

The effects of cognitive dissonance on inappropriate emotional reactions¹

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In most emotionally arousing situations, the individual is usually aware of the cause of his emotional reaction. He probably would feel confident that his reaction is justified if it were obvious that the stimulus situation should evoke such a response in most people most of the time. However, there may be instances when an individual experiences an emotional reaction that does not seem appropriate for the situation. In other words, an individual might become aware that his reaction to a certain situation is different from what is normally expected. In terms of dissonance theory, it might be said in such instances that the individual's awareness of his reaction is dissonant with his appraisal that there might not be adequate reason for such a reaction. He might try to reduce such dissonance by dismissing the importance of his "inappropriate" reaction, perhaps by explaining his reaction on the basis of past experience. For example, the inappropriateness of being frightened of a small dog might be dismissed on the grounds that he was bitten by a dog as a child. Or the individual might try to explain his reaction by attributing it to a general upset state, that is, by saying "I'm worried about an exam, so everything is bothering me today."

Another possible way for the individual to handle the incongruous situation would be to alter his appraisal of the situation, judging it to be one that warranted that emotional reaction. For example, to reduce dissonance, one could find support for his reaction by establishing that enough other people reacted the same way.

An example of this type of situation is found in Schachter's

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study (1959) which was designed to demonstrate that in a variety of fear-arousing situations subjects attempted to reduce their fear by seeking affiliation. Schachter felt that the desire for affiliation was derived from the need for social comparison, that is, it was based on the subject's need to compare his emotional response with that of others who faced the same situation and thus establish the "appropriateness" of his response. However, it seems quite appropriate to suggest that the need for social comparison in this instance was also an attempt to reduce dissonance—dissonance created by the subject's realization that he was frightened and his concern that there was not adequate cause for fear in the situation. Finding others who were also frightened by the situation would offer support for his being afraid and thus serve as a source of dissonance reduction.

Further evidence for the application of dissonance theory to emotional reactions in ambiguous situations is found in Gerard and Rabbie's (1961) study. They demonstrated that when an individual is uncertain of the intensity of his emotional reaction, he tends to seek information from others to provide himself with a frame of reference within which to evaluate his own reaction. One group of their subjects was given information about the intensity of their own reactions and that of others in the group, a second group was given information about their own reactions only, a third group was given no information. An interesting side issue in this study was that subjects who were given information only about their reactions showed greater affiliative tendencies than subjects who were given no information at all. This finding is apparently inconsistent with social comparison theory, which suggests that clarification of the intensity of one's reaction should arouse *less* need for comparison than should the lack of such information. However, if the affiliative tendency were interpreted as an attempt at dissonance reduction rather than social comparison, these results would be more compatible with the theoretical expectations. According to dissonance theory, those subjects who received information about their own fear reaction have a more salient cognition concerning the intensity of their own fear. Since the power of a cognition to arouse dissonance should increase as its clarity increases (Brehm & Cohen,

1962), a clear indication of one's own fear response should be potentially capable of arousing more dissonance than would an ambiguous indication. Thus, subjects who were given information about the intensity of their own fear response should have experienced more dissonance than individuals who had no information aside from their subjective feelings, and this would be especially true if the reaction was thought to be of an inappropriate intensity for the environmental cue. Another of Gerard and Rabbie's findings indicates that only for subjects who received information about their own reaction was a discrepancy between the subject's expected level of fear and the value reported to him positively correlated with the subject's desire to affiliate. This finding implies that it was concern about the appropriateness of the intensity of the reaction to the frightening situation that motivated the subject to seek affiliation and thus find social support for one of the two inconsistent sets of cognition.

Festinger's (1957) interpretation of research by Murray (1933), Prasad (1950), and Sinha (1952) is that individuals might try to handle situations in which their reactions seemed inappropriate by means other than affiliation. He suggests that individuals might attempt to alter their cognitions about the situation, believing the situation such that it would justify the emotional reaction. In Murray's study, pictures which had previously been rated as fearful were re-rated as more fearful after the subjects had experienced a frightening event. The field study by Prasad (1950) demonstrated that "fear-justifying" rumors—that is, rumors foreboding terrible disasters—were spread in areas close to, but not damaged by, recent disasters. In contrast, Sinha's study found that rumors spread within the damaged areas rarely predicted disasters in the future. A dissonance interpretation seems appropriate for all three of these studies, although clearly there are many uncontrolled elements in each.

In a more controlled laboratory experiment Bramel, Bell, and Margulis (1965) demonstrated that dissonance could be aroused by presenting subjects with mild, unafrightening pictures related to Russia and then informing the subjects that physiological measures indicated that the stimulus material aroused fear in them.

These subjects reduced dissonance by altering their previously measured attitudes toward the USSR, showing an increase in the amount of threat they believed the Russians represented

These studies all suggest that if an individual is faced with an emotionally arousing situation where the appropriateness of his reaction is not clear, it might be considered that he is experiencing cognitive dissonance and that his subsequent behaviors are attempts to reduce this dissonance. Given the opportunity, he may choose to affiliate with others for the purpose of finding support for his reaction, or depending on the situation, he may choose nonsocial means of dissonance reduction. For example, if the individual is given the choice of exposing himself to "emotion-justifying" stimuli or to neutral stimuli, and he demonstrates a preference for the emotion-justifying stimuli, then one could explain the behavior as motivated by a desire to reduce dissonance. To demonstrate more clearly the appropriateness of dissonance theory in such situations, a test of the following hypothesis is suggested. Dissonance occurs under conditions of emotional arousal when an individual receives information which implies that his reaction is inappropriate for the stimulus situation. In order to reduce dissonance, he will choose to expose himself to stimuli which will justify his emotional response. An individual who does not experience such dissonance will show no such desire.

METHOD

Subjects

The subjects were 60 male and 60 female undergraduates recruited from introductory psychology classes at Duke University. The experiment was conducted first with the 60 females and was replicated with the 60 males. The subjects were run through the experiment individually by a female experimenter.

Experimental Setting

Upon arriving at the experimenter's office to participate in what had been described on the recruitment sheet as a sensitivity study, the subject was greeted by an experimenter in a white laboratory coat. The subject was asked to sit at a small table facing the experimenter. A black wooden shield extended the length of the table between the subject and the experimenter and directly in front of the shield, on the table, was a meter with a dial ranging from 0 to 250.

The experimenter explained that the experiment had been designed to test sensitivity to electric shock. The subject was led to believe that the shocks would be administered in another room by an assistant and that the purpose of the interview was to explain the experimental procedure. Before describing the experimental procedure to the subject, the experimenter asked him to fill out a routine information sheet which asked for name, address, person to notify in case of emergency, and names, ages, and sexes of siblings. Included on this form was a list of chronic medical ailments, e.g., epilepsy, heart disease, and the subject was asked to check those which he had or had once had.

Manipulation of Threat

After the preliminary information had been collected, the subject was given one of two descriptions of the experiment: one was designed to moderately threaten the subject, and the other was designed to greatly threaten him.

Moderate threat Subjects in the Moderate Threat condition ($N = 90$) were told that an assistant would administer a series of 10 electric shocks, beginning with a very mild shock followed by increasingly stronger shocks. It was explained that one of the purposes of the experiment was to see how people defined pain in terms of the series of shocks. The subject was asked to indicate when the shocks were becoming painful, and he was told that the experiment would be stopped at this point and no more shocks would be given. It was pointed out to the subject that he could actually avoid any great pain by anticipating the painful shock and by asking that the experiment be stopped.

High threat Subjects in the High Threat condition ($N = 30$) were told that they would receive a series of 25 electric shocks, beginning with a very mild shock followed by increasingly stronger shocks. Subjects in this condition were asked to indicate when the shocks became painful in order to fulfil one of the purposes of the experiment, i.e., "to see how people define pain in terms of this series of electric shocks." They were informed of a second purpose of the experiment as follows:

To demonstrate that psychological pain—the feeling that something hurts—is different from physiological pain, which is defined as a muscle contraction or spasm. In order to demonstrate this difference it will be necessary to continue shocking you after you feel pain until we can record a muscle contraction.

The subject was reassured that although the experiment would be quite painful, there would be no aftereffects in terms of burns, head-

ache, or sore muscles and that certainly there would be no permanent damage to him. Apologies were made for asking the subject to participate in such a painful experiment, and justification for the procedure was offered in terms of the scientifically valuable information that could be obtained.

Subjects in both threat conditions were then told that the experimenter was also interested in studying emotional reactions to being shocked because "how frightened an individual is of being shocked has a great effect on how he will react to the shocks." Permission was asked to measure the subject's level of fear while anticipating the experimental procedure so that it might be compared with measures taken during the experiment. The experimenter placed a cuff on the subject's wrist and explained the principle of the galvanic skin response. She directed the subject's attention to the meter that would record his reaction.

Dissonance Arousal

All subjects in the Moderate Threat condition were informed that the average response of other subjects in the experiment was 75, as recorded on the meter. As a check on the subject's perception of his own fear in relation to the reported norm, each subject was then asked to guess what his reaction would be. After his guess, the meter was turned on and subjects were provided with one of three types of information.

Low fear. Each of the 30 subjects in this treatment received information that there was a discrepancy in a lower-than-average direction between his own level of fear and that of others who had participated in the experiment, in this treatment the meter registered 25 for each subject.

High fear. Each of the 30 subjects in this treatment was informed of a discrepancy in a higher-than-average direction, for these subjects the meter registered 150.

Average fear. Each of the 30 subjects in this treatment received information implying no discrepancy between his level of fear and the reported average, the meter registered 75.

In all three information treatments, the subjects were asked to confirm the experimenter's reading by checking the meter and repeating the reading. The deviation or lack of deviation from the average was emphasized. However, no explanations were offered as to why such readings might occur.

In the High Threat condition, one information treatment was administered. Each of the 30 subjects in this condition was informed that the average meter reading for other subjects was 150. As in the other conditions, the subject was asked to guess what his reaction would be, then his reaction was reported to be 150. The subject was

asked to confirm the reading by checking the meter, the lack of deviation from the average was emphasized. (Because there was only one information treatment, the Average Fear treatment, administered in the High Threat condition, this treatment will be referred to as the High Threat condition to differentiate it from the Average Fear treatment in the Moderate Threat condition)

After receiving information concerning his own level of fear, each subject was told that the experimental assistant, who was to conduct the remainder of the experiment, had been called away and was expected to return within 10 to 15 minutes. The subject was given the choice of waiting in the experimental laboratory where he was to be shocked later or of waiting in a waiting room furnished with some magazines.

After the subject had verbally indicated preference, he was asked to fill out a questionnaire. It was explained that the questionnaire was designed to evaluate his attitude toward the experiment and his physiological state, i.e., how hungry or tired he was, since these measures were known to affect reaction to shock. Actually, items concerning the subject's physiological state were used only to make the introduction of the questionnaire seem appropriate at this point in the experiment. The remaining items served as a check on the threat manipulation and as another measure of dissonance reduction.

A question concerning the amount of discomfort the subject expected to feel during the remaining part of the experiment was designed to measure the effects of the two levels of threat. It was expected that subjects in the High Threat condition would anticipate greater discomfort than subjects in the Moderate Threat condition, as measured by this 100-point scale.

A series of scales asked for the subject's description of what he imagined the experimental assistant to be like. The scales included items descriptive of physical appearance and of psychological characteristics. These scales were designed to serve as a more subjective measure of dissonance reduction. The subjects in the High Fear treatment were expected to imagine the assistant more negatively than subjects in other conditions, and the subjects in the Low Fear treatment were expected to view him more positively. It was expected that the subject would use such ratings of the assistant as a way of justifying the level of fear he was told he was experiencing.

A question concerning the subject's rating of the scientific value of the experiment was included as a way of determining how important the experiment was to him or how involved he was in the experiment. It was expected that the manipulations would be more effective for subjects who rated the experiment high on the 100-point scale. Such a rating could be interpreted to mean greater involvement in or commitment to the experiment.

After the subject had completed the questionnaire, the experimenter revealed the deception and described, in brief, the purpose of the experiment. The subject was asked not to discuss the experiment with anyone else. The entire procedure generally took about one-half hour.

Table 1 summarizes the experimental design. The cells contain the number of subjects in each group and the meter reading provided to the subject. It may be seen that the study contains two control groups. The Average Fear group in the Moderate Threat condition was designed to serve as the basis of comparison for each of the other two fear groups in this condition. In the High Threat condition, all subjects were exposed to a manipulation similar to the Average Fear manipulation in the Moderate Threat condition. Thus, any effects obtained in the High Fear treatment and not in the High Threat condition could more confidently be considered the result of dissonance created by the introduction of a discrepancy between the reported average reaction and the reaction reported as the subject's own rather than the result of a high level of fear aroused in the subject by the high meter reading.

RESULTS

Effectiveness of the Experimental Manipulations

Because of the more threatening nature of the instructions to the High Threat group, it was assumed that these subjects would give higher estimates of the amount of discomfort they expected to feel during the experiment than subjects in the Moderate Threat condition. For females, significant differences between High Threat (Mean = 70.00) and Moderate Threat (Mean = 49.76) conditions indicate the effectiveness of this manipulation ($t = 4.361, p < .001$)³. Differences between High Threat (Mean = 52.871) and Moderate Threat (Mean = 46.29) conditions for male subjects, while in the expected direction, are not significant ($t = 1.171, p > .10$). It is not clear that the lack of a significant difference between the two threat conditions for males should be interpreted as an indication that the threat manipulation was ineffective. Another possible interpretation of these findings is that there was a defensive effect on this scale for males, i.e., the male subjects in the High Threat condition were unwilling to admit, especially to a female experimenter, that they actually did anticipate a great amount of discomfort.

3 All tests are two-tailed.

This latter interpretation appears to be reasonable, for on other measures males and females perform quite similarly

The fact that the majority (90 per cent) of all subjects guessed their own fear level to be within 25 points of a given norm suggests that the fear manipulation was effective in communicating a norm to the subject. It also suggests that reporting to the subject that his score differed from the norm by 50 points or more represented a psychologically meaningful deviation to him.

The questionnaire item concerning the scientific value of the experiment reflected no significant differences between groups on this variable, and relatively high scores in all groups suggested most subjects felt involved in the experiment.

Evidence of Dissonance Reduction

It was expected that subjects who experienced dissonance generated by the belief that they were experiencing a level of fear inappropriate to the situation would attempt to reduce dissonance by seeking information to support their level of fear. In the experimental situation it was expected that High Fear subjects would choose the experimental room, representing an attempt to place themselves in a fearful situation to justify a high level of fear; it was also expected that Low Fear subjects would choose the waiting room, suggesting the lack of need for such justification, control subjects in both the Average Fear and High Threat groups were expected to show no definite preference. Table 1 shows the number of subjects choosing each room in each experimental treatment.

It is evident that there is a strong tendency for all subjects in all conditions to choose the waiting room over the experimental room, contrary to the equal tendency demonstrated during pretesting. However, subjects in the High Fear condition did show a greater preference for the experimental room than did other subjects.

There is a significantly greater tendency for subjects in the High Fear condition to choose the experimental room as compared with subjects in the High Threat condition ($\chi^2 = 5.959$, $p < .02$). This finding suggests that subjects were motivated to choose the experimental room, i.e., the fear-justify-

Table 1 Number of subjects in each treatment choosing the experimental room or waiting room ⁴

	Moderate Threat			High Threat
	Low Fear ⁵	Average Fear	High Fear	
Experimental room	6	6	11	3
Waiting room	24	24	19	27

Comparisons between conditions (1) High Fear vs High Threat: chi-square = 5.959; $p < .02$; (2) High Fear vs Average Fear chi-square = 2.049, $10 > p < 20$

ing situation, as a means of reducing dissonance rather than as an attempt to prove that they were not as frightened as the meter indicated. The comparison between the High Fear and Average Fear groups offers weaker evidence that a greater proportion of subjects showed a preference for the experimental room (chi-square = 2.049, $10 > p < 20$) ⁵

Further evidence of dissonance reduction is found in the responses to the questionnaire which revealed significant differences between subjects who chose the waiting room and those who chose the experimental room, these differences occur only in the High Fear group. When mean scores of the amount of discomfort the subjects anticipated within the High Fear treatment are compared, it is found that those who chose the waiting room (Mean = 55.58) anticipated significantly more discomfort than those who chose the experimental room (Mean = 38.46, $t = 2.387$, $p < .05$). Another way of viewing the same data is to dichotomize the subjects within each experimental treatment at the median according to the amount of discomfort anticipated and to divide them according to room choice, forming Table 2.

Only within the High Fear treatment does the comparison indicate a significant relationship between anticipation of little discomfort and choice of the experimental room ($p = .035$) ⁶

⁴ There were no significant differences in the data for males and females, therefore, sexes were combined in all analyses.

⁵ The anticipated effects of dissonance in the Low Fear subjects were not demonstrated, they responded like subjects in the Average Fear group. Data for the Low Fear group will be presented in the tables without additional comment.

⁶ By Fisher exact test.

Table 2 Room choice and amount of discomfort anticipated and number of subjects choosing the experimental room and the waiting room

	Moderate threat			High threat
	Low Fear	Average Fear	High Fear	
Much discomfort ^a				
Experimental room	3	3	3	1
Waiting room	13	13	13	15
Little discomfort ^b				
Experimental room	3	3	8	2
Waiting room	11	11	6	12

Comparison within High Fear treatment by Fisher exact probability test: Much Discomfort vs. Little Discomfort and Experimental Room vs. Waiting Room $p = 035$

Comparisons between treatments within Little Discomfort group by Fisher exact probability tests: (1) High Fear vs. High Threat and Experimental Room vs. Waiting Room $p = 023$; (2) High Fear vs. Low Fear and Experimental Room vs. Waiting Room $p = 060$; (3) High Fear vs. Average Fear and Experimental Room vs. Waiting Room $p = 060$

^aAbove the median.

^bBelow the median.

Dealing only with those subjects, in all groups, who scored below the median, i.e., who anticipated little discomfort, comparisons of subjects in the High Fear group with each of the other treatments indicate that a significantly greater proportion of these subjects in the High Fear treatment chose the experimental room. Thus, there is ample evidence that for subjects in the High Fear treatment, anticipation of little discomfort is significantly related to the choice of the experimental room, there is also evidence that this relationship does not occur in any other treatment group, either among subjects who anticipate relatively little or relatively great discomfort while being shocked.

The conditions for the arousal of dissonance are best met for those subjects in the High Fear treatment who anticipated little discomfort, probably resulting in their strong tendency to choose the experimental room. These subjects evaluated the reasons for fear as relatively low by expressing little anticipated discomfort, and yet they found that according to the meter their fear was 75 points greater than the average, thus, the discrepancy between the two kinds of information was greater for these subjects than for subjects in any other condition. For subjects in the

High Fear condition who anticipated relatively great discomfort, there was less discrepancy between the two kinds of information. The data for the Average Fear and High Threat groups show that it was not simply anticipation of discomfort that determined which room would be chosen, for subjects in these conditions who anticipated little discomfort did not show a preference for the experimental room. Thus it appears the choice of the experimental room was directly related to the discrepancy between the subject's anticipating little discomfort and his discovery that his fear was much greater than the average.

Again if we divide subjects in each treatment group on the basis of room choice and then compare the mean scores of these two groups' evaluation of the experiment, we find evidence that only in the High Fear treatment did the subjects who chose the experimental room (Mean = 77.91) evaluate the experiment significantly higher than subjects who chose the waiting room (Mean = 62.00, $t = 2.110$, $p < .02$).

This tendency seems to occur because the subjects in the High Fear group experienced a greater amount of dissonance. For in addition to the large discrepancy between cognitions created in this group, the fact that these sets of cognitions were important to the subject produced a heightened effect of the experimental manipulations.

The data did not support the assumption that subjects would use fantasy to help justify their experiencing a level of fear discrepant from the average. There were no significant differences between experimental groups in their description of the experimental assistant.

DISCUSSION AND CONCLUSIONS

The results of the present research demonstrate the usefulness of a dissonance formulation to explain an individual's emotional reaction in a stimulus situation where the appropriate response is not readily apparent. It was suggested that dissonance could be aroused by informing the subject that his emotional reaction was inappropriate to the stimulus situation and that he could reduce dissonance by finding evidence in the external environment to support the emotional reaction. The work of other

investigators can be interpreted to mean that one way to reduce dissonance of this type is for the individual to find evidence that his reaction is justified by establishing that others in similar situations have the same types of reaction. A theoretically significant contribution of the present study is the demonstration that a means of reducing dissonance, other than through social support, exists in the individual's finding stimuli in the environment to support his reaction and make it seem appropriate.

In evaluating the effectiveness of the experimental procedure as a test of the hypothesis, it seems that, in general, all groups of subjects seemed to respond to the threat manipulation as anticipated. After the experiment was over, subjects reported that they had believed the threats, in fact, some seemed disappointed that they would not be shocked after psychologically preparing themselves for it.

The fact that most subjects verbalized little concern about being deviant suggests that the information manipulation was somewhat less successful than the threat manipulation. It is conceivable that even in the face of "scientific evidence," i.e., the meter, some subjects in the High Fear and Low Fear groups completely denied or at least refused to admit to the experimenter that their responses were deviant enough to be considered significantly different from the average. Possibly other subjects, who may have believed that their responses were indeed deviant, may have dismissed their deviancy in an experimental situation, considering it different from being deviant "in everyday life."

In keeping with the hypothesis, it was expected that the Low Fear subjects would show a preference for the waiting room and the High Fear subjects a preference for the experimental room. The Average Fear group and the High Threat subjects were expected to show no definite preference as a group, for it was expected that no dissonance was aroused in these subjects. Subjects in all groups tended to prefer the waiting room, with High Fear subjects showing less of a preference than others, so apparently there were several factors other than dissonance reduction which influenced the subject's choices. Possibly the chance to read magazines had greater appeal for subjects who were truly unconcerned about their fear reaction than a chance

to look at the experimental room. Possibly the choice of the waiting room was a way of avoiding a fear-arousing situation, for being exposed to a fearful situation might be uncomfortable in its own right. Clearly the two rooms did not have the same appeal for the control subjects as they had for the subjects in pretesting—that is, in subjects who were administered the average threat treatment. There does not seem to be any easily explained difference between these groups except that the group used in pretesting differed in general attitude from the experimental subjects. The former group might be described as “eager beavers” who wanted to be the first to volunteer. The ones selecting the experimental room may have been more generally curious about the apparatus used in psychology experiments. The later subjects, who had participated in many psychological experiments, in general seemed disappointed in and wearied by all the experiments they had already experienced.

Because the Average Fear and High Threat groups demonstrated a preference for the waiting room, suggesting that the rooms were not equally attractive, it is impossible to be certain that the Low Fear group's preference for the waiting room was an attempt to reduce dissonance as it was predicted; possibly their motivation was masked by a general preference for the waiting room as seen in the control group's choices. Another possibility is that such a preference indicates that no dissonance was created. In retrospect, it seems questionable that telling an individual that his fear reaction was below the average would create the same degree of cognitive conflict as telling him that it was above the average. If conflict was created, certainly the Low Fear individual could resolve it more readily, for it seems socially acceptable and even praiseworthy to underreact in fearful situations.

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