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Dealing with dissonance: A review of cognitive dissonance reduction

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Abstract

This article provides an overview of research about cognitive dissonance reduction. Over the past 60 years, researchers have produced significant theoretical and empirical contributions from cognitive dissonance theory. One of the challenges that remains for dissonance theory going forward is a deeper examination of the process of dissonance reduction. I describe the various reduction strategies that have been investigated followed by models that have been proposed to understand an individual's use of dissonance reduction strategies. I then highlight a series of factors that can help us move research about dissonance reduction forward. These factors can be broadly subsumed under characteristics of the reduction mode and characteristics of the dissonance arousal. I conclude by suggesting that examination of these factors in studies that present multiple reduction modes to participants will provide a better understanding of the process of dissonance reduction.

1 | INTRODUCTION

Each day, we are faced with a host of decisions. This is not surprising, but what is surprising is how often our decisions conflict with our attitudes, values, and goals. What will I have with my lunch—fries or salad? Will I exercise today? Will I drive to work or take the bus? Should I go on vacation or save for a down payment? In each of these instances, a person is presented with conflicting choices, and although one might want to be a healthy, environmentally, and fiscally responsible person, oftentimes one's behavior is incongruous with such goals. When this happens a person can experience a negative affective state characterized by discomfort, tension, and heightened physiological arousal. This experience is known as cognitive dissonance (Festinger, 1957). Cognitive dissonance theory has been one of the most important theories to emerge from social psychology, and although research has documented when, and also, why cognitive dissonance occurs, considerably less research has focused on the process of dissonance reduction, that is, how we resolve the state of dissonance and extinguish those unwanted negative emotions.

Part of the appeal of cognitive dissonance theory is that it elegantly describes a phenomenon that people regularly experience. As an example, Loughnan, Bastian, and Haslam (2014) recently explored the psychology of eating animals, noting that many people are confronted with a meat paradox. That is, we simultaneously care about (and for) animals yet consume products that require animal suffering and death. In their explanation about how people

overcome this paradox, they note the relevance of cognitive dissonance theory. As an example, to reduce the negative affect caused by the meat paradox, individuals can change their behavior (e.g., adopt vegetarianism) or their beliefs (e.g., perceive less ability on the part of animals to suffer). Yet despite decades of work on cognitive dissonance theory, a question that remains unanswered is *which change will a person make?* That is, when confronted with the psychological tension caused by everyday problems and difficult decisions, what dissonance reduction modes are people likely to turn to? Research over the past several decades has identified many dissonance reduction modes. However, the identification of these different modes has not resulted in sufficient progress toward understanding which mode will be used when. This is a vital question because understanding when a particular reduction mode will be used is arguably as important as understanding when dissonance will be aroused.

Understanding the arousal of dissonance is central to the theory, and significant work has been done on this topic (for reviews, see Brehm, 2007; Harmon-Jones & Harmon-Jones, 2008; Kenworthy, Miller, Collins, Read, & Earleywine, 2011; Martinie, Milland, & Olive, 2013). But to fully understand the process of cognitive dissonance, we need to understand its arousal *and* reduction. The purposes of this article are to highlight that less work has been dedicated to understanding the latter part of this phenomenon and to suggest ways forward. Cognitive dissonance is fascinating, in part, because it acts as a motivating force in people's lives. Individuals are motivated to reduce discrepancies that produce aversive affective states (e.g., the discomfort arising from the awareness that although one wants to lead a healthy lifestyle over the past 2 weeks, she or he has not exercised). For an individual in this state, many dissonance reduction modes are available, and these various modes have important consequences for the actor. In this situation, the individual could decide that she or he does not have the necessary time to exercise or conversely she or he could begin exercising. Both of these paths can reduce dissonance, but the chosen path will have important consequences for the individual's short- and long-term well-being. The focus of this article concerns these different dissonance reduction paths because through further investigation of dissonance reduction, we will achieve a greater understanding of cognitive dissonance theory and human behavior.

In this article, following an introduction to cognitive dissonance, I provide an overview of the different dissonance reduction modes and information from models about dissonance reduction. I note that empirical support for understanding when various reduction modes will be used is lacking. As such, I propose a series of factors about the experience of cognitive dissonance that can help guide us in understanding dissonance reduction, and these are grouped under two main categories: characteristics of reduction modes and characteristics of dissonance arousal.

2 | HISTORY OF COGNITIVE DISSONANCE THEORY

The theory of cognitive dissonance first arose out of a research project intended to understand the communication of rumors. While reviewing literature concerning the spreading of rumors, Festinger (1957) came across a study with some puzzling results, which he described (pp. 236–241): Prasad (1950) recorded rumors following an earthquake in India that was felt over a large area, but the resulting damage occurred in only a small area. Prasad documented rumors among people living outside of the damage-affected area. These individuals experienced the earthquake but did not observe any damage from its effects. Surprisingly, instead of being relieved that the earthquake had ended and that no damage occurred in their area, they circulated rumors about forthcoming doom. Festinger argued these rumors served a fear-justifying purpose essential to reducing dissonance experienced by these people. Following the earthquake, residents outside of the damaged areas were likely afraid, but without an observable reason for feeling this way. That is, the cognition of “I’m afraid” was inconsistent with the cognition “we suffered no damage and have nothing to be afraid about.” According to dissonance theory, the propagation of fear-arousing rumors (i.e., predictions of future disaster) served to justify how the residents felt and ultimately reduced their dissonance. However, to conclude that dissonance theory accurately explained these rumors, it would be necessary to document rumors from people within damaged areas. These people observed fatal casualties and damage and, therefore, had a reason to feel afraid. Given this, rumors about forthcoming doom should not circulate in such areas

according to dissonance theory. Although Prasad (1950) did not collect such data, they were collected in a study of rumors following a landslide in Darjeeling, India (Sinha, 1952). Consistent with dissonance theory, eyewitnesses of the landslide's devastating effects did not circulate rumors about impending doom, presumably because their fear did not need to be justified.

After providing a case study that documented the process of dissonance arousal and reduction (Festinger, Riecken, & Schachter, 1956), Festinger (1957) published *A Theory of Cognitive Dissonance*. His work challenged contemporary understandings of human behavior that were rooted in learning theory. Additionally, research on dissonance developed at a time when there was considerable interest within social psychology on the topics of persuasion and attitudes (Hovland, Janis, & Kelley, 1953). Strong connections between dissonance and these topics are evident in early empirical studies. For example, Bochner and Insko (1966) examined communicator disparagement as an alternative to opinion change when one is confronted with dissonance-arousing discrepant information. And attitude change has remained a topic of interest throughout the history of dissonance theory. Cooper (2007) has noted that Cohen's work on dissonance established the most popular procedure for induced compliance, which is writing counterattitudinal essays and measuring attitude change as the primary dependent variable (Brehm & Cohen, 1962). Since then, attitude change has remained a key outcome variable in later studies with researchers using it as an indicator of dissonance.

3 | CHALLENGES AND DEVELOPMENTS

Given the long history of dissonance theory (for a review, see Vaidis, 2014), it should come as no surprise that various critiques of findings from dissonance studies have been put forth, with self-perception theory being a notable challenge. Bem (1967) proposed that attitude change in induced compliance studies was the result of people inferring their attitudes from their behavior rather than viewing attitude change as a process of dissonance reduction. Determining your attitude toward something required that you consider your behavior (e.g., telling a peer how enjoyable a task was or writing in support of a position tells you your attitude toward these topics). This theory questioned the motivational force of dissonance. Given this, a more compelling case for dissonance could be made if researchers provided evidence that dissonance was in fact arousing and aversive.

Researchers documented direct evidence of arousal in participants whose nonspecific skin conductance responses were recorded while they completed an induced compliance task (Croyle & Cooper, 1983). Participants randomly assigned to the high dissonance condition showed elevated levels of physiological arousal when compared to participants who were not placed in a dissonance-producing situation. In another study, participants who experienced dissonance after writing a counterattitudinal essay displayed increased levels of arousal as indicated by galvanic skin responses in comparison to participants placed in a low dissonance condition (Elkin & Leippe, 1986). In terms of aversiveness, the dissonance thermometer is a self-report measure that can track the affective states of participants in dissonance studies, and it has shown that participants experience dissonance-inducing conditions as aversive (Elliot & Devine, 1994). Results from a misattribution study also provided support for dissonance as aversive (Losch & Cacioppo, 1990). Interest in tracking dissonance continues, with researchers using facial electromyograms to detect negative affect (Martinie, Olive, Milland, Joule, & Capa, 2013). Using structural equation analyses, researchers have identified guilt as the affective driver across a range of paradigms (Kenworthy et al., 2011). And recent work has used functional magnetic resonance imaging to identify brain regions (e.g., the anterior cingulate cortex) associated with increased activity during dissonance (de Vries, Byrne, & Kehoe, 2015).

Some authors have challenged reformulations of the original theory and have emphasized a return to the original theory. Beauvois and Joule's (1996) radical dissonance theory emphasizes Festinger's original work and argues for an essential role of commitment in the dissonance process. The action-based model proposed by Harmon-Jones and Harmon-Jones (2002) also advocates a return to the original theory supplemented with an explanation about why cognitive inconsistency produces aversive arousal. Contributions from these scholars are discussed later.

4 | DISSONANCE REDUCTION STRATEGIES

Festinger (1957) proposed three common ways of reducing dissonance: changing one's cognitions (thereby decreasing the number of dissonant cognitions), creating new consonant cognitions, or minimizing the importance of dissonant cognitions (and/or by increasing the importance of consonant cognitions, as suggested by Harmon-Jones, 2000). As research on dissonance continues, specific reduction strategies have been catalogued, and below is an overview of these strategies.

4.1 | Attitude change

The mode of dissonance reduction that has received the most empirical attention is changing a cognition (broadly defined by Festinger as any piece of knowledge), and specifically the changing of one's attitude. Although attitude is just one of several cognitions that could be changed to reduce dissonance, researchers have relied heavily on this construct, perhaps because it was the dependent variable in Festinger and Carlsmith's (1959) seminal work. After experimentally arousing dissonance, participants' attitudes are typically measured using a series of Likert-type scales. For example, if participants just wrote an essay supporting a tuition increase, they would complete items assessing their actual support for a tuition increase, and these ratings would be compared to their preexperimental ratings or the ratings of participants in a control group that did not experience the dissonance induction and who would, therefore, have no reason to change their attitudes. Although attitude change has been used as a reliable indicator of dissonance, several researchers note that dissonance theory has been constricted by researchers' overreliance on this dependent variable (Devine, Tauer, Barron, Elliot, & Vance, 1999; Leippe & Eisenstadt, 1999; Simon, Greenberg, & Brehm, 1995; Wilder, 1992). Festinger (1987/1999) highlighted the importance of this himself, saying "in the ordinary world and if the experimenter is not very careful, a little bit sloppy, there are lots and lots of avenues of dissonance reduction, and those have never been explored" (p. 384).

In addition to limiting how dissonance is measured, examining solely attitude change as a dissonance reduction strategy tells us little about how individuals may actually deal with dissonant experiences. Festinger proposed that individuals can reduce dissonance through multiple pathways, but the dissonance literature is largely centered on attitude change.

4.2 | Distraction and forgetting

A focus on attitude change masked how easy it may be for people to reduce the negative arousal from dissonant cognitions. When researchers moved away from measuring participants' attitudes immediately after they had completed a dissonance-inducing task, they discovered that dissonance could be reduced simply through distraction (Zanna & Aziza, 1976) or forgetting (Elkin & Leippe, 1986). Distraction allows individuals to divert their attention away from their dissonant cognitions and avoid the negative affective state caused by dissonance. Conversely, presenting participants with an attitude change opportunity may actually be a less efficient reduction strategy because this reminds participants about their dissonance. Consistent with this, Elkin and Leippe (1986) found that dissonance (as measured physiologically) did not decline following an attitude change opportunity but did decline when participants were left to forget about the dissonance.

4.3 | Trivialization and self-affirmation

Although Festinger (1957) described trivialization as one of three dissonance reduction strategies, decreasing the importance of dissonant cognitions was not empirically investigated as a reduction mode until almost 40 years later. Simon et al. (1995) investigated the conditions under which trivialization was a likely mode of dissonance reduction. Trivialization was presented as a reduction mode to participants by asking them to respond to four questions about the importance of their counterattitudinal behavior (i.e., writing an essay in support of mandatory

comprehensive finals). Through a series of experiments, the researchers found that participants used the first mode of dissonance reduction presented to them unless their prior attitude had been made salient or they were given a trivializing issue frame, in which case participants were more likely to trivialize the importance of their behavior rather than change their attitude.

Simon et al. (1995) also hypothesized that engaging in self-affirmation leads to trivialization and that trivialization is the process through which self-affirmation reduces dissonance. Self-affirmation, which occurs when participants' important values are made salient, is a dissonance reduction strategy originally tested by Steele and Liu (1983). Steele (1988) thought that dissonance could be reduced indirectly by self-affirmation because it allows an individual to reassert a sense of self-integrity. Research suggests that self-affirmation reduces dissonance through trivialization (Simon et al., 1995). Once an individual reaffirms her or his sense of self, the importance of a discrepant act is weakened, and it no longer arouses dissonance.

4.4 | Denial of responsibility

Responsibility is typically regarded as necessary for the experience of dissonance, and the denial of responsibility has also been suggested as a dissonance reduction strategy (Festinger, 1957, p. 44). This proposition has also been examined empirically (Gosling, Denizeau, & Oberlé, 2006). In a set of experiments, participants who had been presented with different modes of dissonance reduction following a counterattitudinal behavior selected the option first made available to them, one of which was denial of responsibility. Affective ratings reported by participants using Elliot and Devine's (1994) self-report dissonance measure indicated that negative affect was reduced following denial of responsibility. Furthermore, although participants denied responsibility for their behavior when this option was presented first, they also used denial, albeit to a lesser degree, when it was presented second after trivialization. Because participants still used denial of responsibility as a second mode of reduction, the authors suggested that the denial of responsibility may be a stronger form of dissonance reduction than trivialization (which was the mode presented first to half of the participants). Alternatively, this may depend on the type of negative affect aroused by the dissonance induction. In Experiment 3, participants showed greater reductions in negative self-directed affect rather than discomfort, suggesting that the denial of responsibility may be a particularly appropriate way of reducing dissonance associated with feelings of shame and guilt (p. 730).

4.5 | Adding consonant cognitions

Rationalizing inconsistent behavior by adding behavior-consonant cognitions to one's belief system is a relatively effortless method of reducing dissonance. People do this when they seek out new information to support their position, and research on selective exposure has explored how engagement in this process reduces dissonance (Cotton, 1985; Frey, 1986). For example, participants experiencing dissonance over writing counterattitudinal essays in support of nuclear power plants sought out more supportive information (i.e., brochures on nuclear power plants) than participants experiencing low levels of dissonance (Cotton & Hieser, 1980). Similar findings have been found for groups of smokers (Brock & Balloun, 1967) and for participants who choose to continue a boring experiment (Frey & Wicklund, 1978).

Looking for ways to externally justify one's behavior is also a process of adding consonant cognitions. In the peg-turning induced compliance experiment, a participant can easily justify a counterattitudinal behavior by adding the consonant cognition "I was paid \$20 to do it" to his or her cognitive web. In addition to external justifications, an individual can also be overconfident in a position, thereby adding a consonant cognition to reduce dissonance. This has been observed among gamblers who felt more confident about bets after they were placed rather than before (Knox & Inkster, 1968) and among students facing an uncertain exam outcome (Blanton, Pelham, DeHart, & Carvallo, 2001).

4.6 | Changing behavior

Although considerable research has examined attitude change as a mode of dissonance reduction, less research has documented behavior change as a dissonance reduction strategy. When looking back on dissonance research, Festinger (1987/1999, p. 384) said, "I still think that one of the major avenues of dissonance reduction is to change your behavior." Although a major route of dissonance reduction, changing one's behavior requires effort and is often not the most convenient way to reduce dissonance, especially in laboratory experiments employing the free choice paradigm because behavior change is not an option to reduce postdecisional dissonance. According to Festinger (1957), behavior may be resistant to change because it could be painful, otherwise satisfying, or simply impossible to do so.

Some dissonance studies have included behavior change as a dependent variable with promising results for those interested in using dissonance arousal as a mechanism for positive behavior change. Researchers have found that participants are more willing to conserve water (Dickerson, Thibodeau, Aronson, & Miller, 1992), purchase condoms (Stone, Aronson, Crain, Winslow, & Fried, 1994), accept sunscreen (Fernandez, Stone, Cascio, Cooper, & Hogg, 2007), volunteer (Fried & Aronson, 1995), and comply with speed limits (Fointiat, 2004) when experiencing dissonance in an effort to reduce that aversive state. Importantly though, the behavioral reduction options presented to participants are sometimes the only options presented, which tells us less about whether people would actually change their behavior to reduce dissonance when other reduction modes are accessible.

4.7 | Act rationalization

Beyond behavior change, researchers have also investigated whether a new action, one that is consistent with a previous, but problematic, behavior, can reduce dissonance (Beauvois, Joule, & Brunetti, 1993; and described in Beauvois & Joule, 1996; Joule & Beauvois, 1997). When not provided with an opportunity to cognitively rationalize their behavior, smokers who agreed to abstain from smoking for a short period (e.g., 18 or 24 hr) were then more likely to agree to a second and longer abstinence period. Agreeing to the longer abstinence period renders the initial abstinence period as less problematic, thereby reducing dissonance. Beauvois and Joule (1996) have noted that cognitive rationalizations have traditionally received more research attention than have behavioral rationalizations (p. 99). Act rationalization constitutes an alternative behavioral reduction mode.

5 | EXPLORING DISSONANCE REDUCTION

One criticism of the dissonance literature is that researchers typically provide participants with only one way of reducing the dissonance they experience in experiments, and this strategy usually involves attitude change (Simon et al., 1995; Wilder, 1992). The dominant paradigm used to test dissonance theory is the induced compliance paradigm in which participants are asked to write counterattitudinal essays. After completing this dissonance-arousing task, participants are given the opportunity to reduce the dissonance they experience by altering their attitude, so it is consistent with the position they argued for in their essay. However, providing participants with just this one dissonance reduction strategy tells us little about how people actually reduce dissonance in their daily lives.

Relevant to how people may go about reducing dissonance in their daily lives are the findings of studies examining individuals' preferred dissonance reduction strategies (Gosling et al., 2006; Götz-Marchand, Götz, & Irle, 1974; Simon et al., 1995; Starzyk, Fabrigar, Soryal, & Fanning, 2009). For example, researchers have discovered that the first reduction strategy provided to participants is typically the preferred reduction strategy. However, these studies still leave many unanswered questions about spontaneous dissonance reduction outside the laboratory. In particular, studies that have included trivialization, the denial of responsibility, and attitude change as dissonance-reducing options present participants with these options serially, which still leaves questions about the use of dissonance reduction strategies outside the laboratory. Studies in which participants are presented with multiple

dissonance reduction strategies simultaneously are not common (for two exceptions, see Götz-Marchand et al., 1974; Stone, Wiegand, Cooper, & Aronson, 1997). As such, typical dissonance experiments often prescribe the reduction strategy to the participant.

Our lack of knowledge regarding spontaneous dissonance reduction is a serious limitation, particularly if we hope to apply the principles of dissonance to situations outside the laboratory. As an example, health education programs may include dissonance-arousing information or tactics, but if such programs are designed to influence people's beliefs and behavior through inducing dissonance, we need to know more about how individuals resolve that experience of dissonance. For example, when smokers buy cigarette packages bearing a photo of grossly diseased lungs, do they actually resolve to quit smoking or, alternatively, do they try to avoid the sight of the picture, or do they convince themselves that their lungs will be fine?

Insights stemming from the meaning maintenance model (MMM) highlight the numerous ways humans can respond to threats, whether they are threats to self-esteem, belonging, or certainty, or the threat of mortality. Individuals have a need for meaning that, when challenged, results in attempts to reaffirm meaning, even if such reaffirmations occur outside of the threatened domain (Heine, Proulx, & Vohs, 2006). That is, a threat resulting from the domain of certainty could be overcome by focusing on the domain of belonging (e.g., by shoring up one's affiliative needs through in-group identification). According to the MMM, "meaning is sought in domains that are most easily recruited, rather than solely in the domain under threat" (p. 90). So although revising or reinterpreting challenging propositions could offer direct routes to the restoration of meaning, individuals are not restricted to these strategies. Likewise, dissonance can be reduced in a multitude of ways, and not by necessarily addressing the discrepancy directly. Reduction modes vary in the extent to which they directly resolve the discrepancy between incongruous cognitions. Trivializing the importance of a discrepancy, or engaging in self-affirmation, can alleviate negative affect without resolving the discrepancy between cognitions (Gawronski & Brannon, *in press*). Further, a set of studies has demonstrated that dissonance can lead to compensatory strategies predicted by the MMM, which include the affirmation of beliefs unrelated to the discrepancy or the self, and suggests overlap in the psychological processes proposed by these theories (Randles, Inzlicht, Proulx, Tullett, & Heine, 2015). Importantly, Gawronski and Brannon (*in press*) have noted that whether we consider the original work of Festinger (1957) or more recent developments addressing experiences of inconsistency (Proulx, Inzlicht, & Harmon-Jones, 2012), we are still not in a position to predict when different reduction strategies will be used.

Festinger (1987/1999) noted that understanding the multiple pathways to dissonance reduction was equally important as understanding the conditions necessary to arouse dissonance. When reviewing the vast amount of dissonance research, it becomes apparent that although much attention has been paid to the arousal of dissonance, less has been paid to the reduction of dissonance. This is particularly important given that Festinger defined dissonance as a motivating force. People are motivated to reduce the aversive arousal produced by inconsistent cognitions, but we do not know how people most often reduce dissonance and how often people even engage in reduction strategies.

6 | TOWARD A MODEL OF DISSONANCE REDUCTION

Festinger's original work, focused on the description of dissonance and its arousal, understandably provides limited information on determining when one mode of dissonance reduction is likely to be used over another. He noted the importance of effort in dissonance reduction and suggested that behavior will often be the most resistant to change and therefore the least frequently chosen option. Hardyck and Kardush (1968) created a model of dissonance reduction by taking into account effort and other potentially important factors. They categorized different dissonance reduction strategies and proposed a model of dissonance reduction that would allow for predictions regarding preferred reduction modes. Hardyck and Kardush suggested that all dissonance reduction modes fall into one of three categories, "stopping thinking, changing one element of the two that are in the dissonant relationship, and restructuring" (p. 685). As a fourth option, people may choose to tolerate rather than

reduce low levels of dissonance. According to them, forgetting was viewed a preferred reduction mode because it requires less effort than change or restructuring, and although a temporary solution, it is the most efficient way of reducing dissonance. With the interest of predicting reduction mode preference, they provided a model in which the importance of cognitions is plotted against the amount of use of a particular reduction mode. For relatively unimportant cognitions, passive forgetting is the likely strategy, and as the cognitions increase in importance, active forgetting (i.e., suppression) becomes more likely. For moderately important cognitions, any of the three reduction categories are possible, and it is also possible that people will engage in more than one strategy (assuming they are not forgetting the dissonance). Cognitions of high importance will be restructured (e.g., by adding a consonant cognition) or actively suppressed.

In reviewing Hardyck and Kardush's model, Leippe and Eisenstadt (1999) conceptualized the different modes of dissonance reduction as falling on a continuum of elaboration, similar to models of persuasion, which range from passive forgetting to categorical change and on to cognitive restructuring. Under the self-accountability model, if one is experiencing minimal dissonance, then simply forgetting about the cognitive discrepancy may be sufficient to reduce dissonance, but as the level of dissonance increases, so too does one's motivation to reduce it. Hence, when experiencing higher levels of dissonance, one may be more motivated to engage in reduction modes that require more elaboration or effort (e.g., cognitive restructuring).

Hardyck and Kardush's (1968) and Leippe and Eisenstadt's (1999) discussions of the use of dissonance reduction strategies as a function of cognition importance are key works on dissonance reduction. The role of importance in dissonance reduction has been highlighted, but we should also remember that Festinger (1957) introduced the concept of resistance to change. The reduction process will be affected by how resistant cognitions are to change. Some cognitions are less likely to be changed because (a) of reality constraints, (b) changing one cognition may produce dissonance among other cognitions, and or (c) of the pain or effort required to change it. Cognition importance can contribute to resistance to change, but these factors, in addition to importance, underscore the complexity of dissonance reduction.

Findings stemming from the radical view of dissonance theory (Beauvois & Joule, 1996) are also relevant to understanding dissonance reduction. According to this view, various reformulations of dissonance theory are unnecessary. By working from the original formulation proposed by Festinger (1957), they outline the need to identify a generative cognition upon which dissonance is centered. The generative cognition is a problematic behavior (e.g., commitment to a counterattitudinal act) that must be rationalized to reduce dissonance. Individuals can engage in cognitive rationalization (e.g., attitude change), but Joule and Beauvois (1997) have also proposed an alternative form of dissonance reduction, which is act rationalization. Rather than emphasizing a need for consistency, they emphasize the need to rationalize problematic behavior. One way to do this is by engaging in a second problematic act that then makes the initial act less problematic. Act rationalization will be more likely if the cognitive route is blocked and vice versa. In everyday circumstances, Beauvois and Joule (1999) think that attitude change is the most likely rationalization (p. 66) and experimental work has shown that providing an opportunity for cognitive rationalization decreases engagement in act rationalization (p. 67). Further examinations of cognitive versus behavioral rationalizations are warranted to determine if attitude change is in fact the most convenient route to reduction in ordinary circumstances.

Lastly, a model of dissonance reduction should also reflect recent work on the action-based model of dissonance (Harmon-Jones & Harmon-Jones, 2008; Harmon-Jones, Harmon-Jones, & Levy, 2015). According to this model, cognitions often have action implications, and the presence of cognitive inconsistency can interfere with one's ability to act effectively. It is this interference with action that arouses a negative affective state. As such, dissonance is reduced for two reasons. People are motivated to reduce dissonance because it is affectively unpleasant but also because the presence of inconsistent cognitions interferes with our need for effective action (Harmon-Jones, Harmon-Jones, & Amodio, 2012). One consequence of this model in terms of dissonance reduction is that researchers have discovered that enhancements to approach motivation (e.g., by inducing an action-oriented mind-set or by manipulating body postures) increase cognitive-discrepancy reduction (Harmon-Jones et al., 2015). For example, when approach motivation was heightened, participants showed greater spreading of alternatives relative to

comparison groups. It has yet to be seen how approach motivation could influence not only the level of discrepancy reduction but also the type of reduction employed.

These works have helped refine our understanding of dissonance reduction, but models of dissonance reduction are still in their infancy because little empirical work has been directed at supporting or refuting them. Given this, future research examining dissonance reduction will provide valuable information that should enhance our ability to predict *what* reduction mode will be used *when* and by *whom*. Outlined below are nine factors that may aid us in future investigations of dissonance reduction. These factors are subsumed under two major categories: the characteristics of the reduction mode and the characteristics of the dissonance arousal. By examining these properties, we should be in a better position to predict the process of dissonance reduction.

7 | CHARACTERISTICS OF THE REDUCTION MODE

7.1 | Availability

Although the availability of a reduction mode may seem obvious, it is nonetheless essential. Dissonance studies have largely been designed to limit the participant's ability to reduce dissonance through one mode, thus allowing the researcher to observe differences on the dependent variable. But this methodological rigor comes at a cost because "given a free choice among a variety of dissonance-reducing techniques, which more naturalistic situations often afford, the arousal of dissonance may produce effects quite different from those obtained in the laboratory" (Walster, Berscheid, & Barclay, 1967, p. 211). As such, if we want to know which mode individuals are likely to use, we need to offer them multiple reduction modes. Additionally, Festinger (1957, p. 26) noted that sometimes a particular change is not possible. If a change is not possible or available, then an individual must rely on other reduction modes. For example, if a person feels dissonance about his or her contribution to carbon dioxide emissions, he or she may look for ways to curb his or her emissions. One option would be taking public transit instead of driving a vehicle, but this change is only available if his or her municipality offers such a service.

7.2 | Likelihood of success

Theoretical work from Hardyck and Kardush (1968) and empirical work from Walster et al. (1967) emphasized that people will prefer reduction modes that offer a likelihood of success in resolving the dissonance. Walster et al. noted that chosen modes must not be currently challenged by reality, nor should they be anticipated to come under attack subsequently (p. 212), which connects to Festinger's (1957, p. 24) statement about resistance to change and the necessity of reduction modes to respond to reality. As an example, denial of responsibility may be a successful mode when reducing the dissonance aroused from the recognition that one consumes meat from poorly treated animals because the treatment of animals is not directly the consumer's responsibility but rather the farmer's. Yet this mode would likely be less successful in reducing postdecisional dissonance resulting from an individual's desired but unnecessary purchase of a new television.

7.3 | Effortfulness

Festinger (1957) noted two qualities that would influence the adoption of a particular behavioral change, both of which can be subsumed under effortfulness. If modifying a behavior will be painful or involve loss, he suggested it is more resistant to change. Additionally, if the current behavior is satisfying, it is also resistant to change. So behavioral changes that require significant effort to enact are generally less preferred reduction options. Hardyck and Kardush (1968) also acknowledged the role of effortfulness and indicated that effortful reduction modes would only be preferred as the importance of the cognitions increases. Similarly, under Leippe and Eisenstadt's

(1999) self-accountability model, one would expect more elaborate or effortful reduction modes to be preferred when the motivation to reduce the discrepancy is high.

7.4 | Habits

Predicting the use of a reduction mode may also depend on one's habits. "Habits are a form of automaticity in responding that develops as people repeat actions in stable circumstances" (Verplanken & Wood, 2006, p. 91). A large part of our daily behavior can be categorized as habitual, and habits can be resistant to change (Neal, Wood, & Quinn, 2006). As such, a behavior discrepant with one's values may arouse dissonance but may not be changed because it is a habit, thereby making the change of a cognitive element more likely. Or perhaps in the face of habitual behavior, the individual will reduce dissonance through simple distraction. Similarly, people may develop habitual reduction responses to cope with dissonance (e.g., the oft quoted line about "not having enough time to exercise" or when procrastinating the common justification that "we will feel like completing the task tomorrow").

8 | CHARACTERISTICS OF AROUSAL

8.1 | Magnitude of experienced dissonance

From Festinger's original formulation, it is understood that the magnitude of dissonance increases as the number of discrepant cognitions increase and as the importance of the cognitions increases. But how the magnitude of dissonance affects reduction mode selection is largely an unexplored topic. Some research has suggested that a high level of attitude importance is related to more dissonance and greater attempts at reduction, and that this effect is moderated by attitude salience (Starzyk et al., 2009). Relatedly, researchers have observed that as negative affect increases, so too does attitude change for participants in a dissonance condition (Martinie, Olive, et al., 2013).

Building on the work Kelman and Baron (1968), Kumpf and Götz-Marchand (1973) conducted a study to assess the use of reduction modes classified as either avoidant modes (e.g., denial or distortion of newly inconsistent information) or confrontational modes (e.g., attitude change). In an experimental situation that made avoidant modes less resistant to change, the researchers did observe that as the discrepancy increased, so too did use of avoidant modes. This pattern was not observed for the confrontation modes that were more resistant to change. Although this result does not directly address the question of how magnitude relates to mode selection, it demonstrates that resistance to change will influence the relationship between magnitude and mode choice.

Testing some propositions stemming from the self-accountability model (Leippe & Eisenstadt, 1999) will help us understand the role of magnitude in relation to mode selection. For example, do individuals expend more effort in reducing a high state of dissonance by engaging in more elaborate reduction modes? And are distraction and forgetting the modes that are most readily accessed when one is confronted with a situation that arouses minimal levels of dissonance? These authors have suggested that these responses could be highly functional (p. 221).

It is also possible that the *type* of motivation, rather than the magnitude or quantity of motivation, has important consequences for the selection of a reduction mode. There is evidence that autonomous motivation is associated with behavior change, rather than cognitive changes, when confronted with inconsistent cognitions (Lavergne & Pelletier, 2016). Thus, in order to understand the use of different modes, we should learn more about the quality of one's motivation in addition to the quantity of dissonance.

8.2 | Type of induction

Over the past 55 years, researchers have developed different ways to induce dissonance. Readers may be most familiar with the classic paradigms of induced compliance (Festinger & Carlsmith, 1959) and free choice (Brehm, 1956). Beyond these, researchers have explored effort justification (Aronson & Mills, 1959), insufficient justification (Aronson &

Carlsmith, 1963), belief disconfirmation (Festinger et al., 1956), exposure to counterattitudinal information (Bochner & Insko, 1966), double forced compliance (Joule, 1991), vicarious dissonance (Norton, Monin, Cooper, & Hogg, 2003), and the hypocrisy paradigm (Aronson, Fried, & Stone, 1991). Studies have yet to compare how these paradigms potentially differ in (a) the level of dissonance magnitude aroused and (b) the selection of dissonance reduction modes.

In terms of understanding dissonance reduction, work conducted on the hypocrisy paradigm suggests it can lead to behavior change as a preferred reduction mode (Stone & Fernandez, 2008). After an act of hypocrisy, individuals are motivated to restore self-integrity, which can most readily be achieved by practicing the behavior previously advocated (Stone & Focella, 2011, p. 297). However, more studies that provide behavior change as just one possibility for reduction among several are needed to increase our confidence that this paradigm consistently results in dissonance reduction through behavioral means (for an example, see Stone et al., 1997).

8.3 | Affective state

In addition to considering how the dissonance was induced, it may be important to understand the specific affective state aroused because this in turn may influence the adoption of a particular reduction mode. Research reviewed by Carver and Scheier (2008) suggests certain negative emotions (e.g., frustration and anger) tend to result in increases in effort, whereas other negative emotions (e.g., sadness and hopelessness) are associated with decreased levels of effort. If guilt is more akin to the motivating forces of anger and frustration, then this would further support the contention that individuals experiencing guilt from a hypocritical act are primed for action; they may be ready to make behavioral reparations for the act they committed. Indeed, according to a dynamic model of guilt, this emotion serves two functions (Amodio, Devine, & Harmon-Jones, 2007). The initial experience of guilt leads to a decrease in approach motivation, which can serve to interrupt a transgressive behavior and provide an opportunity for reflection. Then when an opportunity for reparation presents itself, the experience of guilt leads to increased approach motivation such that one engages in reparation. Importantly, the evidence presented in support of this model indicated that other negative emotions (anxiety, sadness, and other-directed negative affect) did not predict the desire to engage in reparation, only guilt did. That is, guilt was uniquely associated with dissonance reduction. Furthermore, it may also be the case that guilt is *the major emotion* driving dissonance reduction. Evidence from an analysis that spanned multiple dissonance paradigms found guilt uniquely predicted dissonance effect sizes, which represented dissonance reduction (Kenworthy et al., 2011). In reviewing the guilt literature, the authors indicated that “guilt reduction is achieved through reparative behavioral strategies (often pro-social), cognitive reorganization in general, and increased external attribution for the guilt-producing behavior, in particular” (p. 43). Additional research examining when guilt prompts these different outcomes would help clarify paths to dissonance reduction. Notably, when assessing the free choice paradigm, guilt and other affect variables did not predict dissonance effect size. Therefore, dissonance reduction findings under this paradigm may differ from others because a different affective state is produced or because affect plays a smaller role here than in other paradigms (p. 91). Exploring affective states for this paradigm and others not included in this synthesis (e.g., hypocrisy) should clarify connections between induction, affect, and mode preference.

Another work examining the connections between emotions and dissonance has demonstrated that heightening empathic concern prior to dissonance induction through hypocrisy can result in greater willingness to help (Harmon-Jones, Peterson, & Vaughn, 2003). This finding shows that a heightened emotional state can strengthen the reduction response, but only helping behavior was offered as a reduction mode, so we cannot say how this affective state would influence mode preference. More research concerning the connections between affective states and preferred reduction modes is worthy of exploration.

8.4 | Context of the discrepancy

Participants in dissonance studies have lied to people, written counterattitudinal essays, signed public declarations of commitment to prosocial goals, and chosen between similarly attractive consumer goods, among other things.

As such, individuals can experience dissonance in a wide range of situations and the context in which dissonance occurs is likely to be an important factor in terms of how it will be reduced. For example, Vaidis and Oberlé (2014) discuss how particular contexts, namely, social identity and a salient attitude, can influence the cognition that is most resistant to change, which then has consequences for dissonance reduction. If one's attitude is resistant to change, then seeking social support from others who support the attitude can be a way to achieve consistency. However, if the context changes such that attitude is no longer the most resistant cognition, individuals can overcome dissonance by aligning themselves with someone who initially disagreed their attitude.

Other contextual factors, such as the publicity of a counterattitudinal act, may also have consequences for dissonance reduction. When individuals identify with a behavioral domain, they may be motivated to reduce dissonance from a counterattitudinal act by changing their behavior, but even when this level of identification is not present, individuals may resolve dissonance behaviorally if their counterattitudinal act was witnessed publicly because the behavioral option in this case allows them to save face. For a full discussion of these points, see Lavergne and Pelletier (2016).

It would also be fruitful to explore how reduction strategies vary across related but different behavioral domains. For example, in one study, researchers assessed various reduction modes used by smokers to allay dissonance (Pervin & Yanko, 1965). They found smokers were likely to question research supporting the relationship between smoking and cancer and that smokers minimized the personal relevancy of the risk. Is it possible that similar cognitive strategies might apply to other health-related behaviors, such as exercise? When not meeting physical activity guidelines, are individuals likely to question research supporting the links between inactivity and health? And would they minimize the personal relevancy of the risk of physical inactivity? For a discussion of the role of cognitive dissonance in the realm of physical activity, see Iso-Ahola (2013).

8.5 | Experiences of recurring dissonance

Dissonance studies typically happen in a single laboratory session, whereas in our daily lives, we may confront the same dissonance-arousing situations repeatedly. What effect do recurring instances of dissonance have on people? And how are such recurrences dealt with? That is, do people rely on a single habitual reduction response, or do they mount an arsenal of reduction modes to deal with a pesky and recurrent experience of dissonance? And do such repeat experiences eventually lead people to adopt a more effective reduction mode that resolves the discrepancy? To date, little research has examined this line of questioning (for further discussion, see Wicklund & Brehm, 1976, p. 127).

In research on regret, some have suggested that dealing with regrets that stem from a decision in the distant past involves a process of psychological closure rather than dissonance reduction efforts (Beike, Markman, & Karadogan, 2009; Markman & Beike, 2012). With this in mind, future research on mode preference during instances of regret should take into account the temporal distance of the regrettable decision and the role of psychological closure.

9 | FUTURE WORK

Cognitive dissonance is an enduring theory, and even with thousands of publications (Cooper, 2007), rich theoretical and empirical work remains. Understanding dissonance reduction will rely in part on investigating how the characteristics of reduction modes and the characteristics of arousal relate to individuals' resolutions of dissonance. Going forward, being sensitive to the characteristics of each property and including multiple reduction modes in studies is key to unearthing how people regularly resolve dissonance.

As researchers consider which reduction modes to present in a study, we will need to clearly operationalize the modes. For example, laboratory studies that track participants' consumption of a good (be it condoms, sunscreen, or bus tickets) serve as a proxy for behavior change that outside of the lab is likely more effortful. And certainly, studies that focus on dissonance reduction will also benefit from a consideration of how individual differences

affect engagement in reduction modes. Differences in self-esteem (Stone & Cooper, 2001), approach motivation (Harmon-Jones, Schmeichel, Inzlicht, & Harmon-Jones, 2011), need for cognitive consistency (Bator & Cialdini, 2006; Cialdini, Trost, & Newsom, 1995), dogmatism and tolerance for ambiguity (Shaffer & Hendrick, 1974), personality traits (Matz, Hofstede, & Wood, 2008), and other individual characteristics (Lavergne & Pelletier, 2016) will enhance our understanding of the processes individuals rely on to reduce dissonance. In pursuing work focused on dissonance reduction, we may also discover that some modes are generally used more often than others. Our daily experiences of dissonance can be many, and it is quite possible that distraction serves as a frequent way to alleviate our daily discomforts (Aronson, 1968). Importantly, if our methods rely too heavily on any single mode of reduction, this can obscure the many paths people take to reduce dissonance.

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REFERENCES

- Amodio, D. M., Devine, P. G., & Harmon-Jones, E. (2007). A dynamic model of guilt implications for motivation and self-regulation in the context of prejudice. *Psychological Science*, 18, 525–530. <https://doi.org/10.1111/j.1467-9280.2007.01933.x>
- 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). Skokie, IL: Rand McNally.
- Aronson, E., & Carlsmith, J. M. (1963). Effect of the severity of threat on the devaluation of forbidden behavior. *The Journal of Abnormal and Social Psychology*, 66(6), 584–588. <https://doi.org/10.1037/h0039901>
- Aronson, E., Fried, C., & Stone, J. (1991). Overcoming denial and increasing the intention to use condoms through the induction of hypocrisy. *American Journal of Public Health*, 81, 1636–1638. <https://doi.org/10.2105/AJPH.81.12.1636>
- 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.
- Bator, R. J., & Cialdini, R. B. (2006). The nature of consistency motivation: Consistency, inconsistency, and anticonsistency in a dissonance paradigm. *Social Influence*, 1, 208–233. <https://doi.org/10.1080/15534510600823638>
- Beauvois, J. L., & Joule, R. V. (1996). *A radical dissonance theory*. London: Taylor & Francis.
- Beauvois, J. L., & Joule, R. V. (1999). A radical point of view on dissonance theory. In E. Harmon-Jones, & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 43–70). Washington, DC: American Psychological Association.
- Beauvois, J. L., Joule, R. V., & Brunetti, F. (1993). Cognitive rationalization and act rationalization in an escalation of commitment. *Basic and Applied Social Psychology*, 14, 1–17. https://doi.org/10.1207/s15324834bas1401_1
- Beike, D. R., Markman, K. D., & Karadogan, F. (2009). What we regret most are lost opportunities: A theory of regret intensity. *Personality and Social Psychology Bulletin*, 35, 385–397. <https://doi.org/10.1177/0146167208328329>
- Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74(3), 183–200. <https://doi.org/10.1037/h0024835>
- Blanton, H., Pelham, B. W., DeHart, T., & Carvallo, M. (2001). Overconfidence as dissonance reduction. *Journal of Experimental Social Psychology*, 37, 373–385. <https://doi.org/10.1006/jesp.2000.1458>
- Bochner, S., & Insko, C. A. (1966). Communicator discrepancy, source credibility, and opinion change. *Journal of Personality and Social Psychology*, 4, 614–621. <https://doi.org/10.1037/h0021192>
- Brehm, J. W. (1956). Postdecision changes in the desirability of alternatives. *Journal of Abnormal and Social Psychology*, 52, 384–389. <https://doi.org/10.1037/h0041006>
- Brehm, J. W. (2007). A brief history of dissonance theory. *Social and Personality Psychology Compass*, 1, 381–391. <https://doi.org/10.1111/j.1751-9004.2007.00035.x>
- Brehm, J. W., & Cohen, A. R. (1962). *Explorations in cognitive dissonance*. New York, NY: Wiley.
- Brock, T. C., & Balloun, J. L. (1967). Behavioral receptivity to dissonant information. *Journal of Personality and Social Psychology*, 6, 413–428. <https://doi.org/10.1037/h0021225>
- Carver, C. S., & Scheier, M. F. (2008). Feedback processes in the simultaneous regulation of action and affect. In J. Y. Shah, & W. L. Gardner (Eds.), *Handbook of motivation science* (pp. 308–324). New York, NY: Guilford Press.

- Cialdini, R. B., Trost, M. R., & Newsom, J. T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications. *Journal of Personality and Social Psychology*, 69, 318–328. <https://doi.org/10.1037/0022-3514.69.2.318>
- Cooper, J. (2007). *Cognitive dissonance: Fifty years of a classic theory*. Thousand Oaks, CA: Sage.
- Cotton, J. L. (1985). Cognitive dissonance in selective exposure. In D. Zillman, & J. Bryant (Eds.), *Selective exposure to communication* (pp. 11–33). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cotton, J. L., & Hieser, R. A. (1980). Selective exposure to information and cognitive dissonance. *Journal of Research in Personality*, 14, 518–527. [https://doi.org/10.1016/0092-6566\(80\)90009-4](https://doi.org/10.1016/0092-6566(80)90009-4)
- Croyle, R., & Cooper, J. (1983). Dissonance arousal: Physiological evidence. *Journal of Personality and Social Psychology*, 45, 782–791. <https://doi.org/10.1037//0022-3514.45.4.782>
- de Vries, J., Byrne, M., & Kehoe, E. (2015). Cognitive dissonance in everyday life: An fMRI study. *Social Neuroscience*, 10, 268–281. <https://doi.org/10.1080/17470919.2014.990990>
- Devine, P. G., Tauer, J. M., Barron, K. E., Elliot, A. J., & Vance, K. M. (1999). Moving beyond attitude change in the study of dissonance-related processes. In E. Harmon-Jones, & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 297–323). Washington, DC: American Psychological Association.
- Dickerson, C., Thibodeau, R., Aronson, E., & Miller, D. (1992). Using cognitive dissonance to encourage water conservation. *Journal of Applied Social Psychology*, 22, 841–854. <https://doi.org/10.1111/j.1559-1816.1992.tb00928.x>
- Elkin, R. A., & Leippe, M. R. (1986). Physiological arousal, dissonance, and attitude change: Evidence for a dissonance–arousal link and a “don’t remind me” effect. *Journal of Personality and Social Psychology*, 51, 55–65. <https://doi.org/10.1037/0022-3514.51.1.55>
- 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. <https://doi.org/10.1037/0022-3514.67.3.382>
- Fernandez, N., Stone, J., Cascio, E., Cooper, J., & Hogg, M. A. (2007). Vicarious hypocrisy: The use of attitude bolstering to reduce dissonance after exposure to a hypocritical ingroup member. Paper presented at the meeting of the Society for Personality and Social Psychology, Memphis, TN.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson and Company.
- Festinger, L. (1987/1999). Reflections on cognitive dissonance: 30 years later. Reprinted in. In E. Harmon-Jones, & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 381–385). Washington, DC: American Psychological Association.
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*, 58, 203–211. <https://doi.org/10.1037/h0041593>
- Festinger, L., Riecken, H. W., & Schachter, S. (1956). *When prophecy fails*. Minneapolis, MN: University of Minnesota Press.
- Fointiat, V. (2004). I know what I have to do, but... When hypocrisy leads to behavioral change. *Social Behavior and Personality*, 32, 741–746. <https://doi.org/10.2224/sbp.2004.32.8.741>
- Frey, D. (1986). Recent research on selective exposure to information. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 41–80). San Diego, CA: Academic Press.
- Frey, D., & Wicklund, R. A. (1978). A clarification of selective exposure: The impact of choice. *Journal of Experimental Social Psychology*, 14, 132–139. [https://doi.org/10.1016/0022-1031\(78\)90066-5](https://doi.org/10.1016/0022-1031(78)90066-5)
- Fried, C., & Aronson, E. (1995). Hypocrisy, misattribution, and dissonance reduction: A demonstration of dissonance in the absence of aversive consequences. *Personality and Social Psychology Bulletin*, 21, 925–933. <https://doi.org/10.1177/0146167295219007>
- Gawronski, B., & Brannon, S. M. (in press). What is cognitive consistency and why does it matter? In E. Harmon-Jones (Ed.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (2nd ed.). Washington, DC: American Psychological Association. Retrieved from http://www.bertramgawronski.com/documents/GB_HJDISS.pdf
- Gosling, P., Denizeau, M., & Oberlé, D. (2006). Denial of responsibility: A new mode of dissonance reduction. *Journal of Personality and Social Psychology*, 90, 722–733. <https://doi.org/10.1037/0022-3514.90.5.722>
- Götz-Marchand, B., Götz, J., & Irlé, M. (1974). Preference of dissonance reduction modes as a function of their order, familiarity, and reversibility. *European Journal of Social Psychology*, 4, 201–228. <https://doi.org/10.1002/ejsp.2420040206>
- Hardyck, J. A., & Kardush, M. (1968). A modest modish model for dissonance reduction. In R. P. Abelson, E. Aronson, W. T. McGuire, T. M. Newcomb, M. J. Rosenberg, & P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook* (pp. 684–692). Chicago, IL: Rand-McNally.
- Harmon-Jones, C., Schmeichel, B. J., Inzlicht, M., & Harmon-Jones, E. (2011). Trait approach motivation relates to dissonance reduction. *Social Psychological and Personality Science*, 2, 21–28. <https://doi.org/10.1177/1948550610379425>

- Harmon-Jones, E. (2000). Cognitive dissonance and experienced negative affect: Evidence that dissonance increases experienced negative affect even in the absence of aversive consequences. *Personality and Social Psychology Bulletin*, 26, 1490–1501. <https://doi.org/10.1177/01461672002612004>
- Harmon-Jones, E., & Harmon-Jones, C. (2002). Testing the action-based model of cognitive dissonance: The effect of action-orientation on post-decisional attitudes. *Personality and Social Psychology Bulletin*, 28, 711–723. <https://doi.org/10.1177/0146167202289001>
- Harmon-Jones, E., & Harmon-Jones, C. (2008). Action-based model of dissonance: A review of behavioral, anterior cingulate and prefrontal cortical mechanisms. *Social and Personality Psychology Compass*, 2, 1518–1538. <https://doi.org/10.1111/j.1751-9004.2008.00110.x>
- Harmon-Jones, E., Harmon-Jones, C., & Amodio, D. M. (2012). A neuroscientific perspective on dissonance, guided by the action-based model. In B. Gawronski, & F. Strack (Eds.), *Cognitive consistency: A fundamental principle in social cognition* (pp. 47–65). New York: The Guilford Press.
- Harmon-Jones, E., Harmon-Jones, C., & Levy, N. (2015). An action-based model of cognitive-dissonance processes. *Current Directions in Psychological Science*, 24, 184–189. <https://doi.org/10.1177/0963721414566449>
- Harmon-Jones, E., Peterson, H., & Vaughn, K. (2003). The dissonance-inducing effects of an inconsistency between experienced empathy and knowledge of past failures to help: Support for the action-based model of dissonance. *Basic and Applied Social Psychology*, 25, 69–78. https://doi.org/10.1207/S15324834BASP2501_5
- Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review*, 10, 88–110. https://doi.org/10.1207/s15327957pspr1002_1
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion; psychological studies of opinion change*. New Haven, CT: Yale University Press.
- Iso-Ahola, S. E. (2013). Exercise: Why it is a challenge for both the nonconscious and conscious mind. *Review of General Psychology*, 17, 93–110. <https://doi.org/10.1037/a0030657>
- Joule, R. V. (1991). Double forced compliance: A new paradigm in cognitive dissonance theory. *Journal of Social Psychology*, 131, 839–845. <https://doi.org/10.1080/00224545.1991.9924671>
- Joule, R. V., & Beauvois, J. L. (1997). Cognitive dissonance theory: A radical view. *European Review of Social Psychology*, 8, 1–32. <https://doi.org/10.1080/14792779643000065>
- Kelman, H. C., & Baron, R. M. (1968). Determinants of modes of resolving inconsistency dilemmas: A functional analysis. In R. P. Ableson, E. Aronson, W. J. McGuire, T. M. Newcomb, M. J. Rosenberg, & P. H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook*. Chicago: Rand McNally.
- Kenworthy, J. B., Miller, N., Collins, B. E., Read, S. J., & Earleywine, M. (2011). A trans-paradigm theoretical synthesis of cognitive dissonance theory: Illuminating the nature of discomfort. *European Review of Social Psychology*, 22, 36–113. <https://doi.org/10.1080/10463283.2011.580155>
- Knox, R. E., & Inkster, J. A. (1968). Postdecision dissonance at post time. *Journal of Personality and Social Psychology*, 8, 319–323. <https://doi.org/10.1037/h0025528>
- Kumpf, M., & Götz-Marchand, B. (1973). Reduction of cognitive dissonance as a function of magnitude of dissonance, differentiation, and self-esteem. *European Journal of Social Psychology*, 3, 255–270. <https://doi.org/10.1002/ejsp.2420030305>
- Lavergne, K., & Pelletier, L. G. (2016). Why are attitude-behavior inconsistencies uncomfortable? Using motivational theories to explore individual differences in dissonance arousal and motivation to compensate. *Motivation and Emotion*, 40, 842–861. <https://doi.org/10.1007/s11031-016-9577-3>
- Leippe, M. R., & Eisenstadt, D. (1999). A self-accountability model of dissonance reduction: Multiple modes on a continuum of elaboration. In E. Harmon-Jones, & J. Mills (Eds.), *Cognitive dissonance: Progress on a pivotal theory in social psychology* (pp. 201–232). Washington, DC: American Psychological Association.
- 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. [https://doi.org/10.1016/0022-1031\(90\)90040-S](https://doi.org/10.1016/0022-1031(90)90040-S)
- Loughnan, S., Bastian, B., & Haslam, N. (2014). The psychology of eating animals. *Current Directions in Psychological Science*, 23, 104–108. <https://doi.org/10.1177/0963721414525781>
- Markman, K. D., & Beike, D. R. (2012). Regret, consistency, and choice: An opportunity × mitigation framework. In B. Gawronski, & F. Strack (Eds.), *Cognitive consistency: A fundamental principle in social cognition* (pp. 305–325). New York: The Guilford Press.
- Martinie, M., Milland, L., & Olive, T. (2013). Some theoretical considerations on attitude, arousal, and affect during cognitive dissonance. *Social and Personality Psychology Compass*, 7, 680–688. <https://doi.org/10.1111/spc3.12051>

- Martinie, M. A., Olive, T., Milland, L., Joule, R. V., & Capa, R. (2013). Evidence that dissonance arousal is initially undifferentiated and only later labeled as negative. *Journal of Experimental Social Psychology*, 49, 767–770. <https://doi.org/10.1016/j.jesp.2013.03.003>
- Matz, D. C., Hofstедt, P. M., & Wood, W. (2008). Extraversion as a moderator of the cognitive dissonance associated with disagreement. *Personality and Individual Differences*, 45, 401–405. <https://doi.org/10.1016/j.paid.2008.05.014>
- Neal, D. T., Wood, W., & Quinn, J. M. (2006). Habits—A repeat performance. *Current Directions in Psychological Science*, 15, 198–202. <https://doi.org/10.1111/j.1467-8721.2006.00435.x>
- Norton, M. I., Monin, B., Cooper, J., & Hogg, M. A. (2003). Vicarious dissonance: Attitude change from the inconsistency of others. *Journal of Personality and Social Psychology*, 85, 47–62. <https://doi.org/10.1037/0022-3514.85.1.47>
- Pervin, L. A., & Yatro, R. J. (1965). Cigarette smoking and alternative methods of reducing dissonance. *Journal of Personality and Social Psychology*, 2, 30–36. <https://doi.org/10.1037/h0022090>
- Prasad, J. A. (1950). A comparative study of rumours and reports in earthquakes. *British Journal of Psychology*, 41, 129–144. <https://doi.org/10.1111/j.2044-8295.1950.tb00271.x>
- Proulx, T., Inzlicht, M., & Harmon-Jones, E. (2012). Understanding all inconsistency compensation as a palliative response to violated expectations. *Trends in Cognitive Sciences*, 16, 285–291. <https://doi.org/10.1016/j.tics.2012.04.002>
- Randles, D., Inzlicht, M., Proulx, T., Tullett, A. M., & Heine, S. J. (2015). Is dissonance reduction a special case of fluid compensation? Evidence that dissonance cognitions cause compensatory affirmation and abstraction. *Journal of Personality and Social Psychology*, 108, 697–710. <https://doi.org/10.1037/a0038933>
- Shaffer, D. R., & Hendrick, C. (1974). Dogmatism and tolerance for ambiguity as determinants of differential reactions to cognitive inconsistency. *Journal of Personality and Social Psychology*, 29(5), 601–608. <https://doi.org/10.1037/h0036678>
- Simon, L., Greenberg, J., & Brehm, J. (1995). Trivialization: The forgotten mode of dissonance reduction. *Journal of Personality and Social Psychology*, 68, 247–260. <https://doi.org/10.1037/0022-3514.68.2.247>
- Sinha, D. (1952). Behaviour in a catastrophic situation: A psychological study of reports and rumours. *British Journal of Psychology*, 43, 200–209. <https://doi.org/10.1111/j.2044-8295.1952.tb00343.x>
- Starzyk, K. B., Fabrigar, L. R., Soryal, A. S., & Fanning, J. J. (2009). A painful reminder: The role of level and salience of attitude important in cognitive dissonance. *Personality and Social Psychology Bulletin*, 35, 126–137. <https://doi.org/10.1177/0146167208325613>
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (pp. 261–302). San Diego, CA: Academic Press.
- Steele, C. M., & Liu, T. J. (1983). Dissonance processes as self-affirmation. *Journal of Personality and Social Psychology*, 45, 5–19. <https://doi.org/10.1037/0022-3514.45.1.5>
- Stone, J., Aronson, E., Crain, A. L., Winslow, M. P., & Fried, C. B. (1994). Inducing hypocrisy as a means of encouraging young adults to use condoms. *Personality and Social Psychology Bulletin*, 20, 116–128. <https://doi.org/10.1177/0146167294201012>
- Stone, J., & Cooper, J. (2001). A self-standards model of cognitive dissonance. *Journal of Experimental Social Psychology*, 37, 228–243. <https://doi.org/10.1006/jesp.2000.1446>
- Stone, J., & Fernandez, N. C. (2008). To practice what we preach: The use of hypocrisy and cognitive dissonance to motivate behavior change. *Social and Personality Psychology Compass*, 2, 1024–1051. <https://doi.org/10.1111/j.1751-9004.2008.00088.x>
- Stone, J., & Focella, E. (2011). Hypocrisy, dissonance and the self-regulation processes that improve health. *Self and Identity*, 10, 295–303. <https://doi.org/10.1080/15298868.2010.538550>
- Stone, J., Wiegand, A. W., Cooper, J., & Aronson, E. (1997). When exemplification fails: Hypocrisy and the motive for self-integrity. *Journal of Personality and Social Psychology*, 72, 54–65. <https://doi.org/10.1037/0022-3514.72.1.54>
- Vaidis, D. (2014). Cognitive dissonance theory. *Oxford Bibliographies Online: Psychology*. <https://doi.org/10.1093/obo/9780199828340-0156>
- Vaidis, D., & Oberlé, D. (2014). Approaching opponents and leaving supporters: Adjusting physical proximity to reduce cognitive dissonance. *Social Behavior and Personality*, 42, 1091–1098. <https://doi.org/10.2224/sbp.2014.42.7.1091>
- Verplanken, B., & Wood, W. (2006). Interventions to break and create consumer habits. *Journal of Public Policy & Marketing*, 25, 90–103. <https://doi.org/10.1509/jppm.25.1.90>
- Walster, E., Berscheid, E., & Barclay, A. (1967). A determinant of preference among modes of dissonance reduction. *Journal of Personality and Social Psychology*, 7, 211–216. <https://doi.org/10.1037/h0024992>
- Wicklund, R. A., & Brehm, J. W. (1976). *Perspectives on cognitive dissonance*. Toronto, ON: John Wiley & Sons.

- Wilder, D. A. (1992). Yes, Elliot, there is dissonance. *Psychological Inquiry*, 3, 351–352. https://doi.org/10.1207/s15327965pli0304_17
- Zanna, M. P., & Aziza, C. (1976). On the interaction of repression-sensitization and attention in resolving cognitive dissonance. *Journal of Personality*, 44, 577–593. <https://doi.org/10.1111/j.1467-6494.1976.tb00139.x>

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