant an envelope that contained a questionnaire. Participants were informed that their responses to all questionnaires would remain anonymous and they were asked to place each questionnaire they completed in an envelope, to increase the perception of anonymity. They also completed all questionnaires in private. The dissonance affect questionnaire asked participants to "check the box in front of the words that best describe the extent to which you feel this way right now." Underneath each emotion word were five check boxes labeled with the words *not at all*, *a little bit*, *somewhat*, *very much*, and *extremely*. The three affect items "uncomfortable," "uneasy," and "bothered" were used to assess discomfort (Cronbach's $\alpha = .48$). This assessment of discomfort was developed through factor analyses by Elliot and Devine (1994). The items "tense," "distressed," "irritable," "nervous," and "jittery" were used to assess general negative affect (Cronbach's $\alpha = .54$). These five items were taken from items used in the Positive and Negative Affect Schedule-Expanded Form (PANAS-X) (Watson & Clark, 1991). The items "active," "enthusiastic," "excited," "inspired," "interested," and "proud" were used to assess general positive affect (Cronbach's $\alpha = .88$). The positive affect items were taken from items used in the PANAS-X. The positive affect items were included as filler items, and cognitive discrepancy was not predicted to decrease positive affect because past results indicated that cognitive discrepancy did not affect positive affect (Elliot & Devine, 1994).

Attitude questionnaire. The experimenter returned after the participant finished writing and gave the participant an envelope that contained a questionnaire that assessed how interesting participants found the passage. As she handed the participant the envelope, she told her or him that the envelope contained a questionnaire that assessed what she or he thought about the passage. The experimenter explained that this assessment was needed to see how it affected recall, and the experimenter told the participant to return the questionnaire to the envelope when finished. Written instructions at the top of the

questionnaire reiterated the experimenter's instructions and ended with the statement, "Please answer the following question by circling the number of the scale that best describes your feeling." Responses to the question (How interesting is the passage you read?) were made on a 7-point scale (1 = *not at all interesting*, 7 = *extremely interesting*).

Perceived choice questionnaire. After the participant finished with the questionnaire and placed it in the envelope, the experimenter returned to the cubicle and simply asked the participant to complete another short questionnaire. The questionnaire assessed how much choice the participant had over the position taken in the sentence that was written. Responses to this question were made on a 7-point scale (1 = *no choice at all*, 7 = *very much of a choice*). Once all participants completed this questionnaire, the experimenter thoroughly debriefed the participants. In debriefing, no participants thought that the experimenter would retrieve from the trash the statements they had written.

Results

Manipulation check. The manipulation of choice to write the counterattitudinal statement was effective, as revealed in responses to the question of how much choice participants felt they had to write the statement, with high-choice participants reporting more choice ($M = 4.30$, $SD = 1.89$) than low-choice participants ($M = 1.30$, $SD = 0.68$), $t(18) = 4.73$, $p < .001$.¹

Attitude. As predicted, participants given high choice to write the counterattitudinal statement rated the passage as more interesting ($M = 3.40$, $SD = 1.51$) than did participants given low choice ($M = 1.60$, $SD = 0.97$), $t(18) = 3.18$, $p < .005$.²

Affect. As predicted, participants given high choice to write the counterattitudinal statement reported feeling more discomfort ($M = 2.40$, $SD = 0.58$) than did participants given low choice ($M = 1.57$, $SD = 0.50$), $t(18) = 3.43$, $p < .001$. In addition, participants given high choice reported feeling more general negative affect ($M = 2.04$, $SD = 0.50$) than did participants given low choice ($M = 1.36$, $SD = 0.35$), $t(18) = 3.54$, $p = .002$. For general positive affect, no difference between low- and high-choice conditions emerged, $t(18) = 1.21$, $p > .20$ (grand $M = 2.18$, $SD = 0.84$).³

Mediational analyses. In past research using aversive consequences paradigms that has examined reported negative affect and attitude change, no mediational analyses were performed. Some investigators reported correlation coefficients between affect and attitudes (Higgins, Rhodewalt, & Zanna, 1979; Zanna & Cooper, 1974), whereas others did not (Elliot & Devine, 1994).

Although it is not sufficient to only examine the correlation between negative affect and attitude change to establish mediation (see Kenny, Kashy, & Bolger, 1998), these correlational results might yield insight into whether affect is related to attitude change. This past research, however, has produced mixed results, with both significant (Zanna & Cooper, 1974) and nonsignificant (Higgins et al., 1979) linear relations between the negative affect aroused by counterattitudinal behavior and attitude change.

For the present experiment, I tested whether attitude change was mediated by reported negative affect using recommended regression procedures (Baron & Kenny, 1986; Judd & Kenny, 1981). To establish mediation, three effects must be demonstrated. First, it must be demonstrated that the manipulated variable—choice—affects the dependent variable—attitude change. Second, it must be demonstrated that the manipulated variable—choice—affects the mediator—reported negative affect. These two steps were demonstrated above. Third, it must be demonstrated that the mediator—reported negative affect—affects the dependent variable—attitude change. In this third step, the mediator should affect the dependent variable when the manipulated variable is controlled. The results of the regression analysis suggest that reported affect did not mediate the effects of choice on attitude change, as evidenced by a nonsignificant effect (for discomfort, $\beta = .08$, *ns*; for negative affect, $\beta = .18$, *ns*). The same analysis was performed using perceived choice instead of manipulated choice. The results from this analysis suggested that reported affect did partially mediate the effects of perceived choice on attitude change (for discomfort, $\beta = .31$, $p = .14$; for negative affect, $\beta = .40$, $p < .05$). Interactional mediation, in which the mediator interacts with the predictor variable in affecting the outcome, also was tested using procedures recommended by Judd and Kenny (1981), and no significant effects emerged.

Ancillary analyses. To assess whether the differences obtained in affect and attitude between the choice conditions were the result of differences in the counterattitudinal statements written, two independent judges who were unaware of the experimental condition rated the extremity of the position taken in each counterattitudinal statement. They assigned each statement a score that ranged from 1 (*mildly strong*) to 3 (*extremely strong*). The judges' ratings were significantly correlated, $r(18) = .88$, $p < .001$, indicating high reliability. The ratings were averaged. High- and low-choice conditions did not differ in the extremity of the position taken in the statements ($p > .20$), suggesting that the differences observed were not due to differences in the strength of the counterattitudinal statements.

Discussion

Results of Experiment 1 indicated that dissonance was associated with increased experienced negative affect even in an induced compliance situation where persons did not produce aversive consequences. These results are the first demonstration that a sufficient cognitive discrepancy per se can increase experienced negative affect in an induced compliance situation. These results provide the first cogent demonstration of Festinger's (1957) hypothesis that cognitive discrepancy is psychologically uncomfortable.

A second experiment was conducted to attempt to replicate the results of Experiment 1. In addition, the second experiment was designed to attempt to eliminate an alternative explanation for the results of Experiment 1 as well as previous experiments using similar methods (Harmon-Jones et al., 1996). According to this alternative explanation, participants who were given high choice to write the counterattitudinal statement may have reconstrued their past so that they felt as though they had high choice to engage in the behavior of reading the boring passage. If so, the aversive consequences model could explain these data by positing that choosing to engage in noxious behavior produces an aversive consequence and this, rather than the writing of the counterattitudinal statement, caused the increased negative affect and attitude change. To address this alternative explanation, in Experiment 2, participants were first exposed to a stimulus toward which they had a positive attitude rather than a negative attitude and then they were given low or high choice to write a counterattitudinal statement about it. Because participants were asked to write counterattitudinal statements about a stimulus about which they have a positive attitude, they cannot reconstrue their past behavior of exposing themselves to the positive stimulus as being responsible for inflicting an aversive consequence on themselves.

In addition, the second experiment was designed to test whether the dissonance produced in this induced compliance paradigm was associated with decreased state self-esteem. The self-consistency (Aronson, 1968, 1999) and self-affirmation (Steele, 1988) revisions of the original theory of cognitive dissonance posit that dissonance-producing situations cause their effects because of the threat to self-conceptions of morality and competence (self-consistency theory) or moral and adaptive integrity (self-affirmation theory). Consequently, these revisions could be seen as predicting that acting contrary to an attitude will decrease self-esteem. Surprisingly, no experiments have tested this hypothesis.

Experiment 2 also was designed to assess affect following discrepancy reduction. Previous research by Elliot and Devine (1994) suggested that attitude change in the induced compliance paradigm was associated with

decreased negative affect. However, in the experiment by Elliot and Devine, participants produced aversive consequences. Thus, at present, it is not certain whether the attitude change observed in their experiments reduced the discomfort because the attitude change reduced the aversiveness of the consequence or because it reduced the cognitive inconsistency.

EXPERIMENT 2

Overview

In the context of an experiment on memory, participants ate a piece of chocolate, an object toward which they had a positive attitude. They were then given low or high choice to privately and anonymously write that the chocolate did not taste good. Immediately following this, they completed either a scale that assessed their self-reported affect or a scale of the same length that assessed their attitudes toward an irrelevant topic. They then completed a scale that assessed their attitudes toward the chocolate. Finally, they completed the affect or nonaffect scale that they had not previously completed. It was predicted that freely choosing to write a counterattitudinal statement would increase self-reported negative affect and that changing one's attitudes would reduce the negative affect.

Method

Participants. The study included 52 introductory psychology students (20 men and 32 women, with an equal number in each condition) who participated to partially fulfill a course requirement. They were randomly assigned to either the high-choice or low-choice condition and to whether they completed an affect scale before or after being given an opportunity to engage in discrepancy reduction. Participants were selected from those who had reported in mass testing strong agreement or agreement with a statement assessing attitudes toward chocolate ("I really enjoy Hershey's milk chocolate"). An additional participant in the low-choice condition did not write the counterattitudinal statement. The results reported exclude this participant; analyses with this person's data included are identical in effects to those reported.

Introduction and cover story. One or two students participated in each session in separate cubicles. The experimenter used the same cover story as used in Experiment 1, except that he told participants that he would have them eat a food sample and that they would be asked to recall specific characteristics such as its texture, taste, odor, and so forth (this, actually, never occurred). As in Experiment 1, the experimenter informed participants that he would not know what type of food sample they received.

Then he gave them a written introduction that reiterated his oral introduction.

The food sample. After the participant read the introduction and signed a consent form, the experimenter entered each participant's cubicle and gave each participant a small box covered with a lid that contained a food sample. Every participant received the same food sample, which was a Hershey's milk chocolate Kiss. The experimenter left the participant alone to eat the food sample.

Choice manipulation. Once the participant had eaten the food sample, the experimenter entered the cubicle and gave each participant an envelope that contained a set of instructions and a blank sheet of paper. The instructions contained the choice manipulation, which was identical to the one used in Experiment 1, except that they discussed food samples rather than reading passages.

Dissonance affect questionnaire. The experimenter returned after the participant finished writing and gave the participant an envelope that contained a questionnaire that asked participants about their affective state or about their feelings about television. For the affective state questionnaire, responses to three affect items ("uncomfortable," "uneasy," and "bothered"; Cronbach's $\alpha = .70$) were used to assess dissonance affect, as was done in Experiment 1. Responses to three positive affect items ("happy," "enthusiastic," and "proud"; Cronbach's $\alpha = .78$) were used to assess positive affect. To reduce the number of items and provide room for the self-esteem scales, the general negative affect index and the more lengthy general positive affect index used in Experiment 1 were not used in the present experiment. The state social (e.g., I feel displeased with myself) and appearance (e.g., I feel that others respect and admire me) self-esteem scales developed by Heatherton and Polivy (1991) were used to assess state self-esteem (Cronbach's alphas = .87 and .83). Only two of the three self-esteem scales were used to keep the number of items at a minimum. The two scales used seemed more relevant than performance scale (e.g., I feel confident about my abilities). Responses to each item were made on a 5-point scale (1 = *not at all*, 2 = *a little bit*, 3 = *somewhat*, 4 = *very much*, 5 = *extremely*). The TV questionnaire was used as a filler questionnaire to hold time between counterattitudinal statement and assessment of attitude constant. It contained items assessing attitudes toward viewing television (e.g., I enjoy watching television; I consider watching television a rare treat).

Attitude questionnaire. The experimenter returned after the participant finished writing and gave the participant an envelope that contained a questionnaire that assessed how much the food sample was not enjoyed. As

he handed the participant the envelope, he told her or him that the envelope contained a questionnaire that assessed what she or he thought about the food sample. The experimenter explained that this assessment was needed to see how it affected recall and the experimenter told the participant to return the questionnaire to the envelope when finished. Responses to the statement (I really did not enjoy the food sample) were made on a 9-point scale (1 = *strongly disagree*, 9 = *strongly agree*).

Perceived choice questionnaire. After the participant finished with the questionnaire and placed it in the envelope, the experimenter returned to the cubicle and gave the participant a questionnaire that assessed how much choice the participant had over the position taken in the sentence that was written. Responses to this question were made on a 9-point scale (1 = *not at all*, 9 = *very much*).

Postdiscrepancy reduction affect questionnaire. Finally, participants were given another questionnaire that asked participants about their affective state or about their feelings about TV. Participants who completed the affective state questionnaire first completed the TV questionnaire at this time, and participants who completed the TV questionnaire first completed the affective state questionnaire at this time. Once all participants completed this questionnaire, the experimenter thoroughly debriefed the participants; no participants thought that the experimenter would retrieve their statements from the trash.

Results

Manipulation check. The manipulation of perceived choice to write the statement was effective, as suggested by the result that participants given high choice to write the statement reported having more choice ($M = 6.04$, $SD = 3.05$) than did participants given low choice ($M = 2.15$, $SD = 2.31$), $F(1, 48) = 26.02$, $p < .001$. No other effects were significant.

Attitude. The choice manipulation had a significant impact on attitudes, as suggested by the result that participants given high choice to write that the chocolate did not taste good rated the chocolate as less enjoyable ($M = 4.31$, $SD = 2.45$) than did participants given low choice to engage in the same behavior ($M = 2.23$, $SD = 1.75$), $F(1, 48) = 11.98$, $p < .001$. No other effects were significant.

This effect suggests that the alternative explanation for Experiment 1 and the previous experiments of Harmon-Jones et al. (1996) is not valid. That is, it was not likely that participants inferred from the choice manipulation that was used to induce the writing of the counterattitudinal statement that they had choice to engage in the aversive behavior of reading a boring passage or drinking an unpleasant tasting beverage and that

choosing to engage in this aversive behavior and thus inflict an aversive consequence on themselves caused the attitude change observed in these past experiments. Instead, when considered in light of the present results, parsimony suggests that feeling that one is choosing to write something contrary to an attitude, regardless of whether it is positive or negative, can cause attitude change even when no aversive consequences are produced.

Affect. A sufficient cognitive discrepancy evoked an increase in the experience of negative affect, and this affective experience was reduced following the attitude change opportunity. Because it was predicted that the high-choice/affect-first condition would report more negative affect than each of the other three conditions, a planned comparison was performed that compared the condition in which experienced negative affect was predicted to be highest (high-choice/affect first) with the average of the other three conditions (Rosenthal & Rosnow, 1985). This 1 versus 3 comparison was significant, $t(48) = 2.51$, $p < .01$. Moreover, each condition differed significantly from this critical condition, $ps < .04$ (low choice/affect first $M = 1.49$, $SD = 0.57$; low choice/affect second $M = 1.36$, $SD = 0.50$; high choice/affect second $M = 1.51$, $SD = 0.48$). The residual variance across the other three conditions was marginally significant, $F(2, 48) = 2.44$, $p = .10$. This marginally significant residual variance effect reflected that low-choice/affect-second condition participants reported lower discomfort than did low-choice/affect-first and high-choice/affect-second condition participants, although Tukey's post hoc comparisons revealed nonsignificant differences between these three conditions. Positive affect was not affected by the manipulations of choice and time of assessment of affect, as evidenced by planned comparisons in which positive affect was the dependent variable (grand $M = 2.96$, $SD = 0.91$).

State self-esteem. In addition, the manipulations of choice and time of assessment of affect did not significantly affect state self-esteem. Both social and appearance state self-esteem were subjected to the same planned comparisons as used for discomfort. No significant effects emerged (social self-esteem grand $M = 3.93$, $SD = 0.92$; appearance self-esteem grand $M = 3.41$, $SD = 0.80$). In addition, for the conditions in which self-esteem was reported before attitude, low choice did not differ from high choice on either self-esteem scale ($ps > .20$). Finally, the self-esteem scales were averaged together to form one index of self-esteem. Analyses of this index produced similar, nonsignificant results ($p > .20$).

Mediation analyses. The regression analyses performed in Experiment 1 to test for mediation were performed in this experiment on the conditions in which

affect was reported before attitude. The results suggest that reported affect did not mediate the effects of manipulated choice on attitude change, as evidenced by a nonsignificant effect ($\beta = .05, ns$). The results from the analysis using perceived choice suggested that reported affect did not mediate the effects of perceived choice on attitude change, as evidenced by a nonsignificant effect ($\beta = .20, ns$). Interactional mediation also was nonsignificant.⁴

Ancillary analyses. As in Experiment 1, two independent judges who were unaware of the experimental condition rated the extremity of the position taken in each counterattitudinal statement. The judges' ratings were significantly correlated, $r(50) = .85, p < .001$. The ratings were averaged. High- and low-choice conditions did not differ in the extremity of the position ($p > .20$), suggesting that the differences observed were not due to differences in the strength of the statements.

Discussion

Results of Experiment 2 replicated those of Experiment 1, showing that experienced negative affect and attitude change result from counterattitudinal behavior that does not have the potential to create aversive consequences. In addition to the strength of these effects being enhanced by replication, they are bolstered by the fact that the replication occurred when a different attitudinal object with a different valence was used. Moreover, the results of Experiment 2 provide evidence that suggests that the negative affect is decreased once attitude change has occurred.

It is interesting to note that in Experiment 2, freely choosing to write a counterattitudinal statement did not significantly decrease state self-esteem. This finding is at odds with predictions derived from self-consistency and self-affirmation models of dissonance, which predict that " 'choosing' to write an essay against one's beliefs . . . makes one feel foolish, raises doubts about one's competence" (Steele, 1988, p. 278). Although the finding is a null effect and thus difficult to interpret, it should be pointed out that self-reported discomfort and general negative affect did differ between the low- and high-choice conditions. The finding on state self-esteem should not be interpreted to reflect that discrepancy will never reduce state self-esteem. Festinger (1957) hypothesized that cognitive discrepancy creates a state of discomfort but did not limit dissonance theory to a self-theory. Thus, although dissonance may be associated with decreased self-esteem, it is not necessarily associated with decreased self-esteem. Whether dissonance decreases self-esteem may depend on the cognitions involved in evoking the dissonance. If higher order cognitions such as beliefs about one's own morality or competence are highly accessible and inconsistent with other cognitions,

then self-esteem may temporarily decrease (see Harmon-Jones, in press-b, for a discussion).

GENERAL DISCUSSION

The results of the present experiments provide evidence that dissonance is associated with increased feelings of negative affect even in situations void of aversive consequences, a prediction advanced by Festinger (1957) but never demonstrated. Moreover, the effects on negative affect and attitude change were obtained using two different operationalizations of cognitive discrepancy—one in which participants wrote a positive statement about an object toward which they had a negative attitude and one in which participants wrote a negative statement about an object toward which they had a positive attitude. These results add to the growing body of research showing that the original theory of cognitive dissonance is alive and well and that it cannot be supplanted by the aversive consequences revision (Beauvois & Joule, 1996, 1999; Harmon-Jones, 1999; Harmon-Jones et al., 1996; McGregor, Newby-Clark, & Zanna, 1999). In addition to the present line of research, the aversive consequences model has difficulty explaining results obtained in the belief disconfirmation paradigm (Burris, Harmon-Jones, & Tarpley, 1997), the hypocrisy paradigm (Aronson, 1992, 1999; Stone, Aronson, Crain, Winslow, & Fried, 1994), and other paradigms (Harmon-Jones, 1999).

Considering the Role of Negative Affect in Cognitive Discrepancy Reduction

The present experiments suggest that the present induced compliance paradigm evokes increased negative affect but does not decrease positive affect, a finding consistent with the idea that positive and negative affect are occasionally independently activated (for a review, see Cacioppo & Gardner, 1999). Moreover, the type of negative affect evoked seems to be one that is rather general and diffuse; that is, persons report feeling more uncomfortable, uneasy, and bothered as well as more tense, distressed, irritable, nervous, and jittery. Future research will need to examine whether different dissonance-evoking situations elicit different types of negative affect. In addition, future research will need to examine how dissonance-evoking situations affect different components of emotion, as scientists propose that emotion is composed of experiential, expressive, and physiological components.

Although the results of the two experiments strongly supported the hypothesis that experienced negative affect is increased in situations in which there is a cognitive discrepancy and no aversive consequences, the mediational analyses suggested that reported negative affect did not mediate the relation between the choice

manipulation and attitude change. These results are consistent with past dissonance research that has examined the correlation between reported negative affect and attitude change in aversive consequences paradigms. Before abandoning the hypothesis that experienced negative affect directly causes cognitive discrepancy reduction, it may be worth considering alternative explanations. First, attitude change is just one way in which persons can reduce dissonance, and thus, some participants in the present experiments may have reduced some of their dissonance in an unmeasured manner. Devine, Tauer, Barron, Elliot, and Vance (1999) have found that when persons with extreme and important attitudes on an issue are induced to act contrary to their attitude, they show increased reported negative affect but do not show attitude change. In contrast, persons with attitudes that are as extreme but not as important show both increased negative affect and attitude change. Second, when using reported negative affect as a mediator, it is assumed that reported affect is a valid indicator of the underlying experience. However, it is possible that some persons have difficulty accurately reporting their experienced affective state. On the other hand, the mediational evidence could be interpreted to indicate that experienced negative affect may not directly mediate the cognitive adjustments that occur. Along these lines, Pyszczynski, Greenberg, Solomon, Sideris, and Stubing (1993) found that the expression of dissonance-related affect attenuated the attitude change that typically occurs in the induced compliance situation. Their findings suggest that persons who experience more negative affect may change their attitudes less than persons who experience less negative affect. In addition, other dissonance research suggests that repressors, who probably have less negative affective experience in general (Weinberger, Schwartz, & Davidson, 1979), tend to show more evidence of spontaneous cognitive discrepancy reduction (Olson & Zanna, 1979). Research assessing multiple measures of affect, cognition, and cognitive discrepancy reduction is therefore needed to fully understand the role of affect in cognitive dissonance processes (Harmon-Jones, in press).

Considering Alternative Explanations

In addition to delving into the affective consequences of dissonance, the results of Experiment 2 tested an alternative explanation for the results of previous experiments using the induced compliance paradigm used in Experiment 1 and in the experiments reported in Harmon-Jones et al. (1996). In those experiments, participants partook of a negative stimulus (i.e., read a boring passage, drank a bitter beverage) and then were given low or high choice to write a positive statement about it. If participants in the high-choice condition

reconstructed their past so as to believe that they had high choice to partake of the negative stimulus, then these results could be explained by the aversive consequences model because choosing to partake of the negative stimulus could create a negative consequence for the person. In Experiment 2, participants partook of a positive stimulus and then wrote a negative statement about it. These procedures thus eliminated alternative explanations based on aversive consequences and produced results that cannot be explained by this revision.

Another alternative explanation for the past and present sets of results is that writing the counterattitudinal statement in private threatens the self and threatening the self is an aversive consequence. This aversive consequence is then assumed to be responsible for the dissonance-related negative affect and attitude change. First, and most important, this argument is redundant with the self-consistency version of dissonance theory, and little is gained from it. In addition, the aversive consequences revision excessively narrows the explanatory, predictive, and generative power of dissonance theory (Berkowitz & Devine, 1989; Eagly & Chaiken, 1993; Harmon-Jones, 1999; Harmon-Jones et al., 1996). Moreover, this alternative explanation is not consistent with the theoretical position advocated by the aversive consequences revision (Cooper & Fazio, 1984; see Harmon-Jones et al., 1996, for a discussion). Thus, invoking the idea that there were aversive consequences to the self is not a plausible alternative explanation.

Finally, could the attitude change effects observed in the present experiments be due to demand characteristics? According to this explanation, the participants searched for the experimenter's true hypothesis and then behaved in a manner consistent with it, to make a good impression on the experimenter or to try to help the experimenter by altering their responses to confirm the hypothesis (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990). First, no participants expressed suspicion and all genuinely thought the experiments concerned recall. Second, if participants were acting to help the experimenter, then they should have reported their true attitudes, as the experimenter explained that he needed to know how they felt about the stimulus to examine how it affected their recall performance. Third, a demand characteristics explanation would have to assume that participants in the high-choice conditions were more likely to cooperate with the experimenter and provide the attitude change the experimenter desired, whereas participants in the low-choice conditions were not. It is not clear why such would have occurred. In fact, it seems more likely that low-choice participants would be more likely to evidence demand-induced attitude change given that they were more likely to comply with the experimenter's request to write the counterattitudinal

statements. Finally, why would high-choice participants report feeling more negative affect and evidence more electrodermal activity (Harmon-Jones et al., 1996, Experiment 3) following their counterattitudinal behavior if they were simply reporting changed attitudes to help the experimenter confirm hypotheses? They would likely have felt sufficiently justified in producing the counterattitudinal statements and should not have felt more negative affect or evidenced more electrodermal activity. For these reasons, an alternative explanation based on demand characteristics is not plausible.

Conclusion

The assessment of affect within dissonance paradigms will yield an enhanced understanding of the interplay of affective and cognitive processes and, more specifically, of the role of affect in cognitive dissonance processes. Previous research using task performance measures, psychophysiological measures, and the misattribution paradigm have indirectly suggested that the nature of dissonance is unpleasant (for a review, see Harmon-Jones, in press). The use of the self-report measures in the present experiments provides more direct evidence of the negative affective character of cognitive dissonance. Moreover, the present research demonstrates that emotion can be aroused by the sheer discrepancy between cognitions, thus supporting the original theory of dissonance over the aversive consequences revision. In addition to contributing to a more thorough understanding of the dissonance process, the present research adds to a growing body of research concerned with the role of affect in cognition and behavior (Forgas, in press; Frijda, Manstead, & Bem, in press).

NOTES

1. Because the tests for differences between conditions on attitude and negative affect indexes were based on directional a priori hypotheses derived from theory, all tests involving them were one-tailed. Gender of participant was included as a factor in preliminary analyses in both experiments. It did not produce any significant main or interactive effects, except for an interaction on the choice manipulation check in Experiment 1, $F(1, 16) = 5.61$, $p = .03$, which revealed that although the choice manipulation was effective for both men and women, it was more effective for women than men.

2. To establish that the attitude differences between low- and high-choice conditions did not result because the low-choice manipulation caused participants to decrease the positivity of their attitudes, as might be expected if the low-choice manipulation strongly threatened an important behavioral freedom (reactance theory) (Brehm, 1966), several comparison conditions were run in experiments reported in Harmon-Jones, Brehm, Greenberg, Simon, and Nelson (1996). These conditions indicated that the low-choice manipulations were not inducing reactance motivation that led to decreased ratings in low-choice conditions. Also, if reactance, an aversive motivational state, were causing the attitude change, greater negative affect should have been found in low-choice conditions. Thus, this alternative interpretation does not seem plausible.

3. In Experiment 1, analyses also were conducted with both compliers and noncompliers. High-choice participants rated the passage as more interesting ($M = 2.85$, $SD = 1.68$) than did low-choice participants

($M = 1.60$, $SD = 0.97$), $t(21) = 2.09$, $p < .05$. High-choice participants expressed more discomfort ($M = 2.26$, $SD = 0.64$) than did low-choice participants ($M = 1.57$, $SD = 0.50$), $t(21) = 2.81$, $p < .01$.

4. The correlations between perceived choice and discomfort were .27 for all conditions, .10 for low choice, and $-.56$ for high choice in Experiment 1. In Experiment 2, they were .14, $-.26$, and .05, respectively.

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