

An Introduction to Cognitive Dissonance Theory and an Overview of Current Perspectives on the Theory

Eddie Harmon-Jones and Judson Mills

A little more than 40 years ago, Leon Festinger published *A Theory of Cognitive Dissonance* (1957). Festinger's theory of cognitive dissonance has been one of the most influential theories in social psychology (Jones, 1985). It has generated hundreds and hundreds of studies, from which much has been learned about the determinants of attitudes and beliefs, the internalization of values, the consequences of decisions, the effects of disagreement among persons, and other important psychological processes.

As presented by Festinger in 1957, dissonance theory began by postulating that pairs of cognitions (elements of knowledge) can be relevant or irrelevant to one another. If two cognitions are relevant to one another, they are either consonant or dissonant. Two cognitions are consonant if one follows from the other, and they are dissonant if the obverse (opposite) of one cognition follows from the other. The existence of dissonance, being psychologically uncomfortable, motivates the person to reduce the dissonance and leads to avoidance of information likely to increase the dissonance. The greater the magnitude of the dissonance, the greater is the pressure to reduce dissonance.

The magnitude of dissonance between one cognitive element and

the remainder of the person's cognitions depends on the number and importance of cognitions that are consonant and dissonant with the one in question. Formally speaking, the magnitude of dissonance equals the number of dissonant cognitions divided by the number of consonant cognitions plus the number of dissonant cognitions. This is referred to as the *dissonance ratio*. Holding the number and importance of consonant cognitions constant, as the number or importance of dissonant cognitions increases, the magnitude of dissonance increases. Holding the number and importance of dissonant cognitions constant, as the number or importance of consonant cognitions increases, the magnitude of dissonance decreases.

Dissonance can be reduced by removing dissonant cognitions, adding new consonant cognitions, reducing the importance of dissonant cognitions, or increasing the importance of consonant cognitions.¹ The likelihood that a particular cognition will change to reduce dissonance is determined by the resistance to change of the cognition. Cognitions that are less resistant to change will change more readily than cognitions that are more resistant to change. Resistance to change is based on the responsiveness of the cognition to reality and on the extent to which the cognition is consonant with many other cognitions. Resistance to change of a behavioral cognitive element depends on the extent of pain or loss that must be endured and the satisfaction obtained from the behavior.

An example used by Festinger (1957) may assist in elucidating the theory. A habitual smoker who learns that smoking is bad for health will experience dissonance, because the knowledge that smoking is bad for health is dissonant with the cognition that he continues to smoke. He can reduce the dissonance by changing his behavior, that is, he could stop smoking, which would be consonant with the cognition that smoking is bad for health. Alternatively, the smoker could reduce dissonance

¹Increasing the importance of consonant cognitions was not specified by Festinger as a way to reduce dissonance, although it follows logically from consideration of the dissonance ratio that is used to calculate the magnitude of dissonance and Festinger's (1957) statement that "the magnitude of dissonance (and consonance) increases as the importance or value of the elements increases" (p. 18).

by changing his cognition about the effect of smoking on health and believe that smoking does not have a harmful effect on health (eliminating the dissonant cognition). He might look for positive effects of smoking and believe that smoking reduces tension and keeps him from gaining weight (adding consonant cognitions). Or he might believe that the risk to health from smoking is negligible compared with the danger of automobile accidents (reducing the importance of the dissonant cognition). In addition, he might consider the enjoyment he gets from smoking to be a very important part of his life (increasing the importance of consonant cognitions).

Since it was presented by Festinger over 40 years ago, cognitive dissonance theory has continued to generate research, revision, and controversy. Part of the reason it has been so generative is that the theory was stated in very general, highly abstract terms. As a consequence, it can be applied to a wide variety of psychological topics involving the interplay of cognition, motivation, and emotion. A person can have cognitions about behaviors, perceptions, attitudes, beliefs, and feelings. Cognitions can be about oneself, another person or group, or about things in the environment. Rather than being relevant to a single topic, the theory is relevant to many different topics.

RESEARCH PARADIGMS IN DISSONANCE RESEARCH

We now review briefly the common paradigms used in dissonance research. Important research generated by the theory has been concerned with what happens after individuals make decisions, the consequences of exposure to information inconsistent with a prior belief, the effects of effort expenditure, and what happens after persons act in ways that are discrepant with their beliefs and attitudes.

The Free-Choice Paradigm

Once a decision is made, dissonance is likely to be aroused. After the person makes a decision, each of the negative aspects of the chosen alternative and positive aspects of the rejected alternative is dissonant

with the decision. On the other hand, each of the positive aspects of the chosen alternative and negative aspects of the rejected alternative is consonant with the decision. Difficult decisions should arouse more dissonance than easy decisions, because there will be a greater proportion of dissonant cognitions after a difficult decision than there will be after an easy one. Because of this, there will be greater motivation to reduce the dissonance after a difficult decision. Dissonance following a decision can be reduced by removing negative aspects of the chosen alternative or positive aspects of the rejected alternative, and it can also be reduced by adding positive aspects to the chosen alternative or negative aspects to the rejected alternative. Altering the aspects of the decision alternatives to reduce dissonance will lead to viewing the chosen alternative as more desirable and the rejected alternative as less desirable. This effect has been termed *spreading of alternatives*, and the experimental paradigm has been termed the *free-choice paradigm*.

J. W. Brehm (1956) conducted the first experiment using the free-choice paradigm to test predictions derived from dissonance theory. In his experiment, which was presented as market research, he had women rate how desirable they found eight different products (e.g., toaster or coffeemaker) and then gave each of them a choice between two products that were close in desirability (difficult decision) or between two products that were not close in desirability (easy decision). After choosing which of the two products they would keep, the women rerated the desirability of the products. Results indicated that the women who made a difficult decision changed their evaluations of the products to be more positive about the chosen product and less positive about the rejected product. Spreading of alternatives was less for the women who made an easy decision. The free-choice paradigm continues to be used to gain insights into dissonance processes (e.g., Shultz & Lepper, 1996; Stone, chap. 8, this volume).

The Belief-Disconfirmation Paradigm

Dissonance is aroused when people are exposed to information inconsistent with their beliefs. If the dissonance is not reduced by changing one's belief, the dissonance can lead to misperception or misinterpre-

tation of the information, rejection or refutation of the information, seeking support from those who agree with one's belief, and attempting to persuade others to accept one's belief. In a study of the effect of belief disconfirmation on proselytizing, Festinger, Riecken, and Schachter (1956) acted as participant observers in a group that had become committed to an important belief that was specific enough to be capable of unequivocal disconfirmation. The group believed a prophecy that a flood would engulf the continent. The prophecy was supposedly transmitted by beings from outer space to a woman in the group. The group members also believed that they had been chosen to be saved from the flood and would be evacuated in a flying saucer.

Festinger et al. (1956) described what happened when the flood did not occur. Members of the group who were alone at that time did not maintain their beliefs. Members who were waiting with other group members maintained their faith. The woman reported receiving a message that indicated that the flood had been prevented by God because of the group's existence as a force for good. Before the disconfirmation of the belief about the flood, the group engaged in little proselytizing. After the disconfirmation, they engaged in substantial proselytizing. The group members sought to persuade others of their beliefs, which would add cognitions consonant with those beliefs. This paradigm, referred to as the *belief-disconfirmation paradigm*, continues to generate insight into dissonance processes (e.g., Burris, Harmon-Jones, & Tarpley, 1997; Harmon-Jones, chap. 4, this volume).

The Effort-Justification Paradigm

Dissonance is aroused whenever a person engages in an unpleasant activity to obtain some desirable outcome. From the cognition that the activity is unpleasant, it follows that one would not engage in the activity; the cognition that the activity is unpleasant is dissonant with engaging in the activity. Dissonance should be greater, the greater the unpleasant effort required to obtain the outcome. Dissonance can be reduced by exaggerating the desirability of the outcome, which would add consonant cognitions.

In the first experiment designed to test these theoretical ideas, E.

Aronson and Mills (1959) had women undergo a severe or mild “initiation” to become a member of a group. In the severe-initiation condition, the women engaged in an embarrassing activity to join the group, whereas in the mild-initiation condition, the women engaged in an activity that was not very embarrassing to join the group. The group turned out to be rather dull and boring. The women in the severe-initiation condition evaluated the group more favorably than the women in the mild-initiation condition. This paradigm is referred to as the *effort-justification paradigm*, and it continues to be used fruitfully in research (e.g., Beauvois & Joule, 1996).

The Induced-Compliance Paradigm

Dissonance is aroused when a person does or says something that is contrary to a prior belief or attitude. From the cognition of the prior belief or attitude, it would follow that one would not engage in such behavior. On the other hand, inducements to engage in such behavior, promises of reward or threats of punishment, provide cognitions that are consonant with the behavior. Such cognitions provide justifications for the behavior. The greater the number and importance of the cognitions justifying the behavior, the less the dissonance aroused. Dissonance can be reduced by changing the belief or attitude to correspond more closely to what was said. Instead of using Festinger’s original term, *forced compliance*, this paradigm is now called the *induced-compliance paradigm*.

The first experiment using the induced-compliance paradigm was the groundbreaking study by Festinger and Carlsmith (1959). They tested the hypothesis derived from dissonance theory that the smaller the reward for saying something that one does not believe, the greater the opinion changes to agree with what one has said. In their experiment, men performed boring tasks for 1 hr. Then each was told by the experimenter that there were two groups in the experiment: the one the participant was in, which received no introduction, and a second group, which was told the tasks were enjoyable by a person who had supposedly just completed them. The experimenter asked the participant to substitute for the person who usually said the tasks were en-

joyable, and the participant was given \$1 or \$20 to tell the next person (actually a female accomplice of the experimenter) that the tasks were enjoyable and to remain on call in the future. The participants were then asked to evaluate the tasks by an interviewer from the psychology department, who ostensibly had nothing to do with the experiment. Results indicated that those paid \$1 rated the tasks as more enjoyable than did those paid \$20 or those who merely performed the tasks and were not asked to describe them to another person.

The participants in the experiment by Festinger and Carlsmith (1959) engaged in what is referred to as *counterattitudinal behavior*. The finding that the less money received for engaging in the counterattitudinal behavior, the more positive the attitude has been labeled the *negative-incentive effect*. The reason that term is used is that there is a negative relationship between the amount of incentive (money) and the amount of attitude change in the direction of the counterattitudinal behavior.² Later research by Linder, Cooper, and Jones (1967) showed that the negative-incentive effect occurs when the person feels free to decide about engaging in the counterattitudinal behavior, but when there is no perceived freedom to engage in the counterattitudinal behavior, the opposite effect occurs, that is, the more incentive, the more positive the attitude. When there is no choice about engaging in the behavior, dissonance is minimal, because there is sufficient justification for the behavior (see Festinger, Appendix B, this volume).³

A variant of the induced-compliance paradigm that involves threat of punishment rather than promise of reward is known as the *forbidden-toy paradigm*. In the forbidden-toy paradigm (E. Aronson & Carlsmith, 1963), young children were given the opportunity to play with toys and were threatened with severe or mild punishment if they played

²As in many attitude-change studies, there was no measure of attitude before the experimental treatment. The measure of attitude was taken only after the experimental treatment. This type of design is referred to as an *after-only* design. In an after-only design, attitude change is shown by differences between the experimental conditions on the measure of attitude taken after the experimental treatment.

³Later dissonance theorists have given different reasons why perceived choice is a crucial factor in dissonance effects (Beauvois & Joule, 1996; J. W. Brehm & Cohen, 1962; Cooper & Fazio, 1984; Wicklund & Brehm, 1976).

with a very attractive toy. The threatened punishment was sufficient to prevent the children from playing with the attractive toy. When asked at a later time to evaluate the attractive toy, children who were threatened with mild punishment evaluated the toy less positively than children who were threatened with severe punishment. The induced-compliance paradigm and the forbidden-toy paradigm continue to be used to address questions about dissonance processes (e.g., J. Aronson, Cohen, & Nail, chap. 6, Beauvois & Joule, chap. 3, Cooper, chap. 7, Devine, Tauer, Barron, Elliot, & Vance, chap. 12, Harmon-Jones, chap. 4, Leippe & Eisenstadt, chap. 9, Sakai, chap. 11, Shultz & Lepper, chap. 10, all in this volume).

ALTERNATIVE ACCOUNTS OF DISSONANCE PHENOMENA

Over the years, various alternative theoretical accounts have been advanced to explain the effects found in dissonance experiments. The alternative accounts of dissonance have provoked considerable controversy. In some cases, the controversy has led to important empirical and theoretical advances. We briefly review the major alternative accounts and the controversy they generated.

Alternatives to Dissonance Theory

Self-Perception Theory

Self-perception theory (Bem, 1967, 1972) argued that dissonance effects were not the result of motivation to reduce the psychological discomfort produced by cognitive dissonance but were due to a nonmotivational process whereby persons merely inferred their attitudes from their behavior and the circumstances under which the behavior occurred. The self-perception theory explanation for the negative-incentive effect found by Festinger and Carlsmith (1959) assumes that persons use their overt behavior to judge their attitudes if external cues (such as an incentive) are not seen as controlling the behavior, but they do not use their overt behavior to judge their attitudes if external cues are seen as

controlling the behavior. The explanation assumes that a small incentive is not seen as controlling the behavior, whereas a large incentive is seen as controlling the behavior.

One of the consequences of the controversy generated by the self-perception account was research testing the implications of dissonance theory using the *misattribution paradigm*. In the misattribution paradigm, participants are exposed to an extraneous stimulus (e.g., a pill) that is said to have a certain effect on the person's internal state (e.g., produces tenseness). If the supposed effect of the extraneous stimulus is the same as the actual internal state the person is experiencing, the person may misattribute the internal state to the extraneous stimulus rather than attribute it to the actual cause. If this misattribution occurs, the person may not respond to the internal state in the same way (e.g., will not change cognitions to reduce dissonance, to eliminate the negative affect or arousal).

Zanna and Cooper (1974) were the first to use the misattribution paradigm to show that the attitude change found in the induced-compliance paradigm is motivated by the need to reduce negative affect or arousal, as assumed in the dissonance interpretation. In their experiment, under the guise of a study of the effects of a drug on memory, participants were given a pill to ingest that was actually a placebo with no real effect. The pill was said to cause tenseness, to cause relaxation, or to have no side effects. The participants then took part in a supposedly unrelated experiment in which they wrote a counterattitudinal message under high or low choice. If the pill was said to have no side effects, participants changed their attitudes to be more consistent with the counterattitudinal essay when choice was high but not when choice was low, in keeping with the results of other dissonance research. However, if the pill was said to cause tenseness, participants did not change their attitudes in either the low- or high-choice condition.

Zanna and Cooper (1974) reasoned that the feeling of tenseness that was experienced due to the dissonance created by writing the counterattitudinal message under high choice was misattributed to the pill when the pill was said to cause tenseness. With the tenseness misattributed to the pill, there was no need to reduce the dissonance that was

the true cause of the feeling and thus no need for attitude change to reduce the dissonance.⁴ Bem's self-perception account of dissonance phenomena is unable to explain the findings of the study by Zanna and Cooper. If, as assumed by the self-perception account, attitude change was not the result of motivation to reduce the discomfort produced by cognitive dissonance, then the extraneous stimulus to which the discomfort could be misattributed would have no influence on attitude change.

Prompted in part by the controversy engendered by the self-perception account, additional research has been carried out to assess the motivational and emotional nature of dissonance. By showing that dissonance is associated with physiological arousal and psychological discomfort and that the cognitive changes that occur are motivated by this discomfort, research has demonstrated that self-perception processes cannot account for all effects produced in dissonance experiments (Elliot & Devine, 1994; Fazio, Zanna, & Cooper, 1977; Gerard, 1967; Harmon-Jones, Brehm, Greenberg, Simon, & Nelson, 1996; Losch & Cacioppo, 1990; Zanna & Cooper, 1974). Beauvois and Joule (chap. 3), Devine et al. (chap. 12), and Harmon-Jones (chap. 4; all from this volume) present further experimental evidence that is consistent with dissonance theory but cannot be explained by self-perception theory.

Impression-Management Theory

Another alternative theoretical account that has been offered for the effects obtained in dissonance experiments is impression-management theory (Tedeschi, Schlenker, & Bonoma, 1971). According to this interpretation, attitudes appear to change because persons want to manage the impressions others have of them. They try to create a favorable impression or avoid an unfavorable impression by appearing to have attitudes that are consistent with their behavior. This alternative theoretical account assumes that the attitude change that occurs in disso-

⁴High-choice participants given the pill that was said to cause relaxation changed their attitudes more than did high-choice participants given the pill said to cause no side effects. Zanna and Cooper (1974) reasoned that when the pill was said to cause relaxation, the participants deduced the amount of their tenseness by combining the amount of tenseness actually experienced and the amount of tenseness the pill supposedly reduced.

nance experiments is not genuine and that participants in experiments only appear to change their attitudes after counterattitudinal behavior to avoid being viewed unfavorably by the experimenter.

In contrast to the assumption of the impression-management account, dissonance processes do produce genuine cognitive changes. Results supporting the dissonance interpretation have been obtained in experiments in which the attitude measure was taken by someone who did not appear connected with the experimenter that observed the participant's behavior (Festinger & Carlsmith, 1959; Linder et al., 1967) and in experiments using extremely private situations (Harmon-Jones et al., 1996). Impression-management theory has difficulty accounting for findings that show that dissonance processes that justify recent behavior can produce physiological changes (M. L. Brehm, Back, & Bogdonoff, 1964), and it has problems explaining results obtained in paradigms other than the induced-compliance paradigm, for example, the free-choice paradigm (Wicklund & Brehm, 1976).

Revisions of Dissonance Theory

Currently, there are several versions of dissonance theory that assume, along with the original version, that situations evoking dissonance produce a motivation that results in genuine cognitive changes. However, these revisions offer somewhat different theoretical interpretations for the phenomena observed in dissonance experiments. The revisions differ in what they posit to be the underlying motivation for dissonance effects. Those differences are a major source of the current controversy about dissonance. The different theoretical positions are covered extensively in the present volume by authors who have been intimately involved in the development of the revisions and the controversy they have generated.

Self-Consistency

One of the first revisions proposed was the *self-consistency* interpretation of dissonance (E. Aronson, 1968, 1992). It is based on the idea that situations that evoke dissonance do so because they create inconsistency between the self-concept and a behavior. Because most persons have a

positive self-concept, persons are likely to experience dissonance when they behave in a way that they view as incompetent, immoral, or irrational. This revision interprets the effects observed in the Festinger and Carlsmith (1959) experiment as resulting from an inconsistency between the person's self-concept as a moral person and the person's behavior of telling a lie to another person. This revision has led to an examination of the way in which variables related to the self, such as self-esteem, are involved in dissonance processes and to the generation of new research paradigms (see E. Aronson, chap. 5, and Stone, chap. 8, both this volume).

The New Look

Another revision has proposed that the effects observed in dissonance studies are the result of feeling personally responsible for producing foreseeable aversive consequences (Cooper & Fazio, 1984; Scher & Cooper, 1989). This revision, often referred to the *new look* version of dissonance, proposes that the attitude change observed in the Festinger and Carlsmith (1959) experiment resulted from the desire to avoid feeling personally responsible for producing the aversive consequence of having harmed the other participant by leading them to believe that a boring task was enjoyable. This revision has generated research concerned with identifying necessary and sufficient conditions for the production of dissonance and with the role of arousal and its interpretation in dissonance processes. Controversy about this revision has spurred empirical and theoretical advances (see E. Aronson, chap. 5, Beauvois & Joule, chap. 3; Harmon-Jones, chap. 4; Sakai, chap. 11, all this volume).

Self-Affirmation

Self-affirmation theory proposes that dissonance effects are not the result of cognitive inconsistency, self-inconsistency, or feeling personally responsible for producing aversive consequences, but of behaving in a manner that threatens one's sense of moral and adaptive integrity (Steele, 1988; Steele, Spencer, & Lynch, 1993). This revision interprets the Festinger and Carlsmith (1959) results by assuming that the participants in that experiment changed their attitudes about the task because saying that the tasks were enjoyable when they knew they were boring

made them feel foolish and threatened their sense of self-worth. The self-affirmation revision also has generated much controversy that has led to empirical and theoretical advances (see J. Aronson et al., chap. 6; Cooper, chap. 7; Stone, chap. 8, all this volume).

The Original Version Reaffirmed

Although the revisions of dissonance theory have produced serious challenges to the original version of the theory, other theorists maintain that the original version continues to be viable and that it can explain the evidence generated by the revisions (Beauvois & Joule, 1996, chap. 3; Harmon-Jones, chap. 4; McGregor, Newby-Clark, & Zanna, chap. 13; Mills, chap. 2, all this volume). The resurgence of the original version has generated new experimental paradigms and conceptual advances.

Areas of Agreement and Disagreement

Although there is controversy about the underlying motivation for dissonance effects, there is also much agreement about important issues. Dissonance theorists currently agree that genuine cognitive changes occur in dissonance studies, for example, studies of the induced-compliance paradigm, the free-choice paradigm, and the effort-justification paradigm. Moreover, it is agreed that these cognitive changes are motivated in nature and that the source of this motivation is a form of psychological discomfort.

Currently, the major area of disagreement is the nature of the motivation underlying the cognitive and other changes that result from dissonance. Just as the earlier controversies in the history of dissonance research have led to important empirical and theoretical advances, the controversy regarding the nature of the motivation underlying dissonance effects has been, and promises to continue to be, the source of new research findings. Understanding the nature of the motivation underlying dissonance effects should assist in developing a better understanding of the interplay of cognition, motivation, emotion, and behavior. By advancing knowledge about the determinants of cognitive, emotional, motivational, and behavioral change, dissonance research has the potential to produce significant practical applications to problems of society.

OVERVIEW OF THE PRESENT VOLUME

The chapters written for this volume by dissonance researchers and scholars have been grouped into four parts, organized on the basis of themes shared by the chapters. The placement of the chapters into different parts should not be taken to mean that what is included in the chapters in one part is not relevant to the material contained in the chapters in a different part. Each of the chapters shares the common theme of dealing with issues of importance for the continued development of theory and research on dissonance processes.

Part One, "Perspectives Employing the Original Version of the Theory," consists of chapters discussing work that uses the original version of dissonance theory. In chapter 2, Judson Mills presents suggestions for improving the original version. He contends that the magnitude of avoidance of new dissonance is not influenced by the amount of existing dissonance and that spreading of alternatives occurs before a choice. He proposes changing the definition of dissonance to include the degree to which a behavior will lead to a consequence and the desirability of the consequence.

Jean-Léon Beauvois and Robert-Vincent Joule present their radical dissonance theory in chapter 3. They suggest that dissonance theory is a theory concerned with rationalization of behavior and that as such, it is not a theory of cognitive consistency, the management of personal responsibility, or the management of one's moral worth. They review experiments supporting their viewpoint and describe two new paradigms for dissonance research.

In chapter 4, Eddie Harmon-Jones presents arguments suggesting, in contrast to the new look version of dissonance, that feeling personally responsible for the production of aversive consequences is not necessary to create cognitive dissonance and that dissonance will occur even when aversive consequences are not produced. He presents recent empirical evidence supporting this view and offers a new theoretical interpretation for dissonance theory.

Part Two, "The Role of the Self in Dissonance," comprises chapters that discuss the revisions of cognitive dissonance theory that use the self as a crucial factor in dissonance processes. In chapter 5, Elliot Aron-

son presents his self-consistency interpretation of dissonance and describes a new paradigm for dissonance theory, the *hypocrisy paradigm*, that makes persons mindful of the fact that they are not practicing what they are preaching. He argues that evidence obtained in this paradigm indicates that the production of aversive consequences is not essential for the creation of dissonance.

Joshua Aronson, Geoffry Cohen, and Paul R. Nail present the self-affirmation reformulation of dissonance theory in chapter 6. They describe research derived from self-affirmation theory that was used to challenge the original version of dissonance theory and discuss recent evidence that poses challenges for a self-affirmation theory account of dissonance research.

In chapter 7, Joel Cooper presents the new look version of dissonance theory and discusses recent research on how the self is implicated in dissonance processes. Proposing an interpretation different from self-consistency and self-affirmation theories, he reviews evidence showing that the self is multiply involved in dissonance processes.

Jeff Stone presents an analysis of the conditions under which the self plays a role in dissonance in chapter 8. He considers when the self operates as a standard determining dissonance and when the self operates as a resource for dissonance reduction. He describes research on self-focused attention aimed at determining when effects occur that are predicted by self-consistency theory, self-affirmation theory, or neither theory.

In chapter 9, the final chapter of Part Two, Michael Leippe and Donna Eisenstadt present their self-accountability model of dissonance reduction, which deals with the conditions under which various modes of dissonance reduction are used. They review evidence showing that in addition to attitude change, dissonance can be reduced by forgetting the dissonant cognitions, by elaborate cognitive restructuring, or by changing related beliefs.

Part Three, "Mathematical Models of Dissonance," comprises chapters that present novel mathematical models of dissonance processes. In chapter 10, Thomas R. Shultz and Mark R. Lepper present a computational model of cognitive dissonance, which they refer to as the

consonance model, because it assumes that the motivation underlying dissonance phenomena is to increase cognitive consonance. The model is based on principles of *constraint satisfaction*. They describe simulations of the results of dissonance experiments using an artificial neural network model.

Haruki Sakai presents a mathematical formulation of dissonance, termed the *multiplicative power-function model* in chapter 11. He discusses implications of the model for important theoretical issues, such as the calculation of magnitude of dissonance and specifying the key element around which dissonance is calculated. He also describes research on shared responsibility for negative consequences that casts doubt on the new look version of dissonance.

Part Four, "Dissonance and Affect," comprises chapters that present recent work on the role of emotion in dissonance processes. Patricia G. Devine, John M. Tauer, Kenneth E. Barron, Andrew J. Elliot, and Kristen M. Vance argue in chapter 12 that attitude change, the most commonly used dependent variable in dissonance research, is limited in what it can reveal about the nature of dissonance motivation and dissonance reduction. They describe research demonstrating the value of measures of self-reported affect in dissonance studies.

In the final chapter, chapter 13, Ian McGregor, Ian R. Newby-Clark, and Mark P. Zanna present an account of dissonance in terms of the simultaneous accessibility of inconsistent cognitions. They describe research on attitudinal ambivalence indicating that felt ambivalence arising from the existence of inconsistent cognitions is moderated by the extent to which both cognitions are readily and easily accessible.

As editors of the book, we encouraged the authors to present their own personal views on the important issues in cognitive dissonance research and theory. We hoped to encourage a free and open exchange of ideas relevant to the theory. As expected, differing viewpoints about dissonance are expressed in the different chapters. Also as expected, the differences are not resolved within the book. We hope that the debate about the differences and the controversy about the nature of dissonance will stimulate theoretical development and lead to new insights and findings. We believe that the future of dissonance research prom-

ises to be as exciting and valuable as the past 40 years of work on the theory.

REFERENCES

- Aronson, E. (1968). Dissonance theory: Progress and problems. In R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcomb, M. J. Rosenberg, & P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook* (pp. 5–27). Chicago: Rand McNally.
- Aronson, E. (1992). The return of the repressed: Dissonance theory makes a comeback. *Psychological Inquiry*, 3, 303–311.
- Aronson, E., & Carlsmith, J. M. (1963). Effect of severity of threat on the valuation of forbidden behavior. *Journal of Abnormal and Social Psychology*, 66, 584–588.
- Aronson, E., & Mills, J. (1959). The effect of severity of initiation on liking for a group. *Journal of Abnormal and Social Psychology*, 59, 177–181.
- Beauvois, J.-L., & Joule, R.-V. (1996). *A radical dissonance theory*. London: Taylor & Francis.
- Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74, 183–200.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1–62). New York: Academic Press.
- Brehm, J. W. (1956). Postdecision changes in the desirability of alternatives. *Journal of Abnormal and Social Psychology*, 52, 384–389.
- Brehm, J. W., & Cohen, A. R. (1962). *Explorations in cognitive dissonance*. New York: Wiley.
- Brehm, M. L., Back, K. W., & Bogdonoff, M. D. (1964). A physiological effect of cognitive dissonance under stress and deprivation. *Journal of Abnormal and Social Psychology*, 69, 303–310.
- Burris, C. T., Harmon-Jones, E., & Tarpley, W. R. (1997). “By faith alone”: Religious agitation and cognitive dissonance. *Basic and Applied Social Psychology*, 19, 17–31.
- Cooper, J., & Fazio, R. H. (1984). A new look at dissonance theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 17, pp. 229–264). Orlando, FL: Academic Press.

- Elliot, A. J., & Devine, P. G. (1994). On the motivational nature of cognitive dissonance: Dissonance as psychological discomfort. *Journal of Personality and Social Psychology*, *67*, 382–394.
- Fazio, R. H., Zanna, M. P., & Cooper, J. (1977). Dissonance and self-perception: An integrative view of each theory's proper domain of application. *Journal of Experimental Social Psychology*, *13*, 464–479.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson.
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*, *58*, 203–210.
- Festinger, L., Riecken, H. W., & Schachter, S. (1956). *When prophecy fails*. Minneapolis: University of Minnesota Press.
- Gerard, H. B. (1967). Choice difficulty, dissonance and the decision sequence. *Journal of Personality*, *35*, 91–108.
- Harmon-Jones, E., Brehm, J. W., Greenberg, J., Simon, L., & Nelson, D. E. (1996). Evidence that the production of aversive consequences is not necessary to create cognitive dissonance. *Journal of Personality and Social Psychology*, *70*, 5–16.
- Jones, E. E. (1985). Major developments in social psychology during the past five decades. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (3rd ed., pp. 47–108). New York: Random House.
- Linder, D. E., Cooper, J., & Jones, E. E. (1967). Decision freedom as a determinant of the role of incentive magnitude in attitude change. *Journal of Personality and Social Psychology*, *6*, 245–254.
- Losch, M. E., & Cacioppo, J. T. (1990). Cognitive dissonance may enhance sympathetic tonus, but attitudes are changed to reduce negative affect rather than arousal. *Journal of Experimental Social Psychology*, *26*, 289–304.
- Scher, S. J., & Cooper, J. (1989). Motivational basis of dissonance: The singular role of behavioral consequences. *Journal of Personality and Social Psychology*, *56*, 899–906.
- Shultz, T. R., & Lepper, M. R. (1996). Cognitive dissonance reduction as constraint satisfaction. *Psychological Review*, *103*, 219–240.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 261–302). San Diego, CA: Academic Press.

AN INTRODUCTION

- Steele, C. M., Spencer, S. J., & Lynch, M. (1993). Self-image resilience and dissonance: The role of affirmational resources. *Journal of Personality and Social Psychology*, 64, 885–896.
- Tedeschi, J. T., Schlenker, B. R., & Bonoma, T. V. (1971). Cognitive dissonance: Private ratiocination or public spectacle? *American Psychologist*, 26, 685–695.
- Wicklund, R. A., & Brehm, J. W. (1976). *Perspectives on cognitive dissonance*. Hillsdale, NJ: Erlbaum.
- Zanna, M. P., & Cooper, J. (1974). Dissonance and the pill: An attribution approach to studying the arousal properties of dissonance. *Journal of Personality and Social Psychology*, 29, 703–709.