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Clarifying concepts in cognitive dissonance theory

Commentary on [Zentall](#) on *Cognitive Dissonance*

Eddie Harmon-Jones

The University of New South Wales

Abstract: This commentary on Zentall’s target article focuses primarily on clarifying some postulates and variables in cognitive dissonance theory. I discuss the adaptive motivational functions of dissonance arousal and dissonance reduction, and attempt to clarify some past dissonance experiments and to tease apart a dissonance theory and contrast explanation of effort-justification-type effects. The evidence and arguments reviewed here support the explanatory power of cognitive dissonance theory in a wide variety of circumstances in human and nonhuman animals, but they depend on first defining concepts such as “cognitions” quite broadly, as Festinger did when he originally proposed the theory.

[Eddie Harmon-Jones](#), Professor of Psychology, The University of New South Wales, studies the effects of emotions on attention and other cognitive processes, the role of emotion and motivation in aggressive and pro-social behaviour, and the antecedents and consequences of discrepancies between cognitions (cognitive dissonance theory).

<https://harmonjones.socialpsychology.org>



In a very thought-provoking target article, Zentall (2016) reviews the results of several clever experiments that are consistent with effort-justification effects obtained from research on cognitive dissonance theory. However, Zentall presents the case that the results may be better explained by a contrast effect. He also reviews several exciting new results from experiments suggesting that the anticipation of unpleasant effort could cause increased reward valuation. The target article also includes a very interesting discussion on “out of sight, out of mind” that has not been fully investigated in humans by dissonance researchers. I suspect that this target article will inspire much new research.

In this commentary, I will offer a few observations on Zentall’s target article. I will focus primarily on clarifying some postulates and variables in cognitive dissonance theory, and will then discuss the adaptive motivational functions of dissonance arousal and dissonance reduction. I will also discuss dissonance processes in nonhuman animals and attempt to clarify some past dissonance experiments. I will finish by discussing how one might tease apart a dissonance theory and contrast explanation of effort-justification-type effects.

Clarifications of Postulates and Variables in Cognitive Dissonance Theory

Cognitive dissonance theory is concerned with relationships between cognitions. The term “cognitions” is defined broadly to include almost any knowledge about oneself or the

environment (Festinger, 1957, pp. 9-11). The theory did not propose that "conflict between beliefs" was "the primary responsible mechanism" [Zentall, Introduction, para. 2]. Moreover, the dissonance-theoretic explanation of the effort-justification paradigm is not consistent with the statement by Zentall that "pigeons experienced conflict between their beliefs (the law of least effort) and their behavior (they worked harder on some trials than on others to obtain the same reward)" [The Within-Trial Contrast Effect, para. 4].

Mills (Aronson & Mills, 1959), who conducted the first effort-justification experiment, explained quite precisely why effort should evoke dissonance. He wrote:

"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." (Harmon-Jones & Mills, 1999, p. 7)

The conflict is between the knowledge that the activity is unpleasant and the knowledge that one has engaged in that activity. Hence any unpleasant features of the behavior should evoke dissonance and explain the results accounted for by contrast. Another key part of Mills's (Harmon-Jones & Mills, 1999) explanation is the idea that the effort is "required to obtain the outcome" (p. 7), a point to which I return later in this commentary.

The Motivational Functions of Dissonance Arousal and Dissonance Reduction

Zentall writes, "Although the resolution of cognitive dissonance may make us feel better, it can be detrimental to our health and can in many cases encourage us to behave inappropriately" [Introduction, para. 1]. Festinger (1957) did not discuss whether dissonance and its reduction were associated with negative or positive consequences. However, other dissonance theorists have concurred with Zentall and speculated that dissonance processes were primarily associated with negative consequences and were maladaptive (Aronson, 1995).

In contrast, according to the action-based version of dissonance (Harmon-Jones, 1999; Harmon-Jones, Amodio, & Harmon-Jones, 2009; Harmon-Jones, Harmon-Jones, & Levy, 2015), dissonance processes may serve adaptive functions (although of course, adaptive mechanisms may occasionally cause harm as well). The model begins by positing that cognition is for action; that is, one of the most important functions of cognition is to guide behavior. Inconsistent information (cognitions) causes dissonance because it has the potential to interfere with action. The affective state of dissonance signals that there is a conflict between action tendencies and that the "cognitive inconsistency" needs to be addressed, so that behavior can occur. My colleagues and I have conducted a number of experiments testing hypotheses derived from this model (e.g., Harmon-Jones, Gerdjikov, & Harmon-Jones, 2008; Harmon-Jones & Harmon-Jones, 2002; Harmon-Jones, Harmon-Jones, Fearn, Sigelman, & Johnson, 2008; Harmon-Jones, Harmon-Jones, Serra, & Gable, 2011; Harmon-Jones, Peterson, & Vaughn, 2003; Harmon-Jones, Price, & Harmon-Jones, 2015; Harmon-Jones, Schmeichel, Inzlicht, & Harmon-Jones, 2011).

Dissonance Processes in Nonhuman Animals and Clarifying Past Dissonance Experiments

Zentall's research suggests that something like dissonance processes may occur in nonhuman animals. Similarly, Lawrence and Festinger (1962) reported 16 experiments providing evidence suggestive of dissonance reduction in laboratory rats. More recent experiments have revealed that dissonance reduction may occur in capuchin monkeys (Egan, Santos, & Bloom, 2007). Zentall discusses the latter research and then dismisses it based on the critical work by Chen and Risen (2010).

Egan, Bloom, and Santos (2010) have since addressed the criticisms of Chen and Risen (2010) by using a "blind choice" paradigm. They found spreading of alternatives after their subjects (capuchin monkeys or preschool children) made a choice between two hidden objects. Thus, the attitude change could not be explained by "revealed preferences." Several other studies have also addressed these earlier criticisms (see review by Kitayama, Tompson, & Chua, 2014).

Zentall also provides a "contrast" reinterpretation of the classic experiment by Festinger and Carlsmith (1959). In that experiment, participants were paid \$1 or \$20 to tell a subsequent "participant" that the boring task they had just completed was in fact interesting. From dissonance theory, the dollars paid represented the number of cognitions consonant with engaging in the counter-attitudinal behavior (i.e., telling the next participant that the task was interesting). Most conceptual replications of this experiment operationalized the number of consonant cognitions with a manipulation of perceived choice: Participants who were led to believe that they were freely choosing to engage in counter-attitudinal behavior changed their attitudes to make them more consistent with the behavior than did participants who were led to believe they were "forced" to engage in the same behavior (i.e., having been repeatedly told that they were randomly assigned to make the counter-attitudinal statement). These experiments assumed that perceiving oneself as having freely chosen to engage in counter-attitudinal behavior would provide fewer cognitions consonant with the behavior than perceiving oneself as having been forced by the researcher to engage in the same behavior. It is not clear how a contrast explanation would handle these perceived choice experiments, which form the bulk of research on dissonance theory.

Teasing Apart the Dissonance and Contrast Explanations of Effort Justification

The difference between the two conceptual explanations – cognitive dissonance reduction versus contrast effect – could be teased apart by manipulating whether there is an association between the unpleasant effort and the reward. A contrast explanation would seem to predict that the association would not matter, whereas a dissonance explanation would seem to predict that the association would matter (see the earlier quotation from Mills). That is, according to dissonance theory, the reward should be associated with the unpleasant effort in order to "justify" the effort. If the reward is merely presented closely in time/space to the unpleasant effort and is explicitly described as not being associated with the effort, then increased reward valuation would not be predicted by dissonance theory but would be predicted by a contrast-effect perspective. It may be the case that nonhuman animals often and adult humans occasionally assume implicitly that the reward is associated with the effort. Consequently, it may be difficult to test this idea in nonhuman animals if

they often/always assume that the reward is linked to their own effort. With adult humans, a researcher can explicitly inform them that the reward is not linked to the effort and can thus test these competing predictions.

Research by Gerard and Mathewson (1966) has already provided one of these tests, and it has supported a dissonance-theoretic explanation over a contrast explanation. In this experiment, participants received electric shocks in order to be initiated into a group (initiates condition) or they received electric shocks as part of a study (non-initiate condition). Within each of these conditions, half the participants received intense shocks and half received mild shocks. This experiment used the amount of suffering of physical pain as the manipulation of the intensity of unpleasant effort. After participants received the shocks, they heard and then rated a boring group discussion. Participants in the “initiates” condition were led to believe that this was a recording of a previous meeting of the group that they were about to join, whereas participants in the “non-initiates” condition simply evaluated the group. Participants who experienced the intense (effortful) shocks evaluated the group more positively than participants who experienced the mild shocks. However, this effort-justification effect occurred only when participants were led to believe that they were receiving the shocks in order to gain access to the group (gain a reward). When participants believed they were receiving the shocks as part of a psychological experiment (the non-initiate condition), those who received the intense shocks evaluated the group more negatively than those who received the mild shocks. Thus, the typical effect of shock intensity on the evaluation of the group (i.e., the effort-justification effect) was reversed when participants believed their effort did not lead to admission into the group (the reward), a result that is the opposite of what would be predicted by a contrast effect.

Another line of inquiry, however, predicts a relationship between effort and reward valuation opposite to the one suggested by both dissonance theory and the contrast effect: Theories of decision making (see Kivetz, 2003; Walton, Kennerley, Bannerman, Phillips, & Rushworth, 2006) and social theories of equity (Walster, Walster, & Berscheid, 1978) suggest that greater effort should lead to reward devaluation. These theories view effort as a negative value or as a cost. A reward is perceived as less valuable if it is difficult to obtain than if it is easy to obtain because its benefits are offset by its costs. This principle has been referred to as effort discounting.

In an experiment by Botvinick et al. (2009) two types of task-switching blocks (counterbalanced) were presented to participants: low versus high effort. After each block, participants were shown a screen that indicated whether or not they had earned a dollar (\$ or X), and neural activity in response to this indicator was measured. High-effort blocks with (dollar) rewards caused the least nucleus accumbens activity, which was interpreted to indicate low-reward valuation. Participants had been explicitly informed that the amount they would earn would be equal for high- and low-effort blocks, and would not depend on their speed or accuracy. This methodology differs from dissonance experiments on the effects of effort justification, which do not inform participants that the reward is equal in high- versus low-effort conditions.

Why would these different sets of theories and bodies of research lead to opposite predictions and results? I believe the unrecognized difference between these two perspectives is that the experimental designs used for the two perspectives differ in terms of perceived psychological control over obtaining the reward. That is, in dissonance and Zentall’s contrast experiments, individuals perceive an association between their effort and receiving the reward, whereas in the effort-discounting studies (and in Gerard and

Mathewson's contrast conditions), individuals do not (in fact they are explicitly informed that there is no association between their effort and receiving the reward). The belief that unpleasant effort was necessary to obtain the reward may be an important factor in producing effort justification rather than effort discounting.

The contrast perspective suggests that undergoing any unpleasant experience will make subsequent experiences (rewards) more positive by comparison. Dissonance theory, however, would counter that individuals are only motivated to perceive a subsequent experience more positively when the subsequent event is causally connected to the unpleasant effort. That is, effort justification only occurs when individuals believe they have exerted the effort in order to obtain the reward.

The results of the experiment by Gerard and Mathewson (1966) were inconsistent with a contrast effect interpretation but consistent with cognitive dissonance theory. When participants underwent shocks and were informed that these were unrelated to subsequently being allowed to join a group, they evaluated the group more negatively (not more positively as a contrast effect would predict). These findings, taken together with the results obtained on effort discounting, suggest that cognitive dissonance theory is a better explanation of responses to unpleasant effort than a contrast explanation. An association between effort and reward may often be assumed in nonhuman animals and in humans. ("I worked hard and I am receiving this reward as a result of my work.") However, when that association is explicitly and heavy-handedly broken by a researcher, individuals seem to devalue the reward, as Gerard and Mathewson (1966) and effort-discounting experiments have shown.

Conclusion

Taken together, the evidence and arguments reviewed here support the explanatory power of cognitive dissonance theory in a wide variety of circumstances, in both human and nonhuman animals. However, this requires us to define concepts such as "cognitions" quite broadly, as Festinger did when he originally proposed the theory.

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