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ALTERNATIVE EXPLANATIONS FOR SELF-FULFILLING PROPHECY

by
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of the requirements for the degree of
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CHAPTER I

SELF-FULFILLING PROPHECY

The possibility that merely expecting an event to occur will increase the likelihood that it will occur is an idea which has long intrigued social scientists. As far back as 1898, for example, Albert Moll noted that insomnia, stammering, and cures for mental illnesses seem to occur when they are most expected. Similarly, Jastrow (1900) claimed that he fell from his bicycle when he was most afraid of doing so. He also reported an interesting series of events following the introduction of a tabulating machine into a civil service organization: old employees who had heard gossip about how difficult it was to work with the machine in fact had considerable trouble learning to use it, but new employees who had not heard the gossip had much less trouble.[1]

The importance attributed to such phenomena seems evident in the popularity of terms such as "self-fulfilling prophecy"[2] and maxims such as "the power of positive thinking" and "nothing breeds success like success." These terms have been freely applied as explanations to such problems as the "underachievement" of minority groups (e.g. Clark, 1965) and even to the outbreak of war (Allport, 1950).

There is now a reasonably large amount of evidence suggesting that self-fulfilling prophecy phenomena exist. Although little of this evidence is unequivocal, it is nevertheless persuasive.

For achievement situations a series of studies by Feather (1966, 1968; Feather & Saville, 1967) show consistent self-fulfilling prophecy effects. In all three studies subjects worked on an anagram-solving task after stating how well or how poorly they expected to do. In the first two (Feather, 1966; Feather & Saville, 1967) the experimenter manipulated subjects' expectations by telling them that the task was either easy or difficult and giving them fictitious norms to back up the claim. In the third (Feather, 1968) the first five anagrams were actually either easy or difficult so that subjects would be more or less likely to solve them; here no fictitious norms were given. Subjects rated their chances of solving each anagram immediately before attempting

it. Expectations for subsequent performances increased after real or alleged success and decreased after real or alleged failure in all three studies, and subsequent actual performances were significantly different in the direction implied by the predictions.

Self-fulfilling prophecy is also evident in situations less clearly defined in achievement terms. In medical practice, for instance, "placebo" effects are now commonplace (see Beecher, 1959; Haas, Fink, and Harfelder, 1963). Here a doctor may falsely inform a patient that new evidence shows his ailment to be of shorter duration than was originally thought, or that a pill or injection will cure him. Subsequent predictions of recovery by the patient have often proved sufficient to produce actual cures. In the psychological laboratory comparable effects have been found with expectations about phobic-like fears. Valins and Ray (1967), for instance, had their subjects watch slides containing either the word "shock" or pictures of snakes. During the viewing all subjects heard sounds similar to heartbeats. Those in an experimental group, however, had microphones attached to their chests and had been told that the experimenter was interested in their heart-rate reactions, while those in a control group had been told that the sounds were tape-recorded, as indeed they had been. For all subjects the word "shock" was accompanied by an actual electric shock and an increase in the speed of the tape-recorded sounds, while no such increases accompanied the slides of snake pictures. As desired by the experimenters, by associating an increase in heart rate with the absence of snake stimuli, experimental subjects began to doubt the validity of their presumed fear of snakes. And, when the experimenters subsequently asked subjects to choose among a series of actions toward an actual boa constrictor, these actions ranging from merely entering a room containing the caged snake to picking it out of the cage and holding it, experimental subjects who had never previously touched a snake were significantly more likely to choose more positive actions toward the snake than were comparable subjects in the control condition. Thus, when subjects' beliefs changed about how snakes affected them, so did their actual reactions to snakes. These results were later replicated in a second experiment where subjects were purposely chosen for their high degree of fear of snakes.

I have restricted myself here to cases where the prophet's expectations have to do with his own behavior and the consequences for his person which follow directly therefrom. "Achievement" situations where a person expects to "succeed" or "fail" and ends up doing so are perhaps the most obvious examples of this case, but there are of course many others. Cases where the prophet holds expectations for the behavior of persons other than himself are more complicated because at least two individuals' behavior is involved. The application of the self-fulfilling prophecy principle is the same, however: the prophet's prophecy is assumed to change his own behavior, and the change in his own behavior is assumed to change that of the object of the prophecy. For discussion and data pertaining to this latter type see Rosenthal (1966), Rosenthal and Jacobson (1968), Meichenbaum, Bowers and Ross (1969), and Farina, Allen and Saul (1968).

It would appear to be important to explain self-fulfilling prophecy situations so that their harmful effects can be arrested and their beneficial aspects exploited. In spite of the importance of the issue, however, few explanations for self-fulfilling prophecy have been advanced, and existing explanations have been poorly developed. My attempt to deal with the problem will begin with a review of existing explanations. Given their poor development I will try to fill in some gaps as I proceed with the description; I trust this will not lead to serious misrepresentation of theoretical positions. Clarification of existing explanations may stimulate the introduction of new ones, and eventually judgments can be made about the relative utility of different explanations.

FULFILLMENT PROCESSES

The description of explanations for self-fulfilling prophecy will begin with a brief overview. The explanations will then be described in more detail and evaluated in terms of the evidence for their validity.

One common-sense explanation for self-fulfilling prophecy is that the expectation of events with punitive consequences leads the prophet to worry about these consequences to such an extent that he neglects to take appropriate steps to prevent the occurrence of the event itself.

This process, long presumed to occur in classroom situations, might be referred to as one of anxiety distraction. Yet, this process is really not very simple, because, as will be shown, little is actually known about it. A related explanation is that when the prophesied event would lower the prophet's evaluation of his own worth, as when failure is anticipated in an achievement situation, the prophet takes immediate steps (usually unconsciously) to change his own perceptions of the event so that it will be less threatening if it occurs. He might, for instance, not try very hard so that he can later assure himself that his failure could have been avoided if he had cared enough about success to have striven for it. Actions such as these are often self-defeating, however, for while they may indeed help the prophet defend himself against the threatening implications of failure, they may also increase the probability that the event itself will occur. This explanation might be labeled one of defensive effort, since it is the prophet's allocation of effort to defend his ego at the expense of effort to avoid the actual event which is assumed to fulfill the prophecy.

Several explanations besides that of defensive effort are based upon an assumption that certain psychological states associated with prophecy situations are more uncomfortable than the event itself. One such explanation can be labeled anxiety reduction. Here it is assumed that the prophet of "negative" events will prefer the occurrence of the event itself to the state of anxious anticipation prior to the event. Such a prophet is expected to act quickly and impulsively to reduce his anxiety, and the hastiness of his act is assumed to bring about the feared result. Another explanation of this type, dissonance reduction, assumes that a prophet will actually and purposely (although again perhaps unconsciously) bring about a negative event if he expects it to occur. It is sometimes simply assumed that the prophet will do so to avoid tension associated with a disharmonious fit or bad "gestalt" between his prophecy and his perceptions of the actual event. At other times it is assumed that prophesied events will be sought when the occurrence of these events would justify in the prophet's mind actions he has undertaken because of or with knowledge of the prophecy, but which for one reason or another appear to him to have been unjustified. If a prophet of doom has expended a great deal of effort

preparing for an event, for example, new knowledge that the event will not occur after all may be so disconcerting that he will bring the event about himself.

In the above explanations the cognitive content of prophecies plays an important role. It is assumed to distract the prophet from the task at hand, threaten his ego, arouse anxiety, or provide an anchor for cognitive "set," and it is these content-induced processes which are assumed to lead to prophecy fulfillment. In several other theoretical orientations providing potential explanations for self-fulfilling prophecy, little or no causal significance is currently attributed to the content of prophecies. For example, although the fearful anticipation of negative events is often assumed to be a defining characteristic of anxiety, in Hull-Spence learning theory "arousal" or "drive" is assumed to be the causally significant component. If prophecies of negative events are assumed to increase arousal more than prophecies of positive events and arousal is assumed to disrupt behavior, one has a potentially useful explanation for self-fulfilling prophecy. In Hull-Spency theory arousal is not always expected to disrupt behavior. Under some conditions it is even assumed to facilitate performance. Since arousal is assumed to energize initially stronger or "dominant" responses at the expense of initially weaker responses, whether performance will be impaired or facilitated by increased arousal depends upon the relative strengths of habits related to task-relevant and task-irrelevant responses. If a person is just learning a task or it is a very complex one, an increase in arousal will increase task-irrelevant responses at the expense of task-relevant responses; if the task is well learned or simple, an increase in arousal will facilitate task-relevant responses and improve performance. This adaptation of Hull-Spence theory to self-fulfilling prophecy can be referred to as the <u>energizing arousal</u> explanation.

Finally, in some explanations of self-fulfilling prophecy based upon personality differences, only persons of certain personality types are assumed to fulfill prophecies; in other explanations of this type some personalities are assumed to be more likely than others to fulfill prophecies.

Dissonance Reduction

Perhaps the most startling self-fulfilling prophecy effect is that obtained by Aronson and Carlsmith (1962). As a measure of their "social sensitivity," subjects decided which of three persons depicted in photographs was schizophrenic. Actually, none of the three persons was. Using false feedback for the first four trial blocks the experimenter led subjects to believe that they had either performed very well or very poorly. On the fifth trial block, however, half of them received information that contradicted the prophecies established by the earlier feedback. The experimenter then repeated the fifth trial block on the ruse that he had neglected to time subjects' performances. It was found that subjects given feedback on the fifth trial block discrepant from their prophecies changed their choices more than subjects given consistent feedback. For subjects who had expected to fail but found themselves succeeding on the fifth trial block this entailed changing choices which had brought success to those which subjects would supposedly perceive as leading to failure. Aronson and Carlsmith assumed that subjects preferred actual failure to a bad fit between prophecies and performance.

Unfortunately, this interesting and novel effect has been difficult to replicate. Despite two replications (Brock et al., 1966) and a partial replication (Cottrell, 1965), there are no less than ten failures to replicate (Beijk, 1966; Conlon, 1965; Cottrell, 1967; Frentzel, 1965; Jones, 1968; Kornreich, 1968; Lowin & Epstein, 1965; Moran & Klockars, 1967; Silverman & Marcantonio, 1965; Zajonc & Brickman, 1968). Nor has there been encouraging support for related predictions derived from dissonance theory. The effect has been decreased by decreasing the number of prophecy-establishing trials (Brock et al., 1966), for instance, but the converse has not been observed by increasing the number of trials (Brock et al., 1966) or including general self-esteem (Beijk, 1966; Conlon, 1965). Similarly, there is equivocal support for the prediction that any feedback should aid subjects in their attempts to be consistent. In an experiment with a reaction time task, for example, Zajonc and Brickman (1968) found that subjects who expected to fail and were given feedback were subsequently less likely to improve than subjects who expected to succeed

and were given feedback. The former subjects were also more likely to improve than subjects who expected to fail and were not given feedback. Finally, Brickman (1968) was unable to find very much support for his suggestion that subjects may begin an extended search for information that will refute the discrepant feedback rather than reduce dissonance immediately by changing their performance.

Attempts to claim less strength for the dissonance effect relative to other effects have been no more successful. Bramel (1968) has suggested, for example, that subjects' desire to succeed works against their expectations of failure, so that most changes should be observed in the expectancy of success-failure feedback condition, and changes in the two expectancy-of-failure conditions should be equal if it is assumed that the two tendencies are of equal strength. A careful examination of fifteen experiments reveals, however, that both predictions are supported in only two experiments (Beijk, 1966; Jones, 1968), at least one prediction is supported in seven (Aronson & Carlsmith, 1962; two by Brock et al., 1966; Cottrell, 1965; Cottrell, 1967; two by Lowin & Epstein, 1965), and neither is supported in six (four by Brock et al., 1966; Moran & Klockars, 1967; Zajonc & Brickman, 1969).[3]

The above results throw serious doubt on the dissonance explanation, but Aronson and Carlsmith's results have been replicated on at least two occasions. Why they should appear on these three occasions and not on the many others is still a mystery. Some investigators have suggested that perhaps through stress on the validity of the social sensitivity test or some such cue Aronson and Carlsmith let their subjects know that they wanted performance to match prophecies. But an attempt by Silverman and Marcantonio (1965) to show that Aronson and Carlsmith's results are restricted to conditions where the validity of the test is stressed failed. Furthermore, other studies have shown that the number of choices changed in the Aronson and Carlsmith situation is not related to the importance for the research project subjects attribute to their scores (Cottrell, 1965), to the amount of stress the experimenter puts on changes (Frentzel, 1965), or to the degree of interest subjects supposedly have in pleasing the experimenter (i.e. Frentzel compared volunteer with non-volunteer subjects).

Some day these discrepancies might be explained, but in the meantime I do not think that so much stress should be put on the importance of the Aronson and Carlsmith design for testing dissonance theory's applicability to self-fulfilling prophecy. The design applies only to situations where the prophet receives feedback about his performance while that performance is in progress. More importantly, however, if learning that one has succeeded when one expected to fail produces dissonance, which has yet to be adequately demonstrated, it is not clear why one should prefer changing one's performance to changing one's expectations. In fact, one might find it difficult to justify such a preference, even to oneself. My own feeling is that dissonance theory is most applicable to self-fulfilling prophecy phenomena when the prophet has taken effortful or otherwise distasteful actions because of or in spite of the prophecy, but otherwise with little justification. Since the occurrence of the prophesied event is one of the few means the prophet has to justify his actions under these conditions, dissonance theory more clearly predicts that he should seek out the event. Fortunately there has already been some research on the effects of these conditions. A description of this research may clarify the above claim.

A possible example of unjustified action taken because of a prophecy is found in a study by Aronson, Carlsmith, and Darley (1963). Here subjects had to judge the relative bitterness of two solutions of quinine sulfate and the relative heaviness of two plastic drinking cups filled with lead. After being led to believe that they would have to repeat one but not both of these tasks so that a reliability check could be made, half of the subjects waited twenty minutes and half waited seven minutes before repeating the task. Aronson et al. assumed that the longer waiting period increased the strength of subjects' expectations. An equally reasonable assumption, however, is that these subjects worried longer about the more unpleasant event. If this is so they would have had more at stake in the occurrence of the actual event, for the occurrence of the event would be one of the few cognitions by which the subject could justify his longer, self-inflicted suffering. In the Aronson et al. study subjects were given a clear opportunity to indicate their desire for the occurrence of the

event. On the pretext that the experimenter had forgotten that preliminary results showed that it did not matter whether or not tasks were randomly selected for the reliability check, subjects were allowed to choose the task they would repeat. While most subjects preferred the neutral weight-lifting task, those who waited to repeat the task for twenty minutes, and who, it is argued here, may have suffered more, were significantly more likely to choose the unpleasant tasking task than were those who waited only seven minutes, and who may have suffered less. Subjects may have justified previously unjustified actions taken because of a prophecy by bringing about the event itself.

The above process would fit the definition of self-fulfilling prophecy very well. Of course, the results of this experiment are only suggestive. There are too many untested assumptions for it to be regarded as an adequate test of the above reasoning. There is no direct evidence that subjects suffered. On the other hand, there is some evidence suggesting that a clear prophecy by itself may provide enough justification in such situations to prevent the arousal and reduction of dissonance by other means (Watts, 1966). It is also not clear that Aronson et al.'s results are replicable, since the one attempt thus far was unsuccessful (Goldberg, 1965). Nevertheless, other findings indicate that the matter deserves more study. In the well-known study When Prophecy Fails (Festinger et al., 1956), for example, a group prophesying the end of the world took many clear, visible actions because of their prophecy. They made proclamations to the press, sold all of their belongings, and engaged in other effortful actions which must have made them very uncomfortable when it became clear that the event was not going to occur. Fortunately for the rest of us the prophets were unable to make it occur by their own actions. The vigor with which they increased their proselytizing after the event did not occur, however, suggests that they might well have brought it about if it had been within their power.

Another study can be interpreted as illustrating the self-fulfilling prophecy effects of undertaking effortful or distasteful actions in spite of a prophecy which implied that such actions would be unjustified. Cohen and Zimbardo (1962) aroused subjects' desires to perform well on the experimental task but while subjects attempted to discuss a memorized poem, their voices were distorted by a delayed

auditory feedback device to such an extent that successful discussion was impossible. Half of the subjects were then told that they had a moderate chance of doing well if they continued with the task, while the other half were told that they had a poor chance of doing well. All subjects were then given the choice of continuing or not continuing with this same task. If a subject chose to continue the task in spite of knowing that he was likely to fail, it is argued that he should experience dissonance, since there was little justification for his choice. Subjects who expected to do poorest but still chose to continue should experience the most dissonance, since they had the least justification for their action. Cohen and Zimbardo reasoned that a salient way for subjects to acquire justification for their action would be to reinterpret the experience of failure when it occurred; that is, subjects could reduce their dissonance if they could convince themselves that failure "wasn't that bad after all." At this point in the experiment, Cohen and Zimbardo permitted subjects to set the distortion level for themselves, so that the only way subjects could make their face-saving interpretations was to make the dreaded event itself occur. The results of the experiment lend some support to this complicated reasoning: subjects who chose to continue the task thinking that they had a poor chance of doing well were significantly more likely to leave the distortion at its previous level than were subjects who chose to continue the task thinking that they had a better chance of succeeding. In other words, the former subjects were more likely to act in a way that virtually assured failure.

In the previously mentioned study by Aronson et al. it is not clear that subjects actually suffered because of their expectations. In the Cohen and Zimbardo study the respective element of the presumed chain of events is clearer: subjects chose to continue in spite of knowing that they were likely to fail. Unlike the Aronson et al. study, however, the Cohen and Zimbardo study raises serious questions about the meaning for subjects of the actions which brought about failure. Did subjects who left the distortion at its previous level want to fail so they could reinterpret their feelings about it and justify their having continued with the task, or did they perhaps hope to blame the

experimenter or an implied high level of aspiration for the failure they anticipated? Even more problematic for the particular application of dissonance theory to self-fulfilling prophecy made here is the possibility, suggested by Zimbardo (1969), that high dissonance subjects simply accepted the previously unconquered level as a challenge where success would allow them to redeem themselves. While accepting the challenge might still constitute self-fulfilling prophecy since the likelihood of failure is increased, its relationship to dissonance theory is unclear. Further research with less equivocal performance measures is needed.[4]

Defensive Effort

The immediate stimulus for this explanation of the self-fulfilling effects of prophecies seems to lie with the generalization, well established in the "level of aspiration" literature, that a person is more likely to state extremely high or low goals after failure than after success (Atkinson, 1958; Cohen, 1954; Frank, 1941; Lewin et al., 1944; Mahone, 1960; Sears, 1941). From discussions of the meaning of these goal changes (Frank, 1941; Holt, 1946; Sears, 1941) the impression is left that they are not assumed to represent subjects' true expectations for future performances. Rather, they are assumed to serve ego-defensive purposes of the performer who has failed. By stating extremely high goals, for instance, he can convince himself (and perhaps others) that he uses more stringent criteria for success than do others, and attribute blame for the appearance of failure to his own high standards rather than a faulty performance. If he states extremely low goals, on the other hand, he assures himself of some degree of apparent success.

Although it could easily be assumed from this literature that these extreme goal settings neither significantly affect nor mirror changes in performance, it is important to note that these goal settings could indeed affect the degree of success subjects achieve. When a subject who expects to fail has to choose among tasks of high, moderate or low difficulty, for instance, the choice of a very difficult one to protect his ego increases his chances of failing by any criteria, and personally defined success at a very easy task will be a shallow victory if most other persons look down on it. Other effects of goal setting on self-fulfilling prophecy will be discussed below.

It appears that most theorists of ego-defensiveness attribute most variation in performance to differences in effort. The implication is that when failure is expected decreases in effort help the prophet rationalize the outcome in the same way that goal setting does. The prophet can, in other words, later claim, "I could have done better if I had really tried." This is apparently the interpretation early ego-defensive theorists made. William James (1890), for instance, remarked that "with no attempt there can be no failure; with no failure no humiliation." Freud (1926, p. 55) also attributed these defensive purposes to decreases in effort.[5] Unlike goal setting, of course, decreases in effort should supposedly directly increase the likelihood of failure. If one can assume the latter, the key to the utility of the defensive effort explanation would seem to be the validity of the proposition that decreases in effort to achieve a positive outcome follow the expectation of a negative one.

Diggory, Klein, and Cohen (1964) tested this proposition by attempting to get a direct measure of effort. They electronically measured subjects' "muscle action potential," a concept previously found to relate to energy expenditure but not necessarily to subjects' effectiveness or efficiency as a performer on motor tasks. (See Diggory, 1966, p. 215.) In their experiment subjects performed a digit symbol task with an initial level of aspiration imposed by the experimenter. After each trial subjects received either false success or failure feedback in either a positively or negatively accelerated sequence. They then estimated their chances of succeeding on the next trial. Feedback affected expectations as predicted, and muscle action potential was significantly higher for subjects in the two success conditions than for subjects in the two failure conditions during both performance and rest periods.

There is thus some support for the proposition. Additional evidence can be found in studies using more conventional measures of effort. In two studies by Feather (1961, 1963) subjects were led by fictitious norms to expect either success or failure on a "perceptual reasoning test," a mazelike task which involved tracing the lines of diagrams without raising one's pencil or tracing any line twice. Since the problems were actually insoluble, effort could be measured independently

of actual success. The measures of effort were the number of trials subjects requested for each item and the total amount of time spent on that item. In the first study (1961) subjects could go on to the next item after attempting the previous item once, but they were given no new information about the particular difficulty of the next item. Under these conditions subjects who expected to fail did not show significantly less effort than subjects who expected to succeed. This occurred in the second study (1963), however, where the next item was expected to be moderately difficult.

Two other studies under Diggory's direction provide information about other defensive strategies as well as effort manipulation. As with the Feather studies, results are not always consistent with the prophecy-effort proposition. They are, on the other hand, generally supportive.

In the first of these studies Rosen (1961; see Diggory, 1966, for more complete information) led his subjects to believe that they had a good, fifty-fifty, or poor chance of succeeding at neutrally or highly attractive occupations; these expectations were created by false feedback from an aptitude test. Effort was measured in several ways: by whether or not subjects signed up to return for a "special acceleration program" reputed to be capable of helping them "achieve their vocational goals in a shorter time than was then possible," by how many digit-symbol problems they completed after these problems were described as being part of the special program, and by whether or not subjects intended to return for further information about their test results. The prophecy-effort proposition is clearly supported in the results on the first measure of effort for both positive and neutral occupations: subjects expecting success were most likely to choose the acceleration program, those expecting failure were least likely, and the fifty-fifty group fell between the other two. This was not the case on the problem completion measure, however, where the fifty-fifty group not only completed slightly more problems than the other two groups, but actually performed significantly better. On the return-for-information measure the fifty-fifty and failure groups were less likely to return when the occupation was neutral, but <u>more</u> likely to return when the occupation was highly attractive. Rosen interprets the latter finding

as a dissonance effect. These matters need more research. But one can at least note that Rosen's situation did provoke defensive strategies since with increasing chances of failure, in addition to trying less at the acceleration program, subjects were more likely to devalue the occupations and express disbelief in prior prophecies.

A related study by Cetlin (1964; also more fully described in Diggory, 1966) was also conducted in the context of vocational choice. The task, reproducing complex auditory rhythmic patterns on a telegraph key, was described as a preliminary test for a specific career program. The problems were actually insoluble, but fictitious norms led some subjects to believe they had a reasonably good chance of succeeding and others that they would fail early in the test. A third group of subjects received failure norms only after they had attempted eight of ten trials at a problem. After attempting each trial, subjects could choose to discontinue the test and, if they chose to discontinue, to begin a different test for a different career. Subjects who expected failure early were much more likely than either those who expected success or those who expected failure late to give up and begin another test. Supporting a defensive effort interpretation of these results is the additional finding that subjects who expected to fail were more likely to devalue the ability allegedly measured by the test.

There is thus considerable support for the defensive effort proposition, although there are contradictions in the above results which warrant further attention. It is also important to investigate the relationship between effort manipulation and other defensive strategies, since other strategies may substitute for effort manipulation and hence lessen the likelihood of self-fulfilling prophecy. The few relevant results in the above studies are negative on this point. If different strategies are substitutable, for instance, one would expect subjects in the Cetlin experiment who persisted in spite of expecting to fail to make more use of opportunities to request practice and task alterations, and to be more likely to devalue the ability being tested, but this was not the case.

Anxiety Distraction

It is interesting that the most popular explanation for self-fulfilling prophecy, that persons who expect to fail "clutch" or worry about the event until their worrying distracts them from avoiding it, has received so little attention in empirical research.

Of those studies using related theoretical approaches, only one of direct relevance to self-fulfilling prophecy was located. This study is based on work of Mandler and Watson (1966), who suggest that the anticipation of failure is most likely to disrupt performance when it cannot be incorporated into cognitively planned sequences which structure alternative means-goals routes and ego defenses. Specifically, anticipated failure will be disruptive when its position of occurrence in the sequence is unknown, since at these times alternative routes to success and ego defenses will not be readily available when failure occurs or seems imminent. At these times the person will turn to the most reliable aspect of his thinking, his cognitive plan, only to find himself returning again and again to thoughts of failure instead of substitute paths which would allow him to complete the plan to success. The latter process is clearly an attempt to describe the "obsessive," distracting ruminations implied in informal, commonsense descriptions of the anxiety-distraction explanation for self-fulfilling prophecy.

Mandler and Watson demonstrate the utility of this computer analogy in an ingenious experiment. Subjects were told that they would probably not finish (and hence fail) one of two intelligence tests which were actually equivalent forms of the same test. Half of the subjects were permitted to choose the order in which they would take the two tests, however, while the other half were not given this choice. As predicted, those who could not control the order in which they took the tests did more poorly on both. These findings are very important for the study of self-fulfilling prophecy because they suggest conditions under which it will and will not occur.

Psychologists of a less cognitive persuasion than Mandler and Watson have proposed ideas related to the anxiety-distraction approach to self-fulfilling prophecy, but these ideas have not been applied specifically to the phenomenon. I speak here of such concepts as "interfering responses," "task-irrelevant responses," and "response

competition" associated with the theorizing of the Spences (1966) and others. It has been suggested, for instance, that the arousal of anxiety in threatening situations elicits, because of past conditioning, task-irrelevant responses such as "covert verbalizations reflecting self-depreciation" (Spence & Spence, 1966, p. 308) which compete and interfere with task-relevant responses. The implication is that the interference is mainly one of blocking among motoric responses which may or may not have cognitive components. At the present time, however, there is little direct evidence that prophecies are sufficient conditions to elicit anxiety and task-irrelevant responses although this might be the case. Nor is there direct evidence that such responses increase the likelihood of failure although this too might be the case. Some indirect evidence will be presented in the discussion of personality variables which might affect self-fulfilling prophecy. Certainly this approach deserves more study, particularly since it differs so much in flavor from the Mandler and Watson approach, and may be both simpler in structure and of wider applicability.

Energizing Arousal

As noted earlier, in Hull-Spence theory, drive or arousal is expected to impair performance when task-irrelevant responses are dominant but facilitate performance when task-relevant responses are dominant. If arousal increases with increasing expectations of failure and task-irrelevant responses are dominant in learning stages of a task, on complex tasks, and in persons of low ability, then sulf-fulfilling prophecy should occur under these conditions. On the other hand, if expectations of failure increase arousal but task-relevant responses are dominant, as in performance stages of a task, simple tasks, and in persons of high ability, actual performance should vary inversely with expectations for performance. By allowing one to specify when self-fulfilling prophecy will and will not occur, Hull-Spence theory could provide an important contribution. What is needed at this point is evidence that (1) arousal increases with increasing expectations of negative events, and (2) that arousal has the predicted conditional effects on behavior.

Unfortunately, most studies relevant to the first issue use the

anticipation of events with physically painful consequences; under these conditions the presence of high levels of arousal comes as no surprise. What is interesting, however, is the frequent finding that the anticipation of the event is as arousing as or even more so than the event itself. Thus, for example, Brandt and Fenz (1969) found that the anticipation of a second electric shock kept subjects' arousal levels above those for baseline and milder stress periods. Another experiment was specifically designed to test the hypothesis that anticipation of an event would be more arousing that the event itself. Here Nomikos et al. (1968) had subjects watch either a version of a film where they witnessed several wood-mill accidents without warning, or a version where warning cues preceded the accidents by almost half a minute. Results indicated that arousal as measured by both heart rate and skin conductance was higher for the warned than the unwarned group, and there was more arousal during periods of anticipation than during the viewing of the accidents themselves.

There are many studies which investigate arousal as it is affected by milder kinds of psychological stress. In many cases, however, the specific instructions to subjects are not given in written descriptions of the study, and in many others the stress stimulus simply involves telling subjects that they are in an important achievement situation where their performances will reflect their ability. In these cases it does not seem appropriate to assume that failure prophecies were necessarily created among subjects in high stress conditions. A few studies are more relevant, however. In high stress conditions in a study by Rosenstein (1960), the experimenter went beyond the usual "ego-involving" instructions described above to mention that some of the previous subjects at the university in question must have been "eight-balls" (something akin to "real losers") because their performances had been so much poorer than those of subjects from two more prestigious universities. Introducing this information at the very beginning, in the middle, or at the end of a serial learning task increased arousal on a palmar sweat measure significantly more than in a low stress condition. The results of a second study parallel those of the physical harm studies just described. Here Marlett and Watson (1968) had high school students solve alleged "intelligence test"

problems which involved finding a correct sequence of button pushings. If they found the correct sequence a failure buzzer would not sound and they would go on to the next problem. Actually, all subjects were given twelve continuous failure trials. For half of the subjects the failure buzzer sounded immediately after they had given their answer, while for the other half there was a fifteen second delay. It seems reasonable to assume that the latter subjects spent the extra time anticipating future failure. Arousal as measured by palmar sweating increased significantly more from before the test to after the twelfth trial in the delay than in the no-delay condition.

Although the results of the above studies indicate that arousal does indeed increase with the acquisition of a prophecy of negative events, they are by no means conclusive for showing the relevance of Hull-Spence theory for self-fulfilling prophecy. In the first place, none of them include conditions where negative events are moderately probable, but it is possible that such conditions would be most rather than intermediately arousing. In a study by Epstein and Roupenian (1970), the only one thus far specifically to investigate this possibility, the results are equivocal. Epstein and Roupenian's results do more than raise a complicated spector around the issue of uncertainty, however, for on both measures of arousal the <u>low</u> expectancy group was most <u>highly</u> aroused. The authors suggest that the high expectancy group may have defensively reduced arousal because the shock was unavoidable. If this in fact occurs frequently it would limit the applicability of Hull-Spence theory to self-fulfilling prophecy. While such manipulations of arousal might not occur in achievement-failure situations because failure is seen as avoidable, there is currently no empirical evidence one way or the other.

The second issue surrounding the prophecy-arousal relationship is whether or not arousal differences produced by prophecy differences, particularly in achievement situations, are large enought to affect performance. In Rosenstein's experiment there were no between-group performance differences; in the Marlett and Watson experiment there were differences between the delay and no-delay condition in response latency, the only performance measure used. As noted earlier, few Hull-Spence adherents have included prophecies in their situational

stress manipulations, but in their literature there are references to early studies where situational stress manipulations did not affect performance (see Spence & Spence, 1966). This may have been one of the reasons for the subsequent use of only subjects scoring very high or very low in "manifest anxiety." On this measure, potential subjects describe, among other things, how aroused they usually are in achievement and other potentially threatening situations. The decision to adopt this procedure may have been too hasty, however, since the situational stress manipulations appear to have been very weak. In many cases subjects were simply told that their performance would reflect their ability. For this reason the question of the significance of prophecy-induced arousal differences is by no means answered.

If these issues were resolved in favor of the prophecy-arousal proposition, the question of the validity of the Hull-Spence hypothesis linking arousal and performance would remain. Of the studies discussed thus far, Rosenstein's contains differences in arousal but not performance; Marlett and Watson's contains both, but results are difficult to interpret in Hull-Spence terms because there were no a priori measures of the strength of task-relevant and -irrelevant responses. The anticipation-of-pain studies did not include performance measures.

Most of the evidence supporting the Hull-Spence hypothesis, and there is a great deal[6], is contained in studies where there are no measures of situational arousal. In these studies subjects differing in manifest anxiety are assumed to be differentially aroused in the experimental situations. To date there is very little direct support for this assumption (Krause, 1961; Marlett & Watson, 1968; Martin, 1961; Rosenstein, 1960; Scott & Kessler, 1969). The Spences have countered this criticism (1966, p. 298) by claiming that the drive construct was never intended to be synonymous with physiological arousal. Our purpose here is not to get embroiled in this debate. It seems clear, however, that if energizing arousal processes are to explain most instances of self-fulfilling prophecy, some measures of situational arousal independent of its hypothesized effects on performance should be developed.

Anxiety Reduction

In his insightful analysis of How Children Fail John Holt (1966) describes "answer grabbers":

> It used to puzzle me that students who made the most mistakes and got the worst marks were so often the first ones to hand in their papers (p. 41);

and offers an explanation for their behavior:

> One thing I have discovered is that there is a peculiar kind of relief, a lessening of tension, when you make a mistake. For when you make one, you no longer have to worry about whether you are going to make one. (p. 40)

Several things are implied in Holt's description. One is that impulsive actions will be taken to reduce anxiety when failure is expected. Another is that these actions will lead to actual failure. Here there are gaps which need filling, since it is not clear why this would be so. Holt seems to imply that the prophet assumes his impulsive action will constitute a "mistake" and that the prophet may even purposely take the action in order to have the mistake occur sooner. This may or may not be the case, but whether or not the prophet thinks his action will constitute a mistake and/or wants it to, it is not clear why it would necessarily be one. Perhaps the Hull-Spence task conditions are needed here; that is, impulsivity of response may be particularly likely to lead to failure when the task is unfamiliar and/or difficult. A final issue raised by Holt's analysis has to do with his implication that the main concern of the prophet may be to reduce anxiety arising from "worry about whether or not you are going to make [a mistake]" or uncertainty. Uncertain failure may produce more anxiety than certain failure, but it is not clear that certain failure would be no more arousing than certain success. In fact, from the discussion of the Hull-Spence approach we know that this is often not the case. Should uncertainty prove to be the sole source of anxiety, and should impulsivity and failure increase directly with the amount of anxiety produced, then the criteria for defining the phenomenon as self-fulfilling prophecy would be violated.

Given the theoretical ambiguities associated with this explanation, it is not surprising that few of its propositions have been systematically tested. There are, nevertheless, a number of studies with

relevant information.

Results in the few studies relating prophecies to impulsivity through decision time are contradictory. In the previously mentioned study by Marlett and Watson, decision time was longer in the delay condition, where subjects were supposedly anxiously awaiting failure. But two other studies contain supportive results. Baldwin and Levin (1958) had grade school children find and identify all occurrences of the letter "a" in a continuous story and perform a pegboard task. They then told half of the subjects that they had succeeded and half that they had failed. Assuming that this feedback created commensurate expectations for future trials, the fact that failure increased speed of responding on both tasks supports the hypothesis. In the second study Lotsof (1958) gave subjects one of three types of false feedback about performance on early stages of a task where they had to predict the sequence in which two lights would be flashed, the feedback being information that subjects had succeeded 75, 50, or 25 per cent of the time. As the anxiety-reduction approach would predict, subjects who most expected failure took less time to guess the light sequence on later trials. The 50 per cent group fell between the other two, but was not significantly different from either.

There is less information about the effects of impulsivity on the quality of performance. In the Baldwin and Levin study the greater increases in speed in the failure condition were accompanied by decreases in accuracy. Research is needed here. It would be helpful to have measures of expectancies as well as decision time and quality of performance within the same design. It would also be interesting to investigate Holt's claim that a negative event may be deliberately sought out to reduce anxiety. Even now there is some very indirect but nevertheless suggestive support for the claim. In a study by Walster, Aronson, and Brown (1966), one group of subjects was led to anticipate eating pleasant foods, another was led to anticipate eating unpleasant foods, and a third group was not told which food would be eaten. Subjects were then given electric shock during a waiting period, but they could choose the amount of shock they received. Much to the surprise of the investigators, those subjects who expected to eat unpleasant foods gave themselves more shock than subjects in either

of the other two groups. This finding was subsequently replicated by Rosekrans (1967). Technically this finding does not represent self-fulfilling prophecy, since the event brought about is not the same event which was prophesied. Had subjects been allowed to choose from among the foods instead of different levels of shock, however, one suspects from the results which occurred in the Walster et al. study that subjects expecting unpleasant foods would have been more likely to have chosen to eat unpleasant foods. Of course in the absence of measures of anxiety these findings cannot be explained by invoking the anxiety reduction process, but the latter is at least a highly plausible explanation for the results.

There is little evidence by which to evaluate the claim that uncertainty rather than the mere expectation of negative events is the source of anxiety and anxiety-reducing behavior in these situations. The results of the two relevant studies mentioned here are negative: decision time was not shorter in the 50 per cent expectancy group than in the high and low expectancy group in the Lotsof study, nor did subjects unsure of which foods they would eat administer more shock to themselves than other subjects in the experiment by Walster et al. One should not conclude, though, that uncertainty is unimportant in these types of situations. In an experiment by Belanger and Sattler (1967), for instance, subjects could choose to perform one of two tasks. If they chose one there was an 80 per cent chance that they would receive electric shock; if they chose the other there was only a 50 per cent chance of receiving shock. Subjects in this study preferred the relative certainty over the uncertain, even if the certainty was a shock. The issue of the relative importance of uncertain versus certain negative events clearly deserves more attention.

Personality Differences

There are at least two ways in which personality variables could affect self-fulfilling prophecy. In the first instance, certain types of persons may be more predisposed than others to make or accept particular prophecies for themselves, so that self-fulfilling prophecy may occur naturally and more frequently in them than in others. The translation of these prophecies into behavior may or may not come about through the previously mentioned processes. Second, whether or not

certain personality types are predisposed to make different prophecies, personality variables may moderate or mediate the processes which translate prophecies into behavior. In other words, prophecy-fulfilling processes may occur more often in persons of different types, or, more importantly, the processes prophecies elicit may differ in persons of different types to the point that self-fulfilling prophecy occurs in some types but not in others.

With regard to the natural occurrence of different prophecies, it is likely that persons who generally have a low opinion of themselves (i.e. are "low in self-esteem"), who are generally anxious (i.e. are "high in manifest anxiety"), and/or who generally believe that events and their consequences are not under one's own control (i.e. "belief in external control of reinforcement") are more likely than others to anticipate failure and other negative events. In the cases of self-esteem (Wylie, 1961) and internal-external control of reinforcement (Rotter, 1966), the prediction of one's future or "self-confidence" is an implicit part of the very definition of the dimensions. This is not true of manifest anxiety (Spence & Spence, 1966), but here as with the other two, prophecies are explicitly referred to in empirical measures of the concept.[7] Since persons of these types are often found to be more likely than their opposite types to fail in achievement situations (see Korman, 1968, McGee & Crandall, 1968 and Lott & Lott, 1968, for self-esteem, internal-external control, and manifest anxiety, respectively), it is tempting to conclude that self-fulfilling prophecy occurs naturally more often in persons of these types. These persons may simply be accurately describing what usually happens to them, however, and their prophecies may have no causal significance whatsoever for their behavior. Controlling intelligence in such studies is an important methodological advance (e.g. Battle, 1965, 1966), but it is necessary to isolate potential prophecy fulfilling processes before self-fulfilling prophecy can be inferred.

There are some very interesting phenomena waiting to be explained in studies of naturally occurring prophecies. In a study by Battle (1966), high school students "who were above average IQ, but had low levels of expectancy, performed <u>significantly more poorly</u> [on a motor task] than those who had a high expectancy and were of below-average

IQ" (p. 641). It is hoped that we will soon understand such phenomena; in the meantime there is information about the effects of personality variables on fulfillment processes to examine.

Little has to do with dissonance reduction. We might expect, for example, that subjects high in "achievement motivation" (Atkinson, 1958) would experience more dissonance after choosing to continue a task where they were likely to fail. The only study to examine this hypothesis (Schlachet, 1965), however, contains conflicting results. We might also expect persons low in self-esteem to be less aroused by such manipulations, since taking unjustified action would be consistent with such persons' view of themselves. This hypothesis has not been tested in prophecy situations, but supportive results in other insufficient justification situations (Glass, 1964) suggest that it would be an important factor in such situations.

Personality variables have proved to be important mediators of defensive effort fulfillment processes. In the two experiments by Feather (1961, 1963) described above, manipulated expectations were not consistently related to effort. In both studies, however, an interaction effect between personality and situational variables appeared. The personality variables were "motive to achieve success" (high achievement motivation and low test anxiety) and "motive to avoid failure" (low achievement motivation and high test anxiety). Subjects in whom the motive to achieve success was stronger than the motive to avoid failure showed defensive effort effects, in that they reacted to decreasing expectations for success by decreasing effort. Subjects in whom the motive to avoid failure was stronger than the motive to achieve success did just the opposite, however; they increased their efforts with decreasing expectations for success. If increases in effort increase actual chances for success, the latter would be less likely than the former to show self-fulfilling prophecy. Feather's findings are interesting because they go beyond traditional ego defensive theory, since persons who most fear failure should be most prone to defend themselves by decreasing effort when failure is expected. This is what such a theory would predict for subjects low in self-esteem (see Dittes, 1959, for an example of this theorizing), who are also likely to be high in test and manifest anxiety (Sarason &

Koenig, 1965; Winkler & Myers, 1963), one of the components of the motive to avoid failure. Rotter would also expect persons high in external control to be more likely than those high in internal control to give up when failure is expected, since the former are assumed generally to defend themselves by externalizing responsibility rather than by preventing failure.[8] There is one study where such persons were found to persist less at problem-solving (McGee & Crandall, 1968), but in another this did not occur, nor were there interaction effects between control of reinforcement and situationally manipulated prophecies (Feather, 1968).

A number of findings suggest that anxiety-distraction processes are also affected by personality differences. In Mandler and Watson's study of control over the sequence of failure experiences (see p. 20), subjects high in test anxiety were more likely to report having worried about how well or poorly they and others had done during the testing, and they were also more likely to actually do poorly. Highly anxious subjects also do more poorly when task-irrelevant, ego-threatening information is deliberately introduced into achievement situations (Iverson & Reuder, 1956; Resnick, 1965; Scharf, 1964; Spence & Spence, 1966), and experimentally induced expectations of failure seem to fit this category. For self-esteem the results of one study (Schalon, 1968) show subjects low in self-esteem to perform more poorly than those high in self-esteem after failure experiences, but those in another (Silverman, 1964) contain opposite results. Silverman's study is particularly relevant to distraction processes because false success or failure feedback was introduced while subjects were exposed to the correct answers for a test of knowledge of current affairs. Thus relevant and irrelevant pieces of information were clearly competing simultaneously for subjects' attention. The dependent performance measure was improvement in performance from the first to a second, post-manipulation testing. An improvement in performance would then indicate the degree to which subjects attended to the correct answers rather than the performance feedback. Not only was the performance of high self-esteem subjects <u>more</u> impaired by failure feedback than the performance of low self-esteem subjects, but the performance of low self-esteem subjects was more impaired by success feedback than was the

performance of high self-esteem subjects. Silverman interprets these results to mean that subjects' ego defenses were organized on the basis of their self-esteem, so that inconsistent information was disruptive. His hypothesis as well as his results are thus consistent with Mandler and Watson's concept of a plan for coping with stressful situations.

Research on the supposed higher arousal of subjects characteristically high in anxiety has already been discussed on page 19 and in footnote 6. The only elaboration we will make here is that situational prophecies are seldom manipulated in this literature, and when they are (Rosenstein, 1960), interaction effects between situational prophecies and general anxiety are seldom found.

For anxiety reduction processes one would expect subjects generally high in anxiety to experience more anxiety from failure prophecies, and hence to be more impulsive and do more poorly than subjects generally low in anxiety. In the Marlett and Watson study (see pages 17-18) decision time was shorter for high anxiety than for low anxiety subjects in the delay condition, although this only occurred on the first half of the task; after that high anxiety subjects had longer decision times than low anxiety. It is possible that high anxiety subjects were particularly aroused by the greater uncertainty of failure in the delay condition, but with a continuous increase in the absolute number of failure trials this uncertainty may have been reduced. That high anxiety subjects may be more uncomfortable with uncertainty is suggested by Mandler and Watson's finding that high anxiety subjects in the choice condition were more likely than low anxiety subjects to choose to do the task where failure was certain first.

DISCUSSION

At the outset I wish to make clear that while I may have taken certain interpretive liberties in applying the various theories described here to self-fulfilling prophecy, my intent has not been to somehow explain the propositions and findings associated with the various theories by the principle of self-fulfilling prophecy. Rather, self-fulfilling prophecy is simply treated here as one important phenomenon which these theories may be able to explain. The descrip-

tions of the theories are designed to show how the different processes they postulate could produce self-fulfilling prophecy.

As will already be evident, these postulated processes are indeed different. As noted earlier, the dissonance and anxiety reduction processes, unlike any of the others, are based on the assumption that the prophesied event will be preferred to certain conditions surrounding the prophecy prior to the event, namely, dissonance and anxiety, respectively. In fact, at least in the case of dissonance, this preference is assumed to be so strong that the event may actually be sought out by the prophet. Even where the event is more inadvertant than sought out, the different explanations postulate very different fulfillment processes. While the defensive effort approach suggests that failure occurs because the person prophesying it decreases his efforts to achieve success to protect his ego, the anxiety-distraction approach implies that effort remains high but persons prophesying failure are more likely to attend to task-irrelevant thoughts which get in the way of success. Supposedly neither effort nor distraction is at issue in the Hull-Spence energizing arousal or anxiety reduction approaches.

The explanations also differ greatly in flavor. Thus those within the cognitive tradition in psychology (dissonance, defensive effort, Mandler and Watson's approach to anxiety-distraction, and anxiety reduction) place more importance on the cognitive content of the prophecy than do those within the behaviorist tradition (energizing arousal and the "response interference" approach to anxiety-distraction). In the former the content of the prophecy is an element in cognitive inconsistency, or a threat to one's self-image or physical well-being, and the reactive processes which follow are often assumed to be unconscious; in the latter, prophecies may be only one of many stimuli which could elicit arousal or competing responses, and the question of unconscious cognitive processes is irrelevant.

In spite of these differences, it is important to note that prophecies could simultaneously set off several different reactive processes in the prophet, so that it may not always be efficacious to think of the explanations as necessarily competing with each other. One might even want to predict at this point that self-fulfilling prophecy will be most likely when unjustified actions given a prophecy

have been taken (dissonance), when the prophesied event is a threat to one's ego (defensive effort), when the exact timing of the event is unknown (anxiety-distraction), when the task is unfamiliar, difficult, or the prophet is low in ability (energizing arousal), and so on. Nevertheless, it would be helpful to know which processes are more likely to occur in most prophecy situations as well as their relative impact upon the prophet's behavior. This author feels that efficient movement toward this end would be greatly aided by several methodological innovations in research on these problems.

In the first place, many of the contradictory findings cited in this paper may have arisen because of differences in procedure in different studies; prophecies themselves, conditions associated with prophecies, or task conditions may have differed separately or simultaneously. For this reason it would be helpful in the short run to limit research to a standardized set of experimental situations where these conditions are explicitly known and manipulable, and preferably where self-fulfilling prophecy has already been found. The paradigm for the three Feather studies described on pages 1-2 might be a good starting place.

Second, while the scope of research must be limited if particular problems are to be manageable, if one wants to compare the relative impact of different processes it would be well to test at least two competing explanations against each other rather than the implications of a single explanation in the same experiment. Thus the energizing arousal approach might be pitted against any or all of the others by independently manipulating and measuring expectancy and arousal: if self-fulfilling prophecy occurs only when arousal differences are present or regardless of such differences, we can begin to estimate the importance of this explanation relative to the others. Similarly, we could deliberately introduce task-irrelevant information independently of expectancies and/or effort and determine the relative effects of each. Even when such independent manipulations are impossible it would be useful to have independent measures of several competing concepts. Thus Mandler and Watson were able to show that while subjects high in anxiety were more likely than those low in anxiety to report having been distracted by irrelevant information,

these subjects did not differ in reported effort.

In the third place, to prevent incidences of simply accurate labeling from being interpreted as self-fulfilling prophecy a number of procedures can be followed. If prophecies are manipulated, pre-manipulation performance measures should be obtained. If prophecies are not manipulated, novel tasks could be used to lessen the possibility of simple accuracy effects, and, of course, ability should be measured. Given our present lack of knowledge about the conditions surrounding real-life prophecies, however, the safest procedure is simply to experimentally manipulate prophecies.

This procedure is no cure-all for contaminating effects, however. When experimenters provide subjects with alleged performance feedback, for instance, subjects may assume that they are expected to perform according to what they perceive to be the experimenters' expectations and/or desires. This may be particularly true with female, minority group, and working-class subjects who may have been reinforced in real life for holding failure prophecies, for actually failing, and for acquiescence. Self-fulfilling prophecy does not occur, of course, where prophecies and subsequent behavior are each determined by a third variable, such as anticipated reinforcement, and where prophecy has no independent effect upon behavior. Besides the usual safeguards against actual differential treatment by the experimenter, such as running different prophecy conditions in the same session and keeping the experimenter blind to subjects' conditions, it may therefore be necessary to use different experimenters for the prophecy manipulation and performance phases of the experiment, or some other unobtrusive way of letting subjects know that the experimenter does not expect them to perform in any one particular way.

It is hoped that at some point we will be able to easily identify and explain self-fulfilling prophecy in real life. At that point it will be interesting to see just how frequent self-fulfilling prophecy actually is. It would appear that much therapeutic methodology is predicated on the assumption that it does occur frequently, in that a common aim is to build up a patient's self-confidence. Should we discover that many apparent incidences of self-fulfilling prophecy have in fact been cases of real-life reinforcement, however, we may well

have to face the fact that isolated attempts to build an individual's self-confidence are largely futile, and that what is really needed is a radical change in the social structures within which individuals are forced to function.

CHAPTER II

DISSONANCE REDUCTION VERSUS ENERGIZING AROUSAL AS EXPLANATIONS FOR SELF-FULFILLING PROPHECY

In this chapter I shall present a research design for investigating the relative utility of the dissonance reduction and Hull-Spence energizing arousal explanations for self-fulfilling prophecy. The decision to begin with these two explanations rather than the others occurred for a number of reasons.

First and foremost was my long-standing interest in dissonance theory as it relates to self-fulfilling prophecy; second was my interest in the budding "love-hate" relationship which has arisen between dissonance theory and Hull-Spence theory, a relationship I will describe shortly. Of a more general strategic nature was the fact that while the dissonance and Hull-Spence theories have each received a great deal of attention in empirical research, dissonance having generated a large quantity of research relating directly to self-fulfilling prophecy, neither theory's utility as an explanation for self-fulfilling prophecy has been established empirically.

As noted in the previous chapter, most dissonance research on self-fulfilling prophecy concerns the Aronson and Carlsmith findings which are of dubious validity. If one accepts this author's argument that dissonance theory can only predict self-fulfilling prophecy when conditions triggering self-justification processes exist, one will still find little empirical support for dissonance theory's utility, since the relevance of the two most pertinent studies in the literature is questionable. (See the discussion of the Aronson et al. (1963) and Cohen and Zimbardo (1962) studies on pages 12 through 15 in the previous chapter.)

The relevance of the Hull-Spence Energizing Arousal explanation for self-fulfilling prophecy is only potential since, as noted in the previous chapter, prophecies have seldom been explicitly manipulated in testing the theory. In the few cases where expectations were manipulated and arousal was measured, self-fulfilling prophecy either did not occur (Rosenstein, 1960) or performance was not a concern of the researchers.

The search for a design to test these two approaches began with a consideration of existing self-justification paradigms. The first investigated was the "forced-compliance" design used by Cohen and Zimbardo. Here the subject is led to expect failure, then asked to choose whether or not to continue with the task. While the subject is subtly pressured to choose to continue (hence the somewhat inappropriate term "forced"), he is under the illusion that he is really free to decide otherwise. It is the fact that he could have chosen not to continue that instigates the self-justification dilemma. While this paradigm can explain self-fulfilling prophecy when prophecies predict failure, it cannot explain self-fulfilling prophecy with success prophecies, since a person would supposedly feel little need to justify a decision to continue a task if he expected to succeed.

Self-justification processes would apply, however, to the fulfillment of success prophecies if a prophet chose to forego large rewards in other areas in order to pursue success in one. They would also apply if he somehow chose to suffer for his success prophecies in a more absolute sense, as those prophesying the end of the world in the Festinger el al. study did. There are several real-life situations besides the Festinger et al. case which might exemplify the rewards-foregone condition. One might be referred to as the "school boy's or girl's dilemma." I am speaking here of the difficult time students have deciding whether or not to study for an exam. Supposedly most students see studying as a means towards success, a valued end. It is also seen as a necessary "evil", since studying means giving up other, more pleasurable, activities and perhaps being labeled and harrassed as a "bookworm." Should they decide to study in spite of temptations to do otherwise, they should, according to dissonance theory, put forth extra effort to fulfill the prophecy which led them to give up attractive alternatives in the first place. In short, success would justify having given up these attractive alternatives, but failure would truly add insult to injury, so that efforts toward success and away from failure should be increased.

Given the above considerations one could test dissonance theory's ability to explain the fulfillment of success prophecies by having subjects who expect to succeed either suffer or not suffer for choosing to continue with the task. Suffering could entail taking electric shock, or

simply giving up moderate sums of money. But, just as the Cohen and Zimbardo situation could not handle the fulfillment of success prophecies, so the present situation seems incapable of handling the fulfillment of failure prophecies. While one might conceivably be able to induce subjects to choose to continue a task in spite of expecting to fail and in spite of expecting to suffer in other ways for the decision, the latter manipulation would at best have highly ambiguous meaning in self-justification terms. One might make an analogy to the Cohen and Zimbardo experiment here: extreme failure might allow the subject to convince himself that suffering and failure are not so bad or that he is "man (or woman) enough to take it." Why failure would justify other sufferings is not known to this author, however, and to even begin this kind of reasoning at this point is to violate the very reasons for not using the Cohen and Zimbardo situation in the first place. For these reasons yet another design was explored.

This design was an adaptation of the one used by Festinger and Carlsmith (1959) in their well-known study of forced compliance. In their experiment Festinger and Carlsmith had subjects perform a very boring task. Subjects were then requested to tell "the next subject", an accomplice of the experimenter, that the task was actually very interesting. Festinger and Carlsmith attempted to vary the amount of justification subjects had for taking this action by offering some twenty dollars and others only one dollar. Subjects given only one dollar would supposedly have more difficulty justifying their dishonesty to themselves, would therefore experience more dissonance, and would attempt to reduce this dissonance by changing at least one of the contradictory cognitions. Festinger and Carlsmith reasoned that a relatively likely means for reducing dissonance would be for subjects to come to believe their lie; that is, if they could decide that the task was really not so boring, they could reduce the discrepancy between their previous negative attitude toward the task and the fact that they had told another that the task was pleasurable. Subjects would be more likely to change their original attitude toward the task than their perceptions of their dishonest behavior because their statement to the accomplice was more visible and irrevocable. In fact, subjects given little justification for their "counter-attitudinal" act ($1.00)

subsequently indicated a more positive attitude toward the task than subjects given more justification ($20.00).

The Festinger and Carlsmith findings have been given other interpretations (Bem, 1967; Rosenberg, 1966), and they have not been easy to replicate, even by researchers sympathetic to dissonance theory (e.g., Collins et al., 1970). Nevertheless, they have been replicated more often than the ill-fated Aronson and Carlsmith findings (see the review by Jones and Gerard, 1967, pp. 489-497). Furthermore, more is known about the conditions under which these results will occur; specifically, they are more likely to occur when subjects are explicitly given the option of not going through with the deception of others (Linder, Cooper, & Jones, 1967), and when subjects deceive others by overt role playing rather than by essay writing (Carlsmith, Collins, & Helmreich, 1966). Both of these conditions should make self-justification more difficult for subjects and increase dissonance reducing cognitive and behavioral changes.

It was a relatively easy step to substitute prophecies for task attitudes in the above design. With false feedback subjects could be led to expect either success of failure at a task. Half of each of these two groups of subjects would then be asked to disclose their true prophecies to others (Success Prophecy-Success Statement or Failure Prophecy-Failure Statement). The other half would be explicitly asked to choose between disclosing false or no prophecy information to others; that is, some would make failure predictions to others knowing that they actually expected to succeed (Success Prophecy-Failure Statement), while others would make success predictions to others knowing that they actually expected to fail (Failure Prophecy-Success Statement). Subjects in the latter conditions who comply with the request should experience considerable dissonance, since they would have been given the option to refuse and little incentive for compliance. Following Festinger and Carlsmith's hypothesis, the latter subjetts should attempt to justify their counter-attitudinal behavior by beginning to believe the predictions they made in their public statements.

But what of self-fulfilling prophecy since, up to this point, nothing has been said about actual performance? Well, if subjects repeated the task in question after making their public statements, there

are several reasons for expecting performance changes that would parallel the cognitive changes predicted above. In the first place, such performance changes would provide subjects with further justification for their counter-attitudinal behavior, and secondly, they would bolster the previous cognitive changes. (See Festinger, 1964, for a discussion of the latter relationship between cognition and overt behavior.) Perhaps of more importance than either of the above reasons is the possibility that subjects would dread the implications of the absence of such performance changes; that is, if the predictions they made in their public statements did not come true, all the dissonance reducing effort they had expended on prophecy changes would be undone and dissonance would be experienced all over again. That dissonance-reducing cognitive and behavioral changes may be more irrevocable than other changes is an interesting possibility which has just recently received attention (Lepper, Zanna, & Abelson, 1970; Ryterband & King, 1966). Here we suggest that subjects may anticipate such problems and try to prevent their occurrence by matching prophecy changes with performance changes.

For the design being discussed such performance changes would entail more actual failure for subjects in the Success Prophecy-Failure Statement condition than for subjects in the Success Prophecy-Success Statement condition, and more actual success for subjects in the Failure Prophecy-Success Statement condition than for those in the Failure Prophecy-Failure Statement condition.

There is a problem with the design as it stands in that several sources of dissonance and other types of arousal are confounded in it. It was suggested in the previous chapter, for instance, that failure prophecies are both ego threatening and arousing in and of themselves. One could supposedly hold these factors constant by making the comparisons suggested above; that is, of those who expect to succeed in the beginning, those who make a failure statement will be more likely to fail, and of those who expect to fail in the beginning, those who make a success statement will be more likely to succeed. But the two conditions within each pair do not differ simply by whether or not a counter-attitudinal statement is made, since a failure statement is made in one while a success statement is made in the other. Supposedly just making a failure statement would be more threatening and

arousing than just making a success statement, and, furthermore, choosing to do so in the Success Prophecy-Failure Statement condition may produce dissonance independently of counter-attitudinally produced dissonance. In order to hold these factors constant it would be best to include two control groups where subjects simply choose to make success or failure statements. Unfortunately, it appears impossible to do this without also introducing feelings of dishonesty in subjects, since subjects would be making their public prophecies when they knew that they do not have private ones.

In order to devise a compromise procedure it may be useful to think of each of these factors (failure, telling others that one has failed, and choosing to do the latter) as separate sources of arousal in the Hull-Spence sense. Although one need not do so, one might also see them as sources of dissonance in their own right, since supposedly all three experiences would be inconsistent with high self-esteem, which most persons have. Festinger himself (1957; p. 18) regards dissonance as a drive state, and recent research suggests that this conception may be a useful one. In one experiment, for example, Cottrell and Wack (1967) established habits of different strengths by presenting subjects with Turkish words at different frequencies. They then told subjects that these words would be presented tachistoscopically when, in fact, nonsense words were presented on a preponderance of the trials. Half of the subjects had been subjected to a high dissonance manipulation, in which they learned that they could not get credit for the experiment although they had come specifically because they believed otherwise. As one would predict if one assumed these latter subjects had high drive, high dissonance subjects were more likely than low dissonance subjects to guess high frequency words and less likely to guess low frequency words. Two other experiments in this vein used the Festinger and Carlsmith design. In the first, Waterman and Katkin (1967) induced some subjects to write an essay supporting the suggestion that parking privileges be restricted when, in fact, they themselves were in desperate need of parking facilities; others in a low dissonance condition wrote against the suggestion. Drive-like effects were not as clearcut here as in the Cottrell and Wack experiment since high dissonance subjects performed better on both simple

and complex symbol-matching tasks. It is possible, however, that the latter tasks were not sufficiently complex. Waterman (1969) later repeated the same procedure with a different issue and simple and complex paired-associates learning tasks as the performance measure; here the predicted interaction between dissonance and type of task was clearly obtained for number of errors, and weakly for trials to criterion.

Since dissonance appears to have drive qualities it seems reasonable to assume, as Hull-Spence theorists do with arousal in general (Spence & Spence, 1966), that dissonance from different sources would summate and have some joint effect on performance. The results of an experiment by Brock (1963) support this reasoning. He used a "free choice" dissonance paradigm in which a subject is asked to choose for himself one of two desired objects which are nearly equal in attractiveness. The standard dissonance effect in this situation is for the attractiveness of the chosen alternative to increase while that of the rejected alternative decreases after the choice. Brock obtained these results in both of his experimental conditions. In one condition, however, subjects had already been highly dissonant because most of them (all young children) had been dishonest by peeking at the answers to a guessing game. As one would expect if dissonance from having been dishonest and dissonance from having rejected an attractive object summate, the post-choice spread of ratings of the two objects was significantly larger in the condition where subjects had previously been dishonest than in the condition where they had not.

In applying this reasoning to the present design one realizes that we only have conditions in which one would expect summated effects from at least two sources. We have neither a simple baseline nor a single-source baseline condition by which we can determine the effects of single sources. For this reason, let us now add a no prophecy-no statement or simple Control condition, and one-source Success and Failure prophecy conditions.

The four original and three new conditions are listed on the left of Table 1. (Hereafter the first word in the label for a condition will refer to the direction of the original prophecy; the second will refer to the direction of the public statement.) The word "high", "medium", or "low" in any of the three columns representing Counter-

Table 1

SOURCES OF DISSONANCE BY CONDITION

Condition	Source		
	Counter-attitudinal behavior	Failure Prophecy	Public Failure Statement
Success-Success	low	low	low
Success-Failure	high	low	high
Success	low	low	low
Control	low	low	low
Failure	low	high	low
Failure-Success	high	high	low
Failure-Failure	low	high	medium

Table 2

HULL-SPENCE AND DISSONANCE PREDICTIONS*

Condition	Dependent Variable					
	Prophecy		Arousal		Performance (simple task)	
	H-S	Diss	H-S	Diss	H-S	Diss
Success-Success						
Success-Failure		lowest of 3	highest	highest	highest	lowest
Success						
Control						
Failure			highest	highest	highest	
Failure-Success		highest of 3	highest	highest	highest	highest
Failure-Failure						

* Comparisons to which "highest" or "lowest" refer are made only among the three conditions within a single bracket.

attitudinal, Failure, and Failure Statement sources of arousal indicates the relative amount of arousal from that source in a given condition. The interpretation of the table is straightforward except for the Failure Statement column. There arousal from that source should be higher in the Success-Failure than in the Failure-Failure condition because subjects in the former are given more opportunity to choose not to make the statement.

If the translation of dissonance into Hull-Spence terms were complete, one would now simply add dissonance from the different sources within each condition, rank the conditions by total arousal, and predict performance according to this ranking and the characteristics of the task. Here is where the friendship between the dissonance and Hull-Spence approaches ends. While the Hull-Spence approach is one of non-directional arousal in a passive organism, dissonance is one of active arousal reduction with directional effects on performance. There was no conflict in the previously mentioned studies because performance measures were always purposely chosen to be irrelevant for dissonance reduction.

In the present design this is not the case. Performance changes could undo or lessen the effects of failure as well as justify counter-attitudinal behavior; that is, subjects could reduce failure prophecy or statement dissonance by either doing well or by decreasing effort to protect what little self-esteem they have left. Thus, prophecy and statement dissonance reduction could work at cross purposes with counter-attitudinal dissonance reduction.

The addition of the Success and Failure conditions now allows one to control the effects of success and failure prophecies alone: performance in the Success-Failure condition should be poorer than that in the Success as well as that in the Success-Success condition, and performance in the Failure-Success condition should be better than that in either of the Failure or Failure-Failure conditions. However, this still leaves failure statement dissonance confounded with counter-attitudinal dissonance. We shall simply assume here that failure statement dissonance is less than the other two. Furthermore, where dissonance reducing behaviors conflict we will assume that those behaviors which reduce the greatest amount of dissonance will be "dominant" and will be facilitated by dissonance from other sources.

If the latter two assumptions are made the previously mentioned predictions are not affected. Returning to Table 1, it can be seen that if failure statement dissonance is less than counter-attitudinal dissonance subjects in the Success-Failure condition should still perform more poorly than those in the Success-Success and Success conditions. Dissonance in the Failure-Success condition is still greater than that in the Failure and Failure-Failure conditions. Furthermore, since failure dissonance is common to all three and failure statement dissonance in the Failure-Failure condition is weaker than counter-attitudinal dissonance in the Failure-Success condition, performance in the latter condition should still be better than that in the other two.

Table 2 summarizes the Hull-Spence and dissonance predictions for arousal and performance. The performance predictions for dissonance parallel those which dissonance would make for resultant prophecies (i.e., after the counter-attitudinal manipulation but before performance); the Hull-Spence approach would not make any predictions about prophecy differences. The predictions can be summarized as follows:

1. Prophecies. Both Hull-Spence and dissonance predictions are based on the assumption that success and failure feedback will create different prophecies in the Success, Control, and Failure conditions. These results provide a manipulation check rather than a test of either theory. The Hull-Spence approach makes no predictions for prophecy differences between conditions. The dissonance approach, however, predicts that subjects in the Success-Failure condition will expect to do more poorly than will subjects in the Success-Success and Success conditions, while subjects in the Failure-Success condition will expect to do better than will subjects in the Failure and Failure-Failure conditions.

2. Arousal. Both approaches assume that arousal will be higher in the Failure than in the Success and Control conditions.[9] Furthermore, according to the dissonance approach arousal should be higher in the Success-Failure than in the Success-Success and Success conditions, and higher in the Failure-Success than in the Failure and Failure-Failure conditions.

3. Performance. If the task is a simple one, the Hull-Spence approach predicts better performance in the Failure than in the Success and Control conditions; the dissonance approach makes no predictions here. It does predict that performance should be worse in the Success-Failure than

in the Success-Success and Success conditions, and better in the Failure-Success than in the Failure and Failure-Failure conditions. If arousal is in fact higher in the Success-Failure and Failure-Success conditions than in the conditions with which they are compared, and if the task is a simple one, the Hull-Spence approach makes similar predictions for the Failure-Success condition but opposite predictions for the Success-Failure condition.

CHAPTER III

METHOD

Requirements of the Task

A test of the contrasting dissonance and Hull-Spence predictions required a very simple task with a strong correct response and few conflicting responses. A reaction time task with a single stimulus seemed to meet these criteria. Such a task is particularly relevant for a test of Hull-Spence hypotheses because in that theory response latency itself is assumed to decrease with increasing arousal.[10] The decision to use a reaction time task also helped solve the problem of finding an indivisual task which subjects would still perform in the presence of others. This was necessary if subjects were to see some basis for discussing performance expectations with others. The solution lay with a group reaction timer developed at the University of Michigan by Robert Zajonc (1965). With this apparatus an experimenter can control any one of several lights on the individual panels of up to seven subjects at a time. Subjects respond by pushing a single response switch and the experimenter can record reaction times from clocks on a panel in front of him. The clocks are tripped when the stimulus light comes on and stopped individually as subjects push their response switches.

Subjects

Subjects were 140 male undergraduate students in introductory psychology courses at the University of Michigan. They were required to participate in several hours of experimentation in order to receive credit for their courses.

Overview of Experimental Procedure

Subjects participated in the experiment in groups of three or four. Before entering the laboratory subjects were asked to introduce themselves. This minimum of friendly contact was designed to heighten the conflict subjects would later feel while deciding whether or not to deceive the others. In the laboratory subjects sat at one of four tables separated from the other three by partitions. Subjects could hear but not see each other. The experimenter sat behind a control console at one end of the room.

The reaction time task was then described to subjects. To increase involvement "the ability to react quickly" was described as "...important for many activities, from athletics to survival in a car." The experiment was described as an attempt to see how reaction time is affected by "practice and the presence of others". All subjects were told they were in the group which was to perform in the presence of others. Before subjects began the reaction-time task the experimenter said he would like to measure "... how alert [the subjects'] body is at the moment." The experimenter then took two palmar sweat measurements of arousal, one a demonstration measure to lessen anxiety about the measure, the other a first measure that was actually scored and used. After performing twenty reaction trials subjects were again measured for palmar sweating. They then filled out a questionnaire asking them how well they thought they did, how aroused they had been during the set, and how motivated and distracted they had been. These palmar sweat and self-report measures taken immediately after the first set of trials will be referred to as "Time 1" or "T_1" measures.

Subjects were then told they would take a "rest period" and taken to individual rooms. This provided the experimenter with an opportunity to administer the prophecy and public statement manipulations. Subjects were asked to fill out a questionnaire about their interest and skill in various types of sports and academic testing situations, and then to relax. Five minutes later, after he would supposedly have had time to copy out subjects' reaction times, the experimenter returned and asked each subject individually whether he had been able to relax.

From here the procedure differed according to the condition to which the subject had been assigned. A given experimental session consisted of one of three combinations of conditions: Control subjects only, two Success and two Failure subjects, or one subject in each of the four public statement conditions (Success-Success, Success-Failure, Failure-Success, and Failure-Failure). The combination a given session would represent was determined by a random sequence. In sessions with different conditions the condition in which a subject participated was determined by which of the four individual rooms he entered.

If the session contained only Control subjects the experimenter simply left the room after asking a subject if he had been able to relax.

In the other six conditions he suggested that the subject might like to see how he had done and showed the subject a falsified scoring sheet containing twenty scores for three or four subjects, depending upon the actual number of subjects in that session. Since all subjects had been led to think that they were "number 3" the experimenter could present results indicating that one subject had performed better (Success) or worse (Failure) than the others on most trials. To avoid any implication that the scores might be false the experimenter asked the subject what his number was and then verbally described how the subject's scores compared with the others. The experimenter included an overall assessment so that subjects themselves could not avoid interpreting their performance as Success of Failure. If the session contained only Success and Failure subjects the experimenter then wished the subject luck on the second set of trials and left.

If the session contained the public statement conditions the experimenter went on to tell each subject that only he was being shown the results of the first set of trials because the experimenter wanted the subject to help him with a part of the experiment he had not disclosed yet. That is, in addition to practice and the presence of others, the experimenter wanted to see "...how a person's expectations and performance are affected by knowledge of the expectations of others". In order to investigate this problem, the experimenter continued, he needed someone to tell the other subjects how he expected to do. Subjects were then asked to read a Success or Failure statement describing performance on the last set and predicting performance on the next. In the two low dissonance conditions (Success-Success and Failure-Failure) the experimenter tried to act as if he were sure that the subject would do it; there was no mention of choice. In the two counterattitudinal conditions (Success-Failure and Failure-Success) the experimenter explicitly referred to the discrepancy between the performance feedback and the statement and said that he realized the subject might not want to make the statement for that reason and should therefore feel free to refuse the request. If the subject still agreed to do it arrangements were made for the subject to make the statement. The experimenter would announce over the intercom that "subject number 3" had said he had something he would like to tell the rest of the subjects. The subject would then read the prepared

statement and the others would hear him. In fact, since all subjects believed they were number 3 the cue for reading the statement could be given simultaneously to all four subjects. While each subject believed that only he was reading a statement to the others, all subjects actually read the statement at the same time with only the experimenter listening.

After the above manipulations had been administered the experimenter brought subjects back to the laboratory in preparation for the second set of reaction trials. Before this second set was begun another measure of palmar sweat was taken and subjects indicated how they expected to do on the second set and how aroused, motivated, and distracted they expected to be while performing it. These measures will be referred to as "Time 2" or "T_2" measures. To maintain interest in the task subjects were then warned that boredom was customary in the second set but that these were exactly the conditions in real life when reaction time was most important, as in driving a car. After completing the second set of twenty trials subjects were measured on palmar sweating and questioned about their performance on the second set and their arousal, motivation, and distraction during it ("Time 3" or "T_3" measures). They were also asked about their interest and involvement in the reaction time task, how typical their performance was for them, how lucky or unlucky they had been in their performance, and how interested and involved they had been in the experiment as a whole. Finally, subjects were asked to indicate in writing what they thought the purposes of the experiment were. All subjects were then fully de-briefed and requested to avoid discussing the specifics of the experiment with classmates for another month. It appears that this request was granted.

To summarize the main steps in the experimental procedure, the reaction time task is described and a measure of palmar sweating is taken. Subjects then perform the first set of twenty reaction trials. After indicating how they think they did, and so forth (the T_1 measures), they take a "rest period" in individual rooms where the prophecy and public statement manipulations are administered. After returning to the main laboratory room they indicate how they expect to do, and so forth (the T_2 measures), and perform the second set of reaction trials. After subjects complete the second set of trials similar measures are taken again, the referents now being subjects' performance on and reactions to the

second set and the experimental situation as a whole (the T_3 measures).

The Reaction Time Task

Subjects were told that a single light would appear on the panel in front of them at one of several different intervals from the time the experimenter said "ready". (In retrospect it appears that it would have been better to have explicitly stated that the same light would come on each time, since apparently for the first few trials some subjects were waiting for one of the other lights to come on.) The intervals were of 3, 4, 5, or 6 seconds, there being five trials of each in a random order. There were 10 seconds between each trial in which the experimenter recorded subjects' times and reset the clocks. Occasionally a subject would fail to respond, supposedly because he was giving up, because he wanted to see if the scores he might be given were accurate, or because he was hostile toward the experiment. In such cases the experimenter would go to the subject after two successive non-response trials and ask him if he had perhaps been pushing the switch incorrectly, since for some reason his clock had not started. This procedure reinstated responding in all but two cases, where equipment failure seems to have occurred. (One of the latter incidences appears to have been the result of sabotage.)

Prophecy, Arousal, and Other Measures

To measure expectations about performance subjects were asked either "How well do you think you did on this last set of trials?" (T_1 and T_3) or "How well do you expect to do on this next set of trials?" (T_2). In both cases subjects were asked to place a mark on two 100 millimeter graphic scales with the words "very poorly-very well" or "more poorly than others-better than others" as end-points. (See Appendix A for these and other scales.) [11]

A similar format was used for measuring several potentially different dimensions of arousal. Each dimension was measured by four items; dissonance arousal (confused-not confused, decisive-indecisive, deliberate-hesitant, organized-disorganized), general arousal (relaxed-tense, energetic-sluggish, roused-unaroused, stirred-not stirred), pleasant or "positive" arousal (pleasantly excited-not pleasantly excited, stimulated-not stimulated, alert-not alert, elated-not elated), and unpleasant or

"negative" arousal (unpleasantly excited-not unpleasantly excited, upset-not upset, nervous-not nervous, anxious-not anxious). Different measures of the same dimensions were derived from an adjective checklist built around a measure of situational anxiety developed by Zuckerman (1960).[12] In his measure a subject is scored high in arousal according to how many of eleven high-anxiety adjectives he checks (afraid, desperate, fearful, frightened, nervous, panicky, shaky, tense, terrified, upset, worring) and how many of ten low-anxiety adjectives he does not check (calm, cheerful, contented, happy, joyful, loving, pleasant, secure, steady). Here other adjectives were added to get at the different dimensions of arousal mentioned above. Twelve referred to the dissonance dimension: indecisive, composed, single-minded, deliberate, reluctant, uncertain, confused, collected, puzzled, purposeful, hesitant, and organized. To two of Zukerman's adjectives (calm and tense) were added fourteen pertaining to general arousal (driven, stimulated, restful, intense, energetic, stirred, quiet, alert, fatigued, roused, free, sluggish, tired, subdued). Five of Zuckerman's adjectives were used as an indication of positive arousal (cheerful, happy, joyful, loving, pleasant), and eight as an indication of negative arousal (secure, worrying, contented, steady, upset, nervous, desperate, shaky). The random ordering of the forty-seven adjectives for the second measure was different from the first and third measures.

The palmar sweat measure used here is the Palmar Sweat Index (PSI) developed by Thomson and Suterman and studied by Dabbs et al. (1968). A solution containing a hydrophobe and graphite is applied to the tip of a subject's finger. When the solution dries, open sweat glands with globules of water in them are marked by holes in the fingerprint taken with clear adhesive tape. To score the prints for arousal one simply counts the number of open sweat glands in a given square area of the print. By using this measure the experimenter was able to take measures from all four subjects in a session within approximately two minutes.

The motivation and distraction measures were adapted from those used by Mandler and Watson (1966). For motivation the subjects answered on a 100 millimeter graphic scale either the question "How hard did you try to do well?" or "How inspired are you to try to do well on the next set?". Three other items were included with the arousal items: interested-not

interested, motivated-not motivated, involved-not involved. For distraction the subjects checked a graphic scale in answer to the question "How often did you think about how well or how poorly you were doing?" or "How much are you thinking about how well or how poorly you will do on the next set?" Three other items (distracted-not distracted, embarrassed-not embarrassed, self-conscious-not self-conscious) were included with the arousal items.

The Prophecy Manipulation

After asking the subject what his number was the experimenter examined the false feedback closely (see Appendix B), running his thumb and forefinger along the scores of Number 2 and 3. He then said, "Hmm ... I guess you didn't do too badly at all (too well) on that last set. Your scores appear to be pretty well tied with those of Number 2, but it looks like you came out ahead (behind) overall. Well ... That's interesting. It will be interesting to see how you do on the next set. Good luck!"

The Public Statement Manipulations

Here the experimenter continued from the above quote, "Actually, the reason I am giving this information to you and not to the others at this point is that I would like you to help me with an aspect of the experiment I haven't told you about yet. ... That is, in addition to the effects of practice and the presence of others I would like to see how a person's expectations and performance are affected by knowledge of the expectations of others.... In order to investigate this problem I need someone to tell the other subjects how he expects to do." For Success-Success and Failure-Failure subjects he then said, "Today's subjects have been randomly assigned to hear expectations of success (failure). I hope I can prevail on you to read this statement to the others." These subjects were then handed the prepared statement. For Success-Failure and Failure-Success subjects the experimenter first handed them the prepared statement and then said, "I want today's subjects to hear expectations of failure (success). ... [Appearing chagrined] Now I realize this is a bit of a problem for you, since you actually did rather well (poorly) on the last set of trials. If you don't want to do this you should feel free to refuse to. You are not in any obligated to do it. If you don't I may be able

to get one of the other subjects to read the statement. What do you think? ... Will you try it?"

Interestingly, there was relatively little resistance to the counter-attitudinal request. Most resistance was expressed as doubt that the other subjects would find such a statement believeable. In this case the experimenter disagreed, saying that in fact several subjects had asked if they could speak to the others regarding how they had done on the first set. In a very few cases subjects expressed moral qualms about reading the statement. In these cases the experimenter waited a few minutes to see if the subject would comply on his own. When this did not occur in two instances the experimenter mentioned that there was a problem in getting another subject to do it, in that there would then be two subjects whose data the experimenter could not use. In one of these instances the subject steadfastly refused to read the statement. He was the sole holdout.

The arrangement with the subject for reading the statement was that the experimenter would make this announcement over the intercom: "Excuse me ... Subject Number 3 says he has something he would like to tell the rest of you." The subject would read the statement immediately after hearing the cue "Go ahead, Number 3." The statement itself was worded as follows: "I don't know how the rest of you think you did, but I'm sure that I did pretty well (poorly) on that last set of trials. I'm fairly confident that I'll do well (poorly) on the next one." Those subjects who expressed serious doubts about being able to act well with those specific words were allowed to improvise, with the stipulation that they get across the two points in the statement. Although it was difficult to hear all of the specifics when subjects actually read their statements because all four were speaking at once, the experimenter was able to determine that all subjects who agreed to read the statement in fact did so, and the content of improvised statements seemed to closely follow that of the prepared ones. In several early sessions a few subjects actually heard another subject in the next room read the statement. Four subjects were discarded for this reason. From then on adjacent rooms were not used.

CHAPTER IV

RESULTS: THE HYPOTHESES

Results having to do with prophecies will be presented first, then those pertaining to arousal, and finally those for performance. This order is not meant to imply that the present design allows one to infer that any arousal differences occurred because of prophecy differences. While our adaptation of Hull-Spence theory suggests that failure prophecies should be more arousing than success prophecies, the measurement of prophecies and arousal at the same point in time leaves open the possibility that arousal differences will reflect the experience of past failure rather than the anticipation of future failure. We did, however, try to tap the latter by asking subjects at T_2 how aroused they expected to feel during the second set of trials. As for the dissonance predictions, we assume that differences in arousal preceded the prophecy differences we have measured, but again we cannot demonstrate the causal sequence with the present design. (That arousal differences would remain even after cognitive changes that supposedly reduced dissonance have taken place is not inconsistent with our theoretical analysis since we have assumed that performance changes which have not yet occurred would be undertaken to further reduce dissonance.)

Two kinds of statistical analyses were performed on the results. The first were one-way analyses of covariance of T_2 and T_3 measures of prophecies, arousal, and performance on the second set of reaction trials, with the seven conditions as levels of the independent factor and the respective T_1 or performance scores on the first set of trials as the covariates. Since the results of these analyses indicated that the experimental conditions alone explained relatively little of the variance, subjects' initial expectations for the first set of reaction time trials were used as a second independent factor in subsequent analyses. Since the variance attributable to the seven original conditions was very similar in both types of analyses, only the results of the latter analyses will be presented in the text of this and the following chapter. On the other hand, since the second independent factor was not included in the original hypotheses, results pertaining to it will not be discussed until the next chapter.

Prophecies

Prophecies measured by the general answer (very poorly-very well) to the question "How do you expect to do on this next set of trials" will henceforth be labeled "general", since the answer does not supply subjects with a concrete dimension on which to make a judgement. Those measured by the second answer (more poorly than others-better than others) will be labeled "relative", since they do have a more concrete referent. "Combined" scores are simply the sum of the two preceding scores.[13]

The mean prophecy scores at T_2 as a function of the experimental conditions are presented in Table 3. There it can be seen that Success subjects do expect to do better than Failure subjects (the lower the mean, the higher the expectation), and the means for Control subjects fall in between. The dissonance predictions are not supported on the two prophecy dimensions taken individually, however. The means for the Success-Failure condition are only very slightly larger than those for the Success-Success and Success condition. In the three failure conditions Failure-Success subjects do expect to do better than Failure subjects, particularly on the Relative item, but they expect to do slightly worse than Failure-Failure subjects. On the Combined measure the dissonance predictions fare somewhat better, in that the means for the Success-Failure condition are more clearly larger than those for the Success-Success and Success conditions. On the other hand, those for the Failure-Failure condition remain higher than those for the Failure-Success condition.

That the dissonance predictions were supported in success but partially refuted in failure subjects suggests that some uncontrolled factor may have been operative in the latter. Perhaps telling others that one has failed when, in fact, one has failed may be much more threatening than a simple failure statement by itself. Given the apparent interaction of actual failure with a failure statement, however, we can no longer assume the additivity of arousal sources and account for the effect with the present design. One can only speculate that Failure-Failure subjects defensively refused to believe that they would fail again and resolved to undo their previous performance. Indirect evidence for this possibility will be examined later. For the moment we might note that there is a clear tendency to bias expectations

Table 3

MEAN GENERAL, RELATIVE, AND COMBINED PROPHECY SCORES (T_2) BY CONDITION

Condition	Prophecy			
	General	Relative	Combined (Split on General)	Combined (Split on Relative)
Success-Success	23.71	26.63	49.61	51.04
Success-Failure	33.22	33.08	67.71	66.04
Success	30.39	33.03	64.67	62.01
Control	37.05	41.15	77.60	77.60
Failure	37.83	47.81	84.84	86.81
Failure-Success	37.23	42.41	78.44	81.18
Failure-Failure	35.30	42.26	77.09	78.16

Table 4

SUMMARIES OF ANALYSES OF VARIANCE OF PROPHECY SCORES (T_2)

Source	General			Relative		
	df	MS	F	df	MS	F
Conditions (A)	6	474.41	2.17*	6	984.59	4.57**
Expectancy (B)	1	7311.60	33.51**	1	4767.96	22.12**
A x B	6	.69	<1	6	217.72	1.01
Error	116	218.22		116	215.52	
	Combined (G)			Combined (R)		
Conditions (A)	6	2568.37	3.45**	6	2895.47	3.77**
Expectancy (B)	1	24748.84	33.26**	1	20671.16	26.94**
A x B	6	716.44	<1	6	998.15	1.30
Error	116	744.04		116	767.30	

* $p<.05$
** $p<.001$

upward, since all means in Table 3 are above the theoretical midpoint of 50. Failure-Failure subjects may have reacted to movement closer to this lower limit with a kind of "reaction formation."

It would be misleading, however, to attribute too much significance to the differences described above. This applies to those that support as well as refute the dissonance predictions, since few of the differences in question are large. The analyses of variance summarized in Table 4 indicate significant overall main effects for experimental conditions, but none of the individual means comparisons relevant to the predictions yielded significant results when submitted to a Newman-Keuls test. In fact, the only significant difference in the entire four sets of comparisons is that between the Success-Success and Failure conditions on the Relative prophecy measure.

In retrospect, a good part of the problem may be that the test-retest nature of the measuring instruments prompted subjects to be concerned with presenting consistent prophecy scores over sequential measurements. It was particularly easy for them to do so on the graphic measures, since the order in which the scales were presented was always the same. The prophecy measures may have been even more vulnerable to this bias than the other graphic scales, since they were always first, the idea being to have subjects think about how well they did or were going to do before they filled out the items measuring arousal. In pretests of the procedure subjects appeared to regard stating expectations as a reasonable activity given the nature of the task, but subjects would not necessarily be consciously aware of a concern with consistent responses.

Arousal

In Table 5 the T_2 means on the graphic measures are adjusted for subjects' scores at T_1. Splitting initial expectancies on the General versus Relative items made very little difference on graphic arousal means, so that only those for the Relative split are presented in Table 5. Differences between conditions on the graphic measures of arousal are not very large; in fact, as indicated in Table 6, there is only one significant over-all condition effect, and it is on the General arousal dimension where split-half reliability coefficients are unsatisfactory at .19, .56, and .59, for T_1, T_2, and T_3, respectively.[14] Nevertheless, on the Dissonance dimension means are perfectly ordered according

Table 5

MEAN ADJUSTED SCORES ON GRAPHIC MEASURES OF AROUSAL AT T_2

Condition	Dissonance	General	Positive	Negative
Success-Success	106.05	213.41	205.74	156.18
Success-Failure	127.69	205.01	215.86	143.97
Success	112.86	178.30	206.72	125.94
Control	113.73	173.81	194.34	123.06
Failure	118.99	188.65	189.28	125.74
Failure-Success	127.38	229.46	184.16	154.63
Failure-Failure	105.98	219.72	198.26	149.55

Table 6

SUMMARIES OF ANALYSES OF VARIANCE OF GRAPHIC MEASURES OF AROUSAL (T_2)

Source	Dissonance			General		
	df	MS	F	df	MS	F
Conditions (A)	6	1213.96	<1	6	7283.14	2.62*
Expectancy (B)	1	1307.50	<1	1	267.94	<1
A x B	6	1744.88	<1	6	2931.70	1.05
Error	94	1762.78		94	2794.52	
	Positive			Negative		
Conditions (A)	6	1726.65	1.12	6	3346.31	1.44
Expectancy (B)	1	1219.81	<1	1	.06	<1
A x B	6	1874.97	1.22	6	3075.26	1.32
Error	94	1541.34		94	2324.38	

* $p<.05$

to the dissonance predictions; that is, subjects in the Success-Failure condition are more aroused than subjects in either the Success-Success or Success condition, and subjects in the Failure-Success condition are more aroused than subjects in either the Failure or Failure-Failure condition. Within-cell variance is large, however, and the means do not differ from each other by a Newman-Keuls test.

On the General and Negative dimensions the means in the three failure conditions are as expected. Within the success conditions, however, Success-Success subjects appear to be more aroused than Success-Failure subjects. While it is difficult to account for this result with the limited information available, in talking with subjects I learned that many subjects in the Success-Success condition felt there was a real risk in prophesying success, since this increased the negative consequences of failure. On the Positive dimension results for the failure conditions are in the expected direction, in that Failure-Success subjects are less positively aroused than either Failure or Failure-Failure subjects. In the success conditions the Success-Failure subjects report being more positively aroused than either Success-Success or Success subjects; this contradicts dissonance predictions if one assumes, as dissonance theorists appear to, that dissonance is an aversive state. One would also expect there to be more marked differences among the Success, Control, and Failure conditions on Negative as well as Positive arousal. As with prophecy differences among conditions, however, all arousal differences as measured by the graphic scales are small. Perhaps, as mentioned earlier, the graphic scales were particularly conducive to test-retest consistency biasing.

This is suggested by the stronger condition effects on the checklist measures of the same dimensions of arousal.[15] The T_2 means adjusted for T_1 scores are given in Table 7. The direction of the differences is fairly similar to that in the respective graphic measures, but now there is a significant overall condition effect on the Positive and Negative measures as well as the General measure (see Table 8). The stronger condition effect is still weak in absolute terms, however, since there is still no condition effect on the Dissonance dimension, and (on the others) individual means comparisons do not yield significant differences.

Table 7

MEAN ADJUSTED SCORES ON CHECKLIST MEASURES OF AROUSAL (T_2)

Condition	Dissonance	General	Positive	Negative
Success-Success	4.87	8.32	.45	2.84
Success-Failure	5.11	8.05	.63	2.66
Success	4.25	6.10	1.25	1.92
Control	4.37	6.23	.70	1.83
Failure	4.90	8.14	.57	2.06
Failure-Success	5.89	8.61	.31	2.99
Failure-Failure	5.55	7.38	.37	2.77

Table 8

SUMMARIES OF ANALYSES OF VARIANCE OF CHECKLIST MEASURES OF AROUSAL (T_2)

Source	Dissonance			General		
	df	MS	F	df	MS	F
Conditions (A)	6	5.86	1.49	6	7283.14	2.62**
Expectancy (B)	1	5.86	1.49	1	267.94	<1
A x B	6	1.13	<1	6	2931.70	1.05
Error	103	3.92		103	2794.52	
	Positive			Negative		
Conditions (A)	6	1.57	3.08**	6	4.00	2.89*
Expectancy (B)	1	.11	<1	1	6.11	4.40
A x B	6	.33	<1	6	.92	<1
Error	103	.51		103	1.39	

* $p<.05$
** $p<.01$

The next arousal indices to be discussed combine the separate checklist measures of arousal.[16] Three combined indices were derived from the checklist. One (D+G+P+N) combines scores on all four of the Dissonance, General, Positive, and Negative dimensions. A second (D+G+N) leaves out the Positive Dimension, since its inclusion as an additive to others is at odds with the theoretical conception of dissonance as an aversive state. The third is Zuckerman's Affective Adjective Checklist (AACL), where what we have referred to as positive arousal is treated as low arousal (i.e., the absence of negative arousal or anxiety). The means at T_2 on these measures, adjusted for T_1 scores, are presented in the first three columns of Table 9.[17] The orderings of means generally follow those discussed above, as one would expect, since the present indices simply combine the separate dimensions. In all three combined indices arousal is higher in the Failure-Success than in either of the Failure or Failure-Failure conditions. In the success conditions results on these combined measures are different from those with the separate indices. Previously subjects in the Success-Success condition were more aroused than those in the Success-Failure condition but the addition of the reverse difference on the Dissonance dimension now makes arousal in the two conditions almost identical. (The inclusion or exclusion of Positive arousal seems to have made little difference.) That dissonance arousal is the mediator of this difference can be seen in the means on the AACL measure: it includes no dissonance-related adjectives and arousal in the Success-Success condition remains higher than arousal in the Success-Failure condition. The Success-Success mean is significantly higher than the Success mean by a Newman-Keuls test ($p < .05$), but the Success-Failure mean is not ($p < .10$). As can be seen in Table 10, there is a significant condition effect on all three combined indices. With the aforementioned exception, individual differences are not large or significant.

Finally, we consider palmar sweating (PSI) as a function of the experimental conditions.[18] Means for T_2, this time adjusted for subjects' arousal scores prior to the first set of reaction trials rather than at T_1, can be found in the fourth column of Table 9;[19] the summary of the analysis of covariance is contained in the last section of Table 10. There is a condition effect of borderline significance ($p < .10$) which

Table 9

MEAN ADJUSTED SCORES ON SUMMATED CHECKLIST AND PALMAR SWEAT MEASURES OF AROUSAL (T_2)

Condition	D+G+P+N	D+G+N	AACL	PSI
Success-Success	16.48	15.83	9.17	.54
Success-Failure	16.49	15.85	8.26	.23
Success	13.52	12.54	6.46	.53
Control	13.18	12.45	6.86	.90
Failure	15.62	15.04	7.75	.30
Failure-Success	17.82	17.48	9.40	1.18
Failure-Failure	16.07	15.56	9.10	1.06

Table 10

SUMMARIES OF ANALYSES OF SUMMATED CHECKLIST AND PSI MEASURES OF AROUSAL (T_2)

Source	D+G+P+N			D+G+N		
	df	MS	F	df	MS	F
Conditions (A)	6	48.94	3.00*	6	58.70	3.49**
Expectancy (B)	1	43.08	2.64	1	59.40	3.53
A x B	6	2.83	<1	6	4.90	<1
Error	103	16.29		103	16.84	
	AACL			PSI		
Conditions (A)	6	26.92	7.94***	6	1.80	2.12
Expectancy (B)	1	19.41	5.73*	1	.09	<1
A x B	6	5.10	1.50	6	.40	<1
Error	125	3.39		78	.85	

* $p<.05$
** $p<.01$
*** $p<.001$

reaches significance when initial expectancy is split on the General instead of the Relative prophecy item (see Tables 9a and 10a in Appendix C). Given the direction of differences between means these results are uninterpretable. There is a slight tendency toward more sweating in the Failure-Success than in the Failure condition, but the difference between the Failure-Success and Failure-Failure conditions is miniscule. In the success conditions, furthermore, there is slightly less sweating in the Success-Failure than in either the Success-Success or Success condition. Examination of very recent literature on palmar sweating reveals a frequently occurring interaction effect between certain conditions of arousal and sweating, such that sweating appears to increase directly with arousal when a person can actively remove a threatening stimulus, but negatively with arousal when the person can only defensively avoid thinking or is defensively avoiding thinking about an event (Epstein & Roupenian, 1970; Martens & Landers, 1970). Given this tendency one might argue that failure subjects would be resolving to undo their failure by increased efforts on the task, so that their high arousal would be reflected in increased sweating, while Success-Failure subjects would be defensively anticipating failure to reduce their dissonance, and hence would show little sweating. If this were true, however, one would not expect Failure subjects to sweat less than Success and Control subjects. For these reasons the palmar sweat results remain uninterpretable.

In an overall assessment of the effect of the experimental conditions upon arousal one must conclude that, while there does seem to have been an effect, it was very weak. With the exception of Positive arousal, which one would expect, and palmar sweating, which one would not expect, Failure subjects appear to have been more aroused than Success and Control subjects, but these results are quite weak. As for the more important dissonance predictions, one finds a consistent tendency, again excepting the Positive dimension, for arousal to be higher in the Failure-Success condition than in either the Failure or Failure-Failure condition. Arousal is also consistently higher in the Success-Failure than in the Success condition, still with the understandable exception of the Positive dimension. On dimensions other than Dissonance, Success-Success subjects are more generally and negatively

aroused and less positively aroused than Success-Failure subjects. A public commitment effect may be occurring here; that is, while there may be nothing inconsistent about making a public success prediction when one has succeeded in the past, it may nevertheless be unsettling to have to make the prediction because one then feels committed to live up to it. Unfortunately this possibility was not controlled in the present design. Perhaps I should have striven more vigorously to develop statement-only control groups which would not be contaminated by dissonance arousal.

Since none of the means for the Success-Success and Success-Failure conditions differ significantly, another interpretation of the arousal results can be made. Specifically, there may simply be a public statement effect, such that subjects are more uncomfortable when they have to make a public prediction for their performance than when they do not. Thus subjects in the four public statement conditions are more aroused than subjects in the other three conditions on both measures of General arousal, both measures of Negative arousal, and all three summated indices on the checklist measure. Since dissonance is not relevant to this interpretation the absence of a public statement effect on the Dissonance dimension is not problematic. The only results which do not fit the public statement interpretation have to do with the Positive dimension. If subjects find making a statement <u>per se</u> disturbing, Positive arousal should not be higher in the Success-Success and Success-Failure conditions than in the Control condition on the graphic measure (see Table 5). The greater Positive arousal in the Success-Failure than in the Success condition is also problematic, but it is just as problematic for the dissonance interpretation. On the checklist measure of Positive arousal (see Table 7) the public statement interpretation fares as well as the dissonance interpretation. For the former only the order of the Success-Failure and Failure means should be reversed, for the latter only the Success-Success and Success-Failure means should be reversed, although the previously mentioned public commitment effect could be a contaminating factor here. The problem of choosing between these two interpretations of the results will come up again in this chapter and the next.

Performance

As with arousal, performance scores on the second set of reaction trials have been adjusted for performance on comparable trials in the first set. Thus the first column in Table 11 contains the mean total for all twenty trials on the second set with individual total scores on the second set having been adjusted for individual total scores on the first set. Performance scores are then broken into smaller units.[20] Column two of Table 11 contains adjusted reaction times for the first trial only; column three contains mean total times on the first four trials. All scores are in milliseconds, such that the lower the score, the better the performance.

It is immediately apparent from Table 11 that performance differences between conditions are not very large. The ordering of mean total performance by conditions (column one) is partially in line with the ordering predicted by dissonance theory; that is, Success-Failure subjects perform more poorly than Success-Success and Success subjects. Among failure subjects Failure-Success subjects perform slightly better than Failure subjects, as predicted, but Failure-Failure subjects perform better than Failure-Success subjects. The performance results thus parallel the prophecy results. Differences between the Success, Control, and Failure conditions are much smaller than those previously mentioned. As can be seen in Table 12, there are no significant condition effects. Performance on the first trial, and the first four trials among the three failure conditions, has the same ordering as total performance (see the second and third columns of Table 11), but now Success-Failure subjects do better than Success subjects, and Failure subjects do slightly better than Success subjects. Again the differences are slight.

Tables 13 and 14 contain comparable information about performance on the second, third, fourth, and fifth blocks of four trials on the second set. Again there are no significant condition effects, nor are the orderings of means consistent. Thus, the ordering for the second block is the same as that for total performance, but in the third and fourth blocks the means for the Success-Failure and Success conditions are almost identical, and in the third and fifth blocks performance in the Failure-Success condition is worse than performance in the Failure

Table 11

MEAN TOTAL ADJUSTED REACTION TIMES FOR ALL TRIALS ON THE SECOND SET, FOR THE FIRST TRIAL, AND FOR THE FIRST BLOCK OF FOUR TRIALS

Conditions	Total	First Trial	First Block
Success-Success	376.53	24.82	80.96
Success-Failure	399.87	23.62	84.92
Success	391.57	29.14	89.39
Control	394.37	24.25	87.88
Failure	396.26	25.02	89.37
Failure-Success	389.59	24.17	85.34
Failure-Failure	371.16	22.74	80.59

Table 12

SUMMARIES OF ANALYSES OF VARIANCE OF ADJUSTED SCORES

Source	Total			First Trial		
	df	MS	F	df	MS	F
Conditions (A)	6	2251.32	1.80	6	83.66	1.10
Expectancy (B)	1	4294.13	2.07	1	876.89	11.43*
A x B	6	2307.46	1.11	6	58.73	<1
Error	125	2077.99		125	76.63	
	First Block					
Conditions (A)	6	265.76	<1			
Expectancy (B)	1	2272.25	8.52*			
A x B	6	181.97	<1			
Error	125	266.65				

* $p<.001$

Table 13

MEAN ADJUSTED REACTION TIMES FOR THE SECOND, THIRD, FOURTH, AND FIFTH TRIAL BLOCKS ON THE SECOND SET

Condition	Second	Third	Fourth	Fifth
Success-Success	74.44	73.81	75.06	74.22
Success-Failure	79.34	76.21	79.90	79.88
Success	75.72	76.66	79.47	72.73
Control	73.85	75.82	76.95	78.28
Failure	79.87	74.72	77.38	78.28
Failure-Success	73.77	78.95	73.83	74.91
Failure-Failure	73.55	72.47	73.66	71.05

Table 14

SUMMARIES OF ANALYSES OF VARIANCE OF ADJUSTED SCORES

Source	Second			Third		
	df	MS	F	df	MS	F
Conditions (A)	6	146.38	1.10	6	88.13	<1
Expectancy (B)	1	7.51	<1	1	297.95	2.14
A x B	6	187.87	1.41	6	104.03	<1
Error	125	133.07		125	139.58	
	Fourth			Fifth		
Conditions (A)	6	128.44	1.14	6	309.76	1.81
Expectancy (B)	1	39.23	<1	1	2152.40	13.11*
A x B	6	93.06	<1	6	192.32	1.13
Error	125	112.86		125	171.08	

* $p<.001$

condition. As was the case in the second trial block and total performance, Success-Failure subjects perform more poorly than Success-Success and Success subjects on the fifth trial block. The Hull-Spence predictions fare no better here than they did in the previous results, in that reaction times are better in the Failure than in the Success and Control conditions in only one case (the third trial block), and here the differences are very slight. Furthermore, as noted above, differences among the success conditions are in the direction predicted by the dissonance hypothesis.

There is thus little support for either the dissonance or Hull-Spence predictions for performance. There are no significant condition effects, and while the orderings of means are occasionally tantalizing, they are not consistent, nor is the public statement effect (which could be inferred in the results for arousal) matched by a consistent comparable effect in performance, although subjects in the four public statement conditions do perform better than those in the three no-statement conditions on the first trial and first trial block (see Table 11), and these are important comparisons since one would expect any condition effects to dissipate with time. Results in the other comparisons are mixed. Thus, performance is better when subjects fail and make a public statement than when they make no public statement in the results on the total performance measure and the measures of performance in the second and fourth trial blocks. In these cases, however, performance in the Success-Failure condition is worse than that in the three no-statement conditions. In the third and fifth trial blocks, furthermore, the performance of Failure-Success subjects is worse than that of subjects in the three no-statement conditions.

Another way to analyze the performance results is to look at changes in performance as they relate to changes in prophecies and arousal. Specifically, one would expect subjects who changed their expectations and arousal in the predicted direction to be more likely than others to show the predicted changes in performance.

Correlations between prophecy and arousal changes from T_1 to T_2 are presented in Table 15. A positive correlation indicates that a decrease in arousal accompanies a lowering of expectations; alternatively, a negative correlation indicates that an increase in arousal accompanies a

Table 15

CORRELATIONS BETWEEN PROPHECY AND AROUSAL CHANGES FROM T_1 TO T_2

Condition	Prophecy	D+G+P+N	D+G+N	AACL
Success-Failure	General	.00	.67*	.07
	Relative	.10	-.14	-.27
	Combined	.10	.42	-.05
Success	General	.54	.51	.22
	Relative	.40	.42	.26
	Combined	.44	.42	.25
Control	General	-.07	-.27	-.33
	Relative	-.01	-.02	- .11
	Combined	-.05	-.19	- .26
Failure	General	.46	.37	-.14
	Relative	.08	-.07	-.54
	Combined	.29	.15	-.28
Failure-Success	General	.64**	.57*	.60*
	Relative	.61*	.59*	.59*
	Combined	-.32	-.10	.31

* $p<.05$
** $p<.01$

lowering of expectations. Dissonance predicts positive correlations in the Success-Failure condition, since coming to believe that one will fail should reduce dissonance. The opposite should be the case in the Failure-Success condition, where decreases in arousal should accompany increasing expectations of success. In Table 15, there is only one significant correlation in the predicted direction in the Success-Failure condition. In the Failure-Success condition six of the nine correlations are large and significant, but the direction is opposite to that predicted. Hull-Spence predictions pertain mainly to the Success, Control, and Failure conditions, since there increasing expectations of failure are least complicated by other factors. Results in the Control condition are in the predicted direction, but the correlations are very small. In the Failure condition almost half are in the opposite direction from that predicted, and these latter correlations are as large as the others. Correlations in the Success condition are small but consistently contrary to prediction.

Turning now to the correlations between prophecy and performance changes in Table 16, one again finds little support for dissonance predictions in the Success-Failure condition, but considerable in the Failure-Success condition. The lack of positive results on the combined measure is not that problematic, since a combination of change scores would increase unreliability over that of the already unreliable individual change scores (Cronbach & Furby, 1970). The outcome for the Hull-Spence predictions is almost identical to that for prophecy and arousal: correlations in the Control condition are directional but weak, and those in the Success condition are contrary and weak.

Finally, in Table 17 we present correlations between changes in arousal and changes in performance. Dissonance predicts that they should be negative in the Success-Failure condition, since performance should decrease with increasing arousal, and positive in the Failure-Success condition, since performance should increase with increasing arousal. Only the latter occurs consistently, with correlations in the Success-Failure condition being mixed and small. Hull-Spence predictions suffer a reversal over the two previous sets. The Success condition correlations are now more strongly supportive than they were contrary previously, but the Control condition correlations are almost as strongly contrary as they were supportive previously.

Table 16

CORRELATIONS BETWEEN PROPHECY AND PERFORMANCE CHANGES FROM T_1 TO T_3

Condition	Prophecy	Total	1st Trial	1st Block	2nd Block
Success-Failure	General	-.08	-.04	.14	-.29
	Relative	-.06	-.24	.28	-.16
	Combined	-.09	-.15	.26	-.28
Success	General	.40	.47	.17	.28
	Relative	.15	.13	.06	.17
	Combined	.19	.29	.08	.14
Control	General	-.47	-.22	-.35	-.10
	Relative	-.41	-.32	-.28	-.04
	Combined	-.45*	-.27	-.31	-.05
Failure	General	-.26	-.04	.48	.21
	Relative	-.13	-.18	.08	.16
	Combined	-.19	-.11	.30	.22
Failure-Success	General	.80**	.85**	.87**	.88**
	Relative	.89**	.91**	.87**	.92**
	Combined	.09	-.01	.28	.27

* $p<.05$
** $p<.01$

Table 17

CORRELATIONS BETWEEN AROUSAL AND PERFORMANCE CHANGES FROM T_1 TO T_2

Condition	Arousal	Total	1st Trial	1st Block	2nd Block
Success-Failure	D+G+P+N	.14	.37	.08	.07
	D+G+N	-.24	-.43	-.24	-.17
	AACL	.01	.06	.13	-.33
Success	D+G+P+N	.57*	.21	.26	.64**
	D+G+N	.61*	.25	.30	.69**
	AACL	.27	.24	.16	.06
Control	D+G+P+N	-.25	-.25	-.17	-.50*
	D+G+N	-.08	-.09	-.14	-.47
	AACL	.05	.05	-.14	.31
Failure	D+G+P+N	.20	.17	.19	.06
	D+G+N	.14	.22	.16	.09
	AACL	.23	.21	-.07	-.14
Failure-Success	D+G+P+N	.24	.41	.75**	.61*
	D+G+N	.24	.41	.75**	.61*
	AACL	.24	.41	.75**	.60*

* $p<.05$
** $p<.01$

The above results are discouraging on several counts. In the first place, they neither consistently support nor consistently refute the two theories. Secondly, they fail to indicate consistent self-fulfilling prophecy effects. For these reasons it is difficult to draw firm conclusions. For the moment we shall turn to further results to see if they can throw more light on what happened in the experiment.

Arousal Reduction

Arousal reduction is relevant to the dissonance hypotheses; that is, if prophecy and performance changes are undertaken to reduce dissonance they should do so. The only prediction one can make for T_3 arousal scores is that differences between conditions should be smaller at T_3 than at T_2, since some arousal reduction should have accompanied prophecy and/or performance changes undertaken to justify counter-attitudinal behavior. Mean arousal scores at T_3, adjusted for scores at T_1, can be found in Table 18; the summaries of the analyses of variance are in Table 19.

Condition means for the three self-report measures have the same ordering ws they did at T_2 (see Table 9). There is a decrease from T_2 in amount of variance explained by the conditions on the D+G+N and AACL measures. The absence of a decrease on the D+G+P+N measure is explicable, since dissonance reduction may have been accompanied by relief or Positive arousal which could have offset reduction on the other dimensions. One should also note, however, that the orderings of the means in Table 19, with the exception of those on the PSI, are more in accord with a Public Statement than a dissonance interpretation.

Decreased differences in arousal do not provide a very satisfactory argument for dissonance reduction, however, since differences at T_2 may simply dissipate with time anyway, whether or not subjects want to reduce arousal. For this reason it is important to determine whether arousal reduction actually accompanies predicted changes in prophecies and performance from T_1 to T_2. Furthermore, at T_3 those subjects who think they did as dissonance predicts they should, should be less aroused than those who think otherwise. In other words, if subjects think their performance is in the direction dissonance theory would predict dissonance should actually be reduced, even if their perceptions

Table 18

MEAN ADJUSTED SCORES ON SUMMATED CHECKLIST AND PSI MEASURE OF AROUSAL (T_3)

Condition	D+G+P+N	D+G+N	AACL	PSI
Success-Success	14.54	14.07	7.83	4.58
Success-Failure	14.68	14.04	7.70	5.61
Success	13.20	12.17	6.72	3.53
Control	12.88	12.05	7.03	4.33
Failure	15.06	13.85	7.80	5.25
Failure-Success	17.82	17.41	9.28	4.65
Failure-Failure	15.19	14.62	8.80	4.64

Table 19

SUMMARIES OF ANALYSES OF VARIANCE

Source	D+G+P+N			D+G+N		
	df	MS	F	df	MS	F
Conditions (A)	6	44.06	2.32*	6	53.65	2.82*
Expectancy (B)	1	30.47	1.60	1	43.43	2.30
A x B	6	5.82	< 1	6	9.69	<1
Error	103	19.03		103	18.88	
	AACL			PSI		
Conditions (A)	6	16.30	3.52**	6	6.06	<1
Expectancy (B)	1	12.56	2.71	1	36.74	4.76*
A x B	6	8.09	1.75	6	5.78	<1
Error	125	4.63		78	7.72	

* $p<.05$
** $p<.01$

of performance are inaccurate.

The relevant correlations are in Tables 20, 21, and 22. Since only dissonance predicts arousal reduction, the results presented are restricted to those in the two highest dissonance conditions.

In Table 20 results are contrary to dissonance predictions, since increasing expectations of failure are accompanied by increased arousal in the Success-Failure condition, and by decreased arousal in the Failure-Success condition. These correlations are larger and more consistent than those in the previous tables. Correlations in Table 21 are also contrary to prediction. Although decreases in arousal are paired with poorer performance in a majority of cases in the Success-Failure condition, the correlations are small. In the Failure-Success condition increases in performance are accompanied by <u>increases</u> rather than decreases in arousal. With its high positive correlations in the Success-Failure condition, Table 21 contains strong evidence against a dissonance interpretation, since low expectations should be associated with low arousal. In the Failure-Success condition results are mixed, with high expectations not always being matched with low arousal.

We shall discuss the full implications of the results of this chapter in a later chapter. As a brief summary, however, we note that different conditions do seem to have affected prophecies as predicted by dissonance theory, although not strongly. The same is true for arousal, although differences between conditions are small here as well, and a simple public statement interpretation competes with dissonance. Performance does not seem to have been significantly affected by prophecy differences among conditions, for either the dissonance or Hull-Spence predictions. Internal analyses do not provide consistent evidence one way or the other for either approach. Those relating arousal to prophecy changes are least conclusive, but are more negative than positive in their support for dissonance. Prophecy and arousal changes do relate meaningfully and strongly in the Failure-Success condition, but not in the Success-Failure condition. For arousal reduction one finds that prophecy, arousal, and performance changes in the Failure-Success condition are strongly opposed to the dissonance predictions. Results in general in the Success-Failure and at T_3 in the Failure-Success condition are mixed.

Table 20

CORRELATIONS BETWEEN PROPHECY CHANGES (T_1-T_2) AND AROUSAL CHANGES (T_2-T_3)

Condition	Prophecy	D+G+P+N	D+G+N	AACL
Success-Failure	General	-.56*	-.56*	-.22
	Relative	-.09	-.09	.03
	Combined	-.48	-.48	-.12
Failure-Success	General	.61*	-.65*	.85***
	Relative	.52	.61*	.86***
	Combined	.63*	.66**	-.02

Table 21

CORRELATIONS BETWEEN AROUSAL CHANGED (T_2-T_3) AND PERFORMANCE CHANGES

Condition	Arousal	Total	1st Trial	1st Block	1st Block
Success-Failure	D+G+P+N	-.15	.14	-.20	-.26
	D+G+N	-.15	.14	-.20	-.26
	AACL	-.24	.00	-.27	-.17
Failure-Success	D+G+P+N	.23	.40	.76**	.60*
	D+G+N	.23	.40	.75**	.60*
	AACL	.99***	.99***	.99***	.99***

* $p<.05$
** $p<.01$
*** $p<.001$

Table 22

CORRELATIONS BETWEEN PROPHECIES (T_3) AND AROUSAL (T_3)

Condition	Prophecy	D+G+P+N	D+G+N	AACL
Success-Failure	General	.59*	.53*	.26
	Relative	.72**	.67**	.50*
	Combined	.71**	.65**	.41
Failure-Success	General	.01	-.29	-.15
	Relative	.10	-.54*	.02
	Combined	.14	-.48*	-.34

* $p<.05$
** $p<.01$

CHAPTER V

SUPPLEMENTARY RESULTS: OR, WHAT REALLY HAPPENED

In the beginning of the last chapter we noted that the experimental conditions did not account for very much of the variance in the dependent variables in this study. Splitting initial expectancy scores within conditions seemed, however, to indicate important personality differences. Here we shall begin with a detailed look at this possibility.

Table 23 presents prophecies at T_2 as a function of both conditions and the initial expectancy splits at T_1. The splits were made at the median on the General and Relative measures, although there were several ties in each condition which made random allocation to the High and Low categories necessary. The means in Table 23 indicate that subjects who expected to do most poorly in the beginning (the "Low" groups) were still more likely to expect to do poorly on the second set of reaction trials, regardless of the feedback they received in different experimental conditions. These prophecy differences at T_2 are consistent and marked. The F ratios in Table 4 of the previous chapter (see page 52) are all larger than 22 (df=1, 116), and all significant at much better than the .001 level.

There are several things these results could mean. They could reflect the predilection of persons of different types to make different prophecies for themselves, or they could simply mean that subjects were accurately describing their performances on the first, and accurately predicting their performances on the second, set of reaction trials. The group reaction time task has not been susceptible to subjects' finding out how they actually did by themselves. Several subjects did claim they could distinguish the timing of the click of their own switch from that of other subjects in the session. This is feasible where individual subjects' reaction times were much faster than those of others, but this occurred rarely. When giving false feedback to subjects, furthermore, the experimenter found numerous occasions where subjects would express recognition of, and elaborate explanations for, particularly good or particularly poor times on specific trials,

Table 23

PROPHECIES AT T_2 BY CONDITION AND INITIAL EXPECTANCY SPLITS

Condition	General		Relative	
	High	Low	High	Low
Success-Success	15.11	32.30	21.70	31.67
Success-Failure	24.00	42.44	26.56	39.60
Success	21.11	39.67	21.75	44.30
Control	33.10	41.00	32.80	49.50
Failure	34.00	41.67	43.20	52.43
Failure-Success	30.75	43.70	35.70	49.12
Failure-Failure	24.00	46.60	42.11	42.40
	Combined (Split on General)		Combined (Split on Relative)	
	High	Low	High	Low
Success-Success	32.22	67.00	41.20	60.89
Success-Failure	50.20	85.22	51.89	80.20
Success	45.78	83.56	38.12	85.90
Control	69.00	86.20	60.60	94.60
Failure	81.13	88.56	76.90	96.71
Failure-Success	67.88	89.00	67.10	95.25
Failure-Failure	56.89	97.30	78.22	78.10

when in fact the times in question were not their own. Nevertheless, Low expectancy subjects did do more poorly on the first set. This is evident in Tables 24 and 25. These tables indicate significant expectancy effects in four of the six cases. Results are much weaker when expectancy is split on the General item (see Tables 24A and 25A in Appendix C). In these cases only one of the six analyses (that for the Third Block) yields a significant expectancy effect.

One cannot be certain that the above effects simply reflect accuracy--they could be self-fulfilling prophecy effects in themselves. One does find expectancy effects on the second set of trials when the effects of actual performance on the first set are covaried out. Mean adjusted performance scores are given in Table 26; summaries of the analyses of variance of these adjusted scores are in Table 12 and 14 of the previous chapter. These results indicate fewer and weaker expectancy effects on the second set when the first set is controlled for. The only significant effects occur on the First and Fifth Blocks. Differences again occur between the General and Relative splits. Whereas subjects differing in Relative expectancies show weaker differences on the second than the first set, those differing in General expectancies show stronger differences on the second than the first set. In Tables 11A and 12A of Appendix C one finds significant differences in performance between High and Low Expectancy subjects on both Total trials and the First Block of the second set. Interestingly, Low expectancy subjects do not always do poorer than High expectancy subjects. This is particularly true on the Relative splits. An inspection of Table 26, for instance, reveals that on all but the First Block of trials High expectancy subjects in the Success-Success condition and Low expectancy subjects in the Failure-Failure condition have the best reaction times. We shall return to this result after investigating the meaning of expectancy differences.

Several relevant pieces of information were obtained during the experiment. Some pertain to arousal, others to motivation and distraction, and still others to attitudes toward situations which this experiment typifies. We shall deal with each of these in turn.

There seem to be relatively few arousal differences between High and Low groups. Three exceptions are illuminating, however. Low

Table 24

T_1 PERFORMANCE AS A FUNCTION OF INITIAL (RELATIVE) EXPECTANCIES AND CONDITION

Condition	Total		First Block		Second Block	
	High	Low	High	Low	High	Low
Success-Success	495.10	507.60	144.40	127.30	96.50	102.20
Success-Failure	457.10	539.00	108.40	126.90	94.30	103.10
Success	425.40	535.90	104.30	136.60	82.20	106.10
Control	471.90	499.10	116.40	119.60	94.70	108.00
Failure	491.00	521.70	116.00	118.50	94.90	105.80
Failure-Success	502.00	519.50	127.50	134.00	95.90	103.30
Failure-Failure	436.60	502.10	109.00	128.80	87.10	103.00
	Third Block		Fourth Block		Fifth Block	
Success-Success	86.70	96.60	85.20	191.80	82.30	89.70
Success-Failure	88.00	104.90	84.50	98.70	81.90	105.40
Success	83.30	100.80	75.10	93.40	80.50	99.00
Control	89.90	92.50	81.70	91.20	89.20	87.80
Failure	92.40	105.70	90.70	93.10	135.70	97.60
Failure-Success	88.50	98.40	95.70	91.90	84.40	91.90
Failure-Failure	84.30	96.20	78.20	90.70	78.00	87.40

Table 25

SUMMARIES OF ANALYSES OF VARIANCE OF T_1 PERFORMANCE

Source	Total			First Block		
	df	MS	F	df	MS	F
Conditions (A)	6	4218.33	<1	6	1115.31	1.21
Expectancy (B)	1	87410.00	9.98**	1	3082.13	3.35
A x B	6	7005.00	<1	6	1259.90	1.37
Error	126	8754.25		126	920.25	
	Second Block			Third Block		
Conditions (A)	6	147.60	<1	6	202.92	<1
Expectancy (B)	1	5270.00	12.17**	1	4802.50	14.67**
A x B	6	191.77	<1	6	127.08	<1
Error	126	433.04		126	327.38	
	Fourth Block			Fifth Block		
Conditions (A)	6	292.29	<1	6	2549.06	1.43
Expectancy (B)	1	2546.25	7.66*	1	513.13	<1
A x B	6	280.94	<1	6	2037.29	1.14
Error	126	322.26		126	1779.81	

* $p<.01$
** $p<.001$

Table 26

MEAN ADJUSTED PERFORMANCE SCORES (T_2) BY CONDITION AND EXPECTANCY

Condition	Total		First Block		Second Block	
	High	Low	High	Low	High	Low
Success-Success	361.90	391.17	71.44	90.48	72.53	76.35
Success-Failure	388.32	411.42	79.32	90.52	73.01	85.68
Success	387.32	395.89	88.40	90.37	76.12	75.33
Control	383.42	405.32	85.54	90.21	75.92	71.98
Failure	388.78	403.73	84.75	94.00	79.82	79.92
Failure-Success	380.19	398.99	80.45	90.24	75.57	71.97
Failure-Failure	388.48	353.84	79.78	81.40	75.88	71.23
	Third Block		Fourth Block		Fifth Block	
Success-Success	70.49	77.12	75.74	74.39	73.66	74.78
Success-Failure	72.06	80.37	77.90	81.89	72.51	87.25
Success	76.02	77.31	76.43	82.51	69.57	75.90
Control	72.59	79.05	76.79	77.12	70.55	86.01
Failure	74.00	75.45	76.39	78.36	70.25	79.57
Failure-Success	77.41	80.48	71.99	75.66	77.34	86.20
Failure-Failure	75.06	69.88	77.13	70.19	71.45	70.66

expectancy subjects are more Negatively aroused at T_2, and also more aroused on the AACL measure, which is heavily weighted toward the negative dimension. These results can be found in Tables 8 and 10. Furthermore, at T_3, when subjects would supposedly be anxiously awaiting news of their performance on the second set, Low expectancy subjects sweat more (see Table 20).

The Motivation and Distraction indices proved to be unreliable, with split-half coefficients being .25, .36, and .11 for Motivation at Times 1, 2, and 3, respectively, and .26, .35, and .21 for Distraction. In retrospect the individual items do appear to have heterogeneous meanings. For Motivation, for instance, the items referred to how interested and involved subjects were, as well as how hard they tried and now motivated they were. For Distraction, embarrassment and self-consciousness accompanied items referring specifically to the dimension. Reliability may also have been decreased because one item in each case was set off from the rest. (See pp. 47-8 and Appendix B.) Since these individual items have already been used with success by Mandler and Watson (1966) and Marlett and Watson (1968), we shall report the results for these rather than for the combined indices. The means and analyses of variance for Motivation (how hard subjects reported having tried or how inspired they were to try) are in Tables 27 and 28; those for Distraction (how much they were thinking about how well or how poorly they had done or would do) are in Tables 29 and 30.

We have broken precedent here and included results for Motivation on the General expectancy rather than the Relative expectancy split. We do this because of a puzzling outcome. If one compares Tables 27 through 30 with their respective counterparts in Appendix C, one finds strong General expectancy effects on Motivation, but no effects for Relative expectancies. On the Distraction item, on the other hand, one finds Relative but not General expectancy effects. It appears that subjects who generally make low performance prophecies (i.e. on the General item) are either less motivated or more defensive, while those who make low conditional prophecies (i.e. on the Relative item) are more distracted without being less motivated.

There are several other interesting findings in the Distraction results. There is a condition effect of borderline significance at T_2

Table 27

MOTIVATION SCORES AT T_1, T_2, AND T_3 BY CONDITION AND GENERAL EXPECTANCY

Condition	T_1		T_2		T_3	
	High	Low	High	Low	High	Low
Success-Success	19.60	34.80	20.89	28.90	16.60	31.60
Success-Failure	23.67	38.70	21.67	45.80	18.55	30.30
Success	23.10	27.67	20.30	32.44	22.90	29.00
Control	18.90	30.50	38.80	40.40	33.20	40.60
Failure	26.11	30.89	28.44	41.00	24.78	31.22
Failure-Success	22.33	35.40	27.11	37.20	21.78	29.90
Failure-Failure	26.70	23.90	26.22	43.10	24.50	29.20

Table 28

SUMMARIES OF ANALYSES OF VARIANCE

Source	T_1			T_2		
	df	MS	F	df	MS	F
Conditions (A)	6	107.17	<1	6	495.15	<1
Expectancy (B)	1	2594.12	7.82**	1	4936.56	9.89**
A x B	6	219.98	<1	6	235.85	<1
Error	121	331.40		119	499.18	
	T_3					
Conditions (A)	6	369.25	1.04			
Expectancy (B)	1	2433.25	6.89*			
A x B	6	62.93	<1			
Error	121	353.37				

* $p<.01$
** $p<.001$

Table 29

DISTRACTION SCORES AT T_1, T_2, AND T_3 BY CONDITION AND RELATIVE EXPECTANCY

Condition	T_1		T_2		T_3	
	High	Low	High	Low	High	Low
Success-Success	33.30	48.80	38.40	49.00	47.40	50.80
Success-Failure	48.11	31.30	38.77	40.40	56.00	39.60
Success	36.62	40.40	37.56	45.90	51.44	46.50
Control	40.20	34.40	24.10	27.20	31.00	25.40
Failure	38.20	42.75	35.90	49.75	47.20	41.13
Failure-Success	38.20	54.78	44.10	51.89	44.10	59.44
Failure-Failure	40.70	38.60	39.44	44.70	45.00	48.70

Table 30

SUMMARIES OF ANALYSES OF VARIANCE

Source	T_1			T_2		
	df	MS	F	df	MS	F
Conditions (A)	6	165.25	<1	6	936.63	2.14
Expectancy (B)	1	168.15	<1	1	1726.55	3.94*
A x B	6	668.26	1.71	6	86.00	<1
Error	121	390.25		119	438.44	
	T_3					
Conditions (A)	6	1190.94	2.99**			
Expectancy (B)	1	76.69	<1			
A x B	6	486.09	1.22			
Error	121	397.66				

* $p<.05$
** $p<.01$

(the obtained F is 2.14 when that required for the .05 level is 2.17), and a significant effect at T_3. Differences are not very large, but performance feedback of any kind seems to have increased distraction, and the anticipation of more feedback at T_3 seems to have been still more distracting. This is clearer in the one-way means in Table 31 than in the two-way means in Table 29. There appear to be no other consistent condition differences.

Other sources of information about individual differences are the short questionnaire subjects filled out in the rest period and the general questionnaire they filled out at the end of the experiment. Mean responses to these questions are given in Table 32. A high score indicates low interest, feelings of bad luck, a low opinion of one's ability, and so forth. For the most part differences are not large. The three significant differences indicate that Low expectancy subjects on the Relative item are less likely to play at and watch sports, and less likely to see themselves as being skilled at sports. (The F's are 10.67, 5.21, and 7.07, with 1, 126 degrees of freedom.) The other means indicate slight tendencies for low expectancy subjects to think less of the task, the experiment as a whole, academic testing situations, and their own ability on the latter. They are not, however, less involved in the task or the experiment as a whole. They are slightly more likely to describe their performance as atypical, but at the same time they do not consider themselves to have been more unlucky.

Given the evidence for individual differences, more personality information about subjects was desired. This information could not be collected during the experiment because each session took up the full two hours allotted. However, five months later subjects were sent a follow-up questionnaire containing several personality measures. One was a measure of general self-esteem (Aiken, 1965), another was Rotter's I-E scale (Rotter, 1966), and the third was the Marlowe-Crowne "need for approval" measure (Crowne & Marlowe, 1964). Ten additional items were used instead of Rotter's filler items on the advice of Dr. Patricia Gurin. Three were expectancy items referring specifically to intellectual-game-competition-related abilities, two referred to sports, and five regarded perceptions of masculinity (ability to make friends with men and women, dating and sexual know-how, and mechanical ability).

Table 31

MEAN ONE-WAY DISTRACTION SCORES

Condition	T_1	T_2	T_3
Success-Success	41.05	43.70	49.10
Success-Failure	39.71	39.59	47.80
Success	38.53	41.72	48.97
Control	37.30	25.65	28.20
Failure	40.48	42.83	44.16
Failure-Success	46.49	47.99	51.77
Failure-Failure	39.65	42.07	46.85

Table 32

TASK-RELATED ATTITUDES AND SELF-PERCEPTIONS BY EXPECTANCY

Item	General		Relative	
	High	Low	High	Low
1. Think of task	73.71	85.84	77.52	81.61
2. Task involvement	30.21	37.33	33.88	32.76
3. Luck in performance	51.22	49.46	50.96	49.43
4. Typicality of it	37.99	61.87	41.59	56.97
5. Think of experiment	67.67	79.77	70.56	75.43
6. Involvement in experiment	29.78	35.49	33.95	30.52
7. Interest in sports	3.04	3.36	2.61	3.79***
8. As spectator	3.44	3.58	3.09	3.94*
9. Skill at sports	6.64	7.39	6.33	7.70**
10. Attitude toward academic testing	5.14	5.13	4.99	5.29
11. Performance therein	7.04	7.61	7.07	7.59

* $p<.05$ ** $p<.01$ *** $p<.001$

These items can be found in Appendix D. The rate of return after five months was surprisingly good at 82%. Subjects in the two high dissonance conditions (Success-Failure and Failure-Success) were slightly less likely than others to return the questionnaire, but these differences are not significant.

Of the three general personality measures, only self-esteem related to the expectancy splits. Mean self-esteem scores by condition and the splits are given in Table 33; the summaries of the analyses of variance are in Table 34. Those for the other personality measures are in Appendix C. (One of the specific expectancy dimensions, sports, related to the splits. These results, also contained in Appendix C, support the sports-related results in Table 32.)

It is interesting to see how the two different splits relate in terms of self-esteem. It was not appropriate to do a combined analysis of variance, since the splits were not independent of each other. There is considerable overlap, however, and one finds that in both splits low expectancy subjects have significantly lower self-esteem. There is also a significant condition effect in the Relative expectancy split. I hope this is not a result of the subjects' experiences in the experiment. The fact that Success-Success as well as Failure subjects are lower in self-esteem than the others makes this unlikely.

The discovery that low expectancy subjects are low in self-esteem throws new light on previous findings. One would, of course, expect subjects low in self-esteem to expect failure. Aside from this, however, we see differences in performance on the second set even after initial performance is controlled. This could still reflect accurate perceptions on subjects' parts, but several other findings suggest that self-esteem may still have affected performance. In the first place, we know that low expectancy subjects were more negatively aroused than others (see Table 26). Secondly, we know that those low in General expectancy were less motivated and/or more defensive, and that those low in Relative expectancy were more distracted. (We cannot account for the discrepancy on the two measures, but it is possible that the former were more likely to be "repressors" and the latter "sensitizers" (Byrne, 1961)).

That low self-esteem subjects were more negatively aroused and

Table 33

MEAN SELF-ESTEEM SCORES[X] BY CONDITION AND EXPECTANCY

Condition	General		Relative	
	High	Low	High	Low
Success-Success	30.11	31.11	29.78	31.44
Success-Failure	28.40	31.11	28.00	31.44
Success	28.50	29.40	28.90	29.00
Control	29.29	34.00	30.00	33.89
Failure	31.00	30.89	30.33	31.63
Failure-Success	27.67	28.88	26.57	30.14
Failure-Failure	24.25	28.11	24.50	27.89

Table 34

SUMMARIES OF ANALYSES OF VARIANCE

Source	General			Relative		
	df	MS	F	df	MS	F
Conditions (A)	6	57.73	2.04	6	61.43	2.19*
Expectancy (B)	1	120.82	4.27*	1	180.48	6.44*
A x B	6	12.87	<1	6	8.81	<1
Error	105	28.27		105	28.01	

* $p<.05$

X The higher the score, the lower the self-esteem.

distracted by feedback allows one to interpret a number of previous findings.

First are the two significant interaction effects which occur between expectancy and the experimental conditions and affect arousal. These interactions occur on the Dissonance and D+G+N dimensions of the checklist measure when the expectancy split is made on the General prophecy item. The means for these cases and the Positive dimension are given in Table 35; the summaries of the analyses of variance can be found in Tables 8A and 10A of Appendix C. Only one interaction occurs consistently in all three cases; this interaction is clearer in Table 36, where all three success and all three failure conditions are averaged. The means in Table 36 indicate that after failure High expectancy subjects were more aroused on the Dissonance and D+G+N dimensions, and less aroused on the positive dimension, than low expectancy subjects, while low expectancy subjects were more aroused by success, with the exception of the Positive dimension, than High expectancy subjects were. Second is the interesting interaction effect of expectancy and conditions upon performance, such that reaction times are best for Success-Success subjects with High expectancies and Failure-Failure subjects with Low expectancies. This occurs only on the Third Block in the General expectancy split. But here one finds interactions between expectancy and type of feedback, on the First Trial and First and Second Blocks. The means, given in Table 26A, are more easily interpreted when the three success and three failure conditions are collapsed, as in Table 37. In all three cases Low expectancy subjects do worse after success feedback. On the First Trial and Second Block, furthermore, they do better than High expectancy subjects after failure feedback. On the First Block, Low expectancy subjects do more poorly after both types of feedback, but the difference is greater after success. These interaction effects are not strong (p's are $<.18$, $<.11$, and $<.07$, respectively), but they are suggestive.

Both of these sets of findings are consistent with Silverman's results. In his study, which is described more fully in Chapter I, subjects were more distracted when performance feedback was inconsistent with their self-esteem, and supposedly their expectantions as well, and performance was impaired more when inconsistency was present

Table 35

MEAN ADJUSTED AROUSAL SCORES ON THREE DIMENSIONS BY CONDITION AND EXPECTANCY

Condition	Dissonance		Positive		D+G+N	
	High	Low	High	Low	High	Low
Success-Success	5.56	4.09	.38	.52	16.93	14.60
Success-Failure	4.33	5.74	.55	.67	14.61	16.81
Success	2.83	6.05	1.64	.76	9.63	16.29
Control	4.75	4.00	.38	1.03	12.18	12.71
Failure	4.61	5.12	.62	.51	14.19	15.70
Failure-Success	6.65	5.15	.43	.21	18.23	16.70
Failure-Failure	5.70	5.40	.15	.56	16.14	15.03

Table 36

MEAN ADJUSTED SCORES BY EXPECTANCY AND AVERAGED SUCCESS, AVERAGED FAILURE, AND CONTROL CONDITIONS

Condition	Dissonance		Positive		D+G+N	
	High	Low	High	Low	High	Low
Averaged Success	4.24	5.29	.86	.65	13.72	15.90
Control	4.75	4.00	.38	1.03	12.18	12.71
Averaged Failure	5.65	5.22	.40	.43	16.19	15.81

Table 37

MEAN ADJUSTED PERFORMANCE SCORES BY EXPECTANCY AND AVERAGED FEEDBACK CONDITIONS

Condition	First Trial		First Block		Second Block	
	High	Low	High	Low	High	Low
Averaged Success	23.59	28.14	79.47	90.65	73.41	79.61
Control	24.23	24.28	84.58	91.31	76.14	71.51
Averaged Failure	25.20	22.70	84.96	85.26	75.90	75.57

than when it was absent. Thus, our results as well as his might be interpreted as supporting Mandler and Watson's hypothesis that unexpected outcomes will be debilitating because coping strategies and ego-defenses are structured around a person's expectations.

In all fairness to the Dissonance and Hull-Spence approaches, however, it must be noted that neither a defensive effort nor distraction interpretation of our results is heavily buttressed by internal analyses of results within conditions. Thus the correlations among prophecies, Motivation, Distraction, performance, and self-esteem in Tables 38 through 42 are not subject to a single, coherent interpretation. In fact, they are as weak and inconsistent as those previously presented for the Dissonance and Hull-Spence approaches.

Relying solely on correlations within conditions is unfair to all four approaches, since sample sizes are small, ranging from 11 to 20, and many variables are change scores. For this reason correlations among the major variables at T_2 and self-esteem were computed for the total sample of 140 subjects. These correlations are given in Table 43.

The correlations now follow a fairly consistent pattern. Arousal does not relate to prophecy at T_2, or to self-esteem. Prophecies do relate highly to motivation: the worse subjects expect to do, the less motivated and/or the more defensive they are. Distraction does not correlate with prophecy, but this is to be expected, since <u>any</u> feedback rather than just failure feedback was previously found to increase distraction, and because the interaction effects between initial expectancy and type of feedback would prevent indications of a single relationship between them.

One now finds significant correlations between prophecies and performance in line with self-fulfilling prophecy. Only correlations for total performance scores on the first and second set of trials are given in Table 43. Those for the First and Second Blocks of the second set are somewhat larger. Correlations in Table 43 also indicate that only the AACL measure of arousal relates to performance. The direction, however, indicates that high arousal is associated with <u>poor</u> performance. This contradicts Hull-Spence predictions; dissonance would expect this for only half of the subjects.

Table 38

CORRELATIONS BETWEEN PROPHECY AND MOTIVATION

Condition	Motivation	General$_2$	Relative$_2$	Combined$_2$	Change General$_2$	Change Relative$_2$	Change Combined$_2$
Success-Success	T_2	.26	-.56**	-.20	.03	.00	.65**
	T_3	.57**	-.58**	-.61**	.18	-.44**	.63**
Success-Failure	T_2	.46*	-.16	.14	.22	-.04	.73**
	T_3	.10	-.27	-.06	.08	-.23	.62**
Success	T_2	.32	-.09	-.05	.39	.11	.55*
	T_3	.06	.10	-.27	.05	-.33	.19
Control	T_2	.08	.50*	.33	.11	.37	.32
	T_3	.13	.21	.24	.09	.25	.41
Failure	T_2	-.13	.19	.36	.05	.26	.55*
	T_3	.02	.42	.13	-.37	.12	.20
Failure-Success	T_2	.46*	-.19	-.22	-.21	-.42	.30
	T_3	.27	-.00	-.01	-.32	-.45*	-.10
Failure-Failure	T_2	.44*	.56**	-.18	.31	.01	.14
	T_3	.26	-.20	-.17	.03	.04	.33

* $p<.05$
** $p<.01$

Table 39

CORRELATIONS BETWEEN PROPHECY AND DISTRACTION

Condition	Distraction	General$_2$	Relative$_2$	Combined$_2$	Change General$_{1-2}$	Change Relative$_{1-2}$	Change Combined$_{1-2}$
Success-Success	T_2	.28	.07	.18	.11	.26	-.14
	T_3	.04	-.12	.14	-.29	.18	-.08
Success-Failure	T_2	.10	-.53	-.05	.02	.16	.01
	T_3	-.25	-.44*	-.55*	-.52*	-.63**	.07
Success	T_2	-.12	-.10	-.05	-.05	.18	.04
	T_3	-.15	.33	-.07	-.29	-.24	-.28
Control	T_2	-.25	-.13	.15	-.06	-.18	-.26
	T_3	-.16	.01	.24	.40	.06	.09
Failure	T_2	.33	.32	.26	.07	.21	.22
	T_3	.08	.26	-.07	-.59*	-.39	-.13
Failure-Success	T_2	-.23	-.48*	-.21	-.22	-.05	.17
	T_3	-.07	-.12	.10	-.05	.01	.17
Failure-Failure	T_2	-.33	-.25	-.16	-.04	-.02	-.10
	T_3	-.20	-.16	.11	.08	.14	-.30

* $p<.05$
** $p<.01$

Table 40

CORRELATIONS BETWEEN MOTIVATION AND PERFORMANCE

Condition	Motivation	$Total_1$	$Total_2$	Change $Total_{1-2}$	Change First Trial	Change First Block	Change Second Block
Success-Success	T_2	.79**	.74**	-.02	.41	.40	.41
	T_3	.65**	.65**	-.13	.36	.42	.39
Success-Failure	T_2	.61**	.70**	.32	.38	.01	.19
	T_3	.46*	.59**	-.04	.44*	.12	.28
Success	T_2	.53*	.55*	.39	.47	.52*	.51*
	T_3	.17	.18	-.10	.26	.09	.18
Control	T_2	.27	.37	.26	.35	.19	.29
	T_3	.19	.38	.24	.49*	.23	.38
Failure	T_2	.53*	.59*	.09	.35	.35	.37
	T_3	-.25	-.05	.07	.13	-.14	-.00
Failure-Success	T_2	.02	.20	-.04	-.07	-.21	-.14
	T_3	-.29	-.19	-.13	-.15	-.23	-.20
Failure-Failure	T_2	.29	.23	.27	-.16	.12	-.02
	T_3	.28	.32	.07	.19	.21	.20

* $p < .05$
** $p < .01$

Table 41

CORRELATIONS BETWEEN DISTRACTION AND PERFORMANCE

Condition	Dis- traction	$Total_1$	$Total_2$	Change Total	Change First $Trial_{1-2}$	Change First $Block_{1-2}$	Change Second $Block_{1-2}$
Success-Success	T_2	-.00	-.07	.29	.13	.01	.08
	T_3	.12	-.02	.02	.24	.14	.20
Success-Failure	T_2	-.06	-.00	.16	-.21	-.07	-.14
	T_3	-.09	.00	-.51*	.27	.20	.24
Success	T_2	.18	.11	-.04	.27	.12	.20
	T_3	-.17	-.23	-.28	.04	-.13	-.05
Control	T_2	-.08	-.19	-.30	-.19	-.03	-.12
	T_3	-.13	-.17	-.09	-.18	-.15	-.17
Failure	T_2	-.01	.10	.40	.42	.10	.27
	T_3	.38	.16	-.11	.22	.38	.32
Failure-Success	T_2	.02	.12	-.25	.03	.19	.12
	T_3	.19	.19	.06	.11	.28	.20
Failure-Failure	T_2	-.05	-.08	-.22	.13	-.03	.05
	T_3	-.18	-.25	-.00	-.04	-.11	-.08

* $p<.05$

Table 42

CORRELATIONS BETWEEN SELF-ESTEEM AND OTHER VARIABLES

Condition	General$_2$	Relative$_2$	Motivation$_2$	Distraction$_2$	Total$_1$	Total$_2$
Success-Success	.16	-.08	-.28	-.06	-.26	-.24
Success-Failure	-.38	-.18	-.13	-.06	-.04	-.00
Success	.01	.07	.03	.03	.12	-.20
Control	.13	-.19	-.22	.13	.22	.36
Failure	.27	.08	.18	.14	.12	.17
Failure-Success	.05	-.37	-.24	-.06	.17	.11
Failure-Failure	.08	-.38	.07	.25	-.13	-.12

Table 43

CORRELATIONS AMONG MAJOR VARIABLES (TOTAL SAMPLE)

	D+G+P+N$_2$	D+G+N$_2$	AACL$_2$	Mot.$_2$	Dist.$_2$	Total Perf.$_1$	Total Perf.$_2$
General$_2$	.03	.07	.14	.44**	-.03	.23**	.32**
Relative$_2$	.06	.09	.09	.43**	-.02	.18*	.22**
Combined$_2$	.05	.09	.13	.46***	-.02	.21*	.28**
Self-esteem	-.07	-.08	-.08	-.10	.04	-.11	.00
D+G+P+N$_2$		.98***	.54***	-.12	.31**	.15	.07
D+G+N$_2$			.70***	-.09	.30**	.15	.08
AACL$_2$				.10	.14	.17*	.17*
Motivation$_2$					-.27***	.18*	.23**
Distraction$_2$						.05	-.02

* p<.05
** p<.01
*** p<.001

The correlations also show that Motivation is a better predictor of performance than is Distraction. That the latter does not correlate with performance is consistent with its not having correlated with prophecies. There is also a negative correlation between Motivation and Distraction, suggesting that the two are indeed separate processes.

CHAPTER VI

SUMMARY AND DISCUSSION

Prophecies

In Chapter I a host of studies were reviewed where expectations of success or failure were apparently successfully established. In the present study there is no completely convincing evidence for this outcome. The conditions do seem to have affected expectations since means for the Success, Control, and Failure conditions are in the order predicted. On the other hand, differences between conditions are not striking. Several factors working alone or in concert may have brought about these results.

It may be, as suggested earlier, that retesting subjects' expectations prompted attempts to be consistent over testings, such that pre- to post-manipulation changes were obscured. This is suggested by the finding of inter-condition arousal differences on the checklist, where there were many items in different orders at different testings, but not on the graphic measures, which had fewer items in the same order at each testing.

Another possibility is that subjects were suspicious of the feedback and hence did not accept it. This is unlikely on *a priori* grounds because most subjects had never participated in an experiment before, because the experiment was conducted during the first month and a half of their courses, and because these particular psychology courses (i.e. "Psychology as a Natural Science") would be less likely than others to discuss experiments where deception had been used. That there was relatively little suspicion seems evident from information collected in the experiment. Thus, subjects were asked to state what they thought the purposes of the experiment were, and then prodded to state "any other possible purpose" (see Appendix A). Subjects' open-ended responses were coded as follows. If they did not express suspicion of any kind they were given a rating of 0. If vague suspicions were expressed about "something else being tested" a rating of 1 was assigned. 2 was given if they gave a hypothesis about how the feedback might affect them, and 3 if they thought the performance feed-

back was or might be false. Levels 4, 5, and 6 paralleled 1 through 3, but the referent was the public statement manipulation. If both 1 and 4 or 2 and 4 occurred for the same subjects he received a score of 7, if 1 and 5 or 2 and 5 occurred he received 8, and if 2 and 6 or 3 and 6 occurred he got a score of 9. The frequencies with which subjects in each condition fell into these categories are given in Table 44.

A few subjects saw the feedback manipulation, the statement, or both, as having involved deception (levels 3, 6, and 9, respectively). Also, about a quarter of the subjects in each condition did suggest that the feedback might have affected them, or that it might have been given to see if it would affect them. Nevertheless, suspicion was hardly rampant. The high dissonance conditions were not even consistently suspicion provoking, although suspicion was highest when both failure and counterattitudinal behavior were present (the Failure-Success condition).

A third explanation is that personality propensities to make particular prophecies for oneself are so strong that they overpowered the situational effects in the present study. There is certainly evidence that subjects low in self-esteem are prone to anticipate failure (e.g. see Moses & Duvall, 1960). On the other hand, there seems to be no compelling reason to suspect this would be more likely to occur in this experiment than in others since the feedback manipulation used here was designed to be strong (see page 48).

These same factors may have limited the strength of dissonance effects on prophecy changes. The results do indicate lower prophecies in the Success-Failure than in the Success-Success and Success conditions. Since pair-wise differences among these conditions are not significant, however, one must remain skeptical of the reliability of the ordering. In the failure conditions there is the added problem that prophecies are higher in the Failure-Failure than in the Failure-Success condition. Perhaps, as suggested in Chapter IV, the expectations of Failure-Failure subjects reach a lower, threatening limit and a type of "reaction formation" took place. Similar effects have been found in previous studies. Thus Gerard (1961) gave subjects false success or failure feedback on a spatial visualization test. Half of the subjects in each group were then told that their scores on the

Table 44

SUSPICION LEVEL BY CONDITION

Condition	0	1	2	3	4	5	6	7	8	9
Success-Success	7	2	5	1	0	2	1	0	2	0
Success-Failure	6	4	7	0	0	0	3	0	0	0
Success	5	7	6	2	0	0	0	0	0	0
Control	4	12	4	0	0	0	0	0	0	0
Failure	5	4	10	1	0	0	0	0	0	0
Failure-Success	3	3	4	3	0	0	2	3	0	2
Failure-Failure	6	7	6	0	0	0	0	0	0	1

test would be posted so that members of the class could see how others had done. The anticipation of public disclosure increased self-evaluations resulting from success feedback. Failure feedback, however, decreased self-evaluations more in the private than in the public condition. In the present experiment Failure-Failure subjects were forced to make this disclosure themselves, while Failure subjects constituted a private condition. By raising instead of lowering the prophecies they expressed, Failure-Failure subjects may have been defensively bolstering their self-esteem so that subsequent feedback from others would be less threatening.

Arousal

Interestingly, there is a slight reversal of the Failure-Failure/Failure-Success difference when it comes to arousal, in that Failure-Success subjects are consistently, although not markedly, more aroused than Failure-Failure subjects. This suggests that counterattitudinal behavior may have been a strong source of conflict in this experiment, but that other sources in the Failure-Failure condition may have been strong enought to limit the effects of counterattitudinal behavior on arousal. That the present design did not control all other sources of conflict is also suggested by the results in the success conditions. Here one finds that the Success-Success condition is for the most part as arousing as, and occasionally more arousing than, the Success-Failure condition. As suggested earlier, subjects in the former condition may have felt that they were "sticking their necks out" by making public prophecies of success. On the other hand, the most compelling explanation for the arousal results is not this patchwork analysis employing one explanation for the success and another for the failure conditions. Rather, it is that making <u>any</u> public prophecy is arousing. Thus differences among the four public statement conditions are smaller than differences between them and the other three conditions.

As for the Hull-Spence predictions, one does find a consistent tendency for arousal in the Success, Control, and Failure conditions to follow the predicted order, but differences between the three conditions are weak.

The dissonance and Hull-Spence approaches fare little better when the relationships between prophecy and arousal changes are investigated

within conditions. Subjects who conform to dissonance predictions for prophecies are not more likely to conform to the predictions for arousal; in fact, the bulk of the correlations are opposite to those predicted. The same is true for the Hull-Spence predictions.

In general, the results for arousal are more problematic than those for prophecies for both the dissonance and Hull-Spence approaches. In the first place, if one argues that consistency biases limited prophecy changes, one should still expect clear arousal differences on measures less susceptible to such biases. This is not the case, and, as noted in the previous paragraph, actual arousal changes do not follow prophecy changes in the predicted manner. Secondly, while one could argue in the case of prophecies that personality differences were simply so strong that there was no variance left for the experimental conditions to explain, such is not the case with arousal. Thus, while initial expectancies and conditions on the average explained 43 and 23% of the variation in prophecies, for arousal this difference was reversed with average percentages of less than 1 for expectancies on each of D+G+P+N, D+G+N, and AACL, and 10, 11, and 22 on these three indices for conditions.

Thirdly, both the dissonance and Hull-Spence approaches predict interactions between personality and situational differences, but these predicted interactions do not occur. In the case of dissonance, High expectancy or High self-esteem subjects should experience more dissonance in the Success-Failure and Failure-Success conditions than Low expectancy or Low self-esteem subjects, and hence should be more aroused. This is true of only three of the six relevant comparisons in Table 35, and, as noted in the discussion of Table 36, a more convincing interpretation of the interaction effects is that success and failure were more arousing in a distracting way when they are unexpected. Since low self-esteem relates highly to high manifest anxiety (see pages 24-5), the Hull-Spence approach would expect Low expectancy subjects to be more aroused by failure. The results in Table 36 indicate, however, that the opposite is the case.

Performance

The results for performance are devastating for both the dissonance and Hull-Spence approaches. Here there are no reliable condition effects. Nor are there consistently recurring orderings of means. The ordering for total adjusted performance does follow that for prophecies: performance in the Success, Control, and Failure conditions is in descending order, that in the Success-Failure condition is worse than that in the Success-Success and Success conditions, and that in the Failure-Success and Failure-Failure is better than that in the Failure condition. In this sense performance matches prophecies, and refutes the Hull-Spence hypothesis that performance should increase with increasing expectations of failure and increasing arousal. Since these differences are not reliable, however, it would be presumptious to label them instances of self-fulfilling prophecy.

When relationships among arousal and performance changes are investigated within conditions, the dissonance and Hull-Spence approaches still receive little support. Subjects who conform to the dissonance predictions for prophecies and arousal are not consistently more likely to conform to the predictions for performance. Results are largely positive in the Failure-Success condition, but mixed in the Success-Failure condition. This difference is doubly damaging because dissonance predictions for between-condition prophecy differences were more clearly supported in the Success-Failure condition, and because intra-condition correlations between prophecy and arousal changes were more clearly opposite to those predicted in the Failure-Success condition. Intra-condition correlations provide mixed support for the Hull-Spence predictions. Only in the Control condition does performance consistently improve with decreasing expectations, but when arousal is used instead of prophecy as the correlate of performance, the correlations in this condition are more strongly opposed to the predictions than the previous correlations were supportive. The direction of correlations in the Success and Failure conditions sometimes supports and sometimes contradicts the Hull-Spence predictions, but the correlations never reach statistical significance.

The only striking performance effects have to do with personality differences; that is, subjects who expect to do more poorly in the beginning do so on the first set of reaction trials, and these differences remain on the second set even after performance on the first is covaried out. These effects occur in spite of the feedback subjects receive. Thus, the interactions between initial General and Relative expectancies and feedback which occasionally occurred with arousal appear to have been too weak to significantly affect performance, although there are indications that weak interactions may have taken place. Thus, when General expectancy is used Low expectancy subjects do worse on the first trial than High expectancy subjects after they have been given success feedback, while High expectancy subjects do worse after they have been given failure feedback. This interaction continues for the first and second trial blocks. When relative expectancy is used this occurs only with extreme cases of consistency between expectancy, feedback, and the direction of the public statement; that is, the performance of High expectancy/Success-Success and Low expectancy/Failure-Failure subjects is better than that of other subjects.

These arousal and performance results support neither the dissonance nor the Hull-Spence approaches. Other results tempt one to apply the Mandler and Watson interpretation. Thus Low expectancy subjects generally expect to do more poorly at sports, and are generally lower in self-esteem. Furthermore, Low expectancy subjects on the Relative dimension are more distracted. On the other hand, Low expectancy subjects on the General dimension are less motivated but not more distracted. In correlations for the total sample, moreover, it is motivation rather than distraction which correlates with prophecies and performance.

Clearly more research is needed to make sense of the peculiar relationship between expectancy and motivation and distraction found here. While subjects with Low expectations on each dimension are each low in self-esteem and more likely than High expectancy subjects to fail on the task, the intervening processes appear to be different for

the two types of subjects. Earlier it was suggested that the Low-General subjects might be "repressors" and the Low-Relative subjects "sensitizers." This may be so, but the absence of a clear relationship between distraction and performance weakens the case for this explanation, since sensitization would supposedly affect performance through distraction.

In general, the above discussion implies a causal relationship between a person's typical expectancies (and his self-esteem) and performance, when in fact there is little solid evidence to substantiate this assumption. Controlling initial performance is one thing, but subjects at T_2 were predicting their relative position on the second set, and their performance may simply indicate that they accurately predicted their relative position by accurately describing their past performance. One finding still argues strongly for the occurrence of self-fulfilling prophecy: Low-General subjects do more poorly than High expectancy subjects on the second than on the first set of trials. Furthermore, since motivation decreased and distraction increased from T_1 to T_2, one has further evidence that motivation rather than distraction produces self-fulfilling prophecy.

It is difficult to explain why this study does not indicate situational self-fulfilling prophecy while so many others have. Was this study particularly prone to elicit personality differences? One might think that the opposite would be the case, since subjects would not have had their reaction times tested very often. On the other hand, it is possible that describing the situation as being related to sports had a greater effect in the other direction. This is not a particularly satisfying explanation, however, since the General expectancy subjects, who seem to have shown the most prophecy fulfillment, did not show significant differences on the sports items.

It is equally difficult to know where to go from here. I have serious misgivings about increasing the strength of the prophecy manipulations, since I have already attempted to do so (see Chapter III). Perhaps a more careful selection of subjects is needed. To investigate situational self-fulfilling prophecy one might use only subjects with moderate levels of self-esteem. One could then compare results with those for subjects deliberately chosen for the extremity of their self-

evaluations. It is also clear that motivation and distraction have to be studied in their own right rather than as addenda to the dissonance and Hull-Spence approaches. It may also be helpful to manipulate motivation and distraction independently of, but in the same experiment with, prophecies, since the results of the present study suggest that prophecies themselves may not be all that important as determinants of performance.

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FOOTNOTES

[1] Rosenthal must be credited with having found these early references.

[2] The phrase "the prophecy causes its own fulfillment" seems to have been introduced by Moll (1898), but Merton (1949) is responsible for the popularity of the term "self-fulfilling prophecy."

[3] Bramel claims that his hypothesis is supported in the six experiments by Brock et al., in Cottrell (1965), and in the two studies by Lowin and Epstein. In five of these an interaction effect is found, but in no case is change greatest in the high expectancy-low performance condition. Bramel may have mistaken variances for means in the report of the Brock et al. studies.

[4] A study by Shclachet (1965) attempts to measure avoidance of success by comparing differences in the recall of success- and failure-related words. While the study makes some steps toward the understanding of dissonance hypotheses, it does permit the occurrence of self-fulfilling prophecy.

[5] Diggory (1966) found these references to defensive effort in James and Freud.

[6] Thus, highly anxious subjects do more poorly when competing responses are present in maze learning tasks (katahn & Koplin, 1966: Platz & Honigfeld, 1965), and in serial learning tasks (Spence & Spence, 1966). Similar results have been obtained in paired-associates learning tasks (Lipsitt & Spears, 1965; Spence & Spence, 1966; Stevenson & Odum, 1965), although this has not always been the case (Brown, 1966, Meisels et al., 1967). Positive results in classroom-like situations have been found by Spielberger (1966) and Tucker (1964), but for complex problem solving results are sometimes negative (e.g. Tecce, 1965). Highly anxious subjects usually (Ganzer, 1968; Spence & Spence, 1966; Spielberger, 1966), but not always (e.g. Marks & Vestrie, 1966), perform more poorly on early and better on late trials of a task. Anxiety does seem to be more debilitating for those low in ability (Katahn, 1966; Spielberger, 1966).

[7] I do not mean to imply that these concepts have identical empirical referents. Some items in the measure of manifest anxiety refer to physiological arousal, for instance, but this is not the case with self-esteem and internal-external control. Furthermore, as Rotter points out, someone who is more likely to attribute outcomes to his own doing may be more likely to evaluate himselve negatively if these outcomes are negative. On the other hand, there are fairly high correlations between self-esteem and manifest anxiety (Sarason & Koenig, 1965; Winkler & Myers, 1963), and the relationship between deserves closer study.

[8] The issue of the additivity or disjunctiveness of defensive strategies is relevant here, however; that is, should strategies substitute for each other, the person who can blame the outcome on someone or something besides himself may have less to need to protect his ego by decreasing effort.

[9] Technically, Hull-Spence theory uses "excitatory reaction potential" ($\bar{E}$) as its main construct, with drive (D) and incentive (K) both interacting similarly with habit strength (H) to affect behavior according to the following formula: $\bar{E}=H(D+K)-I$, with I referring to the strength of interfering responses. It is possible that success feedback would increase incentive as much as failure feedback would drive, and hence the two would have similar effects upon behavior. We assume here that failure will increase drive more than success will increase incentive.

[10] Although reaction time is particularly relevant for Hull-Spence theory, it has not always been found to decrease with higher arousal. Clearest support is found in a study by Lansin et al. (1959) using a single light as a stimulus and a single key as a response. Here reaction time decreased with increasing arousal as indicated by EEG changes within subjects. Many other studies report direct relationships, but most of them appear to have used procedures which would be likely to promote competing responses. Thus in Nishisato's study (1966) subjects had to decide which of three lines was the longest and then indicate the correct line by pressing only one of three response keys. Others have required subjects to keep track of several dials (Murphy, 1966), electric shock (Kida, 1967), or have made avoiding shock conditional upon responding quickly (Costello, 1968; Kamin & Clark, 1957). There may be other studies where the Hull-Spence hypothesis is contradicted. The point here, however, is not to argue in support of the Hull-Spence hypothesis. Rather, it is that a single stimulus-single response reaction time task should be a good setting for a test of the hypothesis.

[11] Technically, the T_1 and T_3 measures of "expectations" actually ask subjects to describe past rather than predict future performances. On the other hand, since subjects have no way of knowing how they actually did at these points, in a sense they are predicting what subsequent information about their past performance would reveal. Correlations between T_1 and T_2 measures are moderately high for the first answer to the questions (.50), but very low for the second (-.08). These results may mean that the second answer was very sensitive to changes produced by the experimental manipulations.

[12] Zuckerman reports satisfactory reliability for his measure. He also reports that his measure is sensitive to anxiety changes over time with psychological stresses such as exam-taking. Other validation studies have been undertaken by Biase and Mitchell (1969), who found that the anticipation of sensory deprivation increased scores, and by Johnson (1966), who found that a stressful interview increased scores on the measure.

[13] The product moment correlation between General and Relative prophecy scores was .78 at T_2.

[14] Split-half reliability coefficients and correlations among the four dimensions at T_2 are contained in the following table. At T_1 and T_3,

	Dissonance	General	Positive	Negative
Dissonance	.86	.31	.27	.41
General		.56	.87	.60
Positive			.91	.51
Negative				.89

respectively, reliability coefficients were .90 and .78 for Dissonance, .19 and .59 for the General dimension, .86 and .87 for the Positive dimension, and .79 and .81 for the Negative dimension.

[15] The graphic and checklist measures of the <u>same</u> dimension in many cases correlated <u>less</u> than did scores on different dimensions measured by the same instrument. In the following table the correlations in the diagonal are between scores on the same dimension but different instruments. The other correlations are between the different dimensions on the checklist measure at T_2. These latter

	Dissonance	General	Positive	Negative
Dissonance	.41	.22	-.37	.63
General		.56	-.02	.38
Positive			.10	-.45
Negative				.17

correlations make sense theoretically: Dissonance is positively correlated with Negative and negatively correlated with Positive arousal, and Positive and Negative arousal are negatively correlated.

[16] See footnote 15.

[17] The D+G+P+N and D+G+N measures correlated .98 with each other at T_2, and .59 and .70, respectively, with the AACL measure at T_2.

[18] The sweat prints were scored by magnifying them by a factor of 49.3 and counting the number of open sweat glands in a four square millimeter area. To check reliability, the prints for every tenth experimental session were scored independently by a second scorer. (Many prints were blotchy and hence could not be scored. In these cases the next print was used.) Scores assigned by the two different scorers correlated .97.

[19] In the previous analyses T_1 measures were the covariates, since only these were available. With PSI, however, a measurement before the first set of trials had been taken and was used as the covariate for T_2 PSI scores.

[20] Correlations between trial blocks and total performance at T_1 and T_2 are in the diagonal of the following table. Correlations above the diagonal are for T_2 alone; those below are for T_1 alone.

	1st Trial	1st Block	2nd Block	3rd Block	4th	5th	Total
1st Trial	.14	.17	.25	.05	.07	.30	-.26
1st Block	.13	.29	.35	.35	.43	.17	.45
2nd Block	.51	.23	.04	.42	.58	.23	.49
3rd Block	.01	.66	.03	.38	.73	.75	.44
4th Block	.11	-.37	.09	-.37	-.09	.75	.39
5th Block	.24	-.20	.00	-.03	.14	.15	-.13
Total	.06	.17	.11	.14	-.07	-.02	.22

APPENDICES

APPENDIX A

T_1, T_2, AND T_3 MEASURES

T_1 MEASURES

1. How well do you think you did on this last set of trials?

Very poorly — Neither — Very well

More poorly than others — Better than others

2. How did you feel while you were doing this last set?

Alert — Not alert

Anxious — Not anxious

Involved — Not involved

Confused — Not confused

Decisive — Indecisive

Distracted — Not distracted

Elated — Not elated

Embarrassed — Not embarrassed

Energetic — Sluggish

Deliberate — Hesitant

Interested — Not interested

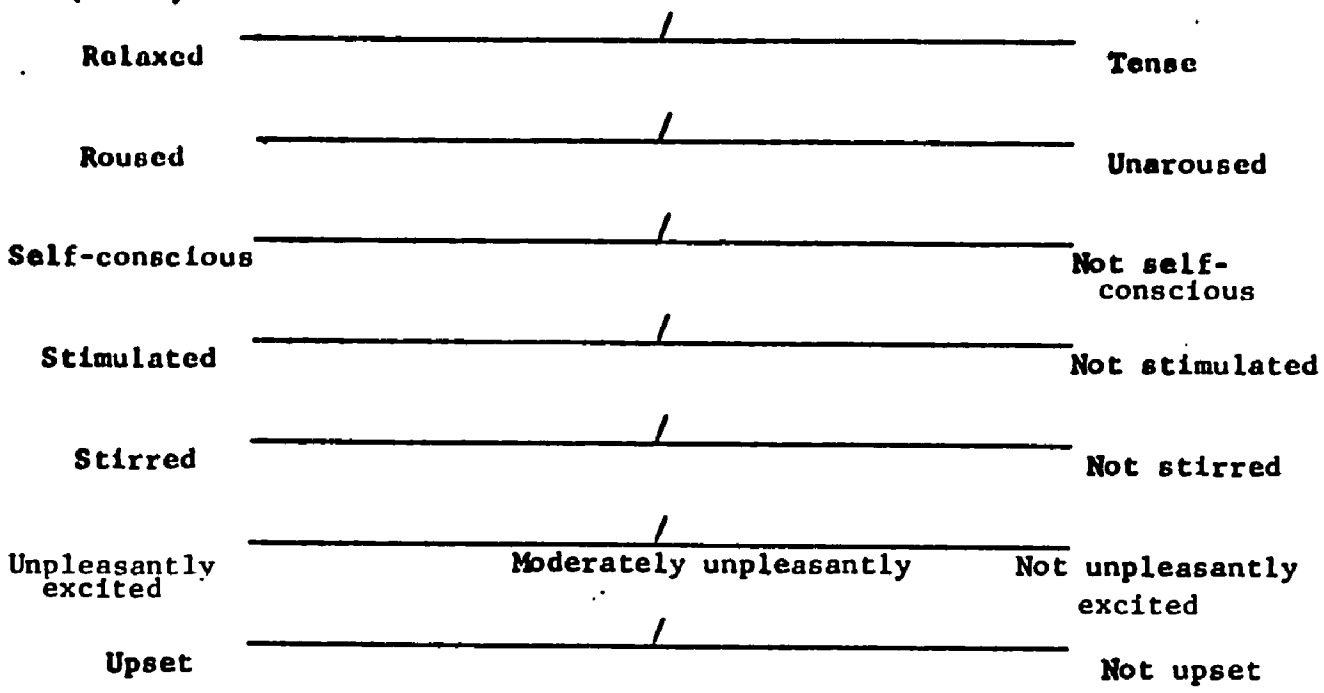
Nervous — Not nervous

Motivated — Not motivated

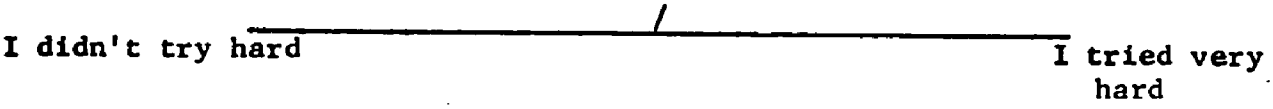
Organized — Disorganized

Pleasantly excited — Moderately pleasantly — Not pleasantly excited

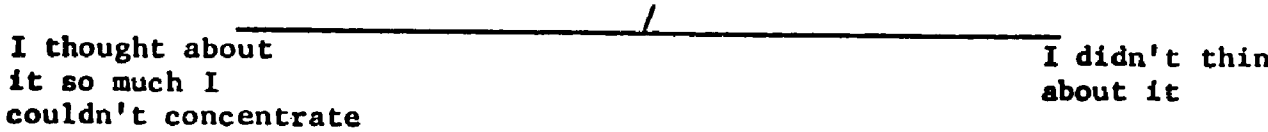
2. (con't)



3. How hard did you try to do well?



4. How often did you think about how well or how badly you were doing?



(OVER)

How do you feel <u>at this moment</u>? (Check as many of the following as you feel represent how you feel at this moment.)

indecisive ___
driven ___
secure ___
contented ___
stimulated ___
thoughtful ___
restful ___
cheerful ___
panicky ___
composed ___
joyful ___
worrying ___
single-minded ___
intense ___
afraid ___
energetic ___
stirred ___

pleasant ___
loving ___
deliberate ___
reluctant ___
quiet ___
terrified ___
uncertain ___
alert ___
fatigued ___
confused ___
roused ___
steady ___
upset ___
fearful ___
frightened ___
free ___

collected ___
calm ___
puzzled ___
sluggish ___
purposeful ___
hesitant ___
nervous ___
tired ___
organized ___
tense ___
subdued ___
happy ___
desperate ___
shaky ___

Any comments you would like to make about how you feel at this moment:

Name _____ Subject Number _____

Age _____ Year: Fr So Jr Sr Grade Point _____

1. How interested are you in sports?

___ : ___ : ___ : ___ : ___ : ___ : ___ : ____ : ____

Very- I play them a great deal

Hardly at all- I seldom play them

___ : ___ : ___ : ___ : ___ : ___ : ___ : ____ : ____

Very - I'm an avid spectator

Hardly at all- I seldom spectate

2. Which do you prefer: individual (e.g., track) or team(e.g.football) sports?

Individual ___ Team ____ Both liked equally ___ Neither liked ___

3. How skilled ar you at the sports in which you participate, if any?

____ : ____ : ____ : ____ : ____ : ____ : ____ : ____ : ____

Hardly at all

Very skilled

____ : ____ : ____ : ____ : ____ : ____ : ____ : ____ : ____

Better than most

Worse than most

4. How do you feel about academic testing situations?

____ : ____ : ____ : ____ : ____ : ____ : ____ : ____ : ____

Fine - I like the challenge

Terrible - I detest them

5. How do you usually do in such situations?

____ : ____ : ____ : ____ : ____ : ____ : ____ : ____ : ____

Very poorly

Very well

____ : ____ : ____ : ____ : ____ : ____ : ____ : ____ : ____

Better thqn most

Worse than most

6. Any qualifications you would like to make to your answers to the above:

T_2 MEASURES

How do you feel <u>at this moment</u>? (Check as many of the following as you feel represent how you feel at this moment.)

confused ___
roused ___
tense ___
secure ___
pleasant ___
thoughtful ___
stimulated ___
energetic ___
terrified ___
fatigued ___
collected ___
organized ___
quiet ___
uncertain ___
alert ___
subdued ___
joyful ___

composed ___
reluctant ___
free ___
indecisive ___
steady ___
loving ___
restful ___
calm ___
hesitant ___
upset ___
panicky ___
desperate ___
worrying ___
intense ___
afraid ___
deliberate ___

tired ___
puzzled ___
nervous ___
driven ___
contented ___
single-minded ___
stirred ___
frightened ___
shaky ___
fearful ___
sluggish ___
cheerful ___
purposeful ___
happy ___

Any comments you would like to make about how you feel at this moment:

1. How well do you expect to do on this next set of trials?

Very poorly — Neither — Very well

More poorly than others — Better than others

2. How did you expect to feel while you are doing the next set?

Alert — Not alert

Anxious — Not anxious

Involved — Not involved

Confused — Not confused

Decisive — Indecisive

Distracted — Not distracted

Elated — Not elated

Embarrassed — Not embarrassed

Energetic — Sluggish

Deliberate — Hesitant

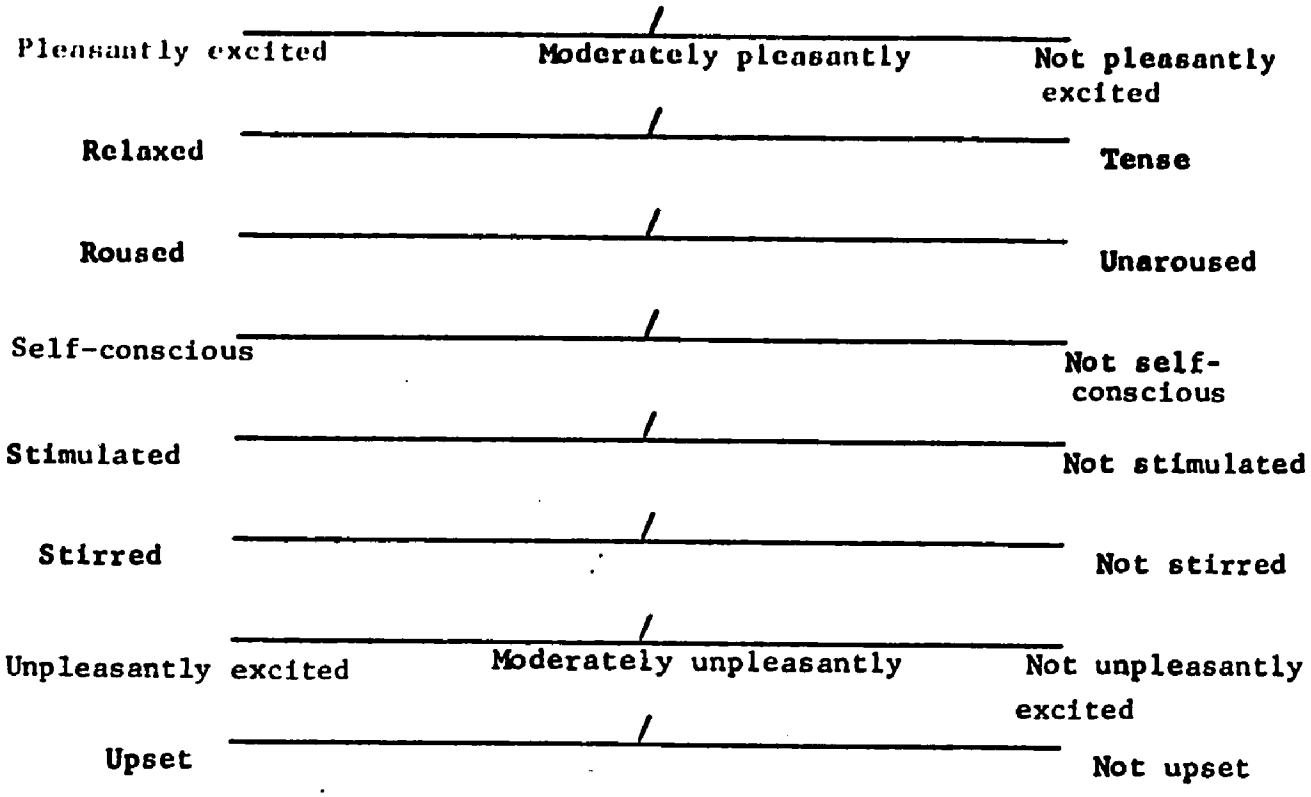
Interested — Not interested

Nervous — Not nervous

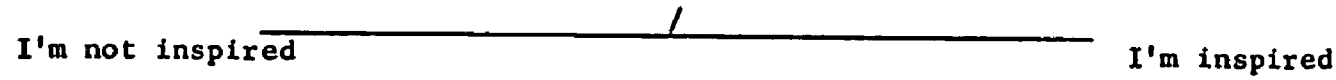
Motivated — Not motivated

Organized — Disorganized

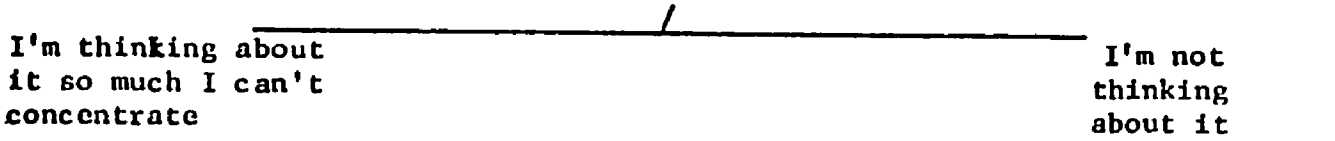
2. (con't)



3. How inspired are you to try to do well on the next set?



4. How much are you thinking about how well or how poorly you will do on the next set?



T_3 MEASURES

1. How well do you think you did on this last set of trials?

Very poorly — Neither — Very well

More poorly than others — Better than others

2. How did you feel while you were doing this last set?

Alert — Not alert

Anxious — Not anxious

Involved — Not involved

Confused — Not confused

Decisive — Indecisive

Distracted — Not distracted

Elated — Not elated

Embarrassed — Not embarrassed

Energetic — Sluggish

Deliberate — Hesitant

Interested — Not interested

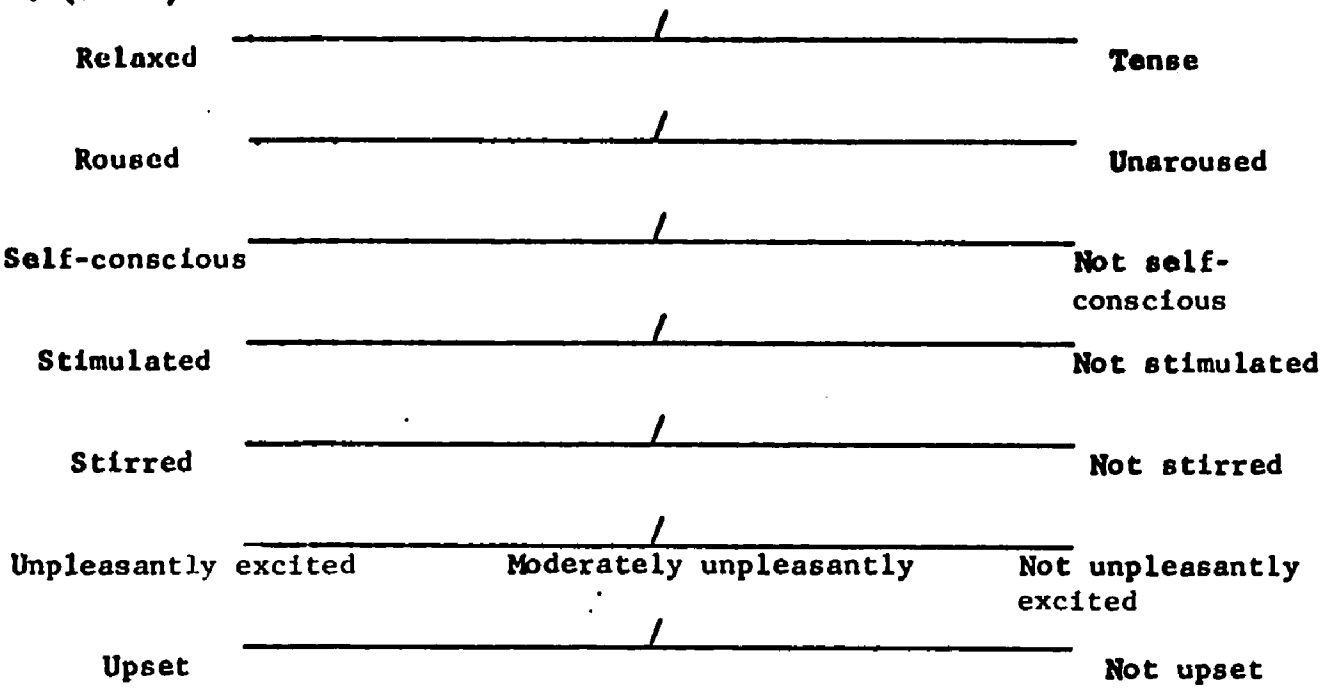
Nervous — Not nervous

Motivated — Not motivated

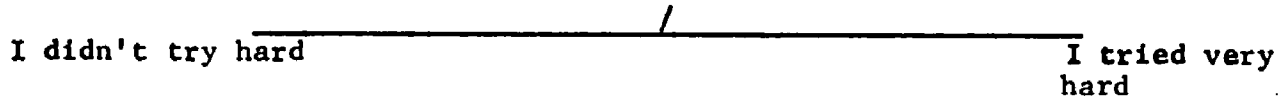
Organized — Disorganized

Pleasantly excited — Moderately pleasantly — Not pleasantly excited

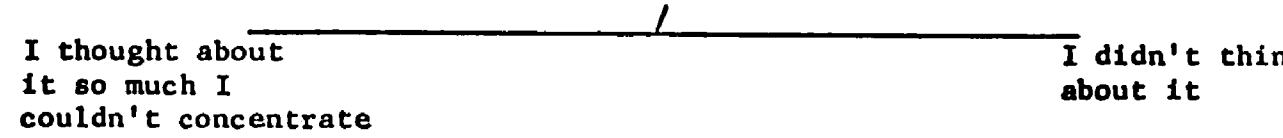
2. (con't)



3. How hard did you try to do well?



4. How often did you think about how well or how badly you were doing?



(OVER)

How do you feel <u>at this moment</u>? (Check as many of the following as you feel represent how you feel at this moment.)

indecisive ___
driven ___
secure ___
contented ___
stimulated ___
thoughtful ___
restful ___
cheerful ___
panicky ___
composed ___
joyful ___
worrying ___
single-minded ___
intense ___
afraid ___
energetic ___
stirred ___

pleasant ___
loving ___
deliberate ___
reluctant ___
quiet ___
terrified ___
uncertain ___
alert ___
fatigued ___
confused ___
roused ___
steady ___
upset ___
fearful ___
frightened ___
free ___

collected ___
calm ___
puzzled ___
sluggish ___
purposeful ___
hesitant ___
nervous ___
tired ___
organized ___
tense ___
subdued ___
happy ___
desperate ___
shaky ___

Any comments you would like to make about how you feel at this moment:

1) What do you think about <u>this reaction time task</u>?

Unimportant ——————/—————— Important

Interesting ——————/—————— Uninteresting

2) How involved were you in it?

Not involved ——————/—————— Involved

3) How do you feel about your performance on it?

I was lucky ——————/—————— I was unlucky

4) How typical was your performance of how you usually do in similar situations?

Very typical ——————/—————— Very atypical

5) What do you think about <u>the experiment in general</u>?

Unimportant ——————/—————— Important

Interesting ——————/—————— Uninteresting

6) How involved were you in it?

Not involved ——————/—————— Involved

7) What would you say were the purposes of this experiment?

8) What might be other purposes of this experiment?

9) What comments would you like to make about the experiment or anything associated with it?

APPENDIX B

a. Success Feedback with 4 Subjects

b. Success Feedback with 3 Subjects

c. Failure Feedback with 4 Subjects

d. Failure Feedback with 3 Subjects

Date _____

Group 1

Trial Block 1

Time (Milliseconds) Per Trial

Subject	Trial																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	152	148	140	138	152	149	143	137	144	138	131	129	144	139	136	140	127	148	130	129
2	133	129	139	127	133	134	124	134	126	124	132	132	129	127	129	125	130	140	125	124
3	145	131	130	138	119	126	124	134	123	121	134	129	125	125	126	121	127	125	125	127
4	160	146	132	122	149	145	135	137	131	134	137	138	135	126	141	137	135	124	147	124
5																				
6																				

Date _____

Group 1

Time (Milliseconds) for Trial

Initial Block 1

Subject

Trial

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2	133	129	139	129	133	134	124	139	126	129	132	132	129	127	129	125	130	140	125	124
3	143	131	130	138	119	126	124	134	123	121	134	129	125	125	126	121	127	125	125	127
4	160	146	132	122	141	145	135	137	131	134	137	138	135	126	141	137	135	124	147	124
5																				
6																				

Date _____

Group 2

Trial Block 1

Time (Milliseconds) Per Trial

Subject

Trial

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	135	129	139	127	133	134	124	134	126	124	124	132	129	127	129	125	130	140	125	124
2	160	146	132	122	141	145	135	137	131	137	134	138	135	126	141	137	135	124	147	124
3	152	148	140	138	152	149	143	137	144	138	131	129	144	139	136	140	127	148	130	129
4	143	131	130	138	119	126	124	134	126	125	121	129	125	125	126	121	127	125	125	127
5																				
6																				

Date _____

Group 2

Time (Reaction seconds) per Trial

Trial Block 1

Subject

Trial

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1																				
2	160	146	132	122	149	145	135	137	131	137	134	138	135	126	141	137	135	124	145	124
3	152	148	140	136	152	149	143	137	144	138	131	129	144	139	136	140	127	148	130	129
4	133	129	139	127	133	134	124	134	126	124	124	132	129	127	129	125	130	140	125	124
5																				
6																				

APPENDIX C

TABLES FOR ALTERNATIVE EXPECTANCY SPLITS

Table 5A

MEAN ADJUSTED SCORES ON GRAPHIC MEASURES OF AROUSAL AT T_2 (GENERAL SPLIT)

Condition	Dissonance	General	Positive	Negative
Success-Success	103.38	212.33	205.63	155.11
Success-Failure	128.23	205.24	216.34	144.21
Success	112.65	178.05	206.49	125.30
Control	112.73	174.50	194.75	123.92
Failure	118.46	189.11	189.79	126.18
Failure-Success	126.28	229.69	184.47	154.79
Failure-Failure	104.32	219.45	199.75	147.56

Table 6A

SUMMARIES OF ANALYSES OF VARIANCE

Source	Dissonance			General		
	df	MS	F	df	MS	F
Conditions (A)	6	1431.46	<1	6	7099.89	2.62*
Expectancy (B)	1	1928.88	1.08	1	513.06	<1
A x B	6	1106.60	<1	6	4125.62	1.52
Error	94	1793.07		94	2714.43	
	Positive			Negative		
Conditions (A)	6	1689.74	1.11	6	1726.65	1.12
Expectancy (B)	1	1280.31	<1	1	1219.81	<1
A x B	6	2255.85	1.49	6	1874.97	1.22
Error	94	1516.65		94	1541.34	

* $p<.05$

Table 7A

CHECKLIST MEASURES OF AROUSAL (T_2) SPLIT ON GENERAL

Condition	Dissonance	General	Positive	Negative
Success-Success	4.87	8.32	.45	2.84
Success-Failure	5.12	8.05	.62	2.65
Success	4.24	6.09	1.25	1.93
Control	4.37	6.23	.71	1.84
Failure	4.90	8.15	.56	2.05
Failure-Success	5.90	8.61	.32	2.99
Failure-Failure	5.55	7.38	.36	2.77

Table 8A

SUMMARIES OF ANALYSES OF VARIANCE

Source	Dissonance			General		
	df	MS	F	df	MS	F
Conditions (A)	6	5.92	1.76	6	17.64	3.33**
Expectancy (B)	1	.55	<1	1	4.16	<1
A x B	6	11.58	3.45**	6	2.36	<1
Error	103	3.37		103	5.29	
	Positive			Negative		
Conditions	6	1.59	3.31**	6	3.96	3.00**
Expectancy (B)	1	.01	<1	1	1.92	1.45
A x B	6	.99	2.06	6	2.70	2.05
Error	103	.48		103	1.33	

** $p<.01$

Table 9A

MEAN ADJUSTED SCORES ON SUMMATED CHECKLIST AND PSI, T_2, SPLIT ON GENERAL

Condition	D+G+P+N	D+G+N	AACL	PSI
Success-Success	16.48	15.83	9.17	.54
Success-Failure	16.49	15.85	8.27	.26
Success	13.51	12.54	6.45	.55
Control	13.18	12.45	6.85	.86
Failure	15.63	15.04	7.75	.29
Failure-Success	17.81	17.47	9.40	1.20
Failure-Failure	16.07	15.56	9.13	1.04

Table 10A

SUMMARIES OF ANALYSES OF VARIANCE

Source	D+G+P+N			D+G+N		
	df	MS	F	df	MS	F
Conditions (A)	6	49.04	3.24**	6	58.61	3.82**
Expectancy (B)	1	15.54	1,03	1	22.47	1.46
A x B	6	27.23	1.80	6	36.36	2.37*
Error	103	15.13		103	15.36	
	AACL			PSI		
Conditions (A)	6	27.27	7.93***	6	1.71	2.25*
Expectancy (B)	1	10.28	2.99	1	.02	<1
A x B	6	5.61	1.63	6	1.57	2.07
Error	125	3.44		78	.76	

* p<.05
** p<.01
*** p<.001

Table 11A

MEAN TOTAL ADJUSTED REACTION TIMES FOR ALL TRIALS ON THE SECOND SET, FOR THE FIRST TRIAL, AND FOR THE FIRST BLOCK OF FOUR TRIALS (GENERAL SPLIT)

Conditions	Total	First Trial	First Block
Success-Success	376.47	24.76	80.72
Success-Failure	399.83	23.65	84.99
Success	391.68	29.18	89.42
Control	394.44	24.31	87.95
Failure	396.14	25.06	89.45
Failure-Success	389.44	24.07	85.22
Failure-Failure	371.35	22.73	80.65

Table 12A

SUMMARIES OF ANALYSES OF VARIANCE

Source	Total			First Trial		
	df	MS	F	df	MS	F
Conditions (A)	6	2231.15	1.10	6	85.18	1.06
Expectancy (B)	1	9771.75	4.83*	1	28.25	<1
A x B	6	2537.90	1.25	6	125.90	1.57
Error	125	2024.51		125	80.17	
	First Block					
Conditions (A)	6	273.76	1.04			
Expectancy (B)	1	1207.31	4.61*			
A x B	6	471.81	1.80			
Error	125	262.09				

* $p < .05$

Table 13A

MEAN ADJUSTED TIMES FOR THE SECOND, THIRD, FOURTH AND FIFTH BLOCKS ON THE SECOND SET

Condition	Second Block	Third Block	Fourth Block	Fifth Block
Success-Success	74.43	73.86	75.06	74.20
Success-Failure	79.34	76.13	79.90	79.89
Success	75.76	76.70	79.47	72.73
Control	73.83	75.88	76.95	78.27
Failure	79.85	74.57	77.38	75.00
Failure-Success	73.76	78.95	73.83	81.76
Failure-Failure	73.58	72.56	73.66	71.02

Table 14A

SUMMARIES OF ANALYSES OF VARIANCE

Source	Second Block			Third Block		
	df	MS	F	df	MS	F
Conditions (A)	6	146.01	1.14	6	87.82	<1
Expectancy (B)	1	119.52	<1	1	478.75	3.51
A x B	6	265.07	2.06	6	139.61	1.02
Error	125	128.42		125	136.26	
	Fourth Block			Fifth Block		
Conditions (A)	6	128.42	1.14	6	310.07	1.63
Expectancy (B)	1	122.34	1.09	1	310.32	1.63
A x B	6	91.38	<1	6	93.55	<1
Error	125	112.30		125	190.48	

Table 18A

MEAN ADJUSTED SCORES ON SUMMATED CHECKLIST AND PSI MEASURES OF AROUSAL, T_3, SPLIT ON GENERAL

Condition	D+G+P+N	D+G+N	AACL	PSI
Success-Success	14.54	14.07	7.83	4.58
Success-Failure	14.69	14.04	7.70	5.61
Success	13.19	12.17	6.72	3.53
Control	12.87	12.04	7.03	4.33
Failure	15.07	13.86	7.80	5.25
Failure-Success	17.81	17.39	9.28	4.65
Failure-Failure	15.19	14.61	8.80	4.64

Table 19A

SUMMARIES OF ANALYSES OF VARIANCE

Source	D+G+P+N			D+G+N		
	df	MS	F	df	MS	F
Conditions (A)	6	44.04	2.80**	6	53.44	2.81*
Expectancy (B)	1	8.77	<1	1	19.40	1.55
A x B	6	5.25	<1	6	11.93	<1
Error	103	19.28		103	18.97	
	AACL			PSI		
Conditions (A)	6	16.30	3.95**	6	6.06	<1
Expectancy (B)	1	12.56	2.60	1	36.72	5.12**
A x B	6	8.09	1.74	6	5.78	<1
Error	125	4.63		78	7.16	

* $p<.05$
** $p<.01$

Table 24A

T_1 PERFORMANCE BY EXPECTANCY (GENERAL) AND CONDITION

Condition	Total		First Block		Second Block	
	High	Low	High	Low	High	Low
Success-Success	495.10	507.60	145.70	126.00	98.20	100.50
Success-Failure	473.80	522.30	113.10	122.20	97.90	99.50
Success	431.00	530.30	105.10	135.80	83.70	104.60
Control	500.80	470.20	124.40	111.60	101.00	101.70
Failure	515.20	497.50	116.80	117.70	101.40	99.30
Failure-Success	482.90	538.60	125.30	136.20	94.90	104.30
Failure-Failure	457.10	485.60	117.30	120.50	91.50	98.60
	Third Block		Fourth Block		Fifth Block	
	High	Low	High	Low	High	Low
Success-Success	86.90	94.40	83.10	93.90	81.20	90.80
Success-Failure	91.60	101.30	87.80	95.40	83.40	103.90
Success	84.60	99.50	76.00	92.50	81.60	97.90
Control	93.10	89.30	90.80	82.10	91.50	85.50
Failure	96.20	101.90	95.20	88.60	144.30	89.00
Failure-Success	85.20	101.70	87.90	99.70	79.60	96.70
Failure-Failure	85.20	95.30	85.20	83.70	77.90	87.50

Table 25A

SUMMARIES OF AN ANALYSES OF VARIANCE OF T_1 PERFORMANCE

Source	Total			First Block		
	df	MS	F	df	MS	F
Conditions (A)	6	4225.00	<1	6	1115.31	1.19
Expectancy (B)	1	27540.00	3.03	1	354.38	<1
A x B	6	10013.33	1.10	6	1363.44	1.46
Error	126	9085.98		126	936.99	
	Second Block			Third Block		
Conditions (A)	6	147.60	<1	6	202.92	<1
Expectancy (B)	1	1136.88	3.47	1	2798.75	8.26*
A x B	6	300.52	<1	6	223.02	<1
Error	126	460.66		126	338.71	
	Fourth Block			Fifth Block		
Conditions (A)	6	292.19	<1	6	2549.17	1.49
Expectancy (B)	1	638.13	1.89	1	100.00	<1
A x B	6	482.02	1.43	6	3530.52	2.06
Error	126	337.79		126	1711.98	

* $p<.01$

Table 26A

MEAN ADJUSTED PERFORMANCE (T_2) BY GENERAL EXPECTANCY

Condition	Total		First Block		Second Block	
	High	Low	High	Low	High	Low
Success-Success	361.08	391.85	72.36	89.17	72.01	76.85
Success-Failure	378.30	421.36	79.50	90.49	71.22	87.46
Success	392.26	391.09	86.56	92.28	76.99	74.53
Control	388.83	400.04	84.58	91.31	76.14	71.51
Failure	406.92	385.36	95.68	83.23	81.75	77.96
Failure-Success	372.17	406.72	85.12	85.33	71.97	75.55
Failure-Failure	361.11	381.58	74.09	87.21	73.97	73.19
	Third Block		Fourth Block		Fifth Block	
	High	Low	High	Low	High	Low
Success-Success	72.49	75.22	74.75	75.38	74.01	74.39
Success-Failure	70.34	81.92	75.15	83.64	74.56	85.22
Success	76.67	76.74	79.53	79.40	69.99	75.46
Control	72.82	78.94	77.06	76.84	78.43	78.10
Failure	75.24	73.90	79.80	74.97	76.48	73.52
Failure-Success	74.47	83.43	70.66	77.00	79.64	83.87
Failure-Failure	73.56	71.56	71.74	75.57	69.31	72.73

Table 27A

MOTIVATION SCORES AT T_1, T_2, AND T_3 BY CONDITION AND RELATIVE EXPECTANCY

Condition	T_1		T_2		T_3	
	High	Low	High	Low	High	Low
Success-Success	22.60	31.80	20.90	29.78	17.90	30.30
Success-Failure	21.11	41.00	21.78	45.70	16.89	31.80
Success	23.11	27.20	17.89	33.40	22.33	28.90
Control	28.00	21.40	44.30	34.90	39.40	34.40
Failure	30.70	25.75	31.70	38.50	31.10	24.13
Failure-Success	33.00	25.00	37.50	26.78	34.10	17.11
Failure-Failure	26.80	23.80	33.56	36.50	27.20	26.50

Table 28A

SUMMARIES OF ANALYSES OF VARIANCE

Source	T_1			T_2		
	df	MS	F	df	MS	F
Conditions (A)	6	106.21	<1	6	515.03	1.02
Expectancy (B)	1	77.51	<1	1	972.15	1.92
A x B	6	497.46	1.47	6	744.09	1.47
Error	121	338.81		119	506.40	

	T_3		
Conditions (A)	6	374.87	1.08
Expectancy (B)	1	12.38	.04
A x B	6	623.52	1.80
Error	121	345.94	

Table 29A

DISTRACTION SCORES AT T_1, T_2, AND T_3 BY CONDITION AND GENERAL EXPECTANCY

Condition	T_1		T_2		T_3	
	High	Low	High	Low	High	Low
Success-Success	35.70	46.40	41.33	45.30	48.90	49.30
Success-Failure	38.33	40.10	42.44	37.10	49.78	45.20
Success	34.70	43.00	35.20	49.44	47.30	50.56
Control	44.20	30.40	33.50	17.80	29.10	27.30
Failure	33.56	46.89	37.11	47.00	45.89	43.11
Failure-Success	49.56	42.90	49.78	46.00	51.89	50.90
Failure-Failure	43.50	35.80	46.78	38.10	54.60	39.10

Table 30A

SUMMARIES OF ANALYSES OF VARIANCE

Source	T_1			T_2		
	df	MS	F	df	MS	F
Conditions (A)	6	155.18	<1	6	925.56	2.16
Expectancy (B)	1	24.42	<1	1	19.84	<1
A x B	6	523.55	1.31	6	534.34	1.24
Error	121	398.66		119	429.41	

Source	T_3		
	df	MS	F
Conditions (A)	6	1170.07	2.85*
Expectancy (B)	1	332.10	<1
A x B	6	172.18	<1
Error	121	410.43	

* $p < .05$

Table 33A

I-E SCORES BY CONDITION AND EXPECTANCY

Condition	General		Relative	
	High	Low	High	Low
Success-Success	12.56	13.00	13.22	12.33
Success-Failure	8.29	9.22	7.14	10.11
Success	11.40	10.70	11.60	10.50
Control	11.57	12.70	12.63	11.89
Failure	12.38	12.67	11.33	13.88
Failure-Success	13.50	7.25	9.86	10.00
Failure-Failure	8.50	13.00	11.38	10.44

Table 34A

SUMMARIES OF ANALYSES OF VARIANCE

Source	General			Relative		
	df	MS	F	df	MS	F
Conditions (A)	6	33.27	1.49	6	38.87	1.64
Expectancy (B)	1	.07	<1	1	2.39	<1
A x B	6	43.13	1.94	6	12.66	<1
Error	105	22.29		105	23.76	

Table 33B

SPORTS EXPECTANCY SCORES BY CONDITION AND EXPERIMENTAL EXPECTANCY

Condition	General		Relative	
	High	Low	High	Low
Success-Success	.22	.44	.11	.56
Success-Failure	.14	.00	.00	.11
Success	.20	.20	.00	.40
Control	.29	.40	.13	.56
Failure	.37	.33	.22	.50
Failure-Success	.17	.13	.00	.29
Failure-Failure	.25	.22	.13	.33

Table 34B

SUMMARIES OF ANALYSES OF VARIANCE

Source	General			Relative		
	df	MS	F	df	MS	F
Conditions (A)	6	.20	.79	6	.22	.99
Expectancy (B)	1	.00	.02	1	2.79	12.53*
A x B	6	.06	.24	6	.06	.29
Error	105	.25		105	.22	

* $p < .001$

Table 33C

MARLOWE-CROWNE SD SCORES BY CONDITION AND EXPECTANCY

Condition	General		Relative	
	High	Low	High	Low
Success-Success	14.00	9.44	14.38	9.11
Success-Failure	13.43	13.00	13.57	12.89
Success	12.70	12.10	11.50	13.30
Control	12.29	9.60	11.63	9.89
Failure	14.00	12.33	13.44	12.75
Failure-Success	10.00	13.75	13.00	11.29
Failure-Failure	12.50	10.78	11.63	11.56

Table 34C

SUMMARIES OF ANALYSES OF VARIANCE

Source	General			Relative		
	df	MS	F	df	MS	F
Condition (A)	6	11.56	<1	6	12.58	<1
Expectancy (B)	1	36.84	1.60	1	41.50	1.77
A x B	6	27.08	1.17	6	19.31	<1
Error	104	23.09		104	23.40	

APPENDIX D

SPECIFIC EXPECTANCY ITEMS

Competitive, Intellectual Game Expectancy Items:

1. a. When I explain a game to a friend and he learns quickly, it is usually because I have explained it well.

   b. It is usually because he was able to understand it.

2. a. In competitive situations I can usually rely on my own self-control to hold my own against others.

   b. I usually have to rely on luck.

3. a. When I lose at a game of cards or some other intellectual game it is usually because the other players are good at the game.

   b. It is usually because I don't play well.

Sports, Physical Expectancy Items:

1. a. When I do poorly at a sport it is probably because it is a very difficult one.

   b. It is probably because I'm not putting everything into it.

2. a. When I do better than usual at sports it is probably because I tried harder.

   b. It is probably because my opponents don't play very well.

Masculinity Expectancy Items:

1. a. Whether or not people want me as a friend is mainly a result of how few or how many other people they already have as friends.

   b. I feel I would be capable of befriending a great many of the men and women I have met.

2. a. If I were walking with a female friend and a mugger attempted to assault us I could probably ward off the attack by myself.

   b. It would depend upon whether or not other people were nearby.

3. a. If I had sexual intercourse with a girl and she seemed to enjoy it it would probably be because she was skilled in such matters.

   b. It would probably be because I was skilled in such matters.

4. a. If I went on a blind date and the girl seemed to have a good time it would probably be because she liked me.

   b. It would probably be because the event we went to or the people we went with were interesting.

5. a. If a man or woman complimented me on my knowledge of mechanical or other practical matters it would probably be because I can really understand such things.

   b. It would probably be because they liked me.