THE EFFECTS OF ANXIETY AND DEMAND CONDITIONS ON MODELING BEHAVIOR

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CHAPTER I

INTRODUCTION

A plethora of research has been done in the areas of anxiety and modeling. This perhaps, is a barometer of the importance of these two concepts to the understanding of human behavior. Though much information has been gathered in these areas, there is still much to be studied. What follows is an introduction to a study of these topics.

Anxiety has been described as the most pervasive psychological phenomenon of our time (Hoch & Zubin, 1950). Hoch and Zubin (1950) go on further to state that if anxiety could be controlled by biological or social means, fundamental alternations in the organization of our civilization would ensue, and the probability of individual happiness would be greatly enhanced.

Anxiety and fear have long been regarded as fundamental human emotions. The concept of fear, according to Cohen (1969), is clearly reflected in ancient Egyptian hieroglyphics. James Kritzeck, of the Department of Oriental Studies at Princeton, noted a central concern with anxiety in the work of the medieval Arab philosopher, Ala Ibn Hazm, of Cordova. In a treatise entitled "A Philosophy of Character and Conduct," written in the eleventh century, Ibn Hazm unequivocally asserts the universality of anxiety as a basic condition of human existence (Spielberger, 1972).

A differentiation should perhaps be made here between fear and

anxiety. Anxiety is generally assumed to differ from fear in its lack of objective focus, the two affective states differing mainly in the extent to which the principal antecedents have an objective or subjective basis (Krause, 1964). As Erickson (1950) has pointed out, the more immature the intellectual and personality processes which differentiate between inner and outer, real and imagined dangers, the more difficult it becomes to maintain a distinction between fear and anxiety. Further the experimental components of anxiety and fear do not seem reliably different (Hamburg, 1958). In general, the distinction between fear and anxiety is consistently maintained only within psychoanalytic theory. These terms tend to be used interchangably in studies conducted within other frameworks. For example, in studies testing learning-theory hypotheses, measures of subjective anxiety (such as an anxiety questionaire) and manipulations of anxiety (fear) through use of objective threats by the experimenter are often considered alternate and equally valid means of testing the fear/anxiety variable in studies concerned with the effects of anxiety on performance (Ruebush, 1963).

Spielberger (1966) states that the conceptual status of anxiety contains a certain degree of ambiguity. This ambiguity, according to Spielberger, arises from the more or less indiscriminate use of the term to refer to two very different types of concepts. Anxiety, in an empirical sense, is most often used to denote a complex reaction or response --a transitory state or condition of the organism fluctuating in strength and time. However, the term anxiety is also used to refer to a personality trait-to individual differences in the extent to which different people are characterized by anxiety states and by prominent defenses against such states (Spielberger, 1966, p. 17).

Anxiety is an important construct in theories of behavior, ranging from psychoanalysis to learning theory, and most authors tend to use a theoretically derived definition, although some use empirically derived definitions. The comparability of findings from different studies is not only complicated by differences in theoretical definitions, but also by differences in operational criteria from study to study within the same theoretical framework (Ruebush, 1963). For purposes of the study the writer has chosen Spielberger's (1972) definition of anxiety as a, "transitory emotional state consisting of feelings of apprehension, tension, and autonomic nervous system arousal (A-state) or as a relatively consistent elevated individual level of anxiety proneness (A-trait)" (p. 10).

The definition of modeling chosen by the writer is one proposed by Flanders (1968). "An observer is said to imitate a model when observation of the behavior of the model, or of expressions attributing certain behavior to the model, affects the observer so that the observer's subsequent behavior becomes more similar to the observed, or alleged, behavior of the model" (p. 316). For purposes of this study the term modeling will be considered synonymous with imitation, identification, social and observational learning.

One of the fundamental means by which new modes of behavior are acquired and existing patterns are modified entails modeling and vicarious processes (Bandura, 1969). Research conducted within the framework of social-learning theory (Bandura, 1965a; Bandura & Walters, 1963) demonstrates that virtually all learning phenomena resulting from direct experiences can occur on a vicarious basis through observation of another person's behavior and its consequences for them. Thus, one can acquire

intricate response patterns merely by observing the performances of appropriate models; emotional responses can be conditioned observationally by witnessing the affective reactions of others undergoing painful or pleasurable experiences; fearful and avoidant behavior can be extinguished vicariously through observation of modeled approach behavior toward feared objects without any adverse consequences accruing to the performer; inhibitions can be induced by witnessing the behavior of others punished; and, finally, the expression of well learned responses can be enhanced and socially regulated through the actions of influential models. Modeling procedures are therefore ideally suited for affecting diverse outcomes, including elimination of behavioral deficits, reduction of excessive fears and inhibitions, and social facilitation of behavioral patterns on a group-wide scale (Bandura, 1969).

Anxiety and Modeling

Recent research on modeling has been provocative because it has suggested the important role which the observation of others plays in influencing social behavior (Bandura, 1965). There has been a plethora of research on modeling, with many different variables being studied--sex (Bandura, Ross, & Ross, 1963a), age (Hicks, 1965), and social power of the model (Mischel & Grusec, 1966) are some examples of the various characteristics that have been studied to determine their effects on modeling. Characteristics of the observer, such as dependency (Ross, 1966), self-esteem (Gelfand, 1962), and racial status (Beyer & May, 1968), have also been studied. One characteristic, however, has received little consideration in terms of its effects on the modeling situation. This characteristic is anxiety. Surprisingly, there has been

little theoretical formulation concerning the effects of anxiety on imitation behavior. Bandura (1969) perhaps came closest when he stated that an increase in arousal should lead to an increase in imitative behavior on the part of the aroused person.

The purpose of this present study is to examine the relationship between modeling and anxiety. More specifically, this study attempts to determine the effects that various levels of anxiety in the observer have on subsequent imitative behavior. Knowledge concerning this relationship could have far reaching implication in various fields. In the field of education, for example, the modeling of certain behaviors or tasks by the instructor may constitute a very important means of aiding students. It may, in fact, be the most effective means of facilitating learning in particular types of students. If it is found for example, that anxious people tend to model more than less-anxious people, this information could be of value to an instructor in terms of how best to reach certain students. It also could be used by the instructor in situations where the whole class is anxious (e.g., the learning of difficult material). The instructor could then modify the presentation in terms of his or her understanding of the relationship between anxiety and modeling. Knowledge of this relationship could also be important in therapy. It perhaps could be used in terms of the therapist serving as a model of certain behaviors to clients.

One must realize, however, that the findings of one study concerning the anxiety-modeling relationship can not suggest anything definite about this relationship, nor about its applications. Further studies would be needed to develop information that would be likely to generalize to school and therapy settings.

CHAPTER II

SELECTED LITERATURE REVIEW

What follows is a selected review of the literature in the areas of anxiety and modeling. The articles/studies selected pertain either directly or indirectly to this study.

Definitions of Anxiety

Anxiety is one of the terms in most frequent current use by researchers in psychology. It is also a term whose definition varies considerably among authors. Freud (1924) described anxiety as an unpleasant affective state. This state, as he observed it in patients who suffered with anxiety neuroses, was characterized by all that is covered by the word "nervous." According to May (1950), anxiety is the apprehension cued off by a threat to some value which the individual holds essential to his or her existence as a personality. Spielberger (1966) felt that anxiety could either denote a transitory state or an ongoing, consistent personality trait of the organism. For purposes of this study, Spielberger's definition has been accepted.

Existing studies of anxiety literally defy summary as a unit (Sarason, 1960). It is possible, however, to discern trends in various areas pertinent to this study. What follows is a review of the relationship between anxiety and certain selected behavior correlates.

The Effects of Anxiety on Self-Concept and Self-Confidence

Several studies have obtained significant relationships between anxiety and measures which reflect a negative conception of the self or a tendency towards self-disparagement (Doris, 1959; Lipsitt, 1959; Walsh, 1956). Clark and Arkowitz (1975) found that high-anxious subjects were more likely to underestimate positive aspects of their performance and overestimate the negative aspects of their behavior. In a review of the literature on paper-and-pencil anxiety scales, Sarason (1960) cited a number of studies (Bendig, 1958; Trapp & Kausler, 1958; Wolf, 1955), that provide evidence that high-anxious subjects are more self-deprecatory, more self-preoccupied, and generally less content with themselves than subjects lower in the distribution of anxiety.

Numerous studies have shown that the anxious person tends to have a poor self-concept and lacks self-acceptance. It would seem to follow that another characteristic of the anxious subject would be lack of confidence in oneself. Studies by Gaudry and Poole (1973) and Meunier and Rule (1967), have indeed found that level of confidence is inversely related to anxiety. In summary, it appears that an anxious subject has low self-esteem and lacks confidence in his or her ability.

The Effects of Anxiety on Dependency and Suggestibility

There is ample evidence of a positive relationship between anxiety and dependency (Heathers, 1954; Walters, Marshall, & Shooter, 1960; Walters & Ray, 1960). Sarason et al. (1960) and Hill and Sarason (1966) suggest that a high test-anxious child has strong dependency needs and

that these needs partially mediate the interfering effect of test anxiety for such children.

In an earlier experiment (Jakubczak & Walters, 1959), it was shown that high-anxious children were more suggestible than were low-anxious children. Walters et al. (1960), has shown that subjects who have been exposed to an anxiety-producing situation are more suggestible than subjects who have not been exposed to a situation of this kind. An analysis of experimental procedures used in studies of suggestibility supports an interpretation of suggestibility as a form of dependency behavior (Asch, 1940; Sherif, 1935). Similarly Jakubczak and Walters (1953), in exposing groups of high and low-dependent children to the autokinetic effect, found that high-dependent subjects were significantly more suggestible than low-dependent subjects. In general, studies seem to indicate a very strong relationship between level of anxiety and the traits of dependency and suggestibility.

The Effects of Anxiety on Susceptibility to Persuasion and Social Influence

Janis (1955) put forth the assumption that persons who are exceptionally lacking in a sense of personal adequacy are excessively fearful of social disapproval and therefore are strongly motivated to conform with demands and suggestions of others. Under the assumption that a high degree of anxiety entails feelings of shyness, fear of being criticized, and low self-confidence in relaionships with other people, Janis (1955), studied the relationship between anxiety and susceptibility to persuasion. The results of the study showed that people high in anxiety were more predisposed to be influenced by persuasive communication.

Fine (1957) found that opinion change in subjects high in inferred anxiety was greater than those low in anxiety. Anxiety has been found to be positively related to suggestibility in an autokinetic situation (Walters et al., 1960) and to susceptibility in propaganda (Goldstein, 1959; Janis & Fesbvah, 1953).

A number of studies have reported that under anxiety arousing conditions subjects tend both to seek out the company of others and to become increasingly susceptible to social influence (Schacter, 1959; Walters & Karal, 1960). Gerard (1963) suggests that evaluational uncertainty regarding some aspect of the self produces a desire to compare oneself with others. Along a similar vein, Walters, Bowen and Parke (1964) reported that emotionally aroused subjects are especially likely to rely on the behavior of others for indications as to how they should respond.

In summary, research seems to indicate that arousal or anxiety leads to: 1) an increased susceptibility to social influence, 2) a desire to affiliate, and 3) a tendency to compare one's self with others.

Conclusions

The relationship between anxiety and selected behavior patterns has been discussed. In general, anxious subjects tend to be less self-confident and less content with themselves, as well as being more dependent and suggestible than low-anxious subjects. It was also found that dependency is positively correlated with suggestibility. Research has also indicated that anxious subjects were more susceptible to persuasion and to the influence of social models.

Theoretical Viewpoints on Modeling

The earliest formulations, dating back to Morgan (1896), Tarde (1903), and McDougall (1908), regarded modeling as an innate propensity. These instinctual interpretations discouraged empirical investigations of the conditions under which modeling occurs. As the instinct doctrine fell into disrepute, a number of psychologists, notably Humprey (1921), Allport (1924), and Holt (1931), accounted for modeling behavior in terms of associative principles.

With the advent of reinforcement principles, theoretical explanations of learning shifted the emphasis from classical conditioning to instrumental response acquisition based on reinforcing outcomes. Theories of modeling phenomena similarly assumed that the occurrence of observational learning is contingent upon reinforcement of imitative behavior. This point of view was most clearly expounded by Miller and Dollard (1941). Miller and Dollard's (1941) pioneering effort virtually founded the empirical study of imitation. Flanders (1968) however, states that while Miller and Dollard's emphasis on direct reinforcement was justified, their claim that imitation presupposes direct reinforcement was false.

When a person observes a model's behavior, but otherwise performs no overt response, he or she can acquire the modeled responses while they are occurring only in cognitive, representational forms. Any learning under these conditions occurs purely on an observational or covert basis. Several theoretical analyses of observational learning (Bandura, 1962, 1965a; Sheffield, 1961) assign a prominent role to representational mediators that are assumed to be acquired on the basis of a contiguity learning process.

A General Overview of Modeling Research

The behavior of models often serves as discriminative cues for observers in facilitating the expression of previously learned responses. Laboratory and field studies have shown that the probability of occurrence of a wide variety of neutral and socially approved behavior can be substantially increased as a function of witnessing the action of real-life or symbolic models. Some behaviors that have been thus facilitated include volunteering one's services (Rosenbaum, 1956; Schacter & Hall, 1952), performing altruistic acts (Blake, Rosenbaum & Duryea, 1955; Bryan & Test, 1967; Harris, 1968), pledging oneself to a course of social action (Blake, Mouton & Hain, 1956; Helson, Blake, Mouton, & Olmstead, 1956), assisting persons in distress (Bryan & Test, 1967), seeking a relevant information (Krumboltz & Thoresen, 1964), and selecting certain types of foods (Duncker, 1938), activities (Madsen, 1968), or articles (Bandura, Ross & Ross, 1963b).

In the case of humans of wide variety of response patterns differing considerably in content, novelty, and complexity have been transmitted through modeling procedures under laboratory conditions. Among the diverse classes of behavior that have been developed are stylistic response patterns (Bandura, Grusec & Menlove, 1966; Bandura, Ross & Ross, 1963b), distinctive modes of aggressive behavior (Bandura, Ross & Ross, 1963a), dramatic play patterns (Marshall & Hahn, 1967), prosocial frustration reactions (Chittendon, 1942), and teaching styles (Feshback, 1967). At an even higher level of complexity, it has been shown that through exposure to the behavior of models, a person can acquire standards for self-reinforcement and self-evaluative responses (Bandura & Kupers, 1964), conceptual behavior (Reed, 1960), moral judgmental

orientations (Bandura & McDonald, 1963), self-imposed delay-of-gratification patterns (Bandura & Mischel, 1965), linguistic structures (Lovaas, 1966a), and distinctive phonetic variations in verbal behavior (Hanlon, 1964).

The Effects on Modeling of Reinforcement to the Observer (Direct Reinforcement)

A number of studies have investigated the effect of reinforcement of the observer contingent upon the observer imitating the model (Clark, 1965; Field, 1952; Hicks, 1965). The results of these studies strongly support the proposition that such reward increases imitation (Clark, 1965; Field, 1952; Hicks, 1965). Caution, however, should be taken in generalizing the above results beyond similar experimental situations. Studies have shown that when reward is made contingent upon the observer's task-success independent of imitation, the tendency for the observer to imitate the model is decreased (Grusec, 1966; Kelly & Lamb, 1957; Kelman, 1950).

The Effects on Modeling of Reinforcement to the Model (Vicarious Reinforcement)

It is becoming increasingly apparent that social learning cannot be adequately explained in terms of direct reinforcement principles. A number of studies strongly support the hypothesis that vicarious reward will increase imitation of the model by the observer (Bisese, 1966; Clark, 1965; Marston, 1966; Willis, 1963). It has been further shown that vicarious reward effects are most likely to occur when the subject believes she or he will have to perform the task, and when the task has

definable properties permitting a clear association between relevant task stimuli, critical modeled behavior, and vicarious reward (Thelen & Rennie, 1972).

Modeling effects can be enhanced by the addition of reinforcement to the model (vicarious reinforcement) or to the observer (direct reinforcement). It has been argued that vicarious reinforcement has an effect primarily on the observer's performance of the imitative response, and that it does not represent a necessary condition for the acquisition of this behavior (Marlott, Jacobson, Johnson & Morrice, 1970). Bandura (1965a) suggests that the acquisition of matching responses results primarily from stimulus contiquity and associated symbolic responses, whereas the performance of observationally learned responses will depend to a great extent upon the nature of the reinforcing consequences to the model or the observer. Liebert and Fernandez (1970), however, state that vicarious consequences should effect both the performance and acquisition of modeled behavior. A study by Peed and Forehand (1973) further confirm this position. Thus, while most studies suggest that vicarious consequences affects performance, its effect on acquisition seems to be a source of dispute among researchers.

The Effects of Antecedent Characteristics of the Model on the Behavior of the Observer

Since repeated contigious stimulation alone does not always result in response acquisition, it is evident that additional conditions are required for the occurrence of observational learning (Bandura, 1969). A number of attention-controlling variables, some related to incentive conditions, others to observer characteristics, and still others to the

properties of the modeling cues themselves, seem to be influential in determining which modeling stimuli will be observed and which will be ignored. Selectivity of modeling stimuli may be partly a function of their inherent physical properities--for example, intensity, size, vividness, and novelty (Bandura, 1969). Of much greater importance for social learning, however, is the acquired distinctiveness of model attributes (Miller & Dollard, 1941).

Studies concerning the effects of nurturance and sex of model have been contradictory and inconclusive (Flanders, 1968). Heatherington and Frankie (1967) found that nurturant models of either sex are imitated more, regardless of the sex of the observer. Rosenblith (1961), however, found that nurturant models are imitated more by female observers. Other experiments (Aronfreed, 1964; Rosenhan & White, 1967) failed to find any nurturance effects.

Concerning sex of model, Bandura, Ross and Ross (1963) suggest that males imitate males and females imitate females only when the behavior is perceived by the observer as sex-appropriate. Still other investigators (May, 1966; O'Connell, 1965) have found the sex of the model to have no effect, while others (Heatherington & Frankie, 1967; Hicks, 1965) have found the sex of the model to have an interaction effect.

Increased imitation of models who are older, more skillful, or who possess high social status was predicted by Miller and Dollard (1941) and Bandura and Walter (1963). Predictions about social status have been supported by demonstrating increased imitation of models with higher social status (Harvey & Rutherford, 1960; Lefkowitz, Blake & Mouton, 1955) and decreased imitation of models whose social status was removed (Shafer, 1965). In short, support has been found for the prediction

that observers more readily imitate models of higher status.

The Effects of Characteristics of the Observer on Modeling

An adequate theory of vicarious learning must explain why, under essentially identical conditions of modeling stimulation, some persons display higher levels of response acquisition than others. There is suggestive evidence that characteristics of observers, deriving from their previous social learning experiences, may be associated with different observational patterns (Bandura, 1969).

In general, research seems to suggest an inverse relationship between self-esteem of observer and imitation. DeCharms and Rosenbaum (1960), and Gelfand (1962) have shown that subjects with high self-esteem display less matching behavior than subjects with low self-esteem. These studies tie in very nicely with the research in the area of self-esteem and conformity. One of the more stable findings relating personality and social influence is a linear relationship between level of self-esteem and conformity. Janis (1954), Berkowitz and Lundy (1957), Lesser and Ableson (1959), and Linton and Graham (1959) have all found that persons low in self-esteem are more persuasible than those whose self-regard is more substantial. In summary, research seems to suggest an inverse relationship between self-esteem and imitation (conformity).

The relationship between dependency and imitation has been the subject of many studies. Bandura and Huston (1961) reported that high-dependent children showed more imitative behavior than did low-dependent children. In the two studies of Bandura, Ross and Ross (1961, 1963), high-dependent children showed more imitation of aggression than did

low-dependent children. Ross' (1962) study of the imitation of deviant behaviors also provides evidence for a positive relationship between the two variables. Indirect support for this relationship is also provided in studies by Cairns (1959), Endsley and Hartup (1960), and Jakubczak and Walters (1959). In general, research seems to suggest a linear relationship between dependency and modeling.

Conclusions

What follows are some conclusions concerning the selected review of the literature on modeling. The earliest formulations regarded modeling as an innate propensity. As the instinct doctrine fell into disrepute, modeling was accounted for in terms of associative principles. With the advent of reinforcement principles, theoretical explanations of learning shifted the emphasis from classical to instrumental response acquisition based on reinforcing outcomes. Theories of modeling assumed that the occurrence of observational learning is contingent upon reinforcement of imitative behavior. Perhaps the most popular exponents of this view were Miller and Dollard.

A general review of the imitation research was then made. It was noted that the behaviors of models often serves as discriminative cues for observers in facilitating the expression of previously learned responses. Studies have shown that the occurrence of a wide variety of neutral and socially approved behavior can be increased as a function of witnessing the action of real-life or symbolic models. It was also noted that a wide variety of response patterns differing considerably in content, novelty, and complexity have been transmitted through modeling procedures.

The modeling literature was also reviewed in terms of selected variables. Results concerning the effects upon imitation of presumed reward to the observer contingent upon the observer's imitation of the model strongly support the basic proposition that such reward increases imitation. Studies presented strongly support the hypothesis that vicarious reward will increase imitation of the model by the observer. It was shown, however, that vicarious reward effects are most likely to occur when the subject believes he or she will have to perform the modeled task, and when the task has definable properties permitting a clear association between relevant task stimuli, critical modeled behavior, and vicarious reward. The differential effects of vicarious reinforcement on performance and learning were then discussed. Studies suggest that vicarious reinforcement definitely effects performance of behavior. It's effect on learning, however, is inconclusive. The effects of various antecedent characteristics of the model were also researched. Studies of the effects of nurturance and sex of model were contradictory and inconclusive. Concerning the status of the model, support was found for the prediction that observer's more readily imitate model's of higher status. Studies were then reviewed concerning the effects of states and traits within the observer on imitation behavior. The relationship between imitation and self-esteem was also discussed. In general research seems to suggest an inverse relationship between self-esteem and imitation. Finally, studies were discussed that generally supported a linear relationship between dependency and imitation.

Anxiety and Modeling

Research shows that high-anxiety subjects tend to be less content

with themselves and to have lower self-esteem than low-anxious subjects. Other studies have suggested that high-anxiety subjects are more dependent than low-anxiety subjects. Subjects high in dependency and low in self-esteem have been found to be highly suggestible. It has indeed been found that anxious subjects who tend to have both these characteristics are more suggestible and more susceptible to persuasion than low-anxiety subjects. Following this line of thought are studies showing that high-anxiety subjects are more susceptible to the influence of social models.

One may ask the question: why should anxiety effect modeling behavior? To answer this question, one can examine a modeling situation through the eyes of an anxious person. An anxious person tends to have lower self-esteem and higher dependency needs than a low-anxious person. Studies incidently, have shown that both these characteristics lead to an increase in imitation. The high-anxiety person viewing a situation in which he or she must respond has two choices: to respond independently or look to one's environment for help. It seems reasonable that highly anxious persons would strive especially hard to uncover environmental cues which might assist them in problem solving. This would tend to stem from their lack of competency in their own abilities, their lack of sureness concerning themselves, and their general tendency to be dependent on other people. What better cue as to how to behave than the behavior of another? It would then seem to follow that high-anxiety subjects would tend to model more than low-anxiety subjects.

Studies on Anxiety and Modeling

A small number of studies have looked at the relationship between

anxiety and modeling. Schacter and Singer (1962) employed a technique to produce a state of physiological arousal by the injections of a sympathomimetic amine, epinephrine. With slight exceptions, this agent provokes a pattern of physiological activation which is a virtual replica of the state produced by active discharge of the sympathetic nervous system. In experimental situations designed to make subjects euphoric, those subjects who received injections of epinephrine were, on a variety of indices, somewhat more euphoric than subjects who received a placebo injection. Similarly, in situations designed to make subjects angry and irritated, those who received epinephrine were somewhat angrier than subjects who received placebo. Schacter and Singer (1962) go on to suggest that given a state of physiological arousal for which an individual has no immediate explanation one will label this state and describe one's feelings in terms of the cognitions available. Another way of explaining the results of this study could be as follows: a high degree of experimentally induced arousal led subjects to imitate the emotional reactions of stooges more than less aroused (placebo) subjects. Schacter and Singer (1962) suggest highly aroused subjects imitate more than subjects who are less aroused. The results of this study, however, have been questioned (Schacter & Wheeler, 1962). In both sets of conditions, the differences between epinephrine and placebo subjects were significant, at best, at borderline levels of statistical significance. Assuming, for the moment, that physiological arousal is a necessary component of emotional states, one of the factors that might account for this failure to find larger differences between epinephrine and placebo subjects can be explained in the following manner. It is highly possible that the placebo subjects also experienced some unspecified degree of

physiological arousal during the experiment. The injection of placebo does not prevent the subject from self-arousal of the sympathetic system, and indeed there is considerable evidence (Woodworth & Schlosberg, 1958) that the arousal of an emotional state is accompanied by general excitation of the sympathetic nervous system. Thus, the failure to find larger differences between the epinephrine and placebo subjects could be a direct result of a smaller difference in arousal levels than was expected.

A test of the proposition at stake, then, would require comparison of subjects who have received injections of epinephrine with subjects who, to some extent, are rendered incapable of self-activation of the sympathetic nervous system. Thanks to a class of drugs known generally as autonomic blocking agents, such blockage is, to some degree, possible. If the proposition that a state of sympathetic discharge is a necessary component of an emotional experience is correct, it should be anticipated that whatever emotional state is experimentally manipulated, it should be most intensely experienced by subjects who have received epinephrine, next by placebo subjects, and least of all by subjects who have received injections of an autonomic blocking agent. A study of this type was done by Schacter and Wheeler (1962). Schacter and Wheeler (1962) extended the range of manipulated sympathetic activation by employing three experimental groups: epinephrine, placebo, and a group injected with the sympatholytic agent, chlorpromazine. Laughter at a slap-stick movie was the dependent variable and the evidence was convincing that amusement was a direct function of manipulated sympathetic activation. In other words, epinephrine subjects were more amused than were placebo subjects, who in turn were more amused than chlorpromazine

subjects. Taken together, these studies suggest that an increase in arousal will lead to an increase in the imitation of an emotional state.

Bandura and Rosenthal (1966) investigated the effects of emotional arousal, manipulated both psychologically and physiologically, on vicarious classical conditioning processes. Five groups of observers underwent procedures designed to induce differential degrees of arousal. Observers then participated in a vicarious aversive conditioning paradigm in which a model exhibited pain cues in conjunction with an auditory stimulus. The acquisition and extinction of observers' emotional responses to the conditioned stimulus were studied. The results disclosed that conditioned emotional responses can be transmitted vicariously. In addition, the overall findings revealed that the observers' emotional arousal was a significant determinant of vicarious conditioning. This was shown by the fact that frequency of conditioned responses was a positive function of the degree of psychological stress. In other words, as the degree of arousal induced by a psychologically stressing situation increased, subjects became increasingly susceptible to the influence of models. In this case what the subjects imitated was a classically conditioned response.

Sarason, Pederson, and Nyman (1968) observed the effects of high, middle, and low test-anxiety on a verbal learning experiment. The subjects were female undergraduates. Prior to, and independent of, the experiment the subjects were administered a 37 item Test Anxiety Scale (TAS). The score distribution was divided into thirds, defined as high, middle and low test-anxious groups. Four of seven experimental conditions required the use of models. The four observational conditions were:

1. Observation Condition (O). Under this condition the subject observed a model "learn" a difficult list according to the usual serial position curve. The subject then performed on a different, but comparably difficult list. Finally, the subject performed on the model's list.

2. Reverse Observation Condition (RO). Under this condition the subject observed a model "learn" a difficult list according to a partially inverted or reversed serial position curve, i.e., material in the middle of the list was "learned" more quickly than material at the ends. Following observation, the subject performed on a different list, and then on the model's list.

3. Observation-Drum Absent Condition (ODA). This condition resembled the Observation Condition described above. However, while an opportunity to observe the model was provided, the subject was not shown the memory drum material upon which the model performed. Following observation, the subject performed on the two lists mentioned above. This condition represents a check on the effects of the subject's observing only the model's behavior.

4. Rating Condition (R). Under this condition the subject was asked to observe carefully the behavior of a "subject" (the model) in the other room. The subject was asked to attend carefully to and rate the degree to which the "other subject" was relaxed, attentive, or upset during her performance. The aim of this condition was to determine the effects of observation when emphasis is not placed on the task but on specified aspects of the model's behavior.

There were three conditions which did not involve observation of a model:

5. Orientation Condition (OR). Under this condition the subject

was met by the experimenter and taken directly to the experimental room. The experimenter then proceeded to show the subject the memory drum apparatus, demonstrating how it worked, and illustrating the method by which the experimenter recorded the subject's responses. The subject then performed on the two lists of disyllable words. The aim of the condition was to determine whether or not detailed orientation to the task at hand would be more facilitative for high than for middle and low anxious scorers.

6. Task Observation Condition (TO). Under this condition the subject did not observe a model perform on a verbal learning task. The subject was given the opportunity, prior to performance on the two lists, to observe the same stimuli to which models had responded in the four modeling conditions described above. This condition represents a check on the possibility that any facilitative effects of the four modeling conditions might be due simply to the opportunity to observe verbal learning material rather than the opportunity to observe the behavior of a model.

7. Control Condition (C). The subject was brought to the experimental room and then learned the two lists.

The directions given then were fundamentally the same with the only difference being that in the O and RO conditions the subject was told that it would be helpful for her to watch someone else doing the same task before she did it herself. Results showed significance for the Conditions variable. This was due to the superiority of the Observation (O) and Reverse Observation (RO) to the other experimental groups. Interestingly, neither the Rating nor the Observation-Drum Absent conditions, each of which involved observation of a model, produced anything

resembling a facilitative effect.

The high and middle TAS groups were significantly superior to the low TAS group. A significant TAS x Conditions interaction showed that the superiority of high and middle TAS to low TAS groups was due largely to the O and RO conditions. The disparity in performance between the high and middle TAS groups, on the one hand, and the low TAS group, on the other, was especially strong under these conditions. In fact the Rating (R) and Observation-Drum Absent (ODA) groups, although they did have an observational opportunity, did not differ from the control group in terms of the effect that anxiety had. In other words the performance of the three anxiety groups in the R and ODA condition, where the modeling effect was possible, did not differ from the performance of the three groups in the control condition where modeling was not possible. In general this study showed that an observational opportunity did have a positive effect on a subject's performance. Furthermore, evidence was gathered which suggested that higher test-anxiety scores were more associated with this beneficial effect than were lower ones. From this it may be possible to make the statement that high test-anxious subjects tend to model more than less test-anxious subjects.

However, a few problems exist here. It was shown that in the modeling conditions where the subject was directly told to watch the model (O and RO conditions), high TAS imitated more than low TAS. In the conditions, however, where modeling/observation was possible but not directed, the difference between high TAS and low TAS was actually nonexistent. It seems highly possible that differences in performance between high and low TAS in the O and RO conditions was due, not to the effect of anxiety on modeling, but to the demand characteristics of the experimental situ-

ations. It is possible that what was measured was not so much the influence of anxiety on modeling behavior, as the tendency of the highly anxious individual to be more conforming and appeasing than the low-anxious individual. Clearly a more rigorous test of this relationship is needed.

Jaffe and Carson (1972) assessed the effectiveness of modeling therapy as a treatment for test anxiety and investigated the role of model affect and consequences in determining that effectiveness. Test anxious subjects were exposed to one of four modeling displays of test taking behavior (calm model - positive consequences, calm model - negative consequences, anxious model - positive consequences, anxious model - negative consequences). A control group was included who took part in two assessment sessions, but who were not exposed to models in between. The subjects for this study were selected from a group of 53 volunteers who had scored on the median or higher on the Sarason Test Anxiety Questionnaire (Sarason, 1971), as compared to a normative sample of 217 students in an introductory psychology course. It was predicted that overall, modeling treatments would facilitate intellectual performance and reduce self-reported test anxiety among high test-anxious subjects when compared to similar subjects who received no treatment.

The results, overall, indicated some success. Subjects exposed to a videotape of an intelligence testing session improved significantly when given parallel testing material as compared to control subjects who took the pre- and post-test without viewing a modeling display in between. The improvement did not generalize to another set of tests omitted from the modeling scenes. Self-report measures of anxiety during the intelligence test, and during college examinations in general, were

not significantly attenuated by the modeling treatment when compared to the control group. Jaffe and Carlson (1972) went on to say that in general, the results of this study confirmed and extended the study by Sarason, Pederson and Nyman (1968).

Jaffe and Carlson (1966) predicted that highly anxious subjects would be susceptible to modeling procedures. The results of their study confirmed this prediction. This writer, however, feels that the methodology of the study does not allow Jaffe and Carlson a very rigorous test of the relationship between anxiety and modeling since Jaffe and Carlson (1966) dealt exclusively with anxious subjects and there were no comparisons with low test-anxious people.

CHAPTER III

STATEMENT OF THE PROBLEM

Selected reviews of the areas of anxiety and modeling have been presented. Intuitively, it seems as if somehow anxiety should have an effect on modeling. The characteristics of an anxious individual (e.g., lack of confidence, dependency, suggestibility) would seem to predispose the anxious individual to pay close attention to the behavior of others in an attempt to best behave in his or her world. There has been a number of studies that have attempted to look at anxiety and modeling. Schacter and Wheeler (1962) and Schacter and Singer (1962) found the highly aroused, more agitated subjects tend to imitate an emotional state more so than less aroused subjects. Bandura and Rosenthal (1966) found a high degree of arousal due to psychological stress led to a greater degree of imitation of classical conditioned responses. These studies have dealt with the relationship of anxiety and the modeling of simple types of learning (emotions and classically conditioned responses). The classically conditioned response, for example, consists largely of an emotional reaction to a stimulus. This response would seem to require a minimum of cognitive activity.

The literature has had little to say about the effect of anxiety on the modeling of a behavior in a situation where the observer must think about the behavior he or she observes in order to react appropriately in that situation. Few studies have looked at the effect of anxiety on the

modeling of a behavior that is cognitively complex. Sarason, Pederson, and Nyman (1968) studied the effects of anxiety in serial learning tasks in which high, middle, and low test-anxious subjects observed models. Results of the study showed that high and middle test-anxious subjects modeled more than low test-anxious subjects. The results of this study, however, may be somewhat suspect due to certain implicit demand characteristics in the modeling conditions. Thus, the effects of anxiety on the modeling of a behavior of a reasonable degree of cognitive complexity is still somewhat uncertain. What seems to be called for is a study, similar to that of Sarason et al. (1968), allowing both high and low anxious subjects to observe a model. However, to determine the effect of demand characteristics upon subjects, a demand and non-demand condition should also be included. The proposed study was attempted to meet these requirements. This study also differed from Sarason et al. (1968) in that the level of anxiety was manipulated and rechecked at the end of the study to insure that differences between anxious and relaxed subjects still existed. Subjects were given the opportunity to observe a model negotiate a pencil maze. After observing the model, the subjects were required to run the maze. Anxious and non-anxious (relaxed) subjects were exposed to two types of models (Fast and Slow) under two types demand conditions (Demand and Non-demand). Data were analyzed in terms of a 2 x 2 x 2 factorial design.

It was hypothesized that:

1. Subjects exposed to the fast model would complete the maze significantly faster than subjects exposed to the slow model. Studies have shown that stylistic response patterns have been transmitted through modeling procedures under laboratory conditions (Bandura, Grusec & Menlove,

1966; Bandura, Ross & Ross, 1963b).

2. The mean time for anxious subjects performing the maze would be faster than the mean time for relaxed subjects exposed to the fast model under the demand condition. Previous research has found that high-anxious subjects tend to imitate more than low-anxious subjects when the subject is instructed to observe the model (Sarason et al., 1968). The characteristics of the anxious individual (e.g., lack of confidence, dependency, suggestibility) would seem to predispose this indivdiual to pay close attention to the behavior of others in an attempt to best behave in his or her environment.

3. The maze time for anxious subjects performing the maze would be slower than the mean time for relaxed subjects exposed to the slow model under the demand condition. This hypothesis was made for the same reasons as hypothesis two.

4. There will be no significant differences in the mean times of anxious and relaxed subjects exposed to the fast or slow model under the non-demand condition. Previous research has found that high-anxious and low-anxious subjects do not differ in imitation when subjects are not given instructions to observe the model (Sarason et al., 1968).

CHAPTER IV

METHOD

Subjects

Eighty female college students enrolled in Introductory Psychology classes at Oklahoma State University participated in this experiment for extra credit. These students were of freshman or sophomore status and between the ages of 18 and 22 years.

Materials

The State Anxiety Scale (A - State) of the State-Trait Anxiety Inventory (Spielberger, 1967) was used in this study. This scale consists of twenty statements that require subjects to indicate how they feel at a particular moment in time, in this case the present (see Appendix A for STAI - A State scale). State Anxiety is conceptualized as a transitory emotional state, a condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension and heightened autonomic nervous system activity. A - State may vary in intensity and fluctuate over time. The conceptions of trait and state anxiety that guided this construction of the STAI are considered in greater detail by Spielberger (1966).

The range of possible scores on the STAI varies from a minimum score of 20 to a maximum score of 80 on both the A-State and A-Trait subscales. The mean score for undergraduate females of the type used in

this study has been found to be 35.12 (Spielberger, 1970). The mean score for a female undergraduate on the A-State scale of the State-Trait Anxiety Inventory is based on a sample of 231 female undergraduates at Florida State University.

Evidence bearing on the construct validity of the A-State scale is available for a sample of 977 undergraduate college students at Florida State University. These students were first administered the A-State scale with the standard instructions (Norm condition). They were then asked to respond how they believed they would feel "just prior to the final examination in an important course" (Exam condition). The mean score for the A-State scale was considerably higher in the Exam condition than in the Norm condition for both males and females. Furthermore, all but one of the items significantly discriminated between these conditions for the males, and all of the items were significantly higher in Exam condition for females. Further evidence concerning STAI validity is provided by Spielberger et al. (1975).

Given the transitory nature of anxiety states, measures of internal consistency such as the alpha coefficient would seem to provide a more meaningful index of reliability of A-State scales than test-retest correlations. Alpha coefficients for the STAI scales were computed by Formula K-R 20 as modified by Cronbach (1951) for the normative samples. These reliability coefficients ranged from .83 to .92 (Spielberger et al., 1975).

A cassete tape recording of a relaxation technique developed by Andre Weitzenhoffer (unpublished manuscript) was used to induce relaxation in the subjects (see Appendix B for relaxation procedure). This tape was seven minutes long. To induce anxiety, a cassete tape record-

ing was also used (see Appendix C for anxiety induction procedure). The tape contained instructions and a difficult philosophical passage from a book entitled Psychoanalysis and Daseinanalysis by Menard Boss (1963). The tape was three minutes in length. A cassete recorder was used to play these tapes.

A BRS Foringer pencil maze was used in the second (modeling) phase of the study. This maze was basically a flat sheet of metal 10.2 cm wide, 25.4 cm long, and 3.2 mm thick. A total of 10 horizontal slots ran parallel to the edge of the maze nearest the subject. Vertical slots were attached to each end of the horizontal slots, one ending in a cul, the other connecting to the center of the next horizontal slot. Thus, there was a total of ten right - left decision points. The slots were cut completely through the metal and were large enough to allow entry of a sharpened pencil. A sharpened number two pencil was provided for both model and subject. Medium bond paper 8½" x 11" was placed beneath the maze to record errors in maze running. In the modeling phase of the study a pair of goggles was used to blindfold the subject when the subject was running the maze. The goggles were shaped like a mask, completely enclosing both eyes. These goggles cut off any vision when worn by the subject. A time study 7451 stopwatch was used to obtain the subject's response time in running this maze. A stopwatch of a similar model was used by experimental assistants (located behind a one-way mirror) in a second experimental room to record the actual amount of time the subject observed the model. A pilot study was run to insure the interjudge reliability of this procedure.

Both phases of the experiment used experimental rooms. In the first phase of the study an experimental room was used that contained a

table measuring 2.4 x .65 m and two wooden chairs. These chairs were used by experimenter I and the subject. Both subject and experimenter were seated at the table. The second phase of the study was conducted in an experimental room 10 m down the hall. This room contained a table measuring 3 x .8 m, two wooden chairs, and a one-way mirror. Experimental room number two also contained a podium measuring 2.5 m high x 1 m wide x .5 m long. The podium was used by experimenter II to store materials. One chair was placed at the table. This chair was used by the model when she ran the pencil maze. Across the table and approximately 3.5 m away the second chair was placed. This chair was used by the subject. The chair was placed at a distance at which the subject could observe the model's style of running the maze; the distance was such, however, that the subject could not memorize the maze.

Procedure

Phase I

The first part of the study dealt with induction of anxiety or participation in a relaxation exercise. After anxiety induction or relaxation procedures were completed, subjects were given the STAI (State Scale) to determine if they were sufficiently anxious or non-anxious to be used in phase two of the study. Of the subjects who underwent anxiety induction, those scoring above the mean for a female undergraduate were considered anxious and asked to continue in the second phase of the study. The others were dismissed. The subjects exposed to the relaxation procedure who scored less than the mean on the state scale were considered non-anxious and also asked to continue in the second phase. The subjects scoring above the mean were dismissed. The relaxation and

anxiety induction procedures were continued until forty anxious and forty non-anxious subjects had been obtained. The STAI scores for anxious subjects ranged from 36 to 64 with the mean score being 46.2. The STAI scores for relaxed subjects ranged from 21 to 35 with the mean score being 28.1.

In the anxiety induction procedure the subject was met by experimenter I in a location designated as the waiting room. Experimenter I was a male college student 22 years of age majoring in psychology. Experimenter I introduced himself to the subject and directed the subject to experimental room #1. The experimenter then told the subject to have a seat. Experimenter I went on to explain that the first part of this study dealt with listening to a tape recording. The subject was told to listen carefully and follow the directions that it contained. The tape recording was then played (see Appendix C for the instructions and anxiety induction procedure). Briefly, the subject was told that she would be required to listen to a passage, comprehend its meaning and communicate this to a group of judges who would analyze her communication style. The passage was a rather complicated essay by Menard Boss on The Psychoanalytic Conception of an Idea. After the tape was finished the experimenter again reminded the subject that she would be evaluated on this material later. The state scale of the STAI was then administered to the subject. Administration of this inventory was alluded to in the tape. The final instructions on the tape mentioned that as an aid to the judges in evaluating your communication style a personality inventory would be given. In a series of pilot studies it was found that this tape recording would consistently increase the level of state anxiety in undergraduate females. As an added precaution to insure that

subjects were state anxious, any subject scoring below the mean (35.12) for undergraduate females was dismissed. Subjects scoring above the mean were then told by experimenter I that the second part of the study dealt with their ability to learn how to run a pencil maze. The subject was also told that further directions would be given to her by the experimenter running that part of the experiment. Experimenter I then ushered the subject to the open door of experimental room #2. Upon doing this, experimenter I returned to his room to prepare for the next subject.

In the relaxation procedure the subject was also met by experimenter I in the waiting area. The subject was then brought into experimental room #1 and seated at the table. It was explained to the subject that the first part of this study dealt with a relaxation procedure. The subject was then told to listen to the tape recording and follow the directions it contained. This relaxation procedure was adapted from a hypnotic induction technique developed by Andre Weitzenhoffer (unpublished manuscript). Briefly, the tape consisted of suggestions to relax, to pay attention to the speaker's voice, and to relax more deeply. A series of pilot studies showed that this procedure consistently reduced the level of state anxiety in undergraduate female subjects. The purpose of the relaxation procedure was to produce non-anxious subjects. As an added precaution to ensure that these subjects were in a non-anxious state the state scale of the STAI was administered immediately after listening to the tape. Any subject scoring above the mean for undergraduate females was dismissed. Subjects scoring below the mean were then told by experimenter I that the second part of the study dealt with their ability to learn how to run a pencil maze. The subject was also told

that further instructions would be given to her by the experimenter running that part of the study. Experimenter I then ushered the subject to the open door of experimental room #2. Upon doing this, experimenter I returned to his room to prepare for the next subject.

Phase II

The second phase of the study dealt with the modeling procedure. There were essentially four different conditions in this part of the study. The four conditions required the use of a model. The model in this study was a twenty-three year old white female undergraduate. The four observational conditions were: 1. Fast Model - Demand Characteristic. Under this condition the subject was ushered to the door of experimental room #2 by experimenter I. While the subject was being ushered to the door, experimenter II was at the podium inside the room scoring a fake performance record. Experimenter II was a twenty-six year old white male graduate student. The model was seated at the table blindfolded, with her pencil in her hand. The maze was positioned in front of the model. When the subject reached the door of the room, experimenter II motioned to the chair placed across the table and 3.5 m from the model. The experimenter then told the subject to be seated. The experimenter further said, "Since you will have to perform the same task as this subject (motioning to the model), I want you to observe her very carefully to see how it is done." The experimenter then turned his attention to the model and prepared her to run the maze by placing her pencil in the starting point of the maze. The experimenter then said to the model, "Let's try this maze again, ready, begin." The experimenter then clicked on his stopwatch to time the model. To the subject, the

experimenter once more repeated his instructions to observe the model. With the command "begin", the model rapidly traced through the maze in approximately ten seconds. (The average time, is determined by pilot data, required to negotiate this maze without practice is thirty-five seconds). The model was able to run it faster due to previous practice and memorization of the choice points. After the model had finished the maze, the experimenter removed the paper from beneath the maze as if to tally the errors. After approximately thirty seconds of examining the sheet, the experimenter remarked, "Very good, let's try it again". This procedure was repeated for two more trials. After examining the model's third tally sheet, the experimenter remarked, "Very good job, you've done it correctly, please report to experimenter I to continue the experiment". The model then left the room. In all, this part of the procedure took approximately 2.5 minutes. As discussed above, thirty second examination periods were interspersed between the three maze-runs. This was done to equate the amount of time subjects observing the fast model spent in the observation condition with the time spent by subjects observing the slow model. In the fast model condition, the model took less time to run the maze. If the examination periods were not interspersed then subjects observing the fast model would be in the observation condition for less time then subjects observing the slow model. Anxiety has a tendency to dissipate with time. With the equalization of length of time the dissipation of anxiety should be the same for both fast and slow model conditions. In both conditions there were approximately 2.5 minutes between entering the room and beginning the experimental task.

In experimental room #2 a one-way mirror was located directly be-

hind the model allowing an excellant view of the subject seated across the room. While the model was running the maze, an experimental assistant located behind the one-way mirror kept track with a stopwatch of the amount of time the subject spent observing the model. The time the subject spent visually fixated on the model was calculated as an aid to later interpretation of the modeling data. For example, failure to model could be perhaps explained by failure to observe rather than by failure to imitate what was observed.

After the model had left the room, the experimenter then seated the subject in the chair the model had vacated and placed the blindfold on the subject. Instructions were then read by the experimenter (see Appendix D for instructions). These instructions briefly explained the maze-solving task to the subject. If the subject had no questions, the task was begun. The experimenter recorded both the subject's total time and the time it took the subject to complete four choice points. The time at four choice points was included because it was felt that this would perhaps yield more accurate measure of the subject's initial style of attempting to negotiate the maze before practice would have a chance to affect this style. After the maze was completed, the subject was told to remove her blindfold. The subject was again asked to complete the state scale of the STAI. It was then explained that the experiment was over. The experimenter then debriefed the subject. The purpose of the arousal or relaxation procedures was discussed and questions were welcomed. After exploring with the subject her present feeling state, the experimenter excused her.

2. Fast Model - No Demand Characteristic. Under this condition the subject was again ushered to the door of experimental room #2 by ex-

perimenter I. Experimenter II, posing to be somewhat behind and hurriedly checking tally sheets, then said to the subject, "Have a seat, I'm running a little behind, but it won't hurt if you sit here. This is purely a motor task, your being here won't have any effect on this subject". The experimenter then turned his attention to the model and went through the identical procedure with the model as in the Fast Model - Demand Characteristic Condition. Aside from the different initial directions to the subject, the Fast Model - No Demand Characteristic Condition was identical to the Fast Model - Demand Characteristic Condition.

3. Slow Model - Demand Characteristic. This condition was identical with the Fast Model - Demand Characteristic condition except that the subject observed the model run the maze twice instead of three times. The model negotiated the maze in approximately sixty seconds each time. There was one fifteen second examination period between the first and second trials of the model.

4. Slow Model - No Demand Characteristic. This condition was identical with the Fast Model - No Demand Characteristic Condition except that the subject observed the model run the maze twice instead of three times. The model negotiated the maze in approximately sixty seconds each time. There was one fifteen second examination period between the first and second attempts.

Statistical Analysis

Data were analyzed in terms of a multivariate analysis of variance. Application of the multivariate analysis of variance is appropriate in cases where two or more dependent variables may be correlated with each other. In the present study, two dependent variables, time to complete

first four choicepoints and total time to complete maze, were found to be correlated (see Appendix E). Under this condition of correlated dependent variables, application of univariate tests, one for each dependent variable, will cause the probability of a Type I error to be higher than the level of significance that is used. The multivariate analysis was used as a screening device to locate sources of variability to be further analyzed. Significant sources of variability were further examined by means of univariate 2 x 2 x 2 factorial analyses. The specific hypotheses were examined by means of one-tailed t-tests. The dependent variables were: First, time to complete first four choicepoints of maze; second, total time to complete maze; and third, change in State-Trait Anxiety Inventory (STAI) scores.

A Pearson product-moment correlation coefficient was calculated between the time needed by subjects to complete the maze and the amount of time they observed the model (visual fixation). Had the correlation been significant, data would have been further analyzed in terms of an analysis of covariance. Interjudge reliability of the visual fixation measure was checked by means of a pilot study. In the pilot study, twenty subjects (one at a time) were allowed to observe a model. A visual fixation measure was calculated by two judges for every subject. These measures were then compared and a Pearson product-moment correlation coefficient computed (r = .99).

CHAPTER V

RESULTS

The dependent measures, time to complete first four choicepoints of maze, total time to complete maze, and change in STAI scores, were first analyzed in terms of a multivariate analysis of variance. Means and standard deviations for each cell of the design appear in Table I. The following sources of variability were found to be of significance: model ($F = 39.96$, $df = 3,70$, $p < .001$), anxiety ($F = 9.91$, $df = 3,70$, $p < .001$), model x anxiety interaction ($F = 2.58$, $df = 3,70$, $p < .06$). To further investigate this significance, univeriate F-tests were run for each dependent variable. Had no factor been found significant with the multivariate analysis, no further tests, other than specific testing of hypotheses, would have been run.

Pearson product-moment correlation coefficients were calculated between the time needed to complete the maze and amount of time subject observed model (visual fixation) for subjects observing fast and slow models. The correlation coefficients between maze and visual fixation time appear in Table II. None of these coefficients was significant.

In Table III, the summary table for the analysis of variance for time to complete the first four choicepoints of the maze is presented. As hypothesized, it was found that subjects exposed to a fast model completed the first four choicepoints significantly faster than those subjects exposed to the slow model. In addition to a significant main

TABLE I

MEANS AND STANDARD DEVIATIONS
FOR EACH CELL OF DESIGN

Fast Model

Group	n	Variable [a] 1	2	3	4
Anxious					
Demand	10	10.400	34.500	0.800	8.461
		2.989	14.547	5.959	1.467
Non-demand	10	10.500	27.000	4.100	8.127
		2.759	6.307	8.465	0.492
Relaxed					
Demand	10	13.200	34.000	8.100	8.779
		3.293	10.853	8.478	0.719
Non-demand	10	18.500	34.300	17.100	7.013
		5.191	12.400	13.404	2.019

Slow Model

Anxious					
Demand	10	28.600	86.300	-2.700	55.650
		13.260	28.496	6.750	3.888
Non-demand	10	23.800	77.300	-4.300	42.550
		10.401	31.341	6.651	10.261
Relaxed					
Demand	10	18.900	61.800	5.300	56.880
		4.557	8.979	8.473	2.730
Non-demand	10	21.400	60.600	2.900	50.650
		12.149	24.305	7.622	6.968

[a]variable 1 = time to complete first four choicepoints of maze
variable 2 = total time to complete maze
variable 3 = change in (STAI) scores
variable 4 = visual fixation time

TABLE II

CORRELATION COEFFICIENTS BETWEEN THE NEEDED TO COMPLETE MAZE AND VISUAL FIXATION TIME

	First 4 Choicepoints	Total Time
Visual Fixation - Slow Model	-.20	-.20
Visual Fixation - Fast Model	.20	.25

TABLE III

SUMMARY TABLE FOR ANALYSIS OF VARIANCE OF TIME TO COMPLETE FIRST 4 CHOICEPOINTS OF MAZE

Source	SS	df	MS	F
Within cells	4560.301	72	63.338	41.942
Model (M)	2656.506	1	2656.506	41.942***
Anxiety (A)	66.613	1	66.613	1.052
Demand Characteristics (D)	10.513	1	10.513	0.166
MA	357.012	1	357.012	5.637*
MD	3.613	1	3.613	0.057
AD	52.813	1	52.813	0.834
MAD	82.012	1	82.012	1.295

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

effect for model, the interaction of model by anxiety was also significant. This interaction was investigated by examination of simple effects. In Table IV, means are presented for the time needed to complete the first four choicepoints of the maze for anxious and relaxed subjects exposed to a fast or slow model. The summary table of simple effects for the model by anxiety interaction is presented in Table V. Examination of simple effects indicated that subjects exposed to a fast model differed significantly from subjects exposed to a slow model in both the anxious and relaxed conditions. Inspection of the data revealed that this difference is greater with anxious than relaxed subjects. It was further found that anxious subjects tended to be significantly slower than relaxed subjects when a slow model was observed.

In Table VI, the summary table for the analysis of variance of the total time to complete the maze is presented. These results were very similar to the results for the first dependent variable, a significant main effect of model, and a model by anxiety interaction was found. An additional finding was a significant main effect for anxiety. In Table VII, mean times to complete the maze for anxious and relaxed subjects exposed to a fast or slow model are presented. A summary table of simple effects for the model by anxiety interaction is presented in Table VIII. As hypothesized, subjects exposed to the fast model completed the maze significantly faster than those subjects exposed to the slow model. Examination of simple effects further indicated that subjects exposed to a fast model differed significantly from subjects exposed to a slow model in both the anxious and relaxed conditions. This effect appears to be greater for subjects in the anxious condition. It was also found that anxious subjects tended to complete the maze significantly slower than

TABLE IV

MEAN TIMES TO COMPLETE FIRST 4 CHOICEPOINTS OF MAZE FOR ANXIOUS AND RELAXED SUBJECTS EXPOSED TO FAST OR SLOW MODEL

Group	Fast Model	Slow Model
Anxious	10.45 seconds	26.2 seconds
Relaxed	12.85 seconds	20.15 seconds

TABLE V

SIMPLE EFFECTS TEST FOR TIME TO COMPLETE FIRST 4 CHOICEPOINTS OF MAZE: MODEL X ANXIETY INTERACTION

Source	SS	df	MS	F
Fast vs Slow model for anxious subjects	2480.622	1	2480.622	39.165***
Fast vs Slow model for relaxed subjects	532.898	1	532.898	8.414*
Within Cells	4560.301	72	63.338	
Anxious vs Relaxed subjects for fast model	57.6	1	57.6	.909
Anxious vs Relaxed subjects for slow model	366.026	1	366.026	5.779*
Within Cells	4560.301	72	63.338	

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

TABLE VI

SUMMARY TABLE FOR ANALYSIS OF VARIANCE
OF TOTAL TIME TO COMPLETE MAZE

Source	SS	df	MS	F
Within Cells	26916.785	72	373.844	
Model (M)	30498.004	1	30498.004	81.579***
Anxiety (A)	1479.197	1	1479.197	3.957*
Demand Characteristic (D)	378.449	1	378.449	1.012
MA	2879.984	1	2879.984	7.704**
MD	11.250	1	11.250	0.030
AD	304.200	1	304.200	0.814
MAD	0.000	1	0.000	0.000

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

TABLE VII

MEAN TIMES TO COMPLETE MAZE FOR ANXIOUS AND
RELAXED SUBJECTS EXPOSED TO FAST
OR SLOW MODEL

Group	Fast Model	Slow Model
Anxious	30.75 seconds	81.2 seconds
Relaxed	34.15 seconds	61.2 seconds

TABLE VIII

SIMPLE EFFECTS TEST FOR TOTAL TIME TO COMPLETE MAZE: MODEL X ANXIETY INTERACTION

Source	SS	df	MS	F
Fast vs Slow model for anxious subjects	26060.965	1	26060.965	69.711***
Fast vs Slow model for relaxed subjects	7317.020	1	7317.020	19.572***
Within Cells	26916.785	72	373.844	
Anxious vs Relaxed subjects for fast model	115.599	1	115.599	.309
Anxious vs Relaxed subjects for slow model	4243.594	1	4243.594	11.351***
Within Cells	26916.785	72	373.844	

***$p < .001$

relaxed subjects when a slow model was observed.

The third dependent variable investigated was change in subjects STAI scores. Pre-test scores were taken after anxiety induction or relaxation procedures. Post-test scores were taken before debriefing procedures at the end of the experiment. In Table IX, the summary table for the analysis of variance using post-test minus pre-test change scores is presented. A significant main effect for anxiety was found. Subjects in the relaxed condition underwent a significantly greater increase in their STAI scores from pre-test to post-test than did subjects in the anxious condition. In Table X, means for pre-test and post-test STAI scores are presented for anxious and relaxed subjects. The question may occur as to whether or not anxious and relaxed subjects differed on their post-test STAI scores. A t-test was used to examine this question. Relaxed and anxious subjects were found to differ significantly ($t = 4.18$, $df = 78$, $p < .01$). In terms of post-test STAI scores, a significant difference in anxiety level between anxious and relaxed subjects was still found to be present at the end of the study.

A significant main effect for model and a significant model by demand interaction was also found for the change in subject's STAI scores (see Table IX). The model by demand interaction was investigated by means of a test of simple effects. In Table XI the mean changes in STAI scores for subjects observing a fast or slow model in the demand or non-demand condition are presented. The summary table for the simple effects test appears in Table XII. The simple effects test showed that only under the non-demand condition did subjects observing a fast model become significantly more anxious than subjects observing a slow model. It is important to note that the model by demand interaction would not be ana-

TABLE IX

SUMMARY TABLE FOR ANALYSIS OF VARIANCE
OF CHANGE IN (STAI) SCORES

Source	SS	df	MS	F
Within Cells	5205.480	72	72.298	
Model (M)	1044.009	1	1044.009	14.440***
Anxiety (A)	1575.302	1	1575.302	21.789***
Demand Characteristic (D)	86.111	1	86.111	1.191
MA	32.512	1	32.512	0.450
MD	332.110	1	332.110	4.594*
AD	30.012	1	30.012	0.415
MAD	58.812	1	58.812	0.730

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

TABLE X

MEANS FOR PRE-TEST AND POST-TEST STAI SCORES
FOR ANXIOUS AND RELAXED SUBJECTS

Group	Pre-test	Post-test
Anxious	46.2	45.6
Relaxed	28.1	36.4

TABLE XI

MEAN CHANGES IN STAI SCORES FOR SUBJECTS OBSERVING A FAST OR SLOW MODEL IN DEMAND OR NON-DEMAND CONDITION

Condition	Fast Model	Slow Model
Demand	4.45	1.3
Non-demand	10.6	-.7

TABLE XII

SIMPLE EFFECTS TEST FOR CHANGE IN SUBJECT'S (STAI) SCORES: MODEL X DEMAND INTERACTION

Source	SS	df	MS	F
Fast vs Slow model for non-demand condition	1276.894	1	1276.894	17,662***
Fast vs Slow model for demand condition	99.225	1	99.225	1.372
Within Cells	5205.480	72	72.298	
Demand vs Non-demand condition for fast model	86.112	1	86.112	1.191
Demand vs Non-demand condition for slow model	122.767	1	122.767	1.698
Within Cells	5205.480	72	72.298	

*** $p < .001$

lyzed if strict adherance to the concept of using the multivariate analysis of variance as a screening device was followed. Since the model by demand interaction was not found significant in the multivariate analysis, further study theoretically could have been discontinued.

Hypotheses two, three, and four will be discussed in terms of their relationship to, first, time needed to complete first four choicepoints of the maze, and second, total time needed to complete the maze. These hypotheses were examined using one-tailed t-tests. The results of these t-tests in terms of the first dependent variable (first four choicepoints) will be discussed first. No significant difference was found between the mean times for anxious (10.4 seconds) and relaxed (13.2 seconds) subjects exposed to the fast model under the demand condition (t = .78, df = 72, p > .05). It was found, however, that mean times for anxious subjects (28.6 seconds) exposed to a slow model under demand conditions was significantly slower than the mean time for relaxed subjects (18.9 seconds) exposed to the same conditions (t = 2.72, df = 72, p < .005). A non-significant difference was found between the means of anxious (10.5 seconds) and relaxed (12.5 seconds) subjects exposed to the fast model under non-demand conditions (t = .56, df = 72, p >.05). A similar result was found for the mean times of anxious (23.8 seconds) and relaxed (21.4 seconds) subjects exposed to the slow model under non-demand conditions (t = .67, df = 72, p > .05).

When total time to complete the maze was examined, the results followed a similar pattern. The total time needed by anxious subjects to complete the maze (34.5 seconds), did not differ from the total time needed by relaxed subjects (34 seconds) when exposed to a fast model under demand conditions (t = .05, df = 72, p >.05). A similar result was

found for the total times of anxious (27 seconds) and relaxed (34.3 seconds) subjects exposed to the fast model under non-demand conditions (t = .84, df = 72, p > .05). It was found however, that the total time needed by anxious subjects to complete the maze (86.3 seconds) was significantly greater than the total time needed by relaxed subjects (61.8 seconds) when exposed to the slow model under demand conditions (t = 2.83, df = 72, p < .01). It was also found that the total time needed by anxious subjects to complete the maze (77.3 seconds) when exposed to the slow model under non-demand conditions was significantly greater than the total time needed by relaxed subjects (60.6 seconds) exposed to the same conditions (t = 1.93, df = 72, p < .05).

CHAPTER VI

DISCUSSION AND CONCLUSIONS

The visual fixation measure was taken on each subject as a possible aid to later interpretation of the modeling data. It was found that the time spent observing the model and the time taken to complete the maze were not significantly correlated. Thus, differences found between subjects in this study were apparently not related to the amount of time each subject spent observing the model. The lack of correlation between visual fixation time and time taken to complete the maze suggests that the length of time a subject observes the model has little or no effect on the extent of modeled behavior that occurs.

One hypothesis made in this study dealt with the effect of a fast or slow model on subject's maze speed. It was hypothesized that subjects observing a fast model would complete the maze faster than subjects exposed to a slow model. Support for this hypothesis was found. Data analyzed both in terms of the time needed to complete the first four choicepoints and the total time needed to complete the maze showed that subjects observing fast models were significantly faster in running the maze than were subjects observing slow models. Thus, the modeling procedure was shown to be effective. This finding is in agreement with previous studies that have found that style of responses can be transmitted through modeling procedures (Bandura, Grusec & Menlove, 1966; Bandura, Ross & Ross, 1963b).

Anxious subjects were found to perform the maze significantly slower than relaxed subjects when the slow model was observed. The greater tendency towards imitation by the anxious subjects can perhaps be explained by the certain characteristics that the anxious individual generally possesses. Anxious individuals tend to lack self-confidence, they also tend to be somewhat dependent and suggestible. Such characteristics would seem to predispose the anxious individual to pay close attention to the behavior of others in an attempt to best behave in his/her world.

It may be noted that the mean time for relaxed subjects to complete the maze (61.2 seconds) is closer to the slow model's time than is the mean for anxious subjects to complete the maze (81.2 seconds). The data, however, still suggest that anxious subjects imitated the slow model's style of running the maze to a greater degree than relaxed subjects. The model negotiated the maze in sixty seconds after memorizing the correct choicepoints. A subject imitating the slow response style, but unfamiliar with the maze, would take longer than the model to complete the maze. The comment might also be made that perhaps the reason anxious subjects took longer in the slow model condition was not imitation, but rather that the anxious subject had greater difficulty in solving the maze than did the relaxed subject. If this were the case, then in the fast model condition as well as the slow model, the anxious subject should take longer to complete the maze. This was not found to be true. Anxious subjects were faster when exposed to the fast model and slower when exposed to the slow model than were relaxed subjects, though differences were significant only when exposed to the slow model. Another question may be raised as to why anxious and relaxed subjects differed

significantly in their response time only when they observed a slow model. Why was there no significant difference between anxious and relaxed subjects when the fast model was observed? This is perhaps best answered by examining the mean times needed to complete the maze for anxious and relaxed subjects exposed to the fast model. The model performed the maze in ten seconds, the mean times for anxious subjects (30.75 seconds) and relaxed subjects (34.15 seconds) were much higher. The model with advance knowledge of the maze's choicepoints, performed at a level very much superior to that which a naive subject could attain. Any differences in the times of anxious and relaxed subjects were perhaps confounded by a "floor effect" in which both groups of subjects, in order to imitate the model, would need to struggle to perform the maze as fast as the model. The extremely fast time of the model perhaps led to a restriction of range in that subjects' scores could not spread out as well as they could if some of the subjects could have completed the maze as fast or faster than the model. The slow model performed at a level which allowed subjects more flexibility in response speed.

The discussion above has dealt with total time needed to complete the maze. Results for time needed to complete the first four choicepoints of the maze followed a very similar pattern. However, it did not seem to be as sensitive a measure as total time. Inspection of the data revealed smaller differences and fewer significant differences for time needed to complete the first four choicepoints than for total time. The time needed to complete the first four choicepoints is perhaps too small a sample of the subject's maze solving behavior to yield accurate, reliable data. The experimental manipulations did not seem tc have the effect on time to complete first four choicepoints as they did on total

time.

Examination of data pertinent to hypotheses two, three, and four yields partial confirmation of these hypotheses. One tailed t-tests were used to test these hypotheses. Following Sarason et al. (1968), it was hypothesized that anxious subjects would imitate more than relaxed subjects. However, based on the writer's interpretation of their results, it was hypothesized that this increase in imitation by anxious subjects should occur only in situations in which a demand condition was invoked. In the Sarason et al. (1968) study, anxious subjects receiving explicit instructions to observe the model imitated the model more than relaxed subjects receiving similar instructions. However, greater imitation for anxious subjects was not evident when no observation instructions were given to the subjects. Though Sarason et al. (1968) did not discuss this condition as a non-demand condition, it resembles the non-demand condition of the present study. Thus, in the present study it was hypothesized that anxious subjects would exhibit directions to observe the model (demand condition), but that there would be no difference between anxious and relaxed subjects when no observation instructions were given (non-demand condition). When total time to complete the maze was used as the dependent variable, it was found that anxious subjects in the slow model, demand condition, imitated significantly more than relaxed subjects. A significant difference was also found between anxious and relaxed subjects in the slow model, non-demand condition with the anxious subjects exhibiting greater imitation than relaxed ones. Though a significant difference was found between anxious and relaxed subjects in both demand and non-demand conditions, inspection of the data revealed greater differences in the demand condition. Further evidence for

greater imitation in the demand condition is found when the dependent variable, time needed to complete the first four choicepoints of the maze was examined. As discussed above, the difference between the mean times tended to be smaller when first four choicepoints was compared with total time to complete the maze. This is perhaps due to the latter dependent variable yielding a larger, more reliable sample of the behavior of the subject, as mentioned above only the most pronounced differences on the total time variable were also significant for the first four choicepoints variable. When data for this variable were examined in the slow model, demand condition, anxious subjects were found to imitate the model significantly more than relaxed subjects. However, no significant difference between anxious and relaxed subjects was found in the slow model, non-demand condition. Thus, anxious subjects were found to exhibit a greater degree of imitation than relaxed subjects in the slow model, demand condition for both of the above dependent variables. These findings are in agreement with expectations based on Sarason et al. (1968) results.

In contrast, the non-demand condition does not take advantage of the suggestibility and appeasement tendencies of the anxious subject to the extent the demand condition does. Thus, the differences in imitation between anxious and relaxed subjects were less pronounced in the non-demand condition. However, in the non-demand condition, the anxious subject probably still has characteristics (lack of confidence, uncertainty, dependence) which would seem to predispose the subject to imitate. Thus some difference in imitation between anxious and relaxed subjects might still be expected.

A third dependent variable investigated was change in subject's

STAI scores. Pre-test measures were taken to insure that the anxiety induction or relaxation procedures were effective. Post-test measures were taken to determine whether or not a change in the subjects level of anxiety had occurred during the experiment. It was found that subjects in the relaxed condition underwent a significantly greater increase in STAI scores than did subjects in the anxious condition. Regression to the mean can perhaps partly explain this occurrence. The experimental situation is, to many individuals, very laden with anxiety. It would seem to follow that the relaxed subjects, though very much at ease after the relaxation procedure, would increase in anxiety as they proceeded through this study, if for no other reason than performance anxiety when running the maze. The anxious subjects were already anxious and therefore were not affected in the same way. Though the relaxed subjects increased in STAI scores, it was found that the post-test scores of the relaxed subjects were significantly lower than those of the anxious subjects. Thus, the increase in STAI scores should not have affected the results of the experiment.

In terms of further research and improvement of this present study, this writer would do a number of things. More intensive pilot studies would be used to set the speeds for the fast and slow models. In particular, speed of the fast model would be decreased to erase the "restriction of range" effect. The speed of the slow model would also be decreased to allow for a sufficient difference between the models. The change of model speed should increase the possibility for an imitation difference between anxious and relaxed subjects to occur with the fast model. Another area of the study that could be improved is the instructions given in the demand and non-demand conditions. It is possible

that more clear cut findings concerning the effect of the demand condition on the anxiety and modeling relationship could have been found with a clearer differentiation between the demand and non-demand conditions.

In terms of future research it would seem important to replicate a somewhat surprising finding concerning the lack of a strong relationship between length of time spent observing the model and the degree the subject imitates the model, as this would be informative as to the necessary requirements for imitation. Future research could also add new variables to the anxiety-modeling relationship. It may be informative to study the effects of sex of model and sex of subject on the anxiety-modeling relationship. Another variable that would seem to merit study is status of the model. Research has shown increased imitation of models who possess high social status (Miller & Dollard, 1941). It is possible that the dependency needs of the anxious subject would predispose that subject to imitate a prestigious or authority figure more than a relaxed subject.

CHAPTER VII

SUMMARY

There have been a number of studies that have studied the relationship between anxiety and modeling. It has been found that highly aroused subjects tend to imitate an emotional state more so than less aroused subjects (Schacter & Wheeler, 1962). It has also been found that a high degree of arousal leads to a greater degree of imitation of classically conditioned responses (Bandura & Rosenthal, 1966). The literature has little to say about the effect of anxiety on imitation that is cognitively complex. Sarason et al. (1968), using a serial learning task, found that high test-anxious subjects imitated more than low test-anxious subjects. Results of this study may be somewhat suspect due to certain implicit demand characteristics in the modeling condition. Further research is needed to study the effect of anxiety on the imitation of a cognitively complex task. It also seems important to examine the effect of the demand characteristic on the anxiety and modeling relationship.

This study examined the effects on maze-solving ability of anxious and relaxed subjects exposed to a fast or slow model under demand or nondemand conditions. Eighty female subjects were used. Forty subjects underwent relaxation procedures and were, in terms of STAI scores, more relaxed than the average undergraduate female on whom the STAI was standardized on. Forty subjects underwent anxiety induction procedures and were, in terms of STAI scores, more anxious than average. These subjects

were exposed to either a fast model (ten seconds) or a slow model (sixty seconds) negotiating a maze. One-half of the subjects were directly instructed to observe the model (demand condition), whereas the rest were merely seated in the experimental room and told to wait their turn (non-demand condition). A measure of the amount of time the subject was visually fixated on the model was also taken. It was hypothesized that: one, subjects observing a fast model would complete the maze faster than subjects observing the slow model; two, anxious subjects would perform the maze faster than relaxed subjects in the fast model, demand condition; three, anxious subjects would perform the maze slower than relaxed subjects in the slow model, demand condition; four, there would be no significant differences between anxious and relaxed subjects exposed to a fast or slow model under the non-demand condition.

The results of this study suggest that the amount of time spent by the subject observing the model is not highly correlated with imitation of that model. It was also found that both anxious and relaxed subjects imitated a style of response with imitation perhaps being greater with anxious subjects. Anxious subjects tended to imitate the model more than relaxed subjects in the slow model condition, but not the fast model condition. Failure to obtain a difference between anxious and relaxed subjects in the fast model condition can perhaps be explained by methodological difficulties leading to a restriction of range effect. The dependent measure, total time to complete the maze, was found to be a more representative sample of the subject's maze-solving behavior than was the time needed to complete the first four choicepoints of the maze. Only the more pronounced differences found when total time to complete maze was used were also found when time needed to complete the first

four choicepoints of the maze was examined.

Data further revealed that anxious subjects tend to imitate more than relaxed subjects in the slow model, demand condition for both the above dependent variables. This is in agreement with the study Sarason et al. (1968) in which anxious subjects imitated more than relaxed subjects when subjects were instructed to observe a model. An additional finding was that anxious subjects tended to imitate more than relaxed subjects in the slow model, non-demand condition when the dependent variable was total time to complete the maze. These findings suggest that a demand characteristic increases the tendency of an anxious subject to imitate more so than it does a relaxed subject. However, even without the demand characteristic it is possible that anxious subjects imitate more than relaxed subjects, at least with certain types of models.

Relaxed subjects were found to increase in their STAI scores from pre-test to post-test. However, since there was a significant difference between anxious and relaxed subjects on their post-test STAI scores, it is unlikely that this increase had an effect on the experiment.

Further research should be designed to investigate further the effect of demand characteristic on imitation. Perhaps a clearer differentiation of instructions to subject would be valuable. A decrease in the speed the fast model negotiated the maze would also be an improvement in this study. The effect of anxiety on imitation behavior would have been clearer had significant differences been found between anxious and relaxed subjects exposed to a fast model as well as the slow model.

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APPENDIXES

APPENDIX A

SELF-EVALUATION QUESTIONNAIRE

SELF-EVALUATION QUESTIONNAIRE
Developed by D. D. Spielberger, R. L. Gorsuch and R. Lushene
STAI FORM X-1

NAME_____ DATE_____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	Almost Never	Sometimes	Often	Almost Always
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I am regretful	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel reated	1	2	3	4
9. I feel anxious	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel "high strung"	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel over-excited and "rattled"	1	2	3	4
19. I feel joyful	1	2	3	4
20. I feel pleasant	1	2	3	4

APPENDIX B

RELAXATION PROCEDURE

Please make yourself comfortable in your chair. I would like you to relax. Pay close attention to my voice. Try to pay attention to it as much as you can. Should your attention wander away from it, that will be all right, just bring your attention back to it. After a while you may find that my voice seems to become faint or to recede from you or again changes in quality. That is all right. Should you get sleepier, that will be fine, too. Whatever happens, let it happen and just keep listening to my voice while you become more and more relaxed. More and more relaxed. Just listen and relax. Whatever you feel is happening, just let it happen.

Relax completely. Relax every muscle of your body. Relax the muscles of your legs. Relax the muscles of your feet. Relax the muscles of your hands, of your fingers. Relax the muscles of your neck, of your chest. Relax all the muscles of your body. Let yourself be limp, limp, limp. Relax more and more, more and more. Relax completely. Relax completely. Relax completely.

As you relax more and more, a feeling of heaviness comes over your body. A feeling of heaviness is coming into your legs and your arms, into your feet and your hands, into your whole body. Your legs feel heavy and limp, heavy and limp. Your arms are heavy, heavy. Your whole body feels heavy, heavier and heavier. Like lead. You are beginning to feel drowsy, drowsy, and sleepy. Your breathing is becoming slow and regular. You are getting drowsy and sleepy, more and more drowsy and sleepy while your entire body becomes more and more relaxed, more and more relaxed.

You are relaxed, quite relaxed. But you can relax even more if you allow yourself to do so. You will soon attain a state of deep, of com-

plete relaxation. You are becoming increasingly drowsy and sleepy. There is a pleasant feeling of warmth and heaviness throughout your body. You are losing interest in everything else but my voice. Soon there will be nothing else to attend to but my voice. All the while you keep becoming more and more deeply relaxed.

You are relaxed, very relaxed. There is a pleasant feeling of warmth and heaviness, of lethargy, all through your body. You are tired and drowsy. You want only to listen to my voice. Pay attention to nothing else but my voice. You have no cares, no worries now. You are pleasantly, deeply relaxed, getting more deeply relaxed all the time. Everything else but my voice is becoming remote, quite remote. Nothing else but my voice seems important, nothing else is importnat. Nothing else but my voice and what I have to say to you now seems of interest. And even my voice may come to you as in a dream as you relax more and more, as you sink deeper into this lethargy, this deep state of relaxation. Relax, relax, deeply relaxed. Deeper and deeper all the time.

In a few moments you will be notified. You will feel pleasant and refreshed.

APPENDIX C

ANXIETY INDUCTION PROCEDURE AND INSTRUCTIONS

The research you are about to take part in is concerned with the analysis of interpersonal communication. Today's study deals with your ability to listen to a reading, comprehend its meaning and communicate this to a group of judges. A passage will be read to you. This passage contains eight ideas of major importance. Your task will be to listen to the passage and pick out these ideas. You will then be required to communicate these ideas to a group of judges. The judges will then evaluate you on your ability to communicate the essential themes of the reading. In order to test your ability to retain these ideas as well as communicate them, you will be required to participate in another task before you talk to the group. It may be of some interest to you to know that the ability to understand and communicate ideas in this manner has been shown to have a strong relationship to general intelligence and basic personality adjustment. You will hear the passage read only once, so you must listen carefully and try to understand the ideas presented. I will now begin the passage. The passage is entitled, "The Conception of an Idea".

The psychological conception of an "idea" is the starting point of contemporary psychology in general and of the psychoanalytic theory in particular. The psychoanalytic theory of neuroses asserts, for instance, that in hysteria unacceptable "ideas" are repressed. In obsessional neuroses, "ideas" are supposed to become detached from their accompanying affect.

Freud, then, too seems to take it for granted that we do have, somewhere within our consciousness or within our unconscious, ideas or mental images or psychic object-representations of all the objects of the external world which we have perceived. Almost all of us would at least

agree that such ideas, mental images, or intrapsychic object-representations take place within ourselves, whether in the head or in the psyche or elsewhere. Among many of us there even seems to be more or less unanimous agreement that the physiological equivalents or "substrata" of these mental images in the brain would constitute their ultimate reality. At any rate, everybody will understand me if I state that I have formed an idea or a mental representation within me of the contents of a book which I have read recently, or of a chemical experiment which I have just carried out, of a football game I have been watching this afternoon, or of a picture which I see at this very moment on the opposite wall.

On closer examination, however, our mutual understanding about our "ideas" of what we have seen or heard, about these mental images somewhere in our psyche, dwindles down to our being in agreement only on the same obscurities. In fact, not one of the constituents of our common phrase, "I have an idea" is clarified in the least. Actually, we do not know at all what we mean when we talk like that. We have "no idea" what the actual nature of an "I" is, nor have we any idea of the "substance" or the "essence" of a mental image or a psychic object-representation within ourselves; we are even less able to picture the possessive relationship between and "I" and such an "idea" of something.

For centuries, philosophers have questioned whether ideas correspond to a reality extranious to our mind or soul, a reality which ideas supposedly represent. Some philosophers say that they do, others say they do not; still others claim that the question cannot be decided. If philosophers are unable to agree on this question, it is best to refrain from philosophical speculation, and to investigate the immediately perceptible phenomena themselves to which the conception of "idea" seeks to

point. To do this is one of the many tasks of psychology.

The passage is now complete. In order to aid the judges in analyzing your style of communication, a questionnaire will be given to you by the experimenter. Please fill it out.

APPENDIX D

INSTRUCTION TO SUBJECT IN MODELING PHASE

In this part of your participation in this study, we are going to test your maze-solving ability. Trace with this pencil (pencil is placed in subject's hand and directed to the starting point) through the grooves and openings to the other end of the maze, always keeping the pencil tip touching the paper underneath. You will be required to keep trying until you correctly complete the maze. Do you have any questions?

APPENDIX E

CORRELATION COEFFICIENTS BETWEEN TIME TO COMPLETE FIRST 4 CHOICEPOINTS OF MAZE AND TOTAL TIME TO COMPLETE MAZE

TABLE XIII

CORRELATION COEFFICIENTS BETWEEN TIME TO COMPLETE FIRST 4 CHOICEPOINTS OF MAZE AND TOTAL TIME TO COMPLETE MAZE

	Slow Model	Fast Model
	First 4	
Total	.8080***	.4521*

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

VITA 2

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