

A REFORMULATION OF COGNITIVE
DISSONANCE AS IT APPLIES TO THE AREA
OF EFFORT JUSTIFICATION

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ABSTRACT

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By

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Festinger (1957) postulated that if the obverse of one cognition follows from another when the two cognitions are considered alone, dissonance is created. Furthermore, he stated that the individual is motivated to reduce the discrepancy between the two elements. An attempt is made in this paper to apply Aronson's (1968, 1969; Nel, Helmreich, & Aronson, 1969) theoretical reformulation of Festinger's cognitive dissonance theory to the effort justification area. Aronson argued that dissonance does not arise between just any two cognitions, but rather that it arises when the discrepant cognitions are of two specific kinds: One involves what the self-concept of the individual would lead him to expect his behavior to be in a situation. The second cognition involves what the individual's behavior in the situation actually is.

Various theoretical papers on the importance of the self-concept in the arousal of dissonance are discussed. Studies from the effort justification area are reported and discussed in terms of the reformulation.

It is speculated that the reformulation will be superior to dissonance theory, as originally proposed, because it can account for both effort and self-satisfaction, while the original version can only deal with the effort variable. To demonstrate this superiority, these hypotheses were tested:

1. That when an individual receives no outside satisfaction manipulation, the more effort he expends, the more positive will be his evaluation of the task.
2. That generally, those who do well on a task will evaluate it higher than those who do not know how well they did, who in turn will evaluate it higher than those who did poorly.
3. That effort will not predict task evaluation as well as manipulated satisfaction will.

The study was carried out using a 3×3 factorial design, with effort and self-satisfaction being the independent variables. Effort was manipulated by asking the subjects to work either one

45-second trial (Low Effort) or five 45-second trials (Medium Effort) or ten 45-second trials (High Effort) on a pursuit rotor task. The Low and High Satisfaction conditions were created by showing the subjects fake norms. "Controls" were given no feedback on their performance.

The results indicate that the second and third hypotheses were confirmed, but the first was not. The failure of the first hypothesis is discussed, as are the theoretical implications of the second and third. An alternative explanation in terms of a loosely-labelled reward theory is presented. It is concluded that the reformulation of dissonance is both theoretically and empirically superior to the original conception of the theory, and that the term dissonance should thus be applied to a situation in which the individual experiences discomfort which is aroused when there is a discrepancy between what his self-concept leads him to expect his behavior to be in a certain situation and what his behavior in that situation actually is.

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INTRODUCTION

In A Theory of Cognitive Dissonance, Festinger (1957)

stated, "Two cognitions are in a dissonant relation if, considering these two alone, the obverse of one element follows from the other" (pp. 260-261). He further stated that when an individual experiences dissonance, he is motivated to reduce, in some way, the discrepancy between the two elements. As Chapanis and Chapanis (1964) point out in their critique of dissonance studies, however, the individual has any number of cognitions in any given situation. Some of these cognitions are consonant with each other, and of course these are irrelevant to the creation of dissonance. Among those elements which are in a dissonant relation, one pair is generally most important to the creation of the dissonance. To use Festinger's classic example, in which a smoker is confronted with the information that cigarette smoking causes cancer, one can see that there are consonant and dissonant cognitions in any such situation. For instance, the cognition "cigarette smoking gives me pleasure" is consonant with smoking cigarettes. A dissonant cognition is that "cigarette smoking stains my teeth." According to the traditional conception of the theory,

however, the two most important cognitions in the situation, and those which cause the dissonance, are, "I smoke cigarettes" and "cigarette smoking causes lung cancer." Obviously, the assumption is made that the individual does not want lung cancer.

However, even if one grants the assumption in the above example, are the cognitions when taken by themselves dissonant? That is, is the knowledge that one smokes cigarettes dissonant with the cognition that cigarette smoking causes lung cancer, given that one does not want lung cancer? No. There is one other assumption which must be made before one can say that the two cognitions are dissonant: One must assume that the individual expects himself to act in a rational, intelligent, mature manner, i. e., that the person's self-concept is one in which he sees himself as an individual who does act in such a manner. If, on the other hand, his self-concept is that of an individual who usually acts in a manner which is not intelligent, it would not be surprising for him to discover that he does something such as smoke cigarettes when he knows that this behavior causes cancer. Of course, this is not to argue that a person with a low self-concept may not be upset to discover that his behavior is harmful; he may be upset, but the cognitions fit in with all the other cognitions he has about his behavior. What is being argued is that in any situation in which dissonance occurs, the cognitions

which are in a dissonant relationship are of two specific kinds: One involves what the self-concept of the individual would lead him to expect his behavior to be in that situation. The second cognition involves what the individual's behavior in the situation actually is.

Theoretical Foundations

A number of authors have speculated on the importance of the self-concept to dissonance. For example, Secord (1968) theorized that those cognitions which are part of the self-concept should be treated differently from those which are not. One reason why this should be done, according to Secord, is that cognitions about the self are often related to each other in a highly organized manner. For example, if one specific aspect of an individual's behavior is criticized, the criticism is apt to generalize to other areas. Secord found that individuals who were told that they were poor in a narrow, specific area that he defined as abstract thinking generalized this information and felt themselves to be lower in general intelligence than those who were told that they were good in this specific ability. Also, people who were told that they were high in general intelligence were less apt to believe that they were poor in abstract thinking. Another reason for treating them differently is that certain roles that people assume cause the self-referent concepts to be closely linked. Thus, when an individual both expects and receives a negative

evaluation, dissonance theory predicts that because the cognitions are consonant, liking for the evaluator should increase. However, because the evaluation generalizes to areas where the person has a positive self-concept--areas in which the cognition is not consonant--liking does not increase. Secord also points out that the reaction to the evaluation will vary depending on the person who is doing the evaluation. Thus, a negative evaluation by a friend will be more painful than one by a stranger. He also maintains that one must take into account self-referent cognitions because the individual may want to present himself as something he is not. A final point is that people will vary in the importance that they attach to one cognition or another. Secord concludes that all of these factors are reasons for treating self-referent cognitions differently from those which are not self-referent. While Secord discusses various ways in which the self-concept is important in the arousal of dissonance, his position is different from the one to be presented in this report in that he does not give it as central a role as it will be given here. He simply states that cognitions which refer to the self must be treated somewhat differently than other cognitions. In the present conception, however, self-referent cognitions are at the very center of dissonance theory.

M. Brewster Smith (1968) holds that dissonance can be aroused by cognitions unrelated to the self, and he cites Osgood and

Tannenbaum's (1955) congruity model, Rosenberg and Abelson's (1960) balance model, and McGuire's (1960) model as evidence. He maintains that even though dissonance theory began as a very general statement, it has moved towards dealing exclusively with self-referent cognitions. He also briefly discusses the distinction between the stable self-concept and more transitory self-percepts, and the implication of this distinction for consistency theory. The pros and cons of these arguments will not be discussed here. What is important for the formulation of dissonance presented in this paper is what Smith sees as a trend which influences the pressure towards consistency but which is basically unrelated to it. That is, people have a tendency to think as well of themselves as they can. Coupled with Secord's belief that people tend to generalize evaluations of the self in one area to other areas, this trend has important implications for this formulation of dissonance. Specifically, there will be very few people who have self-concepts which would allow them to be incapable of experiencing dissonance. Most people, even if their self-esteem is low, still have some self-esteem; will still try to defend their beliefs from attack; will generalize an attack on an area of the self with low esteem to a related area of the self which may not be in low esteem; will still try to justify themselves; will still try to think as well of themselves as they can; and hence, will be vulnerable to the arousal of dissonance.

Bramel (1968) attributes an even larger role to the self-concept. He argues that when an individual makes a choice between alternatives, and furthermore feels responsible for that choice, there are two sources which contribute to the arousal of dissonance: (1) information that disconfirms an expectation, including expectations about the self (disconfirmed expectancies also cause dissonance even if the situation does not involve a choice); and (2) information that one has, no matter what one's intention, chosen either immorally or incompetently. As evidence for the first source Bramel cites various studies, including one that he did in 1962. He gave subjects information faked from a battery of personality tests which was designed to cause their self-esteem either to rise or fall. He then gave them information which led them to believe that they had homosexual tendencies. Although this new information was not pleasant for either group, the high-esteem group should have expected it least, and therefore experienced the most dissonance. It was hypothesized that projection of the homosexuality onto others would be one means to reduce the dissonance. In line with the prediction, it was found that the high-esteem group did use projection more than the low self-esteem group did. Thus, one can see that his first source, disconfirmed expectations, does arouse dissonance. For Bramel, whenever a subject makes a choice that is a poor one, no

matter what was expected, dissonance is aroused. That is, in the second situation described by Bramel, even if Festinger's smoker expected to act in a stupid, irrational manner, when he discovers that he has acted according to expectation (stupid and irrational), dissonance is the outcome. The reason he feels dissonance is that in the past, whenever he has acted either irrationally or immorally, he has been punished by being rejected in some way by people, i. e., laughed at, yelled at, ostracized, etc. Even in the case in which there is no chance of being discovered, because the individual has internalized the group's norms, he still feels guilty, ashamed, and anxious. The same types of feelings are aroused when the individual has expectations disconfirmed, because in the past when he has acted on information that was incorrect, he has probably not been rewarded, and he might even have been punished. To allow Bramel to summarize his own position, dissonance is

anxiety associated with social rejection. The feeling of unworthiness, incompetence, unlovableness is probably aroused both by the failure to predict accurately and the failure to behave competently or ethically. The consequences of anxiety about one's worth are likely to be such things as self-justification and the search for information that will reflect favorably upon the self [p. 365].

A study by TePastte (1969) also shows how the self-concept is important in the arousal of dissonance. The subjects were 51 Michigan State University undergraduates who were run either

individually or in groups of two. They were told that the ability to judge other people and general intelligence are highly correlated. On the basis of a verbal report of an interview between a graduate school candidate and the chairman of the graduate school committee, the subjects were asked to decide whether the candidate should be admitted or not. The interview was so constructed that it was obvious that the student was not qualified. They were then told that written copies of evaluations of the student by two members of the committee were available, one of which was in favor of admitting the student, and one which was not. A four-question attitude scale measured their confidence in their decision, and how well they thought they had impressed the experimenter. It was reasoned that a person with high self-esteem would be more confident in his decision, and that he would not experience dissonance presumably created by the fact that there was someone who wanted the candidate admitted. On the other hand, the low-esteem subjects would experience dissonance and would not be very confident. The subjects were then asked which report they would like to see. The results indicated that the high-confidence subjects were more apt to choose the dissonant information, while the low-confidence subjects chose the consonant evaluation. Since very few people think themselves totally incompetent, however, it is not surprising that low-esteem individuals would choose the

consonant information in an attempt to protect their self-concepts. Thus, the study does show the importance of the self-concept in the arousal of dissonance.

Articles by Aronson (1968, 1969) and Nel, Helmreich, and Aronson (1969) are the main theoretical sources of the present conception. Aronson (1968) states that dissonance theory suffers from a failure to define precisely its limits. After discussing various criticisms of the theory, he argues that dissonance theory makes its best predictions when the cognitions deal with expectations which are firmly held. And, since cognitions the individual holds about his self-concept and his own behavior are likely to be very strong, dissonance will be most likely to occur when there is a discrepancy between the two. Thus, he states that when dissonance theory makes its best predictions,

we are not dealing with just any two cognitions; rather, we are usually dealing with the self-concept and cognitions about some behavior. If dissonance exists it is because the individual's behavior is inconsistent with his self-concept [p. 32].

Aronson applies this analysis by looking at the Festinger and Carlsmith (1959) study in which subjects were paid either \$1 or \$20 to tell a supposedly naive subject that a dull, boring task was exciting and enjoyable. He states that the dissonance which occurred was not between the cognitions "'I believe the task is dull'" and "'I said the task was interesting,'" but rather it is between the cognitions

"'I am a decent, truthful human being'" and "'I have misled a person; I have conned him into believing something which just isn't true; he thinks that I really believe it and I cannot set him straight because I probably won't see him again.'" Thus, of the many cognitions present in the situation, Aronson believes that the two related to the self-concept and the individual's behavior are most important. He also holds that an individual with low self-esteem experiences dissonance when he is successful. He makes the point, however, that to say that the individual experiences dissonance is not to say that he does not feel good because he has succeeded, but merely that the feelings of success are "tempered" by dissonance. Aronson concludes by saying that although he does not think it is an important empirical refinement, he believes that it is an important theoretical refinement to say that dissonance only applies when the cognitions involve either the self-concept or some other strong expectancy.

Nel, Helmreich, and Aronson (1969) extend the theoretical statements of Aronson (1968, 1969) and Bramel (1968) to the area of counter-attitudinal advocacy. They also cite Collins (1969), who argued that dissonance is aroused when the self-esteem of the individual is threatened or when either the self or others may suffer ill effects because of an act by the individual. Citing various studies, they discuss factors that affect the magnitude of dissonance because

of the implications they have for the individual's self-concept. One of these factors is the ability to "take back" a negative act. That is, individuals experience less dissonance if they can disavow or undo their actions. However, it was found in one study (Helmreich and Collins, 1968) that being allowed to make a video tape disclaimer was not sufficient to reduce dissonance, whereas a study (Davis and Jones, 1960) in which the subject thought he would be allowed to actually interact with an individual he had evaluated negatively did minimize dissonance. It is speculated that in the first instance one recorded statement was not felt by the subject to be sufficient to undo the harm that was done. It is mentioned that subjects who feel that they have a great deal of choice and who still engage in the behavior experience more dissonance than those who feel that they have not had much choice (Linder, Cooper, and Jones, 1967). Again, it makes sense that the self-concept would be more affected in a high-choice situation because our culture holds people responsible for their actions to a greater extent if they are free rather than coerced.

Finally, to test this new formulation, the authors discuss the effects on an audience of a statement made by the subject as a factor. That is, depending on whether the audience was pro, neutral, or con on the given topic, the statement would have differential ability to persuade the audience. People who were uncommitted on a subject

would be seen as easier to persuade, and as liable to more change than individuals who were either pro or con. Thus, a subject who argues a counter-attitudinal position to a neutral audience should experience the greatest dissonance, and therefore change his own attitude on the subject more than subjects speaking to different types of audiences. The experimenters hypothesized that in a 2×3 factorial design manipulating monetary inducement by paying subjects either \$.50 or \$5.00, and manipulating the foreseen negative consequences of the counter-attitudinal advocacy by telling the subjects that the audience was pro, con, or neutral that: (1) when the audience is uncommitted, the individuals paid the smaller amount would change their attitude in the direction of the counter-attitudinal statement to a greater extent than the individuals paid more; (2) there should be a larger negative effect between attitude change and monetary inducement in the condition in which the audience is uncommitted than in the other two conditions; and (3) the condition in which the audience already holds the counter-attitudinal position should be most likely to show a positive relationship between monetary incentive and attitude change. The study was carried out using 42 female undergraduates. Employing a deception which separated the counter-attitudinal statement from the post-test, the subjects were asked to make a video tape (using a 5-point outline that they were asked to look over

beforehand) arguing for no legal restriction on the use of marijuana for people over 21. On a pretest ranging from 1 (strongly disagree) to 19 (strongly agree), all subjects had marked 1. It was stressed to the subjects that they were free to refuse, and one subject did so. Subjects had to identify themselves on the tape by home town, name, class, and major. The video tape was played back to them, and they were asked to indicate how persuasive and sincere they thought themselves to be. After that, the subjects returned to the original experimental setting, where they answered a post-test question regarding marijuana that was embedded among other questions. The results indicate that the group with low monetary inducement and the uncommitted audience changed significantly more than the group with high monetary inducement and uncommitted audience. Thus, the first two predictions were upheld. No other comparisons reach conventional significance levels. The authors state that

The notions that discrepancy between self-concept and behavior (according to Aronson) and aversive consequences of behavior (according to Collins and Bramel) are key sources of dissonance, lead in many cases to different predictions from those derived from Festinger's (1959) original statement of the theory [p. 122].

The refinements that were presented above have the effect of increasing the predictive power of the theory. In the present study, for example, the old formulation of dissonance would have predicted a negative relationship between the amount of money paid

and the magnitude of attitude change in all of the conditions; while the results do not reach conventional significance levels, a slight positive relationship was present in the pro-audience condition. Thus, the reformulation of dissonance theory apparently is indeed predictive in the area of counter-attitudinal advocacy.

The Effort Variable

Having seen that the new formulation of dissonance theory has worked in the above field, one can now try to apply it to other areas that have come under the realm of traditional dissonance theory. The area which this paper will explore is that which deals with effort justification.

One of the first studies to be done that utilized effort as a variable was the initiation experiment of Aronson and Mills (1959). These experimenters attempted to determine whether the observation that people who work harder for something value it more than those who do not was true. Theoretically, they argued that the negative aspects of a group are dissonant with any suffering (in this case initiation) that the individual may have had to go through to gain admission to it. Furthermore, they stated that there are two possible ways to reduce dissonance created in this manner: (1) the effect of suffering can be reduced by rationalization, i. e., by saying

that the suffering was not really too bad; (2) the individual can concentrate on the positive aspects of the group while minimizing the negative features. If a great deal of pain had been undergone, however, the individual would not be able to convince himself that it was not unpleasant. Thus, with increasing severity of initiation, one would expect that the individual would turn more and more to the second mode of dissonance reduction. That is, the individual would increase his evaluation of the group. In the above formulation, although it is never discussed, the two cognitions which are discrepant would probably be said to be "I worked very hard to get into this group" and "the group is boring and worthless." As Aronson (1968, 1969) himself said in his reformulation of the theory, however, the two cognitions which cause the dissonance are not the two mentioned above, but rather: "'I am a reasonable and intelligent person'" and "'I have worked hard for nothing.'" It is obvious in this case that, empirically, there is little to be gained from such a theoretical change. It is also apparent, however, that the reformulation can be fitted into this experiment.

To test their ideas, Aronson and Mills designed an experiment in which they varied the severity of initiation that the subjects had to undergo in becoming members of a group which was supposedly discussing the psychology of sex. The subjects were 63 female

undergraduates who were tested individually. When they arrived at the experiment they were told that they would be taking the place of a girl who had had to quit. Thus, the subjects were confronted with an ongoing group. The experimenter told them he was interested in the dynamics of group discussion, and that although everyone seemed interested in the topic of sex, many people were too embarrassed to discuss it freely. They were then told that to combat this problem discussions were held over an intercom system. Next, all subjects were asked if they could discuss sex freely, to which most of them replied that they could. At this point, the controls were told that they were members of the group. The rest were told that all new members would have to take an embarrassment test. To prevent identification with the other members of the group the subjects were told that they were the first to be screened. For the test, the subjects read aloud some sexually-oriented material. The option of refusing was pointed out, but the subjects were advised that they could not join the group if they did not take the test. One person did refuse. In the Severe condition, the girls read 12 obscene words and two descriptions of sexual activity from novels. In the Mild condition the subjects had to read five words related to sex, but which were not obscene. Everyone was then told that she had passed and was a member of the group, but that since she had not

read the material on the topic to be discussed, she would not be able to participate in that week's discussion because if she did an inaccurate picture of the group's dynamics would result. The subject was introduced to the other members of the group by the experimenter, and then heard (what she thought was live, but which was actually taped) the other members of the group introduce themselves, and then hold a discussion. The meeting was designed to be worthless and boring. After the discussion, the experimenter asked the subject to fill out a questionnaire which all members supposedly filled out at the end of each session. The results show that subjects in the Severe condition rated both the participants and the discussion significantly higher than did either the Mild or Control condition subjects. These results seem to support the hypothesis that individuals who work harder to obtain something value it more than those who do not.

Chapanis and Chapanis (1964) make various criticisms of Aronson and Mills' explanation of the results of the experiment. They maintain that it was not proved that the subjects hold the two discrepant cognitions (that they had undergone a painful experience to gain admittance to a group, and that the group was dull and worthless). Furthermore, they propose three alternative explanations for the differences in ratings: The first of these is that the experimenter

created fears in the subjects that the discussions would be very embarrassing and that when they found out that they were not, the girls were relieved. It was this relief which caused the subjects in the Severe condition to like the group more. This is the relief-contrast explanation. Another alternative is that the subjects felt a sense of accomplishment and success in having passed a difficult and embarrassing test, and that it was this factor that caused the different evaluations. Finally, the third alternative explanation is that the reading aloud of such explicit sexual material before a male experimenter aroused the girls in the Severe condition sexually, and they thus either received pleasure, or anticipated pleasure in the future. Chapanis and Chapanis state that although there is no way one can examine any of these explanations with the existing data, there is another equally important factor. That is, for dissonance to have been created, the subjects would have to feel that the discussion was worthless. However, the control group gave the discussion an average rating of 10 on a 0-15 scale, which seems to indicate that they did like the discussion to some extent. The authors conclude their discussion by stating again what must be their favorite alternative explanation of the results. They believe that passing the test gave the subjects a feeling of successful accomplishment. Furthermore, they state that if the same

experiment were carried out using electric shocks, and if the feeling of success was eliminated, the Severe group would not have rated the discussion higher than a control group. Thus, their analysis casts some doubts on the conclusions reached by Aronson and Mills.

However, Gerard and Mathewson (1966) executed an experiment which they hoped would eliminate some of the alternative explanations presented by Chapanis and Chapanis and others (Schlopfer and Bateson, 1962). The subjects used were 48 female undergraduates, all contacted by phone. Those who were in the Initiate condition were asked if they would like to participate in a discussion club that was to talk about the problem of morals on university campuses. The others were simply asked if they would like to take part in a psychology experiment. The latter group was added to rule out the relief-contrast hypothesis. The initiates were told that, in the past, there had been some problem with participants who were unable to remain objective, and that to combat this, all future members of the group starting with her would have to undergo a screening process. In this process, she was told, changes in her skin resistance during exposure to various stimuli would be recorded. Again, telling the subject that she is the first to have to undergo the test eliminates any identification with members of the group who had

previously gone through it. The noninitiates were told that they would be exposed to various stimuli, and that their reactions to these would be recorded. Each group then received the same stimuli: a spray of perfume; a series of slides of paintings; the shooting sequence in Copland's ballet, Billy the Kid; and 3 shocks which were delivered 15 seconds apart. One half of the subjects received strong shocks while the other half received mild ones. After the test, half of the initiates were told that they had passed, and the other half was told nothing. This manipulation was used to test the successful accomplishment explanation of Chapanis and Chapanis. Everyone then listened to a taped 5-minute discussion on the problem of morals on the campus which was supposed to be worthless and boring. The initiates were told that this was a recording of a previous session of the group. Finally, all the subjects evaluated all the stimuli that they had been presented with. The group discussion and the participants were evaluated first.

The results clearly support the dissonance predictions, and eliminate many of the rival explanations of Aronson and Mills' results. The subjects who were given the strong shocks did indeed rate the shocks as stronger. The initiates evaluated both the participants and the discussion higher than the noninitiates. Within the initiate condition, the more severe the shock, the higher the rating

of both the participants and the discussion. The initiates who were not told that they had passed the test did not rate the discussion significantly different from those who were told. However, they did rate the participants higher than did those who were told. This finding, according to Gerard and Mathewson, rules out the successful accomplishment explanation. The experimenters argue that if this explanation were valid, the informed initiates should have evaluated both the discussion and the participants higher than the others, because they were the ones who were told that they had passed the test and thus should have presumably been basking in the light of their accomplishment. Unfortunately, Gerard and Mathewson are making an assumption which is not necessarily valid. It is assumed that those who were not told that they had passed believed that they had not passed. An individual who had gone through the procedure and who was then allowed to listen to a tape of the discussion, however, might have assumed that he had passed the test. If people did assume that they passed, then the successful-accomplishment theory is not ruled out as an alternate explanation. Unlike sex, which was intimately connected with the discussion in the Aronson and Mills experiment, electric shock could not have led the subjects to anticipate pleasure in the future. Therefore, the alternative hypothesis which states that the initiation either gave the

subjects pleasure or led them to believe that they would experience it in the future, is ruled out. Finally, the noninitiate condition eliminates the relief-contrast alternative in that those subjects who were given the stronger shock in this condition did not rate the participants or the discussion higher than did those who received the mild shock, whereas the prediction was that they should. Thus, the conclusion of Aronson and Mills that working hard to obtain something increases one's evaluation of that object was successfully replicated.

Another early effort experiment which generated research was done by Yaryan and Festinger (1961). They attempted to test the hypothesis that people expending a great deal of effort to prepare for an event will judge the event more likely to occur than will individuals who did not expend as much effort. Theoretically, the reason for this difference is that spending a great deal of effort to prepare for something is inconsistent with that event not occurring. Before the event either occurs or does not occur, the reformulation of dissonance holds that the individual has two discrepant cognitions: "I am a reasonable and intelligent human being" and "I have spent a great deal of effort preparing for an event which may not occur." To reduce this dissonance, the individual will increase his belief that the event will occur. The more effort he has expended in preparation,

and the less chance there is that the event will occur, the more the individual will have to justify his behavior to protect his self-concept.

To test the hypothesis, Yaryan and Festinger carried out the following experiment: they told individually-run, volunteer subjects that only half of them would take a special aptitude test, and that the experimenter already knew who was going to take the test. All the subjects were asked to perform a task in preparation for the test. In the high-effort condition, the subjects were asked to memorize a list of 25 symbols and abstract definitions which would be needed for the test. In the low-effort condition, they were told to look the same list over, but that they could use the list during the test. After the subjects had completed the task, they were given a questionnaire which asked them how probable they thought it was that they would personally have to take the test. The results indicate that significantly more high-effort subjects rated their task as harder when compared with the individuals in the low-effort condition. Also, in line with the prediction, the subjects in the high-effort group thought that it was more likely that they personally would have to take the test. Thus, it seems that individuals do experience dissonance when they invest a large amount of effort into the preparation for an event which they realize may not occur,

and that they reduce the dissonance by increasing their belief that the event will occur.

Johnson and Steiner (1965), however, challenge the results of the Yaryan and Festinger experiment on the grounds that the experimental procedure gave the subjects clues which they used to revise their estimate of the probability that they would have to take the test. Specifically, they believe that the amount of work that the experimenter did was the clue. They reason that if the subject sees an experimenter, who knows who is to be chosen, expending a great deal of effort to prepare them for the test, the subjects will think that "The experimenter would not be doing so much work if I were not going to take the test." The experiment that Johnson and Steiner ran to test this explanation had a $2 \times 2 \times 2$ factorial design in which the subject's effort, the experimenter's effort, and the selection criteria were varied. Subject effort was either high or low, just as it was in the previous experiment. In the condition in which the experimenter did not expend much effort, he read a magazine while the subjects performed their tasks. In the condition in which there was high experimenter effort, the tester either wrote out the definitions that the subjects were to examine for a few minutes and then use during the test while the subjects read magazines, or he displayed placards on which the symbols and definitions were printed

while the subjects memorized them. Half of the subjects were told that people would be chosen randomly to take the test, and that the experimenter did not know who the people were. The rest of the subjects were told that the people who would take the test were already chosen, and that the experimenter did know who they were. Thus, the subject's knowledge of the selection criteria was also manipulated. Beside the facts that the subjects were run in groups instead of individually, and that the subjects were assured that their preparation was adequate, the procedure was the same as in the Yaryan and Festinger study.

The results are in line with Johnson and Steiner's predictions. None of the manipulated variables had any effect on the means of the subjective probabilities within the eight cells of the experiment or on the subject's perception of experimenter concern. Over all the subjects, perceived experimenter concern was positively related to feelings of preparedness. For the subjects who were told that the experimenter knew who was to take the test, perceived experimenter concern was positively correlated with subjective probability. This fact was not true for those subjects who thought that the selection process was a random one. Subjects who believed that individuals taking the test were already chosen, and who had higher than median scores on beliefs about experimenter concern and adequacy of

preparation, had significantly higher scores on their subjective probability than did those who fell below the mean on both of the variables. There was no such relationship for those subjects in the chance-selection group. These results thus seem to indicate that perceived experimenter concern does have an influence on the belief that one is chosen to take the test. Therefore, some doubt is cast on Yaryan and Festinger's results.

An unpublished study by Raban (1965) which is reported by Pepitone (1966) also attempts to shed light on the variables in the preparatory effort experiment. The study was run using a $2 \times 2 \times 2$ factorial design in which subject effort, the type of test, and the relevance of the preparation for the test were manipulated. As usual, there was a high and low effort condition. The effort manipulation, however, was not related either to the preparatory activity or the test. In the high-effort condition, the subjects were required to fill out a long questionnaire which they were told would be used for administrative purposes only. They also had to copy a long passage written in Hungarian on the pretext that a handwriting sample was needed. Those in the low-effort condition were not required to do any of these activities. Thus, in this case, the low-effort condition was really a no-effort condition. The subjects were required to fill out a questionnaire after this manipulation. The type of test that the

subjects thought they would be taking was either an IQ test or an auditory perception test. Those in the relevant preparation condition either worked figure analogies or listened to music, depending on whether they were taking the IQ test or the auditory perception test. Also, the subjects were told that the activity would prepare them for the test they had to take. In the irrelevant preparation condition, those taking the IQ test listened to the music, whereas those taking the auditory perception test worked figure analogies. These subjects were told that the activity was merely a standardization procedure. The subjects themselves were female undergraduates who had been recruited for a test at a supposedly private testing service. The individuals were told that since they were volunteers, there was a problem of sampling bias, and that to combat this only half of the subjects would actually take the test and that these people would be chosen at random by a disinterested observer. After the preparatory activity, the subjects again filled out a questionnaire. The results are not in line with those in the Yaryan and Festinger study. What is important for the present research was the finding that sheer physical effort did not affect the subjective probability of the subjects. Thus, even more doubt is cast upon the results of the original study.

In contrast to this failure, Arrowood and Ross (1966) were able to replicate Yaryan and Festinger's findings. They tested 110 undergraduates who were told that they would be taking one of two different IQ tests. The subjects were also informed that one of the tests used abstract symbols. Those in the high-effort condition were told that they would have to memorize the symbols, whereas those in the low-effort condition were told that they would merely have to read them over. However, unlike the other experiments, no one actually had to perform these tasks. The subjects were also told that even though not everyone would be taking the test which used these symbols, a meaningful comparison of the two tests required that everyone engage in the same behavior before the tests. Thus, this experiment manipulates the expected relevance of the preparatory activity. Index cards were taped face down on the desks at which the subjects were seated, and the subjects were informed that the cards, which had been randomly distributed, contained the name of the test they were to take. After this introduction, the subjects filled out a questionnaire which supposedly was to determine their attitude toward IQ tests, but which really contained measures of the dependent variables. The data show that more of the high-effort subjects than low-effort subjects felt that they would take the test which required use of symbols. However, both the high- and low-effort groups

thought that each test would be taken by half the subjects. To quote Arrowood and Ross,

Thus, although subjects in both conditions believed that their objective chances of writing either test were about the same, those subjects led to anticipate an effortful preparation for one of the tests nevertheless believed that they, personally, would probably be taking the test for which they will have prepared [p. 61].

These results clearly support the dissonance prediction.

At this point, it might be well to reach some conclusions about the evidence both for and against the idea that preparatory effort will cause dissonance. First of all, it seems clear that the Yaryan and Festinger study had a number of faults. The greatest of these was the fact that the subjects were not given an adequate reason as to why only half of them would be given the test. Subjects do not expect a scientist to act illogically, even if he is a psychologist, and they would reason that it would be illogical for an experimenter who knew in advance which individuals were to be chosen to run a number of subjects that he did not need. Thus, there is some reason to believe that subjects did receive cues from the experimenter's behavior. On the other hand, the Johnson and Steiner manipulation is also too obvious. The cues presented to the subject are stronger than those presented in the original, and therefore it is not surprising that the subjects did react to them. For example, while the Yaryan and Festinger experimenters are doing extra work,

they do not have "the subjects read magazines for 30 minutes while [they] frantically wrote the definitions which the subjects merely examined for five minutes," nor do they display placards as the Johnson and Steiner experimenters do. They merely spend some extra time with the subjects. The Raban study is also not very damaging, in that the subjects did not expend the effort in preparation for the test, which is what all the subjects in the other experiments did. Finally, the study by Arrowood and Ross, while it does not actually require the subjects to work, is by far the clearest in its support of the hypothesis. There seem to be few methodological problems, and the results are unequivocal: even though subjects in the high effort condition believed both that there would be equal numbers taking each test, and that everyone would receive the same preparation, they still believed that they personally would have to take the test using abstract symbols. In conclusion, it seems that dissonance theory can make predictions about belief in the probability of the occurrence of an event as a function of preparatory effort.

Let us make one final note before we move on to another topic. The Arrowood and Ross experiment can also be explained using the reformulation of dissonance. In this case, the cognitions which are discrepant are "I am a reasonable and intelligent human being," and "I am going to spend a great deal of effort preparing for

an event which may not occur." Again, the two cognitions which create the dissonance deal with the self-concept and the individual's behavior. Here the behavior is a commitment to expend a large amount of energy in preparation for an event. Intelligent, reasonable individuals do not usually make such a commitment unless they are fairly sure that the event will occur. Thus, when the subject does make a commitment knowing that there is a good chance that the event will not occur, dissonance is created. It has been shown, then, that the new formulation of dissonance can predict the same results as the old theory.

In another related study, Aronson (1961) argued that effort could be used to increase the attractiveness of an unrewarded stimuli. That is, he hypothesized that an individual who has to work hard to obtain an object which is valueless will experience dissonance, and that to reduce the dissonance, he will increase his liking for some quality of the object. Traditional learning theory, on the other hand, argues that secondary reinforcement should occur only when there is some reward. Again, the self-concept analysis can be applied. In this situation, the two cognitions which are discrepant would be "I am a reasonable and intelligent human being" and "I have expended a great deal of effort to obtain something which is valueless." Clearly, reasonable people do not usually engage in such behavior,

and thus dissonance should be created. To reduce the dissonance, some quality of the object must be found to be worthwhile.

To test these ideas, Aronson created the following situation: He told 60 female undergraduates recruited from the university employment service that they would be "fishing" for metal containers in which money had been placed. The cylinders were two different colors, and the subjects were told that 85% of one color and 15% of the other color contained money. Actually, only one color cylinder contained money, but the deception was used to force subjects to spend equal time in opening and handling both types of container. The cylinders were lined against a wall in a random fashion and covered with cardboard so that no color was visible; only a metal ring on the top of the container could be seen by the subject. Two effort conditions were run: (1) the Easy condition which required that the subjects obtain the containers with a horseshoe magnet, and (2) the Effortful condition which required the subjects to catch the metal ring on the container with a hook. Those subjects in the Effortful condition were told that their task was tedious, while the others were told that it was not. Another deception that was introduced was that the experiment, which was explained as an attempt to determine the effects of reward on fatigue, was not the experimenter's, but merely one which he was doing for someone else. The experimenter then

went on to excitedly discuss what he explained was an interesting side-effect that he had discovered: that subjects do not take the same amount of time to pull out each container, and that this might be related to the motivational aspects of seeing a color that one liked. He then asked the subjects if they would help him test his idea by rating their preference for the two colors. After the experiment, another color rating was obtained on the pretext that the first was not stable. All subjects received about the same amount of money.

The results are somewhat ambiguous. In the Easy condition, the subjects shifted their color preference toward the rewarded color. However, in the Effortful condition they did not. The concept of secondary reinforcement due to the reward easily explains the data obtained from the Easy condition. To explain the Effortful condition findings Aronson argues that the dissonance and secondary reinforcement effects are equal but in opposite directions, and that they therefore cancel each other. Chapanis and Chapanis (1964), however, offer an alternative explanation. They argue that since it took, on the average, different amounts of time to obtain the containers in the two conditions (14 seconds per can in the Easy, 52 seconds per can in the Effortful), there was a difference in reward rate between the two conditions. That is, the Easy group is a high-reward-rate condition, and the Effortful condition is also a

low-reward-rate group. According to Chapanis and Chapanis, the difference between the groups could be explained by the difference in reward rates. The fact that the Effortful group did not change its ratings is attributable, in their argument, to the fact that they had a low-reward rate. In addition, the fact that Aronson must argue that there are equal but opposing forces is not as convincing an argument as one in which the effects are separated would have been. Thus, the conclusions of this experiment can be accepted only with a degree of caution.

Less ambiguous are the results of Knight (1963), who used dissonance theory to explain the Einstellung effect. He employed a modification of the Luchins (1942) water jar test, giving the subjects five jars, of which three were empty and movable, one was empty and fixed, and one was full and fixed. High and low effort groups were run. They were given a training problem whose solution required moving the same jars an identical number of times, but whose difficulty varied. The subjects were 46 male undergraduates. Three things were found: (1) that the more effort used to acquire a solution procedure, the greater the number of trials needed before that procedure was abandoned when it became inefficient, (2) that the High effort group tended to change to a procedure similar to the original when problems could no longer be solved by it, and (3) when

the High effort group tried to solve a problem whose solution was trivial, they tended to use either the original procedure or one that was similar to it. These results tend to support the hypothesis that when an individual expends a great deal of effort to obtain something, he values it more than someone who has not had to work as hard to obtain the same thing.

Passing reference should be made to Festinger (1961), Lawrence and Festinger (1962), and Lewis (1964), who successfully applied dissonance theory to rats. Lawrence and Festinger found that rats that have to work harder to obtain the same goal extinguish sooner than rats trained under low effort conditions. (Lewis reached the same conclusion.) They also found that rats run under a partial reward schedule, even when placed in the goal box on unrewarded trials, take longer to extinguish than rats run on a 100% reward schedule. A number of experiments have been done by Lawrence and Festinger, but they cannot be reported in detail here. Since rats presumably do not have self-concepts, these results cannot be explained with our paradigm, but they are further proof that effort and disconfirmed expectancy are important variables.

A number of studies have attempted to explore the effect of the effort variable on attitude change. Zimbardo (1965) used different amounts of delayed auditory feedback to vary the amount

of effort required either to read or improvise counter-attitudinal speeches. He found no differences between the read-improvise conditions, but he did find that effort had an effect in the predicted direction in both the pilot study and the experiment itself ($p < .13$ and $p < .10$). An abstract of a paper read by Ostrom at an American Psychological Association convention (1966) reports that he had some success in using physical effort to increase attitude change.

Baron (1968) varied both the attractiveness of the experimenter and effort in an experiment introduced to subjects as one concerned with an analysis of the interview process. Subjects were provided with the questions asked in an interview, and listened to the taped answers while they counted the numbers of nouns and verbs in each sentence. The statements made in the interview were opposed to a position held by the subjects. Effort was varied by the inclusion of white noise in the high-effort condition. The attractiveness of the experimenter was manipulated by a confederate subject after the experimenter had left the room. In both the high- and low-attractiveness conditions, the experimenter was presented as favoring the counter-attitudinal position. The results indicate that the manipulation was effective in that subjects in the attractive-experimenter condition did indeed think that their experimenter was more attractive. While this manipulation had no effect on attitude change, a significant

interaction was found between the attractiveness and effort variables. A simple effects test shows that with high effort an unattractive experimenter results in a more favorable task attitude. The theoretical meaning of these results for the concern of the present study is somewhat ambiguous, but the study does show that high effort can result in attitude change in a counter-attitudinal direction.

Wicklund, Cooper, and Linder (1967) propose that the actual effort should be separated from the persuasive communication. They argue that the subject may become fatigued while performing the task, however, and may become either inattentive or acquiescent. Thus, they propose that the task should not actually be done. Since the task precedes the communication, this procedure also necessitates the deletion of the communication. The experimenters tested their hypothesis (that expected effort will result in attitude change prior to exposure) by carrying out two experiments. At the beginning of the semester the introductory psychology class was given a questionnaire which measured their attitudes on various topics. Forty-five students who were against greater federal participation in local affairs were chosen for the first experiment. They were told that the study was exploring the effects of voice quality on persuasive communications, and that they would be listening to a taped speech

by an individual who was in favor of greater participation by the federal government. The effort manipulation was achieved by telling the subjects that there would be a delay due to the fact that another experimenter was also using the tape. In the short-delay condition, the experimenter told the subjects that he just had to walk down the hall to get the tape, but in the long-delay group the subjects were asked to wait for 10 minutes more than the 30 minutes for which they received credit. They were told that they could fill out a questionnaire while they waited. The results show a significant difference in attitude change between the long-delay group and both the short-delay group and the controls. The initial attitudes were dissimilar enough, however, to necessitate another experiment.

In the second study, the subjects consisted of 39 males who were in favor of draft exemptions for college students. They were told that the study was exploring the relationship between cardiovascular activity and the ability to recall. The study supposedly used a taped speech by Eugene McCarthy that argued against college draft deferments. There were three conditions: (1) a high effort condition in which the subjects were asked to run in place for 7 minutes (they were also given freedom to drop out), (2) a low effort condition in which the subjects were asked to sit quietly for 7 minutes, and (3) a control condition in which subjects were told

that they were controls, and that they would fill out a questionnaire. The results replicate those of the first experiment; the High effort group changed its mean attitude significantly more than either the Low effort group or the controls ($p < .001$ and $p < .005$). The results clearly support the proposition that increased effort can lead to increased attitude change. Furthermore, they can be explained by the reformulated dissonance theory. The two discrepant cognitions in this case are "I am a reasonable and intelligent human being," and "I have committed myself to exert effort while waiting to hear a speech against a position I hold." To reduce this discrepancy, the individual changes his attitude. Thus, in this case, as in all the other studies discussed, we see that the two discrepant cognitions always involve a cognition concerning what the self-concept leads the individual to expect his behavior to be in a given situation and one concerning what the individual's behavior actually is.

Before going on to the present study, what generalizations can be made about the general field of effort justification? First of all, a great many of the studies have confounded the variables involved. For example, the Aronson and Mills (1959) initiation experiment confounded its effort manipulation (reading obscene words) with such things as sexual arousal. Yaryan and Festinger (1961) committed a similar error when they failed to use an adequate

deception. Johnson and Steiner (1965), of course, tried to show that this error had a significant effect. Aronson (1961), as Chapanis and Chapanis (1964) pointed out, confounded reward rate and effort and therefore left his results open to alternative explanations. All of these studies, then, have basically the same fault: they all allow some aspect of the independent variable other than effort itself to influence the dependent variable.

On the other hand, there are a number of studies which have been designed to avoid this problem. One of these is the Gerard and Mathewson (1966) experiment. Their effort manipulation employing electric shock is not confounded with the dependent variable. It varies effort, but it does not have other characteristics which could influence the perceived attractiveness of the group. One of the reasons why shock is so effective is that it is purely physical, and thus it has no other characteristics which could influence the dependent variable. While they do not avoid the problem through the use of a physical effort manipulation, Arrowood and Ross (1966) are also able to keep the dependent and independent variables unconfounded by using an adequate deception. Both the Zimbardo (1965) and the Baron (1968) studies used an effort manipulation that was physical. Wicklund, Cooper, and Linder (1967) state that they purposely designed their experiment to avoid possible confounds by

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using physical effort. As they point out, effort and the communication can be two separate events, but they must be connected. That is, exposure must be dependent upon the subject performing some task. Perhaps the Raban (1965) study failed to find any relationship between physical effort and subjective probability because the two were not psychologically connected. That is, perhaps the subjects felt that the task and test were unrelated. In conclusion, we can say that those studies exploring the effect of effort which have been most successful have used physical effort in their manipulations.

While physical effort, then, has been adequate, there are still some problems encountered in its use. One of these was pointed out by Wicklund et al. when they argued that effort may "produce certain transitory effects on the subjects, thereby altering their responsiveness to the exposure situation" (p. 418). They solved this problem by not having the subjects actually perform the task. Of course, this solution will not be adequate or appropriate to all experimental situations.

A problem which has been discussed by a number of sources, including Wicklund et al., Chapanis and Chapanis, and Zimbardo, is the fact that effort is confounded with satisfaction. That is, in our culture if one has to exert a great deal of effort to perform a task, he often feels very satisfied because he has completed a difficult job.

Added to this feeling of success may be the so-called Protestant Ethic which states that hard work is good in and of itself. Just how much this latter factor is an influence, however, is a matter for speculation. On the other hand, it is desirable for effort and satisfaction to be separated. If this could be accomplished, another alternative explanation for effort effects could be eliminated.

It should be pointed out that the success explanation has been used as an alternative in explaining experiments which did not use physical effort, and thus it is not just a problem to be faced by physical effort studies (see, for example, Chapanis and Chapanis' explanation of the Aronson and Mills experiment). Overall, then, we see that although the use of physical effort does have some drawbacks, the problems are still fewer in number than are encountered when one uses other effort manipulations.

Finally, there is a series of experiments by Locke (1965, 1966a, 1966b, 1967) exploring the relation between task liking and task success which need to be mentioned before discussing the current study. Of the experiments, the important one for this study is one in which a pursuit rotor task was used (1965). Three groups were run, and they were each given a different standard to surpass before they could consider themselves successful. The task consisted of keeping a metal stylus in contact with a circular disk as

it moved in a circle. The subjects were each given 20 trials of 90 seconds duration with a one minute rest after each trial. Locke found that liking was positively correlated to success on the task. All of his other studies replicate these results using word tasks.

It is hoped that the present study will again demonstrate that the reformulation of dissonance theory can lead to more accurate predictions than can be made by Festinger's original conception of the theory. Traditional dissonance theory predicts that the harder an individual works on a task, the more he will like it. This increase in liking will supposedly occur even if the task is boring, if the individual cannot reduce the dissonance by any other means. Task attractiveness will also increase the less an individual receives from the task. One sees from Locke's experiments, however, that success increases task liking. Under the old conception self-satisfaction, while an influence, would not be considered an important variable. On the other hand, the reformulation would predict that self-satisfaction is an important variable. For example, if an individual does poorly on a task, his self-satisfaction will decrease, and a dissonant state will be created. The individual will hold two discrepant cognitions; "I am a competent, capable human being," and "I have done poorly on a task." The individual can reduce this dissonance in a number of ways. For instance, he could lower his

self-concept and come to believe that he is not competent, capable, etc. He could also literally distort feedback from the task and convince himself that he had done well. It is not likely, however, that the individual will utilize either of these methods; the former would be too painful, and the latter too difficult. He could also reject the fact that he had done poorly by saying, for example, that he had not been feeling well when he performed the task. Obviously, there are a number of methods that an individual could use to reduce the discrepancy. The present study, however, will make task deprecation the easiest way to reduce the dissonance. It will accomplish this by having the individual rate the task along a number of evaluative dimensions.

Thus, in the situation in which the individual expends a great deal of effort, the old theory and the reformulation predict somewhat different things. That is, traditional theory predicts that the harder an individual works at a task, the more positive will be his evaluation of it, no matter how he performs. On the other hand, the reformulation predicts that generally, while increased effort does lead to increased task evaluation, the individual's satisfaction with his performance will be a more important variable; and that an individual who does well will like the task more than an individual who does not know how he did, who will in turn like the task more

than an individual who does poorly. Thus, in this study an attempt will be made to manipulate both self-satisfaction and effort to show that the new formulation is both theoretically and empirically superior to the traditional theory.

Towards this end, the following hypotheses were tested:

1. That when an individual receives no outside satisfaction manipulation, the more effort he expends, the more positive will be his evaluation of the task.
2. That generally, those who do well on a task will evaluate it higher than those who do not know how well they did, who in turn will evaluate it higher than those who did poorly.
3. That effort will not predict task evaluation as well as manipulated satisfaction will.

METHOD

General Overview

This study was carried out using a 3×3 factorial design, with effort and self-satisfaction being the manipulated variables. Effort was manipulated by asking the subjects to work either one 45-second trial (Low Effort) or five 45-second trials (Medium Effort) or ten 45-second trials (High Effort) on a pursuit rotor task. The Low and High Satisfaction conditions were created by showing the subjects fake norms. "Controls" were given no feedback on their performance.

Subjects

The subjects were 108 male undergraduates enrolled in either the introductory psychology course or the introductory personality course at Michigan State University. All subjects participated in the study for research credit. They were recruited by means of a sign-up sheet which specified that only males were needed.

Apparatus

On a pursuit rotor, there is a metal disk $\frac{1}{2}$ inch in diameter located near the edge of a turntable which rotates at a constant speed. In this experiment, the speed was a constant 60 r. p. m. Subjects were to keep a metal stylus in contact with the disk as it revolved. The amount of time the stylus was in contact was measured by an automatic counter which gave the subject's time to the nearest 1/100 of a second.

Procedure

Subjects were run individually. The experiment was introduced to them in the following manner. (That which is in parentheses was said to the experimental subjects only. Naturally, only the instructions appropriate to the subject's condition were read.)

What we're interested in is the reaction of subjects to various types of laboratory instruments. We're looking for instruments which are both interesting and enjoyable for participants in experiments. And briefly, what we'd like you to do is to try out one type of instrument, namely the pursuit rotor, and then tell us what you thought of it.

Before I explain how the pursuit rotor operates, let me say something else. (First of all,) we are gathering data on how well subjects perform on the task, so it's important that you try to do well. (Secondly, even though we are continuing to gather data, we have already run a number of subjects and have established norms for the task, so we can give you some feedback as to your relative performance.)

Now, let me explain how the pursuit rotor operates. It works something like a record player. What you have to do is

to keep this stylus in contact with this dot as it moves around in a circle. Now, the amount of time the stylus is in contact with the dot is measured by this automatic counter. You will be given 45 seconds; 5/10 minutes of trials. Said to the 5 and 10 minute groups: You will work for 45 seconds, and then rest for 15. This pattern will be continued until the 5/10 minutes is up. Any questions?

After the last trial, all experimental subjects were told their time. The experimenter then said, "Well, I'll look up the condition you were in, and let you know how you did." Subjects were assigned to either the High or Low Satisfaction condition before they entered the experimental setting, and their time had no bearing on this assignment.

There were separate bar graphs of different color labeled "male" and "female" next to each other on the page. There was some overlap between the male and female ranges. Enough graphs were made so that no matter what time an individual got on the task, he could be told that he did either well or poorly.

Subjects in the High Satisfaction condition were shown a graph which placed their score in the 80 to 90 percentile range for men. The experimenter pointed to their score and said, "Hey, you did pretty well; your score falls in the upper part of the range for men."

Low Satisfaction subjects were shown a graph which placed their score in the 50 to 71 percentile range for women.

This score was below the lowest score for men on the graph.

They were told by a hesitant and embarrassed experimenter, "Gee, you --uh--didn't do too well. Your score falls into the range we would normally expect for girls."

Controls were not given any feedback on their performance.

After the manipulation, all subjects were told:

Okay, now what we'd like you to do is to fill out this questionnaire to get your response to the task and the experimental apparatus. Please answer the questions in order. I'm not interested in how any one person feels about the test, only the way subjects in general do, so don't sign the questionnaire. When you're done, simply place it anywhere in that pile of questionnaires which have already been filled out by previous subjects. (The experimenter pointed to a pile of questionnaires which had been unobtrusively marked for identification. This manipulation was done to prevent evaluation apprehension.) Any questions?

Subjects completed a post-task questionnaire which asked them how interesting and difficult the task was; how much effort they expended; how they would rate their performance on the task in relation to others; how satisfied they were with their performance; and how well they thought the task predicted differences in coordination between individuals, academic success, athletic ability, creativity, driving ability, intelligence, and potential flying ability. Subjects answered the above questions by marking a 10-point scale which was appropriately labeled. For example, the end-points of the question on personal satisfaction were labeled "Very Satisfied" and "Very Unsatisfied." The subjects were also

given a scale on which they ranked the following ten types of experiments in terms of their preference for participation: color discrimination, concept formation (word puzzles), group interaction, interpersonal bargaining, opinion change, perceptual judgment, pursuit rotor, reaction time, reading comprehension, and verbal learning. Finally, the subjects filled out the second page of the Rokeach Value Survey (1967).

After the Control and High Satisfaction subjects had finished the questionnaire, they were thanked and dismissed. Subjects in the Low Satisfaction condition were told by a flustered and embarrassed experimenter, who had been looking through the graphs, that a mistake had been made, and that the experimenter had given them incorrect feedback. It was explained that there were many different conditions; varying trial time, number of revolutions per minute, practice, etc., and that the experimenter had looked up the wrong graph. They were told that in the condition they were in, they had actually performed well. The subjects were then shown a graph which placed them in the 80 to 90 percentile range for men. The experimenter apologized again, thanked and dismissed them.

RESULTS

Success of the Manipulations

Effort

There were two questions which tested the effort manipulation: A standard analysis of variance on the first of these, "How difficult was the task?" indicates no significant effects for Effort ($F = 1.21$, 2 and 99 df, $p = .302$), Satisfaction ($F = 0.26$, 2 and 99 df, $p = .771$), or their interaction ($F = 1.01$, 4 and 99 df, $p = .408$). On the other hand, the more direct question, "How much effort did you expend on this task?" showed significance for both Effort ($F = 3.36$, 2 and 99 df, $p = .039$) and Satisfaction ($F = 3.76$, 2 and 99 df, $p = .027$). Their interaction was not significant ($F = 1.83$, 4 and 99 df, $p = .128$). The means for the One (7.17 out of a possible of 10, where 10 was labeled "Very Much"), Five (7.92), and Ten Minute Effort groups (8.31) across the Satisfaction conditions demonstrate that increasing the number of trials did increase perceived effort in the expected manner.

Satisfaction

Checks on the Satisfaction manipulation show that it was highly successful. Table 1 indicates that Satisfaction had a significant effect ($p < .0005$) in influencing answers to the question in which subjects were asked to rate their performance in relation to others. The means across the Effort conditions also show what one might expect: Low Satisfaction subjects (2.42 out of 10, where 10 is labeled "Top 10%") rated their performance lower than the Controls (5.33), who in turn rated their performance lower in relation to others than did the High Satisfaction group (8.14). Answers to the question, "How satisfied are you with your performance on this task?" also showed a significant Satisfaction effect ($p < .0005$), as Table 2 indicates. The means for the Low Satisfaction, Control, and High Satisfaction groups (2.78, 4.67, 6.25 respectively; where 10 is labeled "Very Satisfied"), as shown in Table 3, indicate the same expected linear increase in satisfaction as was found on the previous question. Thus, it is apparent that subjects who worked harder than others saw their task as more effortful, but not more difficult than those who did not work as hard. One can also see that subjects accepted the feedback that was given to them concerning their performance, and that this feedback had an effect on their personal satisfaction.

Table 1

**Analysis of Variance of Responses to the Question:
How would you rate your performance in relation to that of others
who have engaged in this task?**

Source of Variation	df	MS	F	p
Effort (A)	2	15.6204	5.1777	0.007
Satisfaction (B)	2	294.7315	97.6956	< 0.0005
A \times B	4	1.7870	0.5924	0.669
Within	99	3.0168		

Table 2

Analysis of Variance of Responses to the Question:
How satisfied are you with your performance on this task?

Source of Variation	df	MS	F	p
Effort (A)	2	36.3426	7.5573	0.001
Satisfaction (B)	2	108.7870	22.6219	< 0.0005
A × B	4	12.0509	2.5060	0.047
Within	99	4.8090		

Table 3

Means of the Replies on the Question:
How satisfied are you with your performance on this task?

		Satisfaction			
		Low	Control	High	
Effort	1	2.83	2.92	6.00	3.92
	5	2.33	4.92	4.92	4.06
	10	3.17	6.17	7.83	5.72
		2.78	4.67	6.25	4.56

On the other hand, Effort also showed significant effects on the Satisfaction manipulation checks. Table 1 indicates that Effort was significant ($p = .007$) on the question on which subjects were asked to rate their performance in relation to others. Table 2 indicates that Effort was significant ($p = .001$) when subjects were asked how satisfied they were with their performance. The interaction between Effort and Satisfaction is also significant ($p = .047$). Table 3 indicates a U-shaped function for the means across the Effort variable in both the Low and High Satisfaction groups. Within the Control group, however, the means increase as Effort increases in the expected linear fashion.

Task Evaluation

Task Preference

The main measurement of task evaluation was obtained by a question which asked subjects to rank, in terms of their preference for participation, the pursuit rotor along with nine other tasks. Since there are certain methodological problems in employing analysis of variance on ranks, only the ratings derived from this ranking task are reported. Table 4 indicates that the Effort variable was significant ($p = .041$). Relevant to the first hypothesis are the means for the Control groups which are presented in Table 5.

Table 4

Analysis of Variance of the Rating of the Pursuit Rotor Task

Source of Variation	df	MS	F	p
Effort (A)	2	12.8981	3.3052	0.041
Satisfaction (B)	2	26.2593	6.7291	0.002
A × B	4	3.3287	0.8530	0.495
Within	99	3.9024		

Table 5

Means of the Rating of the Pursuit Rotor Task

		Satisfaction			
		Low	Control	High	
Effort	1	5.42	4.92	3.33	4.56
	5	4.00	3.25	2.83	3.36
	10	4.25	5.00	2.83	4.03
		4.56	4.39	3.00	3.98

These results show (a lower score indicates a higher rating) that the expected linear increase in task evaluation as effort increases does not occur. Instead, the rating is highest in the Five Minute group (3.25), and lower and about equal in the One Minute (4.92) and Ten Minute (5.00) groups. It is only the Ten Minute group, however, which is out of sequence. Taken by themselves, these results do not confirm the first hypothesis. Collapsing across all the Satisfaction conditions, a similar pattern of rating is seen. That is, the means for the One, Five, and Ten Minute groups are 4.56, 3.36, and 4.03 respectively.

Table 4 shows that Satisfaction is significant at the .002 level. The second hypothesis predicts that task evaluation will be influenced by self-satisfaction such that those in the High Satisfaction conditions will evaluate the task higher than will those in the Control conditions, who will evaluate it higher than those in the Low Satisfaction conditions. Table 5 indicates that this prediction is confirmed. The means for the Low, Control, and High Satisfaction conditions across the One Minute Effort conditions are: 5.42, 4.92, and 3.33 respectively. The means across the Five Minute Effort groups are 4.00, 3.25, and 2.83. Again, these results are in line with the prediction. On the other hand, the results across the Ten Minute Effort groups for the Low (4.25), Control (5.00), and High (2.83)

Satisfaction conditions are not quite in the predicted sequence. It is only the mean rating for the Control group which is not in the desired position. Overall, the means for the Low (4.56), Control (4.39), and High (3.00) Satisfaction groups are in the predicted linear sequence. Thus, the second hypothesis is confirmed. Finally, the fact that the second hypothesis is confirmed while the means over all the Satisfaction conditions are not in line with the old dissonance prediction that task evaluation would increase with Effort, lends support to the hypothesis that Satisfaction is a more important variable than Effort.

Auxiliary Evaluations of the Task

Subjects were asked to rate the task in terms of interest-
ingness. They were also asked to evaluate the task in terms of how well they thought it predicted academic success, athletic ability, creativity, driving ability, intelligence, potential flying ability, and differences in coordination. Effort achieved marginal significance ($F = 2.99$, 2 and 99 df, $p = .055$) on the question about coordination. The means of the ratings on this question for the One, Five, and Ten Minute Control groups are 5.33, 7.17, and 7.25 respectively. These means are generally in line with what was predicted by the old dissonance theory for this group. Over all the Satisfaction

conditions, the mean ratings for the One, Five, and Ten Minute Effort groups are 6.42, 7.61, and 7.28 respectively. These means are not in line with the old dissonance prediction. Effort did not approach significance on any of the other questions.

On the other hand, Satisfaction was marginally significant on the questions about coordination ($F = 2.78$, 2 and 99 df, $p = .067$) and athletic ability ($F = 2.93$, 2 and 99 df, $p = .058$). It was significant on the items concerning interestingness ($F = 3.50$, 2 and 99 df, $p = .034$), driving ability ($F = 4.35$, 2 and 99 df, $p = .015$), and intelligence ($F = 5.43$, 2 and 99 df, $p = .006$). A significant interaction was found on the questions about athletic ability ($F = 2.65$, 4 and 99 df, $p = .037$) and creativity ($F = 3.61$, 4 and 99 df, $p = .009$).

The data on the items concerning the ability of the pursuit rotor to predict academic success, athletic ability, creativity, driving ability, intelligence, potential flying ability, and differences in coordination between people were pooled. The results show that only Satisfaction was significant ($F = 3.82$, 2 and 99 df, $p = .025$). Neither Effort ($F = 0.59$, 2 and 99 df, $p = .556$) nor the interaction ($F = 1.44$, 4 and 99 df, $p = .226$) approached significance. The interestingness rating and the preference for participation rating were also pooled. The results indicate that Satisfaction was significant ($F = 5.65$, 2 and 99 df, $p = .005$). Neither Effort ($F = 1.94$,

2 and 99 df, $p = .149$) nor the interaction ($F = 1.23$, 4 and 99 df, $p = .303$) approached significance.

Although Effort approached significance on only two items, a linear function could still have existed in the Control condition. Table 6 presents the means of the ratings of the One, Five, and Ten Minute Effort groups in the Control conditions. The data for the pooled items are also presented. Of the eleven sets of ratings thus shown, only three are in the predicted linear sequence. These items were: coordination, academic success, and driving ability. All of the other items would graph as inverted U's. Thus, it is consistently the Ten Minute group which does not act in the predicted manner.

Table 7 contains the means of the ratings over all the Effort conditions for the Low, Control, and High Satisfaction groups. It also presents the same information for the two pooled items. A linear increase is predicted as one moves from the Low to High Satisfaction conditions. Overall, only five out of the eleven items were in this pattern. Of the eight items on which Satisfaction was significant, however, the pattern was still found five times. The five items are: the task preference rating, athletic ability, driving ability, intelligence, and the item which pooled the seven prediction questions. All of the other items would graph as U's.

Table 6

The Means of the Ratings for the One, Five and Ten Minute
Effort Groups; For the Controls

Item	Controls			p ^a
	One	Five	Ten	
Task Preference Rating ^b	4.92	3.25	5.00	.041
Interestingness	6.17	7.17	6.25	.727
Above 2 Pooled	12.25	14.92	12.25	.149
Prediction of:				
Coordination	5.33	7.17	7.25	.055
Academic Success	2.17	2.58	2.75	.227
Athletic Ability	4.00	6.17	6.08	.187
Creativity	2.17	5.50	2.75	.449
Driving Ability	4.42	5.33	6.00	.510
Intelligence	2.75	3.83	3.00	.874
Potential Flying Ability	4.75	5.58	5.25	.650
Above 7 Pooled	25.58	36.17	33.08	.556

^aProbability of the Effort variable.

^bThe higher the number, the lower the rating on this item only.

Table 7

The Means of the Ratings Over All the Effort Conditions;
For the Low, Control, and High Satisfaction Groups

Item	Satisfaction			p ^a
	Low	Control	High	
Task Preference Rating ^b	4.56	4.39	3.00	.002
Interestingness	7.47	6.53	7.78	.034
Above 2 Pooled	13.92	13.14	15.78	.005
Prediction of:				
Coordination	6.97	6.58	7.75	.067
Academic Success	2.53	2.50	3.00	.513
Athletic Ability	5.17	5.42	6.47	.058
Creativity	3.47	3.47	4.25	.277
Driving Ability	3.94	5.25	5.53	.015
Intelligence	2.75	3.19	4.36	.006
Potential Flying Ability	5.22	5.19	5.36	.950
Above 7 Pooled	30.06	31.61	36.72	.025

^aProbability of the Satisfaction variable.

^bThe higher the number, the lower the rating on this item only.

DISCUSSION

Under the old formulation of dissonance theory it was believed that the harder an individual worked at a task, the more positive would be his evaluation of it. The individual's success or failure, his self-satisfaction, are not mentioned as variables. In all cases, a simple linear increase is predicted between effort and task evaluation. Under the reformulation, however, self-satisfaction is a major variable. It assumes such importance because ego defense, to which self-satisfaction is intimately related, is a foundation of the new theory. Cognitive consistency, upon which the old theory is built, assumes importance here only insofar as it is related to self-satisfaction and ego defense. That is, only when it is important to the individual to have consistent cognitions will inconsistency bother or threaten him. It is being argued that the incorporation of ego defense as a foundation increases the predictive power of dissonance in the effort justification area, because it allows one to account for self-satisfaction while the old theory does not.

To demonstrate this increase in predictive power, the experiment was designed in such a way that effort and satisfaction

were both manipulated, thus allowing for a comparison of their respective effects. The results, as reported, indicate that the manipulation of both variables was indeed successful. The first hypothesis, that when an individual receives no outside satisfaction manipulation, the more effort he expends, the more positive his evaluation of the task will be, is essentially the only prediction that the old dissonance theory makes. The reformulation also makes this prediction. And, the Control groups, which are not controls in the usual sense of the word, but only subjects who did not receive explicit success feedback, represent the groups most clearly subject to this prediction. That is, under the reformulation the Controls are subject to the prediction, but under the old theory all of the subjects should be influenced in this manner.

As the results indicate, this prediction was not very accurate for the Control groups. A linear sequence was found only three times out of a possible of eleven. Clearly, the first hypothesis was not confirmed. The means on the other eight items are in a consistent pattern, however, an inverted U. Therefore, we see a consistent positive increase in task evaluation as effort is increased from the One to the Five Minute groups. And thus, it is the Ten Minute group which for some reason decreases its evaluation of the task. It is interesting to note that had the experiment been run with

only two effort conditions (the One and Five Minute conditions), the results would have been perfect. Furthermore, most of the studies that have been reviewed in this paper have used two effort conditions. It is clear, however, that theoretically a linear increase should have occurred. As previously mentioned, both the reformulation and the old theory do make this prediction. According to the reformulation, Control subjects should have two cognitions which become increasingly discrepant as the task becomes harder: "I am a reasonable, intelligent human being" and "I have worked hard on a boring, useless task." As this discrepancy increases, subjects should reduce the dissonance by increasing their evaluation of the task. But for some reason this did not occur among Control subjects in the Ten Minute group. It is theoretically impossible to state the reason for the decrease in evaluation for the Ten Minute controls. In conclusion, it must be stated that the first hypothesis is not confirmed.

The second hypothesis states that task evaluation will be influenced by self-satisfaction such that those in the High Satisfaction conditions will evaluate the task higher than will those in the Control conditions, who will in turn evaluate it higher than those in the Low Satisfaction conditions. And, as was indicated by the results, this prediction was generally upheld for the main evaluation of the task, the preference for participation rating. Again, it was the failure of

the first hypothesis that causes the slight deviations from what was predicted. It was pointed out in the discussion of the results that it was the Ten Minute Control group which was not in line with the prediction across the Ten Minute Effort condition, and that the reason for this failure was that this group did not give the task a highly positive rating. Furthermore, while the pattern of means over all the Effort conditions was in line with the prediction, the Control groups' mean rating was a little low. Had the Ten Minute group followed the prediction, the mean rating would have been higher, which would have strengthened the weak linear pattern.

Recalling Table 7, which presented the ratings over all the Effort conditions for the three Satisfaction groups, one sees that the second hypothesis was upheld five out of a possible eleven times. At first glance, this figure does not appear to support the second hypothesis because the results are not that much better than the first hypothesis, which was correct on only three occasions. Because one is dealing with ratings over all the Effort conditions rather than ratings within a condition, it would give a more accurate indication of the strength of the second hypothesis if one looked at only those items on which the Satisfaction variable was significant. Thus, of the eight items on which Satisfaction was at least marginally significant, the prediction was correct five times. Furthermore, as

was indicated, in every instance of failure (the interestingness and coordination items, and the pooled item made up of the data from the interestingness and participation preference question) one finds that the means would graph as a U. Thus, it is the Control group which did not give the task a positive enough mean rating, and which was thus not in the linear sequence. Looking at the interestingness and pooled items, one sees (from Table 6) that the pattern of means over the Control condition is an inverted U. Had the ratings been in the sequence predicted by the first hypothesis, i. e., had the Ten Minute group given the task a higher rating, the mean for the Control group over all the Effort conditions would have increased. This increase would have moved the average for the Control group to the position indicated by the second hypothesis. On the coordination item, we see that the means for the Control groups are in a linear sequence, but that the difference between the Five and Ten Minute groups is only 0.08. Thus, the two are essentially equal. Again, had the Ten Minute subjects given the task a stronger rating, the Control group mean would have been higher, and the prediction would have been fulfilled. In summarizing the evidence for the second hypothesis, it can be stated that over half (five out of eight) of the items were in the predicted pattern. Furthermore, it has been shown that in the three cases in which the pattern was not found, it was

always the Control group which was not in the expected position.

It was this failure to find the pattern predicted by the first hypothesis which led to the unpredictably low mean rating for the Control condition. Finally, it was a failure of the first hypothesis, and not the second, which caused the three errors. Therefore, it can be asserted that the second hypothesis is generally confirmed.

The theoretical importance of the confirmation of the second hypothesis is twofold. First of all, it established self-satisfaction and ego defense as important variables. The individual enters the experimental situation, and he is told (in the High and Low Satisfaction conditions) that he will receive feedback concerning his performance on the task. It can be assumed that people will be anxious or nervous in this type of situation. First of all, individuals (especially students) are always being tested or evaluated in ways that have either positive or negative implications concerning their skill or ability in some area, and this evaluation will create anxiety. Furthermore, as Secord pointed out, an evaluation of one aspect of a person tends to generalize to other areas. If one further assumes, as M. Brewster Smith does, that people tend to think as well of themselves as possible, then one can state that the cognition "I am an intelligent, capable human being" will apply to most people and that, in this kind of testing situation, success or failure will have

implications for this self-perception. Thus, for the High Satisfaction subject, success indicates that his evaluation of himself is correct, and that he is capable, intelligent, etc. This pleasant feeling generalizes to the task, and the individual gives it a high rating. On the other hand, the subject in the Low Satisfaction condition is faced with failure. Clearly, if one accepts the above assumptions, this failure will have negative implications for the individual's positive self-concept. He thus has two cognitions: "I am an intelligent, capable, masculine human being" and "I have done poorly on this task; I have performed like a girl." To resolve this discrepancy, he can either change his self-concept or he can neutralize his failure by various means. Obviously, it would be easier to do the latter. Thus, the individual gives the task a low rating. That is, he says, "No, this task is not interesting, and I do not think it predicts any of these things very well." In this way the individual may be able to state that, "This task does not mean anything; I am still capable, masculine, and intelligent." So, at the very foundation of the theory is the assertion that dissonance occurs when there is a discrepancy between the self-concept, and what this implies the person's behavior will be, and what the individual's performance in the situation actually is. The fact that the predictions of the second hypothesis are confirmed indicates that the above analysis of the mechanism underlying the individual's behavior has some merit.

The second theoretical contribution of this hypothesis lies in its implications for both the third hypothesis and the reformulation in general. That is, the fact that it was confirmed indicates that the reformulation is able to account for variables that the old theory did not even consider. The old theory's only prediction was that task evaluation would increase as effort increased. On the other hand, the reformulation makes that prediction, plus it predicts the differences that were found among the Satisfaction conditions. Therefore, it seems as if the reformulation has improved old dissonance theory. It is relevant to the third hypothesis in that the old theory based its predictions on Effort, and could not account for Satisfaction factors. One can see from the results, however, that Satisfaction has accounted for a greater portion of the findings than could be accounted for by Effort.

This failure of the Effort variable can be seen in other ways. On the nine different task evaluation items, and the two pooled sets of data, Effort was significant on one item and marginally significant on another. By contrast, Satisfaction was significant on six items and marginally significant on two more. Furthermore, on the most important task evaluation item (the preference for participation rating) the significance levels indicate that while both Effort and Satisfaction are significant, Satisfaction has a stronger effect.

Clearly then, Satisfaction can predict task evaluation better than Effort. Thus, the third hypothesis is confirmed.

Failures

The main weakness of this study was the failure of the first hypothesis. As stated in length above, both theoretical positions predicted a positive linear increase in task evaluation within the Control condition as effort increased. The results, however, indicated an inverted U, with the Ten Minute group giving the task a rating below what was expected, and often at the level of the One Minute group. As was also indicated, these results had an adverse effect on the second hypothesis. Again, as mentioned earlier, had the study used just the first two Effort conditions, the results would have been perfect. Had the Five and Ten Minute Effort groups been the only ones used, however, the results would have been in many cases exactly opposite to the prediction. That is, task evaluation would have decreased with increased effort. Thus, in this case, the difference between a successful and unsuccessful study could have been the choice of the amount of effort that the subjects were forced to expend. Since most experiments use only high and low effort conditions, the obvious question is: If the successful and unsuccessful dissonance studies of the past are repeated using an

extra effort condition, would different results be obtained?

Obviously, it is impossible to state at this point if a similar situation exists, and whether the same variables are operating in the same manner in those studies. Perhaps what is most disappointing is that it is impossible to account for these results theoretically using just effort and satisfaction. It seems clear, though, that even if the reformulation is correct, there is some unaccounted for variable influencing the results.

An added variable which might explain the behavior of the Ten Minute Control group is involvement. Even though he does not receive specific feedback on his performance, the control subject will still try, to a certain extent, to do well. First of all, most subjects are cooperative, and these were specifically instructed to try to do as well as they could. Second, the subjects did receive some feedback in that they could see whether they were in contact with the dot to a significant extent. Furthermore, as the number of trials, and thus effort, increased, the individual's involvement increased, because he made more of an investment in the situation. At a certain point, however, one might expect that the subject would resist increased involvement. He could have simply become bored with the task, and decided that he did not care about trying to perform well. Or, he might have decided that the minimal feedback

that he received was not worth the increased effort. If the Ten Minute Controls became bored, or decided that the task required too much effort, their involvement would have decreased, which would have caused a decrease in the amount of dissonance that they experienced. A decrease in dissonance would have led to a decrease in task evaluation. Perhaps this process is responsible for the results that were obtained. In conclusion, it should be noted that this process can be incorporated into the reformulation of dissonance because it assumes that the individual is reducing his involvement as a means of ego defense. That is, with an increasing number of trials, there is some point at which the individual can no longer justify his effort expenditure, and thus he reduces his involvement to avoid dissonance.

An Alternative Explanation

Like any other study, the results of this experiment can be explained in ways other than the one presented above. One of these could be loosely termed a reward theory. Basically, this theory makes the same predictions as new dissonance theory, but it posits a different underlying mechanism. That is, it would state that the High Satisfaction subjects would rate the task highly because they were rewarded after the task with a very positive evaluation of their

performance. Being told that one did well on a task is pleasant (a reward), and this feeling generalizes to the task itself. On the other hand, individuals in the Low Satisfaction condition would evaluate the task less positively because they would have been punished by their feedback. This kind of approach makes sense intuitively, and also fits the results. The predictions for the Control condition are also the same as the reformulation's. New dissonance theory predicts that when an individual works very hard on a task which is not intrinsically rewarding, a discrepancy is created between what the individual's self-concept leads him to expect his behavior to be, and what his behavior actually is. To reduce this dissonance, to justify the effort expenditure, the individual increases his evaluation of the task. The alternative explanation asserts that there is no need to postulate something as mysterious as dissonance. Instead, it makes the assumption that the Protestant Ethic has been part of the socialization process, and that it is widespread in the culture. That is, the theory assumes that people see hard work as good, in and of itself. Thus, under this analysis, effort does not cause dissonance, but rather it leads to self-satisfaction, which in turn leads to the positive evaluation of the task. This type of explanation was also presented by Chapanis and Chapanis in their successful accomplishment explanation of the

results of Aronson and Mills' initiation experiment. The mechanism postulated here, however, is somewhat different.

There is some evidence to support the reward analysis of the results of the present study. First of all, the general results of the experiment are in line with the theory, because its predictions and the reformulation's are the same. Second, it will be recalled that on the Satisfaction manipulation check questions, Effort was also significant on these items. Furthermore, on the Effort questions Satisfaction was also significant. Thus, the situation exists in the Control condition that those people who are most satisfied have also expended the most effort. This result clearly supports the contention of reward theory. On the other hand, this theory also fails to explain the inverted, U-shaped function that was found on many of the task evaluation items. Clearly, what is needed is an experiment which would lead to different predictions by the two theories, so that their areas of competence could be contrasted and delineated. It would also be worthwhile to apply this analysis to other dissonance studies to see whether reward theory could better explain the results. Until that time, the acceptance of one of these theories over the other will be a matter of theoretical preference.

Conclusion

Whether either of the theories is preferred, it is clear that they are both able to account for variables that the old dissonance theory cannot account for. All three theories support the hypothesis that the Control groups should have increased their evaluation of the task as effort increased. Unfortunately, none of the three can account for the results that were obtained without making assumptions that were not tested in the present study. Both the reward and the new dissonance theories support the second and third hypotheses theoretically, however, while old dissonance theory does not. The prediction of the second hypothesis, that generally, those who do well on a task will evaluate it higher than those who do not know how well they did, who in turn will give it a more positive rating than those who did poorly, was confirmed. Had the old dissonance theory been correct, there should have been no differences among the Satisfaction conditions in how they rated the task. The ratings were not equal, and old dissonance is unable to account for the differences theoretically. The original statement of dissonance also cannot account for the fact that Satisfaction, rather than Effort, was more predictive. The old conception is not able to deal with the Satisfaction variable. Both reward theory and the reformulation can. In conclusion, one can state, first, that the reward explanation

merits further investigation. Second, one can conclude that this study has accomplished its purpose. That is, it has confirmed what was shown in the counter-attitudinal advocacy area: that the reformulation of dissonance is both theoretically and empirically superior to the original conception of dissonance. The term dissonance should thus be applied to situations in which the individual experiences discomfort which is aroused when there is a discrepancy between what his self-concept leads him to expect his behavior to be in a certain situation, and what his behavior in that situation actually is.

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