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A Study of the Experimenter Modeling Effect on the Manifest Anxiety Scale

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A STUDY OF THE EXPERIMENTER MODELING EFFECT ON THE MANIFEST ANXIETY SCALE

by

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LIFE

Jerome S. Pietrzak was born on January 27, 1943 in Chicago, Illinois. After graduating from St. Ailbe Grammar School in 1957 and then from Mount Carmel High School in 1961, he attended De Paul University until June of 1965 when he was awarded a degree of Bachelor of Arts in psychology.

Following one trimester of full-time graduate study in psychology at the University of Florida, he gained his first clinical experience at Chicago State Hospital as a Mental Health Rehabilitation Intern. In September of 1966, he began full-time graduate work in psychology at Loyola University. The author has completed a clerkship and internship at the Loyola Guidance Center and is currently continuing his clinical training at the Veterans Administration Hospital at Hines, Illinois.

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CHAPTER I

Introduction

When the performance of subjects on a given task tends to be similar to the performance of their respective experimenters, we have what Rosenthal (1966) calls an "experimenter modeling effect." This phenomenon occurred in a master's thesis by Weickert (1967) who used the Taylor Manifest Anxiety Scale with 386 Catholic high school students. Weickert administered the MMPI, including the Manifest Anxiety Scale, to eight experimenters who subsequently administered the MAS to groups of high school students. Each experimenter administered the MAS in each of two roles, one defined by religious garb and one by clothing appropriate to laymen. Although the over-all effect of the religious vs. layman role was not significant, Weickert discovered that the MAS scores of the subjects were correlated at the .01 level of significance, using a rank order correlation, with the MAS, Pd, Pt, and Sc scores of the experimenters.

The purpose of this present study is to test Weickert's finding that the subjects's MAS scores are a function of the experimenter's MAS score. It is hypothesized that there will be a significant relationship between the MAS scores of the

experimenters and the MAS scores of their subjects. A secondary purpose is to increase our understanding of this relationship. The general question is, if the subjects's MAS scores are a function of the experimenter's MAS score, then how does this happen? One of the most fundamental aspects of the process would seem to be the degree of the subject's conscious awareness of the experimenter's manifest anxiety. It is hypothesized that subjects's ratings of their experimenter's MAS score, by responding to the MAS as they think their experimenter would respond, will be significantly related to the MAS score that their experimenter actually obtained.

An adjective check list and four questions are included in the experimental procedure in order to provide additional data that can be used to investigate any experimenter effects that may occur. This data can also be used to learn more about the phenomenology of the subject and how he reacts to the interpersonal structure of the experimental situation.

The possible significance of this study is also increased by its value as a check on the validity of using the Manifest Anxiety Scale as a measure of overtly manifested anxiety. It should be noted that Taylor (1953, 1956) developed this scale as a measure of drive, but that researchers have often used the scale as an experimental instrument for measuring anxiety in

clinical studies. If the experimenter's MAS score is truly "manifest" to the subjects, and subject rated scores of their experimenter's manifest anxiety, using the MAS, should be positively correlated with the actual MAS scores of the experimenters. Since there will be such a brief opportunity for the subjects to observe their experimenters, and since the subjects will be clinically naive observers, a failure of this correlation to reach significance would not tend to invalidate the MAS, but a significant positive correlation would be strong evidence for its validity as a measure of observable anxiety.

Several differences between the interpersonal structure of this experiment and that of Weickert's experiment may be important. For example, four experimenters of each sex will be used in this study, whereas Weickert used only male experimenters. This of course makes it possible to assess the possibility of experimenter sex effects. Other differences between the two experiments are that in this experiment, all of the experimenters will be laymen, and the subjects will be incoming college freshmen.

At this point, it is appropriate to consider the relevant literature. The discussion of the literature will involve the following areas: The anxiety of the experimenter, the interpersonal relationship between the experimenter and his subjects,

and the validity of rating someone else's manifest anxiety, especially in regard to the MAS.

CHAPTER II

Review of Relevant Literature

Experimenter's Anxiety

Masling (1960, 1966) has reviewed the influence of situational and interpersonal variables in projective testing, but as Turner and Coleman (1962) point out, most of the studies in this area have been concerned with the Rorschach. Although the one to one, examiner-subject interactions of such projective testing situations intuitively seem the most susceptible to the influence of the examiner, the recent massive body of literature on experimenter effects reviewed by Rosenthal (1966) suggests that experimenter or examiner effects may also be significant in situations and tasks previously assumed to be relatively free of the influence of the experimenter. In Weickert's (1967) study, for example, certain aspects of the experimenter's personality seemed significantly related to subjects's performance on a paper and pencil, self-report scale administered in a group setting.

This review will not be an attempt to examine the rapidly growing literature on experimenter effects, nor even all of the literature pertaining to the personality characteristics

of the experimenter. It will largely be restricted to the main experimenter variable of interest in the present study, the experimenter's anxiety.

In a study by Rosenthal, Persinger, Vikan-Kline, and Mulry (1963), 40 experimenters were administered the Manifest Anxiety Scale before administering a photo rating task to 230 subjects, half of whom were males and half females. The correlation between the experimenters's MAS scores and the subjects's rating of success of the photographed people was plus .48 ($p = .02$), while in a similar study by Rosenthal, Kohn, Greenfield, and Carota (1965), using 26 experimenters and 115 female subjects, the correlation was minus .54 ($p<.01$). In a verbal reinforcement study by this same research group (Rosenthal, Kohn, Greenfield, & Carota, 1966), using 19 male experimenters and 60 female subjects, high and low anxious experimenters obtained more conditioning than did medium anxious experimenters ($p = .08$).

Young (1959) administered the Worchel Self Activity Inventory to 48 introductory psychology students and then had these students administer a memory for digits task to 48 other students. Subjects tested by more poorly adjusted experimenters, as measured by the Worchel Self Activity Inventory, performed better at the task than did subjects tested by better adjusted

students. Subjects were not administered any measure of anxiety. It seems possible that the assumed anxiety or drive level of the more poorly adjusted experimenters somehow increased the anxiety or drive level of their subjects and that this improved their performance.

While increased state anxiety would tend to decrease the digit span performance of subjects already moderately anxious, it could well be that an increase in state anxiety would bring highly relaxed subjects up to an optimal drive level. Since the experimenters were peers of the subjects, it seems reasonable to assume that the subjects felt more relaxed than in the more typical research situation where the experimenters are graduate students and often appear to subjects to be faculty members. Therefore, the subjects of the more poorly adjusted experimenters may have done better because their drive or anxiety level was elevated enough to enhance their performance, yet the peer quality of the experimenter-subject relationship helped to keep them from becoming so anxious that their anxiety would interfere with the task.

McGuigan (1960, 1963) found that the more neurotic of his 9 experimenters tended to obtain poorer performance than the less neurotic of his experimenters, neuroticism being measured by the B1-N scale of the Bernreuter. The correlation between

the neuroticism of the experimenters and the time taken by the subjects to reproduce Design Number XVII of the Kohs Block Design Test was .35. In discussing McGuigan's study, Rosenthal (1966) concluded that more anxious experimenters tended to obtain less adequate performance. This conclusion is clearly in error, however, because the performance measure, time taken to complete the task, correlated only .04 with the MAS scores of the experimenters.

Winkel and Sarason (1964) employed the Test Anxiety Scale in a study of verbal learning, using 144 introductory psychology students, half male and half female, as subjects. Their experimenters were 24 male undergraduate students, half of whom had previously scored from 0 to 4 on the TAS and half who scored 9 or above. Prior to and independent of the experiment, the subjects also had taken the TAS. Three different motivational levels were introduced by preliminary instructions and after the first list of nonsense syllables, subjects were given either success or failure reports before beginning a second list of nonsense syllables. The data of each list were analyzed separately.

In regard to the effect of experimenter anxiety, there were several findings which held for both lists. The main effect of experimenter anxiety was not significant. However, there

were several consistent interactions with experimenter anxiety which did reach significance. In both lists, the interaction between experimenter anxiety and sex of subject was significant at the .05 level. With high anxiety experimenters, there was little difference between the performances of males and females, but with low anxiety experimenters, females performed much better than males. Also for both lists, the interaction between experimenter anxiety and differentially motivating instructions was highly significant ($p<.01$). Again, with high anxiety experimenters, there was little difference in performance between the three different sets of instructions, but with low anxiety experimenters, highly motivating instructions produced much better performance than did either of the other two sets of instructions.

Another interaction with experimenter anxiety that reached significance in both lists was that between experimenter anxiety, subject anxiety, differentially motivating instructions, and sex of subject ($p<.01$, first list; $p<.05$, second list). The findings here were that high anxiety males tested by high anxiety experimenters performed much more poorly with achievement orienting instructions than they did with either of the other two instructions. Perhaps for high anxiety males, a high anxiety experimenter and highly motivating instructions produce

too much stress, whereas with a low anxiety experimenter and highly motivating instructions, the stress may be reduced enough to produce optimal performance. Why this would not hold for high anxiety females is not clear.

While the interaction between experimenter anxiety, subject anxiety, and sex of subject was significant ($p<.05$) in the first list, this interaction did not even approach significance in the second list after the administration of "success" or "failure" instructions. In regard to this interaction in the first list, low anxiety females who were tested by low anxiety experimenters performed at a higher level than any other group involved in this interaction. When interpreting this interaction as well as the other interactions involving sex of subject, it should be remembered that all experimenters were males.

In the area of intelligence testing, Egeland (1967) investigated the influence of experimenter anxiety and subject anxiety on the Wechsler Intelligence Scale for Children. The subjects were fifty-four fifth graders and the experimenters were two male graduate students in school psychology. As in the Winkel and Sarason (1964) study, the experimenters were not involved in administering the anxiety measure to their subjects, so that there was no possibility of an experimenter modeling effect.

Egeland found that although there were no significant differences in Full Scale or Performance I.Q., the subjects tested by the experimenter with the high MAS score (27) scored significantly higher in Verbal I.Q. ($p<.05$) than the subjects tested by the experimenter with the low MAS score (7). Whereas, children who scored high on the Children's Manifest Anxiety Scale performed equally well regardless of their experimenter's anxiety level, children who scored low on this scale did better when tested by the experimenter who had scored high on the MAS. Egeland suggested that the highly anxious experimenter increased the drive level of his low anxiety subjects, but had little effect on the high anxiety subjects who already were high in drive level. Another suggestion was that the anxiety of the high anxiety subjects prevented them from detecting experimenter cues and reinforcements that tend to improve WISC performance.

The subtests on which the subjects of the high anxiety experimenter did significantly ($p<.05$) better than the subjects of the low anxiety experimenter were Comprehension, Similarities, and Vocabulary. The subjects of the experimenter with the lower anxiety level did not do significantly better on any subtest. On the Coding subtest, a significant experimenter by subject interaction occurred whereby subjects tested by the experimenter with an anxiety level similar to their own did better

than subjects tested by an experimenter with an anxiety level different from their own ($p<.025$).

Although Egeland's experiment is a valid contribution to the study of experimenter effects, it is impossible to know whether it was the MAS of the experimenters or some other experimenter characteristic that differentially affected the subjects. This is a problem inherent in any attempt to study a specific experimenter variable using only two experimenters, because any two experimenters differ in numerous ways.

In the studies so far examined in this review, there has been one very important factor that differed from Weickert's (1967) study. The dependent variables in these other studies have not included the subjects' anxiety. Even where subject anxiety and experimenter anxiety were both studied (Egeland, 1967; Winkel & Sarason, 1964), the measure of subject anxiety was not administered by the experimenters who tested the subjects in the main part of the experiment. Consequently, from these studies, we have no direct information about how an experimenter's performance on an anxiety measure relates to how his subjects perform on that same measure. In addition to Weickert's (1967) study, which has already been discussed, two other studies give us some information about this relationship.

The first of these is by Sanders and Cleveland (Cleveland, 1951; Sanders & Cleveland, 1953). For this study, nine male, second year graduate students enrolled in a projective techniques course in which each administered 30 Rorschach Tests. Subjects were 270 male college sophomores, ranging from 18 to 24 years of age. Experimenter overt anxiety and hostility were rated by their subjects with a 15-item questionnaire. Experimenter and subject covert anxiety and hostility were measured with Elizur's Rorschach Content Test. Out of 38 Rorschach scoring categories, analysis of variance indicated that 20 of these categories showed a significant variance (.05 level and beyond) among examiners. Taking the three highest and the three lowest experimenters on each criterion measure, overt and covert anxiety and hostility, Sanders and Cleveland then related these experimenter variables to the 20 subject variables that were significantly influenced by the experimenters. Because R, or number of responses, was highly correlated with many variables, the number of variables considered significantly related to the experimenter variables was greatly reduced.

Sanders and Cleveland conclude that the experimenters who are higher in overt anxiety or are perceived by their subjects as being more anxious elicit from their subjects more general

responsiveness (R), more oppositional trends (S%), and more responsiveness to external and emotional stimuli (C) than do experimenters who are lower in overt anxiety. It would seem that this "overt anxiety" is perhaps more similar to manifest anxiety as measured by the MAS than "covert anxiety," which presumably may be conscious to neither the subjects nor the experimenters themselves. At any rate, the covert anxiety of the experimenters, as measured by Elizur's Rorschach Content Test was found to be significantly related to other subject Rorschach variables. The experimenters higher in covert anxiety obtained Rorschach performances from their subjects with significantly more human responses (H), human movement responses (M), Y responses, higher hostility scores, and a smaller percentage of animal responses (A%) than experimenters who scored lower in covert anxiety.

Most relevant to the present investigation were the findings in regard to the relationship between experimenter and subject measures of anxiety. Neither overt nor covert experimenter anxiety was significantly related to subject covert anxiety. The mean anxiety score of the subjects tested by experimenters who were higher on covert anxiety was almost identical to the mean anxiety score of subjects tested by the experimenters who were lower on covert anxiety scores (10.7 and 10.8

respectively). Although the difference between means for experimenters higher and lower on overt anxiety was also insignificant, there was a tendency for experimenters higher on overt anxiety to elicit a lower covert anxiety score from their subjects than was elicited by experimenters lower on overt anxiety (7.5 and 9.0 respectively; $F = 1.89$). Unfortunately, subjects were not given any measure of overt anxiety, so that it is impossible in this study to assess the relationship between experimenter overt anxiety and subject overt anxiety, which might have been more comparable to the Weickert (1967) study. When interpreting these findings, it should also be remembered that experimenter overt anxiety was measured by subject ratings rather than self ratings.

The other study that provides information on the relationship between a measure of experimenter anxiety and the subsequent measure of the subject's anxiety is a study by Barnard (1963, 1968). In this study, the experimenters were administered Heath's Phrase Association Task and subsequently administered this task to their subjects. The subjects who were tested by experimenters who had shown a high degree of disturbance on the association task also showed a higher degree of disturbance on that task than did subjects whose experimenters had shown a low degree of disturbance ($p<.025$). If "disturbance"

on the Heath Phrase Association Task can be considered to be similar to manifest anxiety on the Manifest Anxiety Scale, then Barnard's (1963) findings are very consistent with Weickert's (1967) findings. It may be that "disturbance" on the Heath task is more related to situational anxiety than to the relatively stable personality characteristic presumably measured by the MAS. That disturbance on a word association task and MAS performance reflect different dimensions of anxiety is suggested by a study by Wiggins (1957). He reported an absence of relationship between the MAS and the Word Association Task.

With the main body of the literature on experimenter anxiety reviewed, we can proceed to a more careful analysis of the effect of the experimenter's MAS score on the MAS scores of his subjects. Using Weickert's (1967) study as a model, most of this analysis will also apply to the present study as well. In his study, the MAS scores of the eight experimenters correlated significantly ($p<.01$) with the MAS scores of their subjects. Does this mean that the experimenter personality characteristic measured by the MAS partly caused the subjects to score a certain way on their own MAS performance? Similarly, does this mean that the way experimenters responded to the MAS affects how their subjects respond to the MAS? To properly

assess the possibility of such causal relationships, we must evaluate the plausibility of the alternatives.

One possibility is that the correlation was caused by chance, but Weickert's statistics tell us that this is very unlikely, the odds against this being less than 100 to 1 ($p<.01$). Given that there is a significant correlation between the MAS scores of the experimenters and the MAS scores of the subjects, the correlation could be due to a causal effect of the former or its correlates upon the latter, a causal effect of the latter or its correlates upon the former, or a causal effect of one or more other variables upon the MAS scores of both experimenters and subjects.

In Weickert's study, and even more so in the present study, the first possibility does not appear to be very plausible. Since the experimenters responded to the MAS before testing their subjects, it is not possible that the way the subjects responded to the MAS affected the way the experimenters responded to the MAS. However, is it conceivable that through some kind of biased assignment of experimenters to their groups of subjects, experimenters could have been assigned to the groups that would be most like themselves in manifest anxiety? In Weickert's study, there does not appear to be a biased assignment of experimenters to their subjects, so that this

possibility does not seem likely. In the present study, experimenters were assigned randomly to their groups of subjects.

Two remaining possibilities are that the correlation obtained in Weickert's study could be due to experimenter variables related to MAS performance or to one or more other variables that caused both experimenters and subjects to perform similarly on the MAS. Of course, the third possibility exists that the correlation could be due to a combination of the above two types of factors. The present author is inclined to think that the correlation is partly due to certain experimenter characteristics that are related to experimenter MAS performance. What follows is an attempt to analyze experimenter-subject interaction and to specify some plausible ways by which MAS related experimenter characteristics could influence the subject's performance on the MAS.

The Interpersonal Relationship between the Experimenter and his Subjects

Weickert (1967, pp. 31-32) hypothesized that an experimenter who is manifestly anxious within the normal range

> may come across to his subjects as more open and honest, as interested in them and their responses, rather than too calm and disinterested. The subjects could thus feel more willing to express themselves to such a concerned and imperfect experimenter. . .

Although this seems to be a plausible hypothesis, the literature on experimenter anxiety does not contain much information related to it. However, the study already mentioned by Sanders and Cleveland (1953) does provide some information on how high and low anxiety experimenters are perceived by their subjects. In this study, a three item questionnaire was used to assess the degree of emotional closeness and liking that subjects felt towards their experimenters. Experimenters who had been rated by their subjects as being low on overt anxiety or hostility were liked by their subjects more than experimenters who were rated higher on overt anxiety or hostility. Also, the experimenters who were rated low on overt anxiety or hostility were rated as the type of person the subjects would more likely want as "close friends." For experimenters who differed in covert anxiety as measured by Elizur's Rorschach Content Test, there was no significant difference in degree of liking or desire for emotional distance by their subjects. It is interesting that the experimenters who were higher in covert hostility were liked more than experimenters who were lower in covert hostility.

That experimenters who are seen by their subjects as being more anxious are liked less does not contradict Weickert's hypothesis about the interested, open, honest, and imperfect

experimenter. A person may well be more willing to admit his anxiety to a person whom he sees as also being anxious, yet this same person would probably prefer less anxious persons to be his friends.

While Weickert's hypothesis about how the MAS scores of the subjects come to be significantly correlated to the MAS scores of their experimenters seems plausible, a more careful and elaborate analysis of the interpersonal situation involved seems in order. There are several interpersonal factors which may be operating at the same time to produce the high correlation between experimenter and subject MAS scores. While they may all be somewhat overlapping, the distinctions between them seem valid and useful in helping us to understand the process involved.

The first of these might be called the experimenter's need for consensual validation of his own normalcy. An experimenter, like everyone else, wants to be "normal." When the experimenter administers the MAS to subjects drawn from a normal population he no doubt assumes that most of them are, in fact, normal. If he considers himself more or less normal, he probably expects his subjects to respond to the MAS in more or less the same way that he responded to it. Rosenthal (1966) cites an impressive body of literature that experimenters tend to elicit the data

that they expect to elicit. Rosenthal (1966) refers to this phenomenon as "experimenter expectancy effects." If each experimenter expects the MAS scores of his subjects to be similar to his own MAS score, the data on experimenter expectancy effects would suggest that experimenter and subject MAS scores will be positively correlated.

Although it is not clear how the experimenter manages to bias the responses of his subjects, there are two studies that provide some useful clues. The first of these is a study by Rosenthal, Fode, Friedman and Vikan (1960) in which those experimenters who were more effective in biasing their subjects in a photo rating task were rated by them as being significantly more interested (.01 level), slow-speaking (.05 level), and given to the use of hand gestures (.05 level) than experimenters who were less effective in biasing their subjects. There was also a tendency (.10 level) for more biasing experimenters to be better liked, appear more personal, and use more head and leg gestures and movement.

In the second study, Rosenthal, Kohn, Greenfield, and Carota (1966) found that subjects who showed greater verbal conditioning rated their experimenters as significantly more interested (.001 level), businesslike (.001 level), professional (.01 level), quiet (non-loud) (.02 level), enthusiastic

(.04 level), consistent (.05 level) and expressive-voiced (.08 level) than subjects who showed less verbal conditioning did.

The second interpersonal factor which may be operating to produce a correlation between experimenter and subject MAS scores is the subject's use of the experimenter as a norm for what is an acceptable degree of anxiety. Like the experimenter, the subject wants to be within the normal range in anxiety. Most subjects are probably very uncertain as to what degree of anxiety is "normal." Consequently, it seems reasonable to hypothesize that the subjects will tend to regard their experimenter as a norm for what is an acceptable degree of anxiety. If the experimenter appears very nervous, subjects may feel that a greater degree of anxiety is acceptable and may thus admit to more anxiety symptoms on the MAS. On the other hand, if the experimenter appears rather calm, subjects may be more hesitant to admit anxiety symptoms since this would imply that they are more anxious than their experimenter and perhaps not as "normal" as they would like to appear. Therefore, experimenter and subject scores on the MAS would tend to be positively correlated.

The work of Edwards (1957) and others on social desirability tends to confirm the hypothesis that the subject's desire to appear normal often affects the way he responds to tasks

like the MAS. Also, the correlation between experimenter and subject MAS scores is an instance of what Rosenthal (1966) calls positive "experimenter modeling effects." As defined by Rosenthal, when the experimenter's performance on a task is significantly related to the performance of his subjects on that same task, we speak of the experimenter "modeling effect." The following summary of the literature follows the format of Rosenthal's chapter (1966) on modeling effects.

Hyman, Cobb, Feldman, Hart, and Stember (1954) and Maccoby and Maccoby (1954) have reviewed interviewer modeling effects in survey research. Rosenthal (1966) concludes that in survey research, modeling effects are variable in magnitude, but usually positive; that is, there is a positive correlation between the responses of the experimenters and those of the subjects.

In the area of laboratory experiments, Rosenthal cites the following studies as evidence of experimenter modeling effects: Barnard (1963), Schmeidler and McConnell (1958), Rosenthal, Greenfield, and Carota (1966). Rather than simply culling the literature for studies that support one's hypothesis "post hoc," it is also necessary to design experiments with the specific hypothesis in mind. Rosenthal (1966) reports on a series of nine studies that he says were specifically designed to assess the occurrence and magnitude of modeling effects

(Haley & Rosenthal, 1964 I & II; Hinkle, 1961; Persinger, 1962; Rosenthal & Fode, 1963b; Rosenthal, Persinger, Mulry, Vikan-Kline, & Grothe, 1964a, 1964b; Rosenthal, Persinger, Vikan-Kline, & Fode, 1963a; Rosenthal, Persinger, Vikan-Kline, & Fode, 1963b; Rosenthal, Persinger, Vikan-Kline, & Mulry, 1963; White, 1962). The task was always a photo rating task of perception of a person's degree of success. While highly positive modeling effects were initially found, there were four later studies that found negative modeling effects. Rosenthal hypothesizes that when knowledge of the purpose of the research gradually circulated among the school population of "experimenters," experimenters began to try especially hard to avoid a positive modeling effect. They may have tried so hard, in fact, that they produced the opposite effect. This shows how important it may be to keep the experimenters ignorant regarding the fact that experimenter modeling is being studied.

The fact that the correlation between experimenter and subject MAS is an "experimenter modeling effect" in itself is not of much explanatory value. As used by Rosenthal, it is an intervening variable rather than an hypothetical construct. However, in his discussion of modeling effects in survey research, Rosenthal (1966) hypothesizes that the subject may want to respond the way he thinks the interviewer would respond in

order to make the social interaction more pleasant or because he would like to be more like the interviewer because the interviewer may have a higher status. It seems likely that modeling effects occur in different experiments for different reasons.

In the study by Weickert (1967) and in the predicted interpersonal situation of the present study, two reasons have so far been proposed to explain the modeling effect on MAS scores. These involve the experimenter's need for consensual validation of his normalcy and the same need on the part of the subject. A third interpersonal factor that may be involved is the dyadic effect of verbal and non-verbal communication. It has been found that the more one person discloses about himself to another, the more that other person will tend to disclose in return (Jourard, 1959; Jourard & Landsman, 1963). Jourard (1964) has called this correlation between what one person discloses to another and what that other discloses to him the "dyadic effect." What is important here is that people do not communicate with one another by only the content of their words. The skilled clinician, for example, learns much more about his client than what the client actually tells him. Every day ordinary people make implicit judgements about the character, attitudes and moods of other people which do not seem to depend completely on the content of what the other people say to them. In regard to our

topic of manifest anxiety, ordinary people not specifically trained in personality assessment often seem capable of observing that one person is obviously "nervous" in certain situations while another one does not appear to be nervous.

Although the validity of such untrained assessments will be discussed further in the next section, it seems plausible that if subjects can detect that an experimenter is being secretive and guarded, for example, the subjects will tend to be secretive and guarded in their responses to a scale like the MAS. If an experimenter responds to the MAS in a guarded fashion, thus obtaining a lower MAS score, his guardedness may be apparent in his style of relating to his subjects, even if the content of instructions is highly standardized. The studies on self-disclosure cited above suggest that if subjects perceive their experimenter as guarded, their responses to the MAS will also be guarded, so that their MAS scores will tend to be correlated with the MAS score of their experimenter. Conversely, if an experimenter is open and unguarded in his responses to the MAS, he may well appear to be open and unguarded to his subjects. Consequently, they can relax their own defenses and admit more of their anxiety. Similarly, if an experimenter discloses his anxiety by showing it in his behavior, the subjects will feel more free to admit their own anxiety.

In summary, there seem to be several interpersonal factors that may explain the correlation between experimenter and subject scores on the MAS. Briefly, these are the experimenter's need for consensual validation of his own normalcy, the subject's use of the experimenter as a norm for what is an acceptable degree of anxiety, and the dyadic effect of verbal and non-verbal self-disclosure. Although it is probably true of all three factors to some extent, the second factor espeoially depends on the subject's ability to perceive the experimenter's manifest anxiety. Therefore, it is appropriate to now consider the literature on the validity of rating someone else's manifest anxiety.

The Validity of Rating Someone Else's Manifest Anxiety

If the psychologically untrained subjects of the present study can, with only a brief period with which to observe their experimenters, successfully predict how their experimenters would respond to the MAS, it will be strong confirmation of the validity of using the MAS as a measure of observable anxiety. Before considering the literature already available on these points, another question might be asked. What kinds of cues can subjects react to in evaluating the MAS of their experimenter? Or to put the question another way, how does the experimenter communicate his anxiety to his subjects?

Rosenthal (1966) presents some data that suggests that more anxious experimenters communicate their manifest anxiety by "excessive fidgeting and a meeker, less self-assured voice (p. 64)." Probably, there are many different things about a manifestly anxious experimenter that a subject can perceive. While it seems reasonable that a skilled clinician might be able to make reasonably accurate evaluations of a person's manifest anxiety in a brief period, it might be hard to believe that an untrained undergraduate subject could do this.

However, Rosenthal, Fode, Friedman, and Vikan (1960) discovered that subjects were extremely accurate in their rating of 27 different experimenter characteristics. Before administering a brief photo rating task to their subjects, the experimenters were asked to predict in writing the average rating he would actually obtain from his subjects. A Spearman rank correlation was computed on the correlation between the subjects' ratings of the experimenters and the experimenters' ratings of themselves on these 27 variables. The correlation was .89 which was significant at well beyond the .0005 level (t = 9.70, df = 25).

In order to get a better idea of how accurate the subjects in this study are likely to be in rating their experimenters with the MAS, it will be useful to briefly summarize a review

by Taylor (1956) of better trained raters in various MAS validation studies. Ratings by psychiatrists in different studies have correlated .61 (Gleser & Ulett, 1952), .28 and .29 (Ulett, Gleser, Starr, Haddock, Lingley, & Lawler, 1953), and .40 (Ulett, Gleser, Lawler, & Winokur, 1952) with the MAS. Similarly, ratings by experienced counselors (Hoyt & Magoon, 1954) and psychologists (Buss, Wiener, Durkee, & Baer, 1955), obtained correlations with patient MAS scores of .47 and .60 respectively. Ratings by nurses (Kendall, 1954) of the anxiety of patients in the upper and lower 13 per cent on the MAS were significantly different.

On the one hand, untrained subjects would be expected to obtain less accurate ratings than the trained observers in the above studies, especially since the time and methods of observation available to the subjects in the present study will be more limited. On the other hand, none of the above studies used the method of rating the experimenter's manifest anxiety that is proposed in this study. Considering the findings of Rosenthal, Fode, Friedman, and Vikan (1960), it is hypothesized that in the present study, the subjects' accuracy in rating their experimenter's MAS score will be siginificantly better than chance.

CHAPTER III

Method

Experimenters

Twelve different undergraduate psychology classes were contacted to form a sample of prospective experimenters from which eight experimenters were later selected. These were summer session classes and included such courses as general psychology, personality problems and mental health, psychology of personality, social psychology, theory and methods in psychology, psychology of learning, and statistical methods. Students in these classes were told that if they were selected for the final phase of the experiment, they would be assisting the investigator in the administration of a psychological experiment with some incoming freshmen, and that they would be paid five dollars. The students were assured that their responses would be kept confidential and that, eventually, all aspects of the experiment would be explained to them. All of the class instructors encouraged their students to participate and most offered some minor grading advantage as an added incentive.

In this way, 56 prospective experimenters were recruited and were administered the Manifest Anxiety Scale. Table 1

presents the age and MAS statistics for this group of prospective experimenters. It should be noted that the means, medians, and standard deviations of age and MAS scores are consistently higher for the females. The sex difference in age may have been due to the inclusion of three Catholic nuns, ages 29, 35 and 51, who tended to be considerably older than most of those tested. The higher MAS scores for the females is consistent with previous findings, in that when sex differences have been found in the MAS, females have generally scored higher (Brim, Glass, Lavin, & Goodman, 1962; Davis, 1968; Goodstein & Goldberger, 1955; Phillips, 1966; Sinick, 1956; Weickert, 1967).

The variances and means of the male and female prospective experimenters were different enough ($C = .81$, $p<.01$; $t = 1.58$, $p<.10$) to warrant the use of two separate distributions in selecting the male and female experimenters. This was considered to be a more conservative procedure than selecting the experimenters on the basis of the total MAS distribution of prospective experimenters, which would have obscured the sex difference in MAS scores. Z scores were therefore computed separately for the male and female samples of prospective experimenters, and the experimenters were then chosen in the following manner. Using the sample of male prospective experimenters, four male experimenters were selected at equal Z score intervals from the

TABLE 1

Age and MAS Statistics of Prospective Experimenters

Sex	N	Age M	Age Md	Age SD	MAS M	MAS Md	MAS SD
Male	27	21.63	21.00	3.21	14.04	13.00	5.95
Female	29	23.62	22.00	6.56	17.62	14.00	10.03
Total	56	22.60	21.00	5.32	15.89	14.00	8.51

highest to the lowest MAS score. Using the Z scores computed for the female sample of prospective experimenters, the female experimenters were chosen in the same manner.

The MAS scores of the eight experimenters chosen by this method are listed in Table 2 along with the sex and age of each experimenter. Table 3 presents the means and standard deviations of experimenter age and MAS. The experimenters ranged from 18 to 25 years of age, the average age being 21.38. The mean MAS score for male experimenters was 18.25 and the mean MAS score for female experimenters was 24.25.

Subjects

The subjects were 93 incoming freshmen who volunteered for the experiment with the understanding that they would be credited with two hours of experiment participation time whenever they took the Psychology 101 course. One of the requirements of this course is that each student volunteer for five hours of psychological experimentation in the experiments of their choice. The incoming freshmen took part in the experiment during the summer before they began their college curriculum. Their mean age was 17.59 years, and they consisted of 51 males and 42 females.

TABLE 2

Sex, Age and MAS of Each Experimenter

E	Sex	Age	MAS
1F	F	22	44
1M	M	23	32
2F	F	20	31
2M	M	21	24
3F	F	21	17
3M	M	25	13
4F	F	21	5
4M	M	18	4

TABLE 3

Means and Standard Deviations

of Age and MAS for the Experimenters

	Age		MAS	
Sex	M	SD	M	SD
Male	21.75	2.59	18.25	10.64
Female	21.00	.71	24.25	14.65
Total	21.38	1.88	21.25	13.11

Test Material

Each subject was given a booklet of test materials that included the 90-item version of Taylor's Biographical Inventory (1953). It contains the 50 items of the Taylor Manifest Anxiety Scale (MAS) and 40 other items which, for this experiment, were used only as buffer items. The first page of the test booklet required such information as name, sex, and age. This was followed by the written part of the instructions, which told the subjects to answer the items of the Biographical Inventory by following the instructions printed on it. This first page of the test booklet is reproduced in Appendix I.

This was followed in the test booklet by an IBM answer sheet for the recording of the responses to the Biographical Inventory. This, in turn, was followed by a page with instructions to "answer the items of the Biographical Inventory as you think your experimenter would answer them." The complete instructions on this page are reproduced in Appendix II. The next page in the test booklet was an IBM answer sheet, provided for the recording of how the subjects thought their experimenter would respond to the Biographical Inventory. This was followed by an 86 item adjective check list consisting of adjectives drawn from Black's Adjective Check List (1956), a list of traits used by Rosenthal, et al. (1960), and several additions and

modifications based on the author's judgement of what might be important traits related to experimenter influence. The adjectives were arranged in pairs of opposites. The subjects were instructed to check the words that seemed to characterize their experimenter. The adjective check list and the complete instructions to it are reproduced in Appendix III.

The check list was followed by four items designed to elicit the subject's subjective comments about the experiment. Each question or request for information was printed at the top of a page, with the rest of each page provided for the subject's written response. These items are presented in Appendix IV.

Procedure

The experimenters were randomly assigned to their groups of subjects. The assignment of subjects to groups was determined mainly by the order in which they were able to participate. The experiment was run on five Saturday afternoons during the summer. When two groups were tested on the same Saturday, subjects were assigned to each group randomly, with the exception that an effort was made to have an approximately equal number of subjects of each sex in each group.

A week prior to the running of each group, the investigator contacted the respective experimenter individually.

Each experimenter was told that the purpose of the experiment was to see how well the subjects could judge them on various traits as measured by the MAS and the adjective check list. It was explained that although some current research is being devoted to the use of non-professionals in therapeutic contacts with the emotionally disturbed, it is not known how well untrained non-professionals can do at another traditionally professional task, the assessment of personality. This study was explained as a preliminary effort in this problem area.

All experimenters were told that the complete rationale and results would be explained to them after the data were analyzed. Each experimenter was given the adjective check list and then was given a copy of instructions that he was to follow in administering the experiment to his group. This instruction sheet is reproduced in Appendix V. After reading the instruction sheet and discussing any questions he might have about it, each experimenter was requested to become thoroughly familiar with the instructions and to use it as a guide when administering the experiment. Experimenters were instructed to answer questions from their subjects in a non-directive manner, and examples were discussed. It was explained that they should dress for the experiment as they would if they were teaching a class in the university. Each experimenter

was told that his responses and those of his subjects would be confidential.

On the day of the experiment, each experimenter was given the necessary testing materials and any last minute questions he might have about the procedure or instructions were answered. The investigator assisted in directing the subjects to the proper testing room, but otherwise had minimal contact with them. At 1 P.M., the experimenter entered the room and said that he would wait a little while for the rest of the subjects to arrive. At 10 minutes after 1 P.M., the experimenter printed his name on the blackboard after the heading, "Your Experimenter:". He then introduced himself as their experimenter and gave the following instructions:

> I am going to pass out a booklet and an Experiment Participation Certificate to each of you. There are three parts to the test booklet, but please do one at a time and do not look ahead. There will be plenty of time for you to finish, so do not hurry. All of your answers will be confidential. I'll pass out the certificate and the booklet now. Write the number of your certificate and my initials on the front of the booklet and keep the certificate for yourself. Don't begin with the booklet until I give you the rest of the instructions. (At this point, the experimenter hands out the certificate and the test booklet.)
>
> When all groups have been run and the experiment is completed, there will be a meeting where everything will be explained and the general results will be discussed. This will be sometime during

> the Fall semester. If you write your address on the back of the booklet, we will be sure to send you a post card when we're ready to discuss the results. Before then, please do not talk about the experiment with any other student who has not yet participated in it. You may take as much time as you like, but since we want everyone to complete the entire test booklet properly, we ask that you stay until at least 2:15. If you like, you can leave the room individually for short rest periods, but if you do do this, do not discuss the experiment with anyone during this time.

After giving these instructions, the experimenter then asked if there were any questions, and after answering these, he asked his subjects to begin. The instructions in the test booklet were sufficient to direct the subjects through the rest of the experiment on their own, but the experimenters were directed to remain in the room for the rest of the experiment, except for brief breaks into the corridor and to the water fountain. Only one experimenter left the room for such breaks. Similarly, only three subjects out of a total of 93 took a break outside of the testing room.

Although it was seldom necessary for a subject to ask a question, all such questions were answered by repeating appropriate sections of the instructions and encouraging subjects to interpret difficult test items as best they could in relation to the instructions.

CHAPTER IV

Results

The number of subjects contacted by each experimenter is presented in Table 4. The total number of subjects tested was 93, and the group size ranged from 10 to 14.

Table 5 lists the Spearman rank order intercorrelations among the MAS scores of the experimenters (EMAS), the mean subject MAS for each group (SMAS), and the mean MAS of each experimenter as rated by his subjects (RMAS). None of the nine correlations listed is significant at the .05 level. This includes the correlation of .45 between SMAS and EMAS, which was the main relationship being studied in this experiment.

Table 6 shows the MAS scores of the experimenters and the mean MAS scores of their subjects in the present study and in Weickert's (1967) study. This comparison will be discussed later. The Spearman rank order correlation between the lowest five EMAS scores of the present study and the corresponding SMAS means is .90 ($p = .05$, 1-tailed).

The largest sex difference among those listed in Table 5 is that for EMAS correlated with RMAS. Males tended to judge

their experimenter's MAS level accurately (r' = .36), and females tended to judge their experimenter's MAS level inaccurately (r' = -.33). Male subjects also tended to judge their experimenter's MAS as more similar to their own (r' = .50) than did females (r' = .26), and the MAS of the male subjects correlated higher with their experimenter's MAS (r' = .38) than did the MAS of the female subjects (r' = .10).

Table 7 presents the mean subject MAS (SMAS) for each group compared to the MAS of each experimenter. This is followed by Tables 8 and 9 which show the SMAS medians and standard deviations, respectively. The female subjects scored higher in mean and median MAS as well as having had greater variance in these scores than the male subjects. The difference between the means was tested by a t test and failed to reach an acceptable level of statistical significance (t = .89). However, when the 56 students tested as prospective experimenters were combined with the 93 subjects in the main part of the experiment, the combined sample yielded a mean of 17.56 for females which was shown to be significantly greater than the mean of 15.36 for males (t = 1.67, $p<.05$, 1-tailed). There was a trend for the subjects of female experimenters to score higher on the MAS than the subjects of male experimenters, but this did not approach significance (t = .64).

Table 10 presents the mean rating of each experimenter's MAS by his subjects (RMAS), compared to the actual MAS of each experimenter (EMAS). This is followed by Tables 11 and 12 which give the RMAS medians and standard deviations, respectively. There were statistically insignificant tendencies for male subjects to see their experimenters as more anxious than female subjects did (t = 1.06) and for female experimenters to be seen as more anxious than male experimenters (t = 1.31). This latter tendency appears to be greater in terms of median scores, with the median RMAS for male experimenters being 14.00 and the median RMAS for female experimenters being 17.00.

The responses to the four essay-type questions were categorized and summarized. The first item the subjects were asked to answer about the experiment read: "Please describe your feelings about this experiment." The responses to this were extremely varied, but the frequency of some of the most common answers are listed in Table 13. Thirty-five subjects either made hypotheses about the purpose of the experiment or expressed confusion about what the purpose might be. Twenty-two subjects described the experiment as interesting or expressed interest in the results. The next most frequent type of response was to praise the experiment as a stimulus to insight about one's self (15 subjects). The other common responses to this item

were that it was difficult to rate the characteristics of the experimenters (11 subjects), that many of the items were repetitive (8 subjects), and that they were participating partly in order to receive experiment participation credit (7 subjects).

The next question about the experiment requested the subjects to list the things about the experimenter that they used in judging how he would respond to the Biographical Inventory Items. These responses turned out to be too diverse, vague, and overlapping to categorize clearly, but some observations can be reported. No subject was unable to name something about his experimenter that he used in judging his responses to the MAS items. In fact, most subjects named several things, including physical characteristics, behavior, clothing, inferred personality traits, sex and many other attributes. Some of the responses to this question read more like psychological reports than the observations of naive freshmen, and most of the subjects seemed to enjoy this task thoroughly. Very few, however, gave any indication of how they used their observations in deciding how their experimenter would respond to the inventory items.

The third question in this series asked the subjects whether there was anything about their experimenter that affected how they scored their own Biographical Inventory.

seventy-eight per cent clearly denied being influenced in any way. Six per cent reported that the sincerity, informality, or other attributes of their experimenter made them try hard to answer the test items truthfully. The other 16 per cent either named some experimenter characteristic without specifying how it affected them or they gave a response that was irrelevant to the question.

The fourth and final question about the experiment was phrased as follows: "Did your experimenter make you nervous? Calm? Angry?" The responses to this item are categorized and listed in Table 14. Note that the two types of responses that together accounted for over 83 per cent of the subjects were that the experimenter made them feel calm or that he had no effect on them at all. Only 8.60 per cent of the subjects reported any feelings of anger or nervousness, and the great majority of these were female subjects.

In examining the responses to this item it seemed that the subjects of female experimenters tended to write more about their feelings and their experimenters than did the subjects tested by male experimenters. Quantifying this comparison, it was found that only 23.81 per cent of the subjects contacted by female experimenters reported no feelings in response to their experimenter, whereas 54.90 per cent of the

subjects contacted by male experimenters reported no feelings. It was hypothesized that female experimenters evoke more conscious feelings from their subjects by being more warm, friendly, and personal. To test this hypothesis, six adjectives were selected from the adjective check list for analysis. The relative percentage of subjects applying these adjectives to experimenters of each sex are listed in Table 15. The percentages listed for the male and female experimenters are the percentages of their respective subjects who described them with these adjectives. Note that female experimenters were more likely than male experimenters to be described as warm, friendly, personal, and professional, whereas male experimenters tended to be seen as impersonal and business-like.

TABLE 4

Number of Subjects Contacted

by Each Experimenter

E	Male	Female	Total
1M	6	6	12
2M	5	9	14
3M	9	4	13
4M	5	7	12
Subtotal M	25	26	51
1F	6	4	10
2F	7	4	11
3F	7	4	11
4F	6	4	10
Subtotal F	26	16	42
Total	51	42	93

TABLE 5

Spearman Rank Order Intercorrelations Among EMAS Scores, SMAS Group Means, and RMAS Group Means; N = 8 Groups

Correlated Variables	Male	Female	Total
SMAS and EMAS	.38	.10	.45
RMAS and SMAS	.50	.26	.08
EMAS and RMAS	.36	-.33	.14

For N = 8 a correlation would have to exceed .643 in order to be significant at the .05 level, 1-tailed test.

TABLE 6

The MAS Scores of the Experimenters and the Mean MAS Scores of Their Subjects in the Present Study and in Weickert's (1967) Study

Present Study		Weickert's Study	
EMAS	SMAS	EMAS	SMAS
44	16.60	26	18.67
32	15.92	17	17.82
31	15.00	13	16.78
24	18.57	11	17.93
17	22.27	9	16.86
13	16.23	9	16.53
5	14.90	7	15.89
4	13.83	4	14.71

TABLE 7

Mean Subject MAS (SMAS) for Each Group Compared to MAS of Each Experimenter (EMAS)

E	EMAS	Mean SMAS Male	Female	Total
1M	32	16.50	15.33	15.92
2M	24	18.20	18.77	18.57
3M	13	14.67	19.75	16.23
4M	4	12.80	14.75	13.83
Subtotal M	24.25	15.44	17.00	16.24
1F	44	13.50	21.25	16.60
2F	31	17.71	10.25	15.00
3F	17	22.86	21.25	22.27
4F	5	11.33	20.25	14.90
Subtotal F	18.25	16.65	18.25	17.26
Total	21.25	16.06	17.48	16.70

TABLE 8

Median Subject MAS for Each Group

Group	Male	Female	Total
1M	17.00	15.50	15.50
2M	18.00	17.00	17.50
3M	11.00	21.50	15.00
4M	13.00	14.00	13.00
Subtotal M	15.00	16.00	16.00
1F	18.00	21.00	17.50
2F	12.00	12.50	12.00
3F	23.00	24.00	23.00
4F	11.00	18.00	13.00
Subtotal F	15.50	16.00	16.00
Total	15.00	16.00	16.00

TABLE 9

Standard Deviations of Subject MAS for Each Group

Group	Male	Female	Total
1M	6.85	5.10	6.05
2M	5.42	6.20	5.93
3M	6.61	10.76	8.45
4M	5.11	5.40	5.36
Subtotal M	6.44	7.02	6.78
1F	6.80	9.52	8.86
2F	8.96	4.82	8.51
3F	5.29	10.64	7.73
4F	1.52	6.57	6.14
Subtotal F	7.74	9.44	8.46
Total	7.16	8.04	7.60

TABLE 10

Mean Rating of Each Experimenter's MAS by His Subjects (RMAS) Compared to the Actual MAS of Each Experimenter (EMAS)

E	EMAS	Mean RMAS Male	Female	Total
1M	32	18.50	17.67	18.08
2M	24	13.20	11.33	12.00
3M	13	11.11	13.25	11.77
4M	4	17.60	14.29	15.67
Subtotal M	24.25	14.60	13.88	14.24
1F	44	14.00	14.00	14.00
2F	31	21.14	10.75	17.36
3F	17	20.71	14.25	18.36
4F	5	12.33	21.25	15.90
Subtotal F	18.25	17.35	15.06	16.48
Total	21.25	16.00	14.33	15.25

TABLE 11

Median Rating of Each Experimenter's MAS by His Subjects (RMAS) Compared to the Actual MAS of Each Experimenter (EMAS)

E	EMAS	Median RMAS Male	Female	Total
1M	32	16.50	18.50	18.50
2M	24	14.00	9.00	10.50
3M	13	11.00	14.00	11.00
4M	4	23.00	13.00	15.50
Subtotal M	18.50	14.00	13.50	14.00
1F	44	15.00	15.50	15.00
2F	31	21.00	10.50	20.00
3F	17	24.00	14.50	22.00
4F	5	13.00	21.00	16.00
Subtotal F	24.00	17.00	15.00	17.00
Total	20.50	16.00	14.00	15.00

TABLE 12

Standard Deviations of Each Group's Ratings of its Experimenter's MAS (RMAS)

Group	Male	Female	Total
1M	9.43	4.63	7.45
2M	6.79	6.72	6.80
3M	5.09	5.45	5.29
4M	7.14	6.87	7.17
Subtotal M	7.77	6.61	7.20
1F	4.76	7.04	5.78
2F	8.85	7.50	9.59
3F	6.24	5.93	6.88
4F	4.51	8.22	7.63
Subtotal F	7.43	8.18	7.77
Total	7.72	7.27	7.56

TABLE 13

Frequency of Common Responses to the First Essay Question: "Please describe your feelings about this experiment."

Response Categories	Frequency
Concern about Purpose	35
Interesting	22
Insight into Self	15
Difficulty in Rating Experimenter	11
Repetitive Items	8
Experiment Participation Credit	7

TABLE 14

Per cent of Subjects Responding in Each of Four Ways to the Last Essay Question: "Did your experimenter make you nervous? Calm? Angry?".

Feeling Reported	Male	Female	Total
Calm	50.98	33.33	43.01
No Feelings Reported	41.18	40.48	40.86
Angry or Nervous	1.96	16.67	8.60
Other	5.88	9.52	7.53
Total	100.00	100.00	100.00

TABLE 15

Per cent of Subjects Using Selected Adjectives to Describe Their Experimenter: Male vs. Female Experimenters

Adjective	Male	Female
Warm	21.57	59.52
Friendly	58.82	73.81
Personal	17.65	35.71
Professional	47.06	66.67
Business-Like	58.82	35.71
Impersonal	54.90	33.33

CHAPTER V

Discussion

The major hypothesis of this experiment was not confirmed. That is, the manifest anxiety of the subjects was not correlated significantly with the manifest anxiety of the experimenters. There was a tendency in the predicted direction, but the correlation of .45 between the EMAS and SMAS falls short of the .86 correlation found by Weickert (1967) and the .64 necessary for significance at the .05 level.

The failure here to confirm the experimenter modeling effect on the Manifest Anxiety Scale has many possible explanations. It is of course possible that there are no substantive factors that produce a real experimenter modeling effect on the MAS and that Weickert's (1967) findings occurred by chance. In as much as the modeling effect in Weickert's study could have occurred by chance only one time out of a hundred ($p<.01$), it is reasonable to assume that under certain conditions a true experimenter modeling effect will occur on the Manifest Anxiety Scale.

The possibility remains, however, that these conditions are so restrictive that only an exact replication of Weickert's

study would produce his findings. It seems more likely, on the other hand, that the necessary conditions are not all that specific, and that the failure of this study to replicate his findings is due to several major differences between the two experiments.

For example, the subjects in Weickert's experiment were high school students, whereas the subjects in the present study were incoming college freshmen. Subtle differences in the procedure are numerous because of the different additional variables being studied, and these variables themselves may interact in unknown ways to complicate the comparison between the two studies. Whereas Weickert manipulated the religious-lay role variable, none of the experimenters in the present study wore religious garb. Whereas Weickert employed all male experimenters, both male and female students served as experimenters in this study. The mean experimenter age of 26.50 years in his study is a bit older than the mean age of 21.38 in this study. While it is possible to list more differences between the two studies, it is perhaps more useful to discuss the two differences which appear to be the most significant. These are the difference in sample sizes and the difference in experimenter MAS distributions.

The sample sizes differed in that Weickert used 386 subjects whereas this experiment was conducted with only 93 subjects. With as few as 10 subjects in some of the groups, the chance variations in MAS among the subjects may well have been great enough to obscure the admittedly subtle experimenter modeling effect. More subjects in each group may be necessary before we can rely on even the most random of sampling techniques to equate the groups on MAS level. The small sample size of the groups, therefore, could explain why the obtained tendency in the predicted direction did not reach statistical significance.

The other possibly crucial difference between Weickert's study and this one consists of differences in the experimenter MAS distributions. To help illustrate this point, Table 6 was set up to show the MAS scores of the experimenters and the mean MAS scores of their subjects in the present study and in Weickert's study.

Examination of Table 6 reveals that the range of experimenter MAS (EMAS) scores in the present study is much wider than that in Weickert's study. Note that the range of EMAS in Weickert's study goes from 4 to 26 and that this range encompasses only 5 of the 8 experimenters in the present study. The comparable range in the present study is from 4 to 24, and this

excludes the experimenter MAS scores of 31, 32, and 44. If only the five experimenters in the present study who are within the range of experimenter MAS scores in Weickert's study are used to compute a rank order correlation between experimenter MAS and mean subject MAS, the correlation is .90 ($p = .05$), which is about the same magnitude as the correlation that Weickert obtained (.86) for a similar range of experimenter MAS scores.

What does all this mean? It may mean nothing other than a chance variation of scores selected on an "after the fact" basis. On the other hand, it may be an exceedingly important finding. The suggestion here is that the experimenter modeling effect does consistently occur on the MAS, but only within certain ranges of MAS scores. The findings of the present study and the findings of Weickert's study both suggest that the experimenter modeling effect on the MAS occurs within an EMAS range of from 4 to 26. It may of course occur within an even broader range, but even 4 through 26 certainly includes the majority of MAS scores in any normal population. It will be up to future research to determine whether this analysis is correct, but there is an adequate rationale to explain why the experimenter modeling effect could occur throughout most of the EMAS distribution and not occur at extremely high levels. MAS scores beyond a certain point in a normal population are perhaps

reflecting some additional subject characteristics that are not reflected to a great degree at lower levels.

Consider the MAS scores of 4 and 44 obtained by 2 of the experimenters in the present study. Both of these experimenters appeared to be normal, successful college students who seemed free of any conspicuous signs of high anxiety, and yet they differed greatly in manifest anxiety as measured by the MAS. The MAS of 44 is actually more than three standard deviations from the mean (Table 1). If increments in MAS scores had the same meaning at extremely high levels as they do at the other levels of MAS, it would seem doubtful that the three experimenters with MAS scores of 31, 32, and 44 would still appear to be well adjusted college students. Therefore, it is hypothesized that beyond a certain point, perhaps a MAS score of 27 or 28 in a normal population, higher MAS scores no longer tend to reflect higher anxiety as much as they may reflect other characteristics—perhaps insightfulness, openness or particular personality styles of handling anxiety.

Thus far, this discussion has been limited to the relationship between the MAS score of the experimenters and those of his subjects. The second major relationship under study was that between the MAS score of the experimenter (EMAS) and the MAS score of the experimenter as rated by his subjects when they

responded to the Manifest Anxiety Scale as they thought their experimenter would respond (RMAS). It was felt that the degree of subject accuracy in this task would reflect the degree to which the subjects were consciously aware of their experimenter's anxiety level.

The finding here was that the subjects did not do significantly better than chance in predicting the response of their experimenters. The rank order correlation between the EMAS scores and the respective RMAS means was only .14 (Table 5). Nor is there any apparent trend related to the experimenter distribution as was discovered for the EMAS:SMAS relationship. Since the subjects were unable to demonstrate any awareness of their experimenter's anxiety level, it seems unlikely that a conscious awareness of the experimenter's MAS level is involved in the experimenter modeling effect on the Manifest Anxiety Scale. Table 5 contains the suggestion of a sex difference in this matter in as much as the male subjects obtained an EMAS:SMAS correlation of .36, whereas the females tended to be less accurate, with a corresponding correlation of -.33. More likely than not, however, this difference was obtained by chance and does not represent a true sex difference.

Another major relationship listed in Table 5 is that between the RMAS and the SMAS. It was thought that the MAS

scores of the subjects might be positively correlated with the MAS scores that they ascribed to their experimenters because of an hypothesized tendency for subjects to use themselves as a norm for deciding how their experimenter would respond to the MAS. A rank order correlation of .08 between RMAS and SMAS indicates that subjects tend not to use themselves as a norm in this way. However, Table 5 also lists the same correlation computed for male and female subjects individually. Interestingly, these correlations are considerably higher than the correlation based on all of the subjects. The .50 correlation obtained by male subjects is the highest in Table 5, and it suggests that male subjects may indeed use themselves as a norm for deciding how their experimenter would respond to the MAS. Since this correlation is not statistically significant, however, we should favor the hypothesis that they do not do so.

The finding that females scored higher on the MAS is consistent with previous research (Brim, et al., 1962; Davis, 1968; Goodstein & Goldberger, 1955; Phillips, 1966; Sinick, 1956; Weickert, 1967) and is therefore not surprising. Female subjects also reported more feelings of anger or nervousness in response to one of the questions about their participation in this experiment (Table 14). Not only do females tend to report higher levels of trait anxiety; they also may have a greater

awareness of experiencing situational anger and nervousness in experimental situations.

Other hypotheses suggested by trends in the MAS data of this experiment are: that male subjects tend to perceive their experimenter as being more anxious than female subjects do (page 43); that female experimenters tend to elicit higher MAS scores from their subjects than male experimenters do (page 42); and that female experimenters tend to be seen by their subjects as more anxious than male experimenters (page 43). Testing of these and the hypotheses already mentioned might add a great deal to our understanding of the experimenter modeling effect on the MAS.

Most of the supplementary data from the essay questions need not be discussed here, but the description of these findings that was given in Chapter IV is important in itself because it provides us with a better understanding of what subjects experience in an experiment like this one. This understanding is basic to even the most sophisticated interpretations of our most elaborate data. One basic assumption, for example, that is usually not checked is the cooperativeness of the subject. Were the subjects really taking the experimental tasks seriously? In this experiment, for example, it was feared that subjects might not try very hard to decide how their experimenter would

respond to the MAS and that they would resort to random responses. By asking the subjects for things about the experimenter that they used in making their judgements about him, it was learned that subjects apparently enjoyed this task as an interesting challange and that they apparently tried hard to answer the items correctly.

The overwhelming denial by the subjects that their experimenter made them feel nervous suggests that the experimenter modeling effect on the MAS is not due to any tendency for nervous experimenters to make their subjects more nervous and thus respond affirmatively to more of the anxiety items. Perhaps the most important hypothesis formed on the basis of the supplementary data was that female experimenters tend to elicit more conscious feelings from their subjects than male experimenters do, and that they may do this by being more warm, friendly, and personal. In spite of this greater interpersonal skill, females were not seen to be less professional than male experimenters. Even the reverse tended to be true, so that perhaps we should examine the dominating assumption in psychological testing and research that business-like objectivity is more professional or useful than uniform warmth and friendliness.

This research may have raised more questions than it answered, but if it has done so, it has been a success. It now

seems less likely that the experimenter modeling effect on the MAS occurs because of the conscious awareness of experimenter's manifest anxiety level. Most of the proposals about how it occurs were based partly on the assumption of this awareness. For example, how can subjects successfully use their experimenter as a norm for what is an acceptable degree of anxiety when they cannot accurately perceive his anxiety level? Or how can the dyadic effect of self-disclosure occur if the experimenter in no way discloses his anxiety level to his subjects? The remaining rationale is that the experimenter expects his subjects to respond to the MAS in more or less the same way that he responded to it, because he assumes or prefers to think that both he and his subjects are normal. This we have called the experimenter's need for consensual validation of his own normalcy. It also involves an expectancy on the part of the experimenter of how the subjects will respond. This suggests that the experimenter modeling effect on the Manifest Anxiety Scale may be simply a special instance of Rosenthal's (1966) most researched phenomenon, the experimenter expectancy effect.

CHAPTER VI

Summary

Ninety-three incoming college freshmen, in groups of from 10 to 14 subjects each, were administered the Manifest Anxiety Scale by 8 experimenters, 4 male and 4 female, who had previously been administered the MAS by the investigator. As part of the experiment, the subjects were required to respond to the MAS as they thought their experimenter would respond. An experimenter adjective check list and 4 essay questions were included as supplementary sources of data.

Analysis of the data revealed that the MAS scores of the subjects were not significantly related to the MAS scores of their experimenters. However, when the range of experimenter MAS scores was restricted to the range used in previous research (Weickert, 1967), from 4 to approximately 26, the experimenter MAS scores and the subject MAS scores correlated .90 ($p = .05$, 1-tailed). None of the relationships involving the MAS scores of the experimenters as predicted by their subjects reached significance. The implications of these findings in relation to the experimenter modeling effect on the Manifest Anxiety Scale were discussed and several new hypotheses were drawn from the supplementary data.

APPENDIX I

Instruction Sheet to

Part I of the Experiment Booklet

Please answer the following:

Name (print): _____

Sex: _____ Major Field (if decided): _____

_____

Age: _____ Class (Fresh., Soph., Jr., Sr.): _____

Part I

There are three parts to this booklet, but please do one part at a time and do not look ahead. Attached to the back of this booklet with a paper clip is a series of "true or false" questions called the Biographical Inventory. Detach it.

The answer sheet on the next page is your answer sheet for the Biographical Inventory. Read the instructions on the Biographical Inventory and begin.

APPENDIX II

Instructions to Part II

Part II

Now answer the items of the Biographical Inventory as you think your experimenter would answer them. We understand that this will be difficult, but take your time and try your best. Use the answer sheet on the next page. Answer all items even if you have to take a "blind guess" at some of them. We want you to answer the items as you think your experimenter would answer them.

APPENDIX III

Adjective Check List Used in the Experiment

Part III

Please check the words in this list that you feel characterize your experimenter. It is not necessary to check one of each pair, and do not debate too long over any particular word. You may check as few or as many as seem appropriate.

Honest____	Absent-minded____	Aloof____
Dishonest____	Alert____	Affectionate____
Intelligent____	Seclusive____	Sentimental____
Unintelligent____	Sociable____	Hardheaded____.
Masculine____	Open____	Warm____
Feminine____	Secretive____	Cold____
Conscientious____	Nervous____	Frivouous____
Careless____	Calm____	Serious____
Professional____	Business-like____	High-strung____
Amateurish____	Casual____	Relaxed____
Fidgety____	Mature____	Impulsive____
Motionless____	Immature____	Deliberate____
Personal____	Talkative____	Emotional____
Impersonal____	Quiet____	Unemotional____
Secure____	Arrogant____	Irritable____
Insecure____	Humble____	Good-tempered____
Slow-speaking____	Affected____	Softhearted____
Fast-speaking____	Natural____	Hardhearted____
Loud-voiced____	Hostile____	Popular____
Quiet-voiced____	Friendly____	Unpopular____
Consistent____	Ruthless____	Suspicious____
Inconsistent____	Kind____	Trustful____
High-statused____	Conceited____	Impatient____
Low-statused____	Self-dissatisfied____	Patient____
Defensive____	Apathetic____	Interested____
Undefensive____	Enthusiastic____	Disinterested____

Meek____ Poised____
Bold____ Awkward____

Depressed____ Sophisticated____
Cheerful____ Shy____

APPENDIX IV

Questions Used to Elicit

Subjective Comments About the Experiment

1. Please describe your feelings about this experiment. Write as little or as much as you like.

2. What things about your experimenter did you use in making your judgements about how he would respond to the items in the Biographical Inventory? Write as little or as much as you like.

3. Was there anything about your experimenter that affected how you scored your own Biographical Inventory Items? Write as little or as much as you like.

4. Did your experimenter make you Nervous? Calm? Angry? As in the other questions, write as little or as much as you like. Thank you for your cooperation.

APPENDIX V

Printed Instructions for the Experimenters

Instructions

(The experimenter should become thoroughly familiar with these instructions, and should use this as a guide when actually giving the instructions to the subjects.)

At 1 P.M., the experimenter should say that we will wait a while for the rest of the students to get here. The experimenter should then pass out pencils to anyone who does not have one, saying that any type of pencil will be all right, as long as it has an eraser. At 10 minutes after 1 P.M., the experimenter should print his name on the blackboard after the heading "Your Experimenter:". He may then tell them his name and introduce himself as their <u>experimenter</u>, and begin with the following directions:

> "I am going to pass out a booklet and an Experiment Participation Certificate to each of you. There are 3 parts to the test booklet, but please do one part at a time and do not look ahead. There will be plenty of time for you to finish, so don't hurry. All of your answers will be confidential. I'll pass out the certificate and the booklet now. Write the number of your certificate and my initials on the front of the booklet and keep the certificate for yourself. Don't begin with the booklet until I give you the rest of the instructions."

(PASS OUT THE CERTIFICATE AND THE BOOKLET)

"When all groups have been run and the experiment is completed, there will be a meeting where everything will be explained and the general results will be discussed. This will be sometime during the Fall semester. If you write your address on the back of the booklet, we will be sure to send you a post card when we're ready to discuss the results. Before then, please do not talk about the experiment with any other student who has not yet participated in it. You may take as much time as you like, but since we want everyone to complete the entire test booklet properly, we ask that you stay until at least 2:15. If you like, you can leave the room individually for short rest periods, but if you do this, do not discuss the experiment with anyone during this time."

"Are there any questions?" (After questions:) "You may begin."

Answers to questions should be limited to information that is given in the instructions (verbal and written) or to technical information such as how responses are to be recorded or what they are to do regarding the Experiment Participation Certificate, and so on. If the question of confidentiality comes up, it should be explained that in the final stages of data analysis, the names will be removed. They should record their names, however, because it is part of the experimental design and it is necessary for recording their participation and notifying them of the meeting where the experiment will be discussed.

Questions may be asked regarding some of the items in the booklet. It is part of the experiment for the subjects to

interpret the items as best they can by themselves. A general rule, then, is that the subjects should try to interpret the test items as best they can in relation to the instructions. When the subjects get to the part of the booklet that requires them to answer the Biographical Inventory as they think you would answer it, some may have such questions as: "How in the world can I know how you would answer this?" If this occurs, the experimenter should encourage the subjects to try to do this even though it is difficult.

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APPROVAL SHEET

The thesis submitted by Jerome S. Pietrzak, has been read and approved by members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

December 22, 1969
Date

Donald C. Walker
Signature of Advisor