EXPERIMENTER BIAS AS A FUNCTION OF AMBIGUITY OF STIMULUS

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by

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ABSTRACT OF THESIS

The present research examined the effect of the ambiguity of the task stimulus on the E-bias phenomenon. Ambiguity was manipulated by variations in the exposure durations in a person perception task. In addition the study examined the relationship between dominance of the S and their susceptibility to E-bias.

Slides of men's faces were presented tachiscopically for (.1 sec., .5 sec., and 5 sec.) durations to 68 Ss, required to rate the degree of success or failure of the faces on a 20 point scale. Positive or negative biases had been induced in each of 6 Es, who tested Ss in each of the three exposure conditions. The results indicated a significant main effect for bias ($F = 3.77$, $p < .06$) and for exposure time ($F = 4.90$, $p < .025$). The interaction between bias and exposure ($F = 1.41$) failed to reach significance. However a t of 2.43, significant at the .025 level of confidence, was found in the .1 sec. condition. No significant results were found for dominance. It was concluded from the results that ambiguity of stimulus is a crucial variable in the transmission of E-bias. It was further concluded that additional research is needed in the investigation of dominance of the S.

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CHAPTER I

INTRODUCTION

The realization that man can influence another man, or animal, without the use of conscious communications was made by Pfungst in 1911. Pfungst was investigating the now famous horse Clever Hans, who was believed to be able to spell, read and solve problems. A series of experiments conducted by Pfungst revealed that Hans was unintentionally cued by his questioners. The questioners reflected their expectations by unintentional signals which the horse could perceive. Pfungst summarized his findings by declaring his investigators had been misled by "looking for, in the horse, what should have been sought in the man." Thus Pfungst pointed out the basis of the problem which has been more recently carried into the laboratory. May an experimenter (E) contaminate his results by transmitting unintentional cues to his subjects (Ss) so as to influence their behaviour in the manner he desires?

The problem of the experimenter's influence on his subjects, while fleetingly touched upon in the literature over the years (Ebbinghaus, 1913; Stanton and Baker, 1942, and Joel, 1949), was relatively ignored until recently. One of the most thorough and systematic analyses of the interpersonal nature of the psychological experiment which helped set the stage for the contemporary concern for the social psychology of the psychological experiment, was that

by Riecken (1962). Riecken noted three aims of the subject. The first of these is the attainment of those rewards the subject feels are due him from having accepted the invitation to participate. A second objective of the subject is to discover the rationale of the experiment. Finally, the subject is motivated to be as good a subject as possible. Riecken pointed out that the subject wants to be evaluated favourably by the experimenter so therefore she tries to make her performance an appropriate one. One of the cues responsible for the subject responding in this manner is the experimenter's unintended communications. Indeed this cue and the resulting interaction between the subject and the experimenter is the major reason why the subject responds in such a favourable manner.

What the subject attends to in order to behave so as to be evaluated favourably has been articulated by Orne (1962). Orne suggested that the S's response in an experiment is a function, not only of the independent variable being investigated, but also of the "demand characteristics" of the situation. The demand characteristics includes such variables as campus rumors about the research, setting of the laboratory, and the presence of E. These serve as cues to S of the true purpose of an experiment. The S, in trying to be a "good subject," tries to confirm the experimental hypothesis. The demand characteristics cue her as to what these hypotheses might be, and hence how she should behave.

The personal attributes of E, the setting of the laboratory and other situational variables provide a source of demand

characteristics which are transmitted to S and thereby affect her response. Rosenthal (1966) and his associates have studied the E influence most extensively.

One of the variables which Rosenthal and his associates have been particularly concerned with are the biosocial attributes of both S and E. More specifically, Rosenthal and his co-workers (Rosenthal, 1963: Rosenthal, Persinger, Mulry, Vikan-Kline, and Grothe, 1964a; 1964b) have found that the sex of both S and E is important in laboratory studies. In general the studies found that the conditions which maximize the E-effect occurred when Es were males and Ss were females. Other biosocial attributes investigated and found to influence data included experimenter's age (Ehrlich and Riesmen, 1961), race (Cantril, 1944: Williams, 1964), and religion (Hyman, 1954). Rosenthal surmizes:

> "The general conclusion to be drawn from much of the research reviewed here seems to be that Ss tend to respond in the way they feel to be most proper in the light of the investigator's attributes" (p. 61).

Another variable which influences the collection of data is the psychosocial attributes of E. In particular, Rosenthal has emphasized E's need for social approval, and anxiety during the interaction with S. Rosenthal, Persinger, Vikan-Kline and Mulry (1963) had Es obtain Ss' ratings of the degree of success or failure Ss perceived in a set of photographed faces. In this study more anxious Es obtained higher ratings, more indicative of success, than less anxious Es. However in another study conducted by Rosenthal, Kohn, Greenfield,

and Carota (1965), it was the less anxious Es who obtained higher ratings of the success of the photos. Thus as yet, there are no consistent relationship between S's response and E's anxiety level, nevertheless E's anxiety level appears to be related to the data he obtained in some manner. Similarly, Mulry (1962), Rosenthal, Persinger, Vikan-Kline and Mulry (1963), Rosenthal, Kohn, Greenfield and Carota (1965), and Marcia (1965) all found E's need for approval to be related to S's responses in an unpredictable manner. Rosenthal has found that such additional psychosocial attributes of E as E's acquaintance (Sach, 1952), and E's experience (Brogden, 1952) may also exert some influence on the S's response. This is a function of E behaving differently thereby altering the stimuli offered to the S.

Rosenthal has used the phrase, E-effect, to describe the influence of these experimenter attributes on the subjects' responses. E-effect is used to describe the overall influence of the E on the subjects' responses. In contrast to the E-effect, Rosenthal has also been concerned with the more specifice E-bias effect. E-bias effect is used to describe the unintentional transmission of E's anticipated confirmation of the hypothesis so as to affect S's response in the desired direction. E-bias has generally been operationally defined as a significant difference between the results obtained by Es expecting one result and by Es expecting the opposite result.

Rosenthal has demonstrated the E-bias effect with both human and animal Ss. Rosenthal and Fode (1963) using rats as Ss tested the hypothesis that Es are able to obtain from their animal Ss the

data they want or expect to obtain. Two groups of Es and two groups of randomly assigned animals were used. One group of Es was instructed that its group of rats was "maze-bright" and a second group of Es was instructed that its group of rats was "maze-dull." In a simple T maze the "maze-bright" rats performed significantly better than the "maze-dull" rats. A questionnaire given to Es showed that Es who expected good performance from their animals described their behaviour toward their animals as more pleasant and more friendly. These Es were more satisfied with their participation in the experiment, and felt more relaxed in their contacts with the rats.

Rosenthal and Fode (1961) were also the first to demonstrate the E-bias effect with human subjects using a person perception task. Ss were required to rate, on a 20 point scale ranging from -10 to +10, the degree of success or failure that Ss perceived in the "neutral" photographs of men's faces. One-half of the Es were told their Ss would average a -5 rating on the 10 neutral photographs, whereas the remaining one-half of the Es were told that their Ss would average a +5 rating. All Es expecting success ratings obtained higher ratings than did any E expecting failure ratings. This study and its replications, Rosenthal and Fode (1963b) and Fode (1965) have served as the foundation for much subsequent research.

As in the experimental arrangement described above, Rosenthal and his associates have concentrated their investigation on the E-bias effect. Their investigation has indicated that Es offered an incentive of $5.00 to obtain "good data" obtained data opposite

to their expectancies, whereas Es offered a moderate incentive of $2.00 for obtaining "good data" obtained data in accordance with their expectancies (Rosenthal, Fode, and Vikan-Kline, 1960). Thus to maximize the E-bias effect, it is apparent that the E must be motivated to perform well but not motivated enough to lose sight of the goals of the experiment.

Another important variable which influences the E-bias effect is the "monitoring" effect. In one study (Rosenthal, Persinger, Mulry, Vikan-Kline, and Grothe 1964a) monitoring of Es' procedure by a senior experimenter interferred with the appearance of the bias effect. Monitoring involves the presence of a third person observing the interaction between E and S. Monitoring sometimes increased the bias effect, other times decreased it, and at still other times, reversed the bias effect. The influence of early data returns on biased Es (Rosenthal, Persinger, Vikan-Kline and Fode, 1963), and the distinction between Es expecting and desiring certain results (Rosenthal, Kohn, Greenfield and Carota, 1966) are two additional variables Rosenthal has examined which influence the E-bias effect. In addition to studying variables which influence the E-bias effect, current research has been concerned with how the bias is mediated. Fode (1960) found that verbal cues alone are sufficient to mediate E-bias. Adair and Epstein (1968) in a very recent paper confirmed this conclusion.

Recently the E-bias effect has been demonstrated in tasks other than person perception. Masling (1965) extended the findings of Rosenthal to experimentation with projective techniques. Fourteen

graduate student examiners (Es) volunteered for a "quick, more efficient method of learning the Rorschach procedure." Seven students were told that experienced Es always elicited more "human" than "animal" response. The results showed that Es influenced their Ss to give the respective desired response without Es or Ss awareness of this influence. The expected evidence for verbal conditioning of the Ss was not found. Masling concluded that Es influenced their Ss through postural, gestural, and facial cues.

Marwit and Marcia (1965) obtained the E-bias effect in a very similar task. Thirty-six undergraduate students administered a modified Holtzman inkblot test to fifty-four subjects with the expectation of obtaining either a high or a low total number of responses. One group formulated their own expectations, the other was given expectations. The results of the study showed that it made no difference whether Es evolved their own hypotheses or were given ready-made hypotheses. Bias was found to be an especially strong phenomenon, independent of the source of the hypothesis, number of questions asked in inquiry, or experimenter's and subject's knowledge of the purpose of the experiment.

Silverman (1968) extended the generality of the E-bias effect to a task where the criterion response of the S was not a verbal judgment of some sort. More specifically he used the criterion variable, differential latencies of response in a word association task. Silverman attributes the E-bias effect in his study "to a different tone of voice on the part of the E in delivering critical

and neutral stimulus words."

In contrast to the apparent generality of the E-bias effect other studies utilizing different tasks have failed to demonstrate the E-bias effect. Pflugrath (1962) employed as Es, graduate students in counselling and guidance, to administer the Taylor Manifest Anxiety Scale (1953) to students enrolled in introductory psychology. Es were divided into three groups; one group was told the Ss they would be testing were highly anxious, another group was told their Ss scored low on anxiety, and a third group was told nothing about their Ss. The overall analysis of the results showed no significant differences in anxiety scores obtained from S by the three groups of Es.

Wartenberg-Ekren (1962) had eight Es administer the Block Design of the WAIS to thirty-two Ss. Prior to this procedure, Es were led to expect that one-half of their Ss would perform well and one-half would perform poorly. She reasoned, "that since it required more attention and concentration on the part of S, a reasoning task would leave less attention (than Rosenthal's person perception task) for observation of E's behaviour." From the failure of her study to obtain E-bias she concluded "that the generality of the experiment outcome - bias phenomenon as alleged by Rosenthal needs further exploration."

Recently Wessler (1966) has extended the study of the E-bias effect to investigate the psychomotor performance of Ss. The task was to extinguish one of two lights by the depression of the appropriate button. The dependent variable was the speed with which the

subjects reacted. One-half of the Es were given instructions designed to lead them to expect their Ss would perform faster than a norm and one-half were led to expect a performance slower than a norm. Feedback for one-third of Es was accurate, one-third received information that their Ss did not perform as expected regardless of their Ss' actual performance and one-third received information that their Ss did perform as expected. One-half of the Es, after having run the first of two Ss, were cautioned to be more objective in dealing with the next S. Wessler's hypothesis, that experimenter expectancy, type of feedback, and cautioning had no effect on the amount of experimenter effect was confirmed by the results. Wessler concludes:

> "Reaction time proves to be resistant to the effect of experimenter expectancies. It is suggested that in order for bias to occur, the task should be ambiguous with regard to the criterion response. Faced with such ambiguity, the subject is dependent upon the experimenter for information about what response will be considered most acceptable" (p. 2173-B).

Thus it is apparent that one of the most influential variables concerned with the E-bias effect is the nature and type of task. There is need to try to classify and study which tasks contribute to the E-bias effect and which do not.

This need to clarify the nature of E-bias was realized in a recent criticism by Barber and Silver (1967). They point out that more rigorous methodology is needed in this area. They advise:

> "That more sophisticated research is needed which varies the characteristics of the participating individual (principal investigators, experimenters, and subjects), the relationships between these individuals, the methods for inducing biases, and the type and nature of experimental tasks" (p. 40).

It is one of the aims of this study to try to clarify this latter variable.

In contrast to the task stimuli in the Masling (1966), Rosenthal (1966), Marwit and Marcia (1967), and Silverman (1968) studies, the task stimuli in experiments which failed to obtain the E-bias effect appeared to be so structured that S did not have to rely on cues from E to solve the task. The instructions were precise, the task was clear and all that was required of the S was well-defined in the S's repertoire. By comparison, Rosenthal's person perception task, Rorschach or Holtzman's inkblot tests and the word association test would be placed at the opposite end of the scale if one were to have a continuum for extremely structured to extremely ambiguous tasks. In other words, by an examination of those studies in which E-bias has been demonstrated in contrast to those in which bias has not occurred appears to be differentiable on the basis of task ambiguity.

Shames (1967) has attempted to distinguish between these two types of tasks; on the one hand there is the "attitude-oriented" task which appears conducive to paralinguistic and kinesic cues from E, and on the other hand, there is the "fact-centered" task which is not influenced by E's cues. This distinction is confirmed by Shames in his study using the Rosenthal person perception task as the "attitude-oriented" task and a numerosity estimation task as the "fact-centered" task. Shames found bias in the "attitude-oriented" task but not in the "fact-centered" task. Shames' results support our contention that the nature of the stimulus is an important variable in E-bias studies.

Masling (1966) in trying to clarify the nature of the task which is conducive to E-bias, tested the hypothesis that the E-bias effect would occur with an ambiguous task. The rationale for the hypothesis came from the observation that with an ambiguous task the subject is dependent upon the experimenter for cues how to solve the problem. By varying the time exposure of dots presented tachiscopically, he was able to vary the ambiguity of the stimulus. His results showed that the shorter the time exposure the more ambiguous the stimulus and the greater the probability of obtaining the E-bias effect.

From the studies cited the evidence strongly suggests that the stimulus must be ambiguous to allow the S to be influenced by E. Thus the main purpose of this study is to examine the relationship between the ambiguity of the stimulus and the E-bias effect.

If the hypothesis this study is designed to test is confirmed, i.e., the transmission of E-bias with an ambiguous stimulus, it follows that with an ambiguous stimulus the S has a need to attend to E for cues to how to solve the problem. Consequently any variable which influences S's attention to E also influences the E-bias effect. One such variable is the personality of S; more specifically whether S is dominant or submissive. Thus the present study is also concerned with whether the S who is dominant is more or less susceptible to E-bias than the S who is submissive. Assuming that the submissive S looks for others for cues as to how he should respond, one would predict greater E-bias with these Ss than with dominant Ss. In addition, the

personality of the S may influence the behaviour of the E so as to lead to greater or less E-bias. In this regard a study by Heller, Myers, and Vikan-Kline (1963) hypothesized that interviewers confronted with client friendliness would respond with likable agreeable behaviour, while interviewers confronted with client hostility would respond with subtle counter hostility and anxiety. Also, it was hypothesized that client dominance would evoke passive interviewer behaviour and client dependence would evoke interviewer activity and hyperactivity. To control client imput, four actors were trained as clients and were presented in counter balanced order to thirty-four therapists in training for one-half hour interviews. On the basis of observer ratings, all hypotheses, except for interviewer anxiety, were confirmed. If one were to classify the interviewers as Es and the clients as Ss, the results support our contention that the personality of S influences the E-S interaction, thereby influencing the E-bias effect. Therefore, onthe basis of this study, one expects to get a significant difference between positively and negatively biased groups when the Ss are low in dominance and no differences when the Ss are high in dominance.

Statement of the Problem

The E-bias effect has been primarily demonstrated by Rosenthal using a person perception task. Marwit and Marcia (1967), Masling (1965), and Silverman (1968) have extended the findings of Rosenthal to other tasks which one might categorize as ambiguous. Ambiguity

refers to the structure of the stimulus. What is meant by structure is the form and content of the stimulus. Pflugrath (1962), Wartenberg-Ekren (1962), and Wessler (1966) failed to obtain the E-bias effect using rigid or structured tasks. If one considers Rosenthal's person perception task as vague, it can be argued that E-bias occurs only with a nonstructured stimulus. This study proposes to examine the effect of ambiguity of the task stimulus on the E-bias effect by varying the exposure duration of the photographs of a person perception task. The rationale for this manipulation comes from studies by Masling (1966) and Shames (1967). Shames found little or no bias with judgments of the numerosity of dots presented at five second exposure but Masling found bias in judgments with dots presented tachiscopically. Therefore, it is hypothesized that as speed of presentation of photographs is increased the bias effect is increased, i.e., progressively greater differences will be obtained between the ratings of positively and negatively biased groups as exposure duration is increased. In addition, it is hypothesized that the overall E-bias effect repeatedly obtained in previous studies will also be found in the present study irrespective of the exposure duration.

If the transmission of E-bias occurs only with an ambiguous stimulus, it follows that with an ambiguous stimulus the S has a need to attend to E for cues as to how to solve the problem. One variable which influences S's attention to E, thereby influencing the E-bias effect is the personality variable, dominance, of the S. Heller,

Myers and Vikan-Kline (1963) found in an interview situation that client dominance would evoke passive interviewer behaviour and client dependence would evoke interviewer activity and hyperactivity. Thus a dominant S will evoke only a minimal number of cues from E, whereas a dependent S will evoke a large number of cues from E. As the number of cues emitted from E increased, the probability of Ss response being influenced by E also increases. Therefore, it is hypothesized that there will be a significant difference between positively and negatively biased groups when the S is submissive, and that there will be no significant differences when the S is dominant.

In summary then, the hypotheses the present study was designed to test are as follows:

1. It is expected that the overall E-bias effect repeatedly obtained in previous studies will also be found in the present study irrespective of exposure duration.

2. It is predicted that as speed of presentation of photographs is increased the bias effect is increased, i.e., progressively greater differences will be obtained between the ratings of positively and negatively biased groups as exposure duration is increased.

3. It is hypothesized that there will be a significant difference between positively and negatively biased groups when the S is submissive, and that there will be no significant differences when the S is dominant.

CHAPTER II

METHOD

Subjects (Ss) and Experimenters (Es)

The Ss were 68 female students from the Introductory Psychology course at the University of Manitoba. All Ss, volunteers from a list of 200 eligible students who had previously completed the Dominance subscale of the Personality Research Form A (Jackson, 1967), selected the present study as part of their research participation requirement. While no effort was made to obtain Ss on the basis of their performance on the Dominance subscale, the availability of these scores permitted a subsequent analysis of the effect of E bias on high and low dominance Ss.

Six male students, from the Psychology of Personality course at the University of Manitoba, served as Es. All Es volunteered to participate following a telephone appeal made by the principal investigator to students randomly selected from a larger group of volunteers.

Photograph Judging Task

The photograph judging task consisted of pictures of men's faces which the Ss were required to rate in terms of success or failure, on a 20 point scale ranging from -10, extreme failure, to +10, extreme success. These pictures had been used in a previous

study which confirmed the Rosenthal bias phenomenon (Adair and Epstein, 1968). The pictures were made into 35 mm slides, an example of which is presented in Figure 1.

The slides were presented tachiscopically to S seated 1 foot from a transparent screen. The pictures, which projected an approximately 2in. X 2in. image, were presented onto the screen by means of a rear slide projection. The entire area of the screen was covered by a black cardboard except for an opening $3\frac{1}{2}$in. X $4\frac{1}{2}$in. where the slides were projected. S was instructed to focus on this outlined portion of the screen. E was seated at a right angle facing S and on S's right hand side. A timer regulated the inter-photograph interval and the duration of exposure of the slide automatically. During the inter-photograph interval of 10 seconds E changed the photographs by pressing a remote control switch attached to the slide projector. The lighting in the room was made dim by partly closing the shades in the room. A rating scale (Figure 2) was placed in front of S to assist her in completing the ratings. A record sheet (Figure 3) and pencil were available to all Ss to record their responses.

Training and Bias Inducement of Es

Each E volunteered for one and one-half hours of testing, at a convenient time for himself and the principal investigator. All Es were trained by the principal investigator in the operation of the slide projector and timer. Es were instructed to test Ss at each of the 3 exposure times, 5 sec., .5 sec., and .1 sec. While the exposure

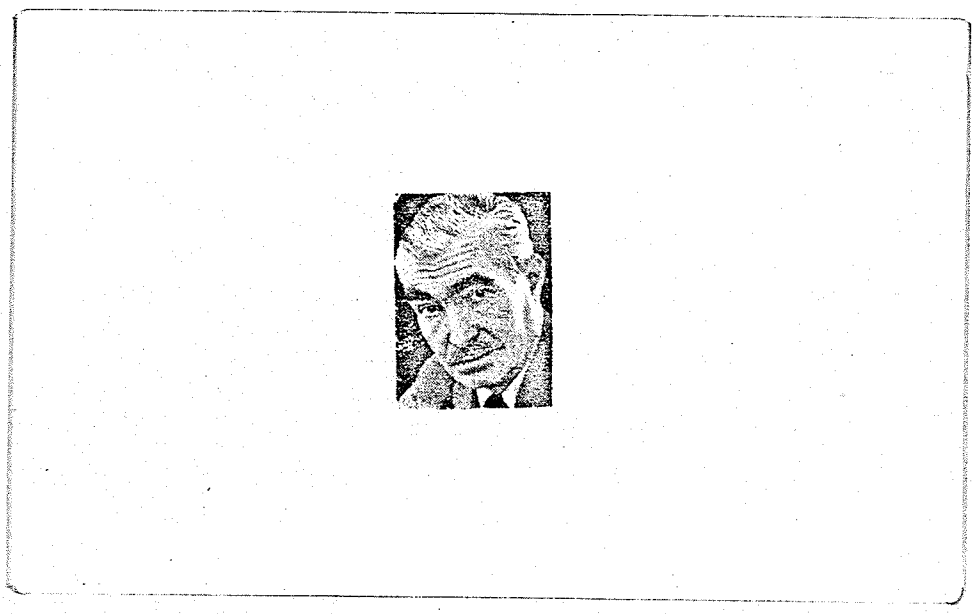

Fig. 1 Sample stimulus slide used in study

RATING SCALE

Extreme Failure	Moderate Failure	Mild Failure	Mild Success	Moderate Success	Extreme Success

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10

Fig. 2 Rating scale used in study

Name _____

Age _____

No.	Rating
1	.....
2	.....
3	.....
4	.....
5	.....
6	.....
7	.....
8	.....
9	.....
10	.....

Subject #

Mean

Experimenter

Fig. 3 Record Sheet used in study

time for each S remained constant, Es were required to change the time for the next S according to a randomized schedule prepared by the principal investigator. Copies of the experimental procedure and instructions to operate the projector and timer were typed out and left in front of each E. These instructions are given in Appendix A.

As the Es arrived they were assigned alternately to a +5 bias group or a -5 bias group. One-half of the Es were told that previous research had found that Ss averaged a +5 rating, whereas the other one-half of the Es were told that previous Ss averaged a -5 rating. All Es were motivated to perform by being told their participation in this study would be a major contribution to the principal investigator's Master's Thesis. The instructions read to E are a modification of those used by Rosenthal (Rosenthal, Persinger, Vikan-Kline and Fode 1963). The exact instructions read to E were as follows:

> "You have been asked to participate in a research project developing a test of empathy. The reason for your participation in this project is to standardize results of experiments of this type. There is the problem in psychological research of different examiners getting somewhat different data on the same tests as a function of individual differences in both subjects and experimenters. Therefore, to standardize the tests it is better methodological procedure to use groups of experimenters.
>
> You will now be asked to run a series of subjects and obtain from each ratings of photographs. The experimental procedure has been typed out for you and is self-explanatory.
>
> According to previous research of this nature, others have found Ss of the personality type you will be running have averaged a -5 rating under conditions of very brief exposure time like we are using. You should similarly expect to get these results using time exposures of 5, .5, and .1 of a second. Since this is part of my Master's Thesis, your running these subjects will be a major contribution.

Just read the instructions to the subjects. Say nothing else to them except hello and good bye. Good luck!"

All Es received the same instructions except that one-half of the Es were biased to expect positive ratings from their Ss and one-half were biased to expect negative ratings.

Procedure

Each S arrived at the experimental room and was greeted by E. After being seated S was asked to fill in the biographical data at the top of the record sheet. Ss were spaced at 5 minute intervals and were randomly assigned to one of 3 treatment groups. Each group received a different exposure duration for the 10 slides, i.e., either a 5 sec., .5 sec., or .1 sec. exposure for the slides. E read identical instructions to S in all 3 groups. These instructions were a modification of those employed by Rosenthal (1964). Emphasis was placed on the short time interval the slide would appear on the screen. The exact instructions read to Ss were as follows:

"I am going to read to you some instructions. No questions can be answered about this experiment. OK?
We are in the process of developing a test of empathy. This test is designed to show how well a person is able to put himself into someone's place. You will see a series of photographs. For each one I want you to judge whether the person pictured has been experiencing success or failure. To help you make more exact judgments you are to use this rating scale. As you can see the scale runs from -10 to +10. A rating of -10 means that you judge the person to have experienced extreme failure. A rating of +10 means that you judge the person to have experienced extreme success. A rating of -1 means that you judge the person to have experienced mild failure while a rating of +1 means that you judge the person to have experienced mild success. You are to rate each photograph as accurately and as quickly as you can.

> The pictures will be presented for only a very brief period. I will first show a blank slide to give you an idea of how long each slide will be presented. Then each of the photos will be presented at 10 second intervals in the area outlined in black. Write down the rating you assign each photograph immediately. Indicate the number of the rating and the sign. All ready? Here is the first slide. (No further explanation may be given although all or part of the instructions may be repeated.)"

Each S was then given 10 slides at 10 sec. intervals and asked to rate each slide in terms of success or failure. One-half of the Ss were run by positively biased Es and one-half were run by negatively biased Es.

Controls for Maximizing E-bias effect and Minimizing E-effect

The procedures were designed to facilitate the occurrence of the E-bias effect while at the same time minimizing differential confounding from several sources of E-effects. For example, optimal motivation on the part of E was created by emphasizing the importance of accurate data collection. In addition, the E-bias effect was enhanced by employing male Es testing female Ss, and by not monitoring the experimental interaction.

Similarly attempts were made to minimize, or at least to maintain relatively constant across treatment conditions, several sources of potential E-effects. For example, employing male Es of the same approximate age, race, and other biosocial characteristics in each of the treatment conditions reduced the possibility of differential results due to E-effects. There are several other variables which might produce E-effects or influence the occurrence of E-bias, e.g., E's anxiety or early data returns, which have not been controlled. These variables have been for the most part, either so irregularly observed in previous studies or, if controlled would have made the present experiment so unwieldly that they have been left to chance variations.

CHAPTER III

RESULTS

Each E obtained ratings of the 10 photographs from his Ss. Of the 72 Ss who signed the appointment sheet 4 failed to make an appearance. Each S's ratings of the 10 photographs were summed and a mean computed. These 68 means constituted the dependent variable for the experiment and are presented in Table 1 with the means obtained by each E under each treatment condition. A graphic representation of the means is shown in Figure 4.

To distribute randomly any possible order effect due to each E administering all three treatment variables, the order of presenting the treatment variable to successive Ss was randomized. Similarly, whether E received the positive or negative bias was also randomized. In accordance with these sampling techniques the data were analyzed in a 2 X 3 factorial design. Table 2 presents a summary of this analysis of variance.

Initially it was hypothesized that a significant overall bias effect would be obtained. In other words it was expected that positively and negatively biased Es would obtain significant differential ratings from their Ss, regardless of the exposure condition in which their Ss were tested. This hypothesis was supported by a significant

TABLE 1

Ss' MEAN RATINGS OF THE PHOTOGRAPHS OBTAINED BY POSITIVELY AND NEGATIVELY BIASED Es UNDER DIFFERENT EXPOSURE CONDITIONS

		-5 Bias			-5 Bias			Exposure	
		E_1	E_2	E_3	E_4	E_5	E_6	Means	S.D.
5 second	S_1	3.4	-0.3	2.3	2.4	4.2	3.2		
	S_2	2.4	2.0	3.0	2.9	2.9	-0.0		
exposure	S_3	4.0	3.0	1.4	0.4	1.2			
	S_4	3.1	3.9	3.7	3.3	0.9			
E Mean		3.2	1.9	2.6	2.3	2.3	1.2	2.33	1.39
.5 second	S_1	3.3	0.7	3.6	3.6	2.3	3.8		
	S_2	0.7	1.5	2.5	1.9	1.2	6.4		
exposure	S_3	4.4	5.4	4.1	0.0	-0.6	2.2		
	S_4	0.4	-1.7		2.4	0.3			
E Mean		2.2	1.5	3.4	2.0	0.8	4.1	2.20	2.01
.1 second	S_1	2.0	5.7	2.6	0.8	-0.7	-0.1		
	S_2	2.0	-0.5	2.8	0.5	3.2	-1.8		
exposure	S_3	3.0	1.3	-0.3	-1.9	-1.6	-0.8		
	S_4	1.4	0.2	1.0	0.9	0.3	0.7		
E Mean		2.1	1.7	1.5	0.3	0.3	-0.5	0.90	1.75
Bias Means			2.20			1.34			
S.D.			1.69			1.90			

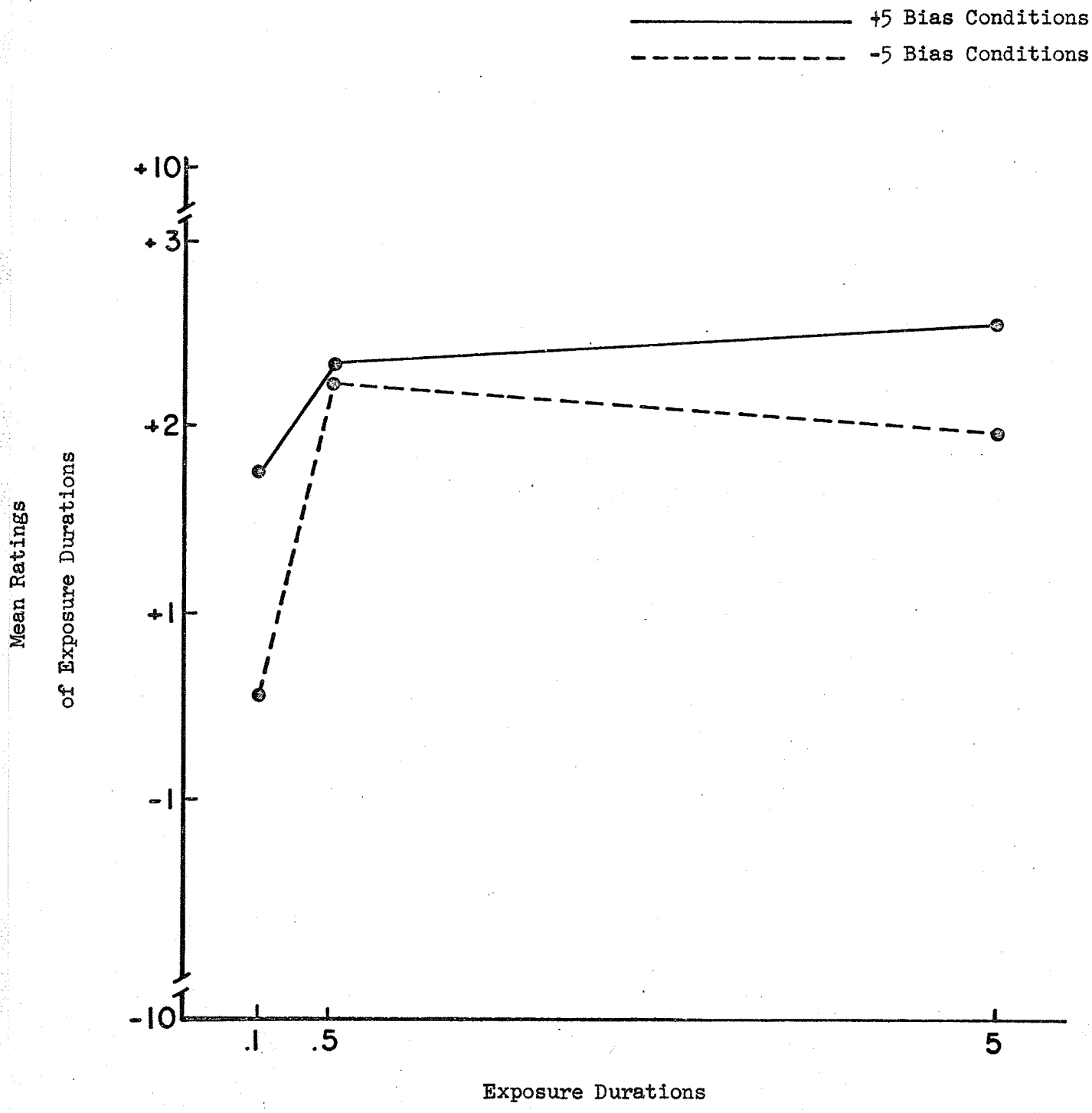

Fig. 4 The mean ratings of positively (+5) and negatively (-5) biased subjects under each of three exposure durations

TABLE 2

SUMMARY OF ANALYSIS OF VARIANCE FOR Ss' MEAN RATINGS OF THE PHOTOGRAPHS OBTAINED BY POSITIVELY AND NEGATIVELY BIASED Es UNDER DIFFERENT EXPOSURE CONDITIONS

Source	df	SS	MS	F
Bias	1	10.72	10.72	3.77*
Exposure	2	27.83	13.92	4.90**
Bias X Exposure	2	8.01	4.01	1.41
Within Cells	62	176.15	2.84	
Total	67	225.07		

*Significant at .06 level

**Significant at .025 level

main effect of bias[1] ($F = 3.77$, $p < .06$)[2] which substantiated the effectiveness of the treatment manipulation. Es who were positively biased influenced their Ss significantly different than Es who were negatively biased. The positive biased Es obtained significantly higher ratings from their Ss than the ratings obtained by negatively biased Es.

In addition to the main effect of bias, the summary of the analysis of variance presented in Table 2 indicates a main effect of exposure duration ($F = 4.90$, $p < .025$). This result indicating that S's ratings were influenced by the duration of exposure of the slides, was not predicted as there appeared to be no clear rationale for such an hypothesis. This significant effect of exposure time, however is illustrated by the decrease in the magnitude of S's ratings as the speed of exposure time was increased. This may be seen in Figure 2 in the lower mean ratings of all Ss tested in the .1 sec. exposure condition in comparison with the higher ratings of Ss in the 5 and .5 sec. exposure conditions.

The hypothesis this experiment was designed to test, however, greater bias as the duration of exposure of the photographs is decreased, was not supported. It was expected that the difference between the

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[1] Bias has been operationally defined in all previous studies as the difference in the Ss' ratings obtained by positively biased Es and those obtained by negatively biased Es.

[2] The E-bias effect has been found significant at the .05 level or better in a number of previous studies, such that acceptance of the significance of the overall bias effect at the .06 level in this study appears warranted.

ratings of Ss tested by positively and negatively biased Es would increase as the length of the exposure of the slides was decreased, i.e., a statistical interaction was expected. However, the interaction between bias and exposure time ($F = 1.41$) failed to obtain significance at the .05 level of confidence. Examination of Figure 4, however, suggests that the bias effect, the magnitude of the difference between positively and negatively biased groups, was greater for the .1 sec. exposure time than for the other exposure durations. Since the analysis revealed a significant bias effect across all conditions, it was decided to examine by t-test the magnitude of the bias effect in each condition of exposure time. The results failed to reach the .05 level of confidence for the 5 sec. and .5 sec. exposure conditions. However, an analysis of the bias effect in the .1 sec. exposure condition resulted in a t of 2.43, which was significant at the .025 level of confidence ($df = 22$). This lends some support to the hypothesis that at the short exposure time the bias effect will be found, while with longer exposures, the effect will not occur.

Since all Ss except one, had scores on the Dominance subscale of the Personality Research Form A (Jackson, 1967), an analysis of the relationship between dominance of the S and the E-bias effect was made. Based on the entire population who took the inventory at the University of Manitoba, the mean was calculated to be 8.0 (Lay, 1968). Since the mean for this population closely approximated the mean for Ss across North America (Jackson, 1967), it was decided to divide the Ss into high and low dominance groups, according to this criterion. Therefore, Ss with scores equal to or greater than 8 were defined as high dominance Ss

TABLE 3

RATINGS OF PHOTOGRAPHS FOR HIGH AND LOW DOMINANCE *Ss* TESTED BY BIASED *Es* (+5 and -5)

	High Dominance			Low Dominance			Total	
	N	Means	S.D.	N	Means	S.D.	N	Means	S.D.
+5 Bias	13	1.61	1.72	21	2.72	1.51	34	2.29	1.66
-5 Bias	9	0.38	1.54	24	1.70	1.92	33	1.34	1.90
Total	22	1.11	1.72	45	2.18	1.80	67		

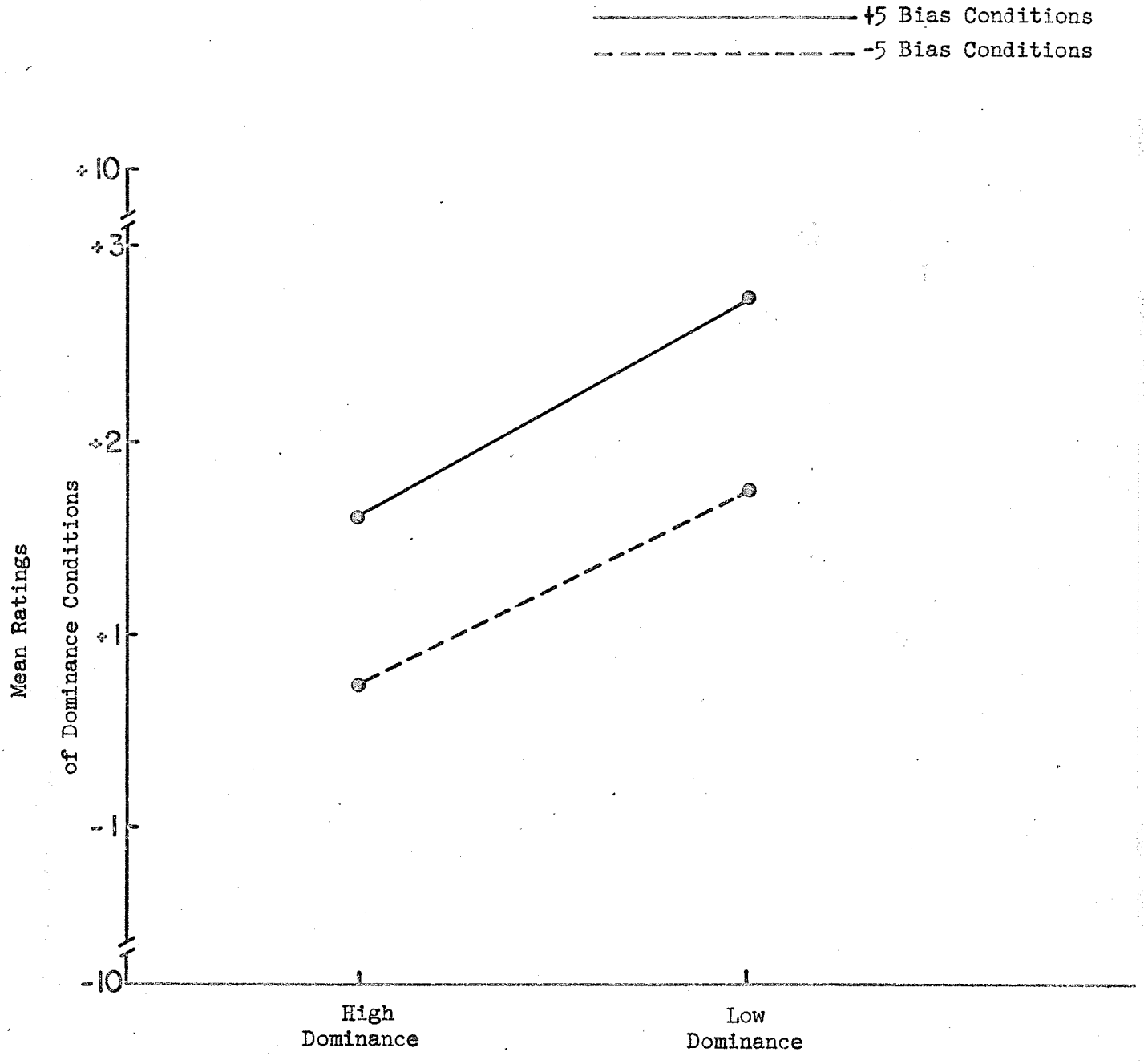

Fig. 5 A comparison of the means assigned to the photographs by Ss in each dominance condition tested by Es biased to expect +5 and -5 ratings.

TABLE 4

SUMMARY OF ANALYSIS OF VARIANCE FOR RATINGS OF PHOTOGRAPHS FOR HIGH AND LOW DOMINANCE *Ss* TESTED BY BIASED *Es* (+5 and -5)

Source	df	SS	MS	F
Dominance	1	21.78	21.78	7.41*
Bias	1	21.03	21.03	7.16*
Dominance X Bias	1	0.16	0.16	0.05
Within Cells	63	185.03	2.94	
Total	66	221.45		

*Significant at .01 level

and with scores less than 8 as low dominance Ss. Twenty-two of Ss were thus classified as high dominance and forty-five of Ss as low dominance. The Ss were proportionally distributed across each of the exposure times[1] so that the effect of S's dominance was approximately equal across exposure conditions. Similarly the effect of exposure condition was equally distributed among the personality groupings.

Each S's mean rating of the 10 photographs again constituted the dependent variable. Overall means for the high dominance group and the low dominance group in both the positive and negative bias condition are presented in Table 3. These means are shown graphically in Figure 5. Table 4 presents a summary of this analysis of variance.

A significant main effect for both bias ($F = 7.16$, $p < .01$) and dominance of the S ($F = 7.41$, $p < .01$) was found. Es who were positively biased obtained ratings from their Ss which were significantly higher than the ratings obtained from Ss whose Es were negatively biased. The main effect for dominance showed that high dominance Ss rated the slides significantly lower than low dominance Ss ($F = 7.41$). However, the expected interaction hypothesis of a significant bias effect when the S is dependent, and an absence of bias when the S is dominant was not supported. The interaction between dominance of the S and the bias ($F < 1$) was not significant at the .05 level of confidence.

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[1] See Appendix B for the distribution of high and low dominance Ss in each exposure condition.

CHAPTER IV

DISCUSSION

The hypothesis this study was designed to test, i.e., greater bias, as the duration of the exposure of the photographs is decreased, was not supported. However the occurrence of a significant bias effect with the .1 sec. exposure condition, together with a significant main effect for exposure times indicated that the type and nature of the stimulus may be a crucial variable in E-bias studies. It might be noted that the means for the 5 sec. and .5 sec. exposure conditions are significantly higher than the means for the .1 sec. exposure condition. It can also be seen that the means for the 5 sec. and .5 sec. exposure conditions closely approximate each other. The difference between the means in the .5 sec. and 5 sec. conditions and the mean for the .1 sec. condition appears to be a result of the S not having enough time to orientate herself to the stimulus in the .1 sec. condition. Because the slide appears for only a very brief time the S misses rating the first slide thereby increasing her anxiety and tension. Observation of the data revealed that Ss missed rating more slides in the .1 sec. condition than in either the .5 sec. or 5 sec. condition. It is possible in her frustrated state of mind she correspondingly rated the slides nearer the neutral point than in the .5 sec. and 5 sec. conditions. In the latter two conditions the S may not become anxious but perhaps remains calm thereby rating the slides

higher. The S's anxiety at not adequately seeing the picture also explains the greater bias in the .1 sec. condition.

A comparison of the positive bias group with the negative bias group in the .1 sec. exposure condition resulted in a significant difference. This result may be attributed to the frustrated state that the S was in. Since S was too frustrated herself to solve the problem she focused her attention on E who provided her with the necessary cues to solve the task. In the .5 sec. and 5 sec. conditions the S remained calm and was capable of solving the task herself, consequently there was no significant difference between the positive bias group and the negative bias group.

In addition to the investigation of the ambiguity of the stimulus, the present study investigated the dominance of the S's personality. A distribution of Ss into groups of "high" and "low" dominance was performed. The main hypothesis, that there will be a significant bias effect when the S is dependent, and that there will be no bias when the S is dominant, was rejected by the occurrence of a nonsignificant interaction. The rejection of this hypothesis may be attributed either to the failure of the Personality Research Form to distinguish adequately between dominant and dependent Ss or to the overpowering effect of E's high status on S. Orne (1962) has shown that subjects will go to great extremes to give adequate performances. Consequently in order to help E confirm his hypothesis S will place herself in a subordinate role. Since placing herself in this inferior position changes her personality, S's degree of dominance did not effect

the E-bias phenomenon.

The occurrence of a significant main effect for dominance may be a result of a conflict for power between the high status E and the high dominance S. The high dominance S may be unwilling to occupy this subservient position and in the process of challenging for power she may reject the cues that E sends her. Behaviourally this rejection was seen by S rating the slides more neutrally than the low dominance S.

Although the ambiguity hypothesis was not supported, the presence of significant bias effect in the .1 sec. exposure condition and the nonsignificant bias in the .5 sec. and 5 sec. exposure conditions suggests that the notion of a continuum of the degree of ambiguity of the stimulus is credible. This continuum should range from extremely structured to extremely ambiguous tasks. Along this continuum there should be some point at which the stimulus transcends from ambiguous to structured. The present study supports this suggestion in that tachiscopical exposures at times faster than .5 sec. resulted in E unintentionally transmitting cues to S, whereas tachiscopical exposures at times slower than .5 sec. did not result in the transmission of the E-bias effect. The existence of this continuum is further supported by the occurrence of bias in Marwit and Marcia (1965), and Masling (1965), in which an ambiguous stimulus was utilized, and the failure to obtain bias in experiments which utilized a structured task (Pflugrath, 1962; Wartenberg-Ekren, 1962, and Wessler, 1966).

Although certain hypotheses of the present study were not supported the occurrence of a significant difference between the means of the positively and negatively biased groups, supports the earlier findings of Rosenthal and Fode (1961) that Es are able to transmit their bias to Ss. It is to be noted, that the results of the present experiment were obtained using female Ss and male Es as suggested by Rosenthal and his co-workers (Rosenthal, 1963; Rosenthal, Persinger, Mulry, Vikan-Kline, and Grothe, 1964a; 1964b). Consequently any attempt to generalize from the present results must take this into consideration.

Implications and Needs For Further Research

The results of the present study suggested that the stimulus is an important variable in the E-bias phenomenon. In future studies dealing with E-bias there will be a need to locate each task on this continuum to determine its degree of ambiguity. Also, it might be useful to re-evaluate earlier findings by Rosenthal and his co-workers in terms of this new continuum.

In view of these findings, it might be suggested that all previous research involving a E-S interaction must be re-evaluated and the stimulus located in terms of this continuum. If it can be shown that the stimulus was ambiguous the authenticity of the results of all previous studies of this nature must remain in doubt. That this is so can be seen from the powerful influence that the E-bias effect had on the ambiguous stimulus used in the present study.

Consequently all studies which have required S to make an evaluative judgment are examples of studies which may need to be re-evaluated according to this new concept.

In regard to future studies concerned with the personality trait, dominance of the S, it would be advisable to investigate such variables as S's sex, age, status, attitudes, and their effect on the E-bias effect before proceeding to the more complex variable, dominance. A greater understanding of this personality trait is needed before its relationship to bias can be clarified.

The present study by further validating the bias phenomenon gives cause for concern to all Es as to how they can control this persistent contaminating variable. Rosenthal (1966) has suggested several ways of controlling the E-bias effect. Among the most promising is the double blind technique in which both E and S do not know which treatment condition they are giving or receiving. Rosenthal has also suggested using automated data collectors to avoid the E-S interaction. However, both methods only serve to minimize the bias phenomenon.

Thus it is apparent that research investigating the E-bias effect, is much needed. Such problems as how the bias is transmitted and what are the environmental conditions which maximize the E-bias effect are still unanswered. Because the E-bias effect penetrates almost all experimental research, it is imperative that this phenomenon be better understood. The complete understanding of the bias phenomenon could result in startling changes in techniques of

teaching, psychotherapy, advertising, politics, and many other professions which involve the interaction of two or more people.

CHAPTER V

SUMMARY AND CONCLUSIONS

This investigation was concerned with examining the effect of stimulus ambiguity on the occurrence of the E-bias phenomenon. Since previous studies in E-bias have primarily utilized the person perception task, or similarly ambiguous tasks, it was proposed that E-bias would be more prominant the more ambiguous the stimulus. Ambiguity in this study was defined in terms of the structure of the task. Ambiguity of the stimulus was manipulated by varying the exposure duration of the photographs in a standard person perception task. In addition the study also examined the potential contribution of the dominance of the S to susceptibility to E-bias effect.

Six Es presented 10 slides to each of 68 Ss, who were required to rate the slides in terms of success or failure on a 20 point scale. One-half of the Es were biased to expect high ratings from their Ss while the remaining half were biased to expect low ratings from their Ss. One-third of each group of Ss received .1 second exposure to each slide, one-third received .5 second exposure, and the remaining third 5 seconds exposure.

The hypothesis of a greater bias effect with increased speed of presentation of the photographs was not supported. Although a significant main effect of bias was obtained, an examination of each exposure condition revealed that it was only with .1 sec. exposure

that the bias effect, i.e., a difference between positively and negatively biased Es, reached significance. These results, together with a main effect for exposure times, were interpreted as an indication that the S became less certain of her judgments as the exposure duration decreased and therefore became more dependent on the E for cues as to how she should respond. The results failed to reveal any meaningful relationship between the bias ability of the Ss and their dominance scores.

It was concluded that the structure of the task stimulus is a crucial variable which must be considered in future E-bias studies. It may be that as the task becomes more ambiguous the S becomes more dependent upon the E for cues as to how she should respond in the experiment. This interpretation is certainly consistent with previous E-bias studies and with the data in the present study. It was further concluded that additional experiments are needed to clarify the relationship, between the personality trait of dominance, and the bias phenomenon.

REFERENCES

Adair, J.G. and Epstein, J. The role of verbal cues in the mediation of experimenter bias. Psychological Reports, 1968, 22, 1045-1053.

Barber, T.X. and Silver, M.J. Fact, fiction and the experimenter bias effect. Psychological Bulletin. (In press).

Brogden, W.J. The experimenter as a factor in animal conditioning. Psychological Reports, 1962, 11, 239-242.

Cantril, H. and research associates. Gauging public opinion. Princeton: Princeton University Press, 1944.

Ebbinghaus, H. Memory: A contribution to experimental psychology (1885). Translated by H.A. Ruger and Clara E. Busseneus. New York: Teachers College, Columbia University, 1913. (Abstract).

Ehrlich, J.E. and Riesman, D. Age and authority in the interview. Public Opinion Quarterly, 1961, 25, 39-56.

Fode, K.L. The effect of nonvisual and nonverbal interaction on experimenter bias. Unpublished master's thesis, University of North Dakota, 1960.

Fode, K.L. The effect of experimenters' and subjects' anxiety and social desirability on experimenter outcome bias. Unpublished doctoral dissertation, University of North Dakota, 1965.

Heller, K., Myers, R.A. and Vikan-Kline, Linda. Interviewer behaviour as a function of standardized client roles. Journal of Consulting Psychology, 1963, 27, 117-122.

Hyman, H.H., Cobb, W.J., Feldman, J.J., Hart, C.W. and Stember, C.B. Interviewing in social research. Chicago: University of Chicago Press, 1954.

Jackson, D.N. and Goshen, N.Y. Personality Research Form Manual. Research Psychologists Press, 1967.

Joel, W. The interpersonal equation in projective methods. Journal of Projective Techniques, 1949, 13, 479-482.

Lay, C. Personnel communication, 1968.

Marcia, J. Hypothesis-making, need for social approval, and their effects on unconscious experimenter bias. Unpublished master's thesis. Ohio State University, 1961.

Marwit, S. and Marcia, J. Tester-bias and response to projective instruments. Journal of Consulting Psychology, 1967, 31, 253-258.

Masling, J. Differential indoctrination of examiners and Rorschach responses. Journal of Consulting Psychology, 1965, 29, 198-201.

Masling, J. Personnel correspondence to Dr. J.G. Adair, 1966.

Mulry, R.C. The effects of the experimenter's perception of his own performance on subject performance in a pursuit rotor task. Unpublished M.A. Thesis, University of North Dakota, Grand Forks, 1962.

Orne, M.T. On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. American Psychologist, 1962, 17, 776-783.

Pflugrath, J. Examiner influence in a group testing situation with particular inference to examiner bias. Unpublished M.A. Thesis, University of North Dakota, Grand Forks, 1962.

Pfungst, O. Clever Hans (the horse of Mr. von Oston): A contribution to experimental, animal, and human psychology. (Translated by C.L. Rahn). New York: Holt, 1911.

Riecken, H.W. A program for research on experiments in social psychology. In N.F. Washburne (Ed.) Decisions, values and groups, Vol. II. New York: Pergamon Press, 1962, pp 25-41.

Rosenthal, R. Experimenter attributes and determinants of subjects' responses. Journal of Projective Techniques and Personality Assessment, 1963, 27, 324-331 (a).

Rosenthal, R. Experimenter modeling effects as determinants of subjects' responses. Journal of Projective Techniques and Personality Assessment, 1963, 27, 467-471 (b).

Rosenthal, R. The effect of the experimenter on the results of psychological research. In B.A. Maher (Ed.) Progress in experimental personality research, Vol. I. New York: Academic Press, 1964, pp 79-114.

Rosenthal, R. Experimenter effects in behavioural research. New York: Appleton-Century Crofts, 1966.

Rosenthal, R. and Fode, K.L. The problem of experimenter outcome-bias. In D.P. Ray (Ed.) Series research in social psychology. Symposia studies series, No. 8, Washington, D.C.: National Institute of Social and Behavioural Science, 1961.

Rosenthal, R. and Fode, K.L. The effect of experimenter bias on the performance of the albino rat. Behavioural Science, 1963, 8, 183-189 (a).

Rosenthal, R. and Fode, K.L. Psychology of the scientist: V Three experiments in experimenter bias. Psychological Reports, 1963, 12, 491-511 (b).

Rosenthal, R., Fode, K.L., and Vikan-Kline, Linda. The effect on experimenter bias on varying levels of motivation of Es and Ss. Unpublished manuscript. Harvard University, 1960.

Rosenthal, R., Kohn, P., Greenfield, P.M., and Carota, N. Experimenters' hypothesis-confirmation and mood as determinants of experimental results. Perceptual Motor Skills, 1965, 20, 1237-1252.

Rosenthal, R., Kohn, P., Greenfield, P.M., and Carota, N. Data desirability, experimenter expectancy, and the results of psychological research. Journal of Personality and Social Psychology, 1966, 3, 20-27.

Rosenthal, R., Persinger, G.W., Mulry, R.C., Vikan-Kline, Linda and Grothe, M. Changes in experimental hypotheses as determinants of experimental results. Journal of Projective Techniques and Personality Assessment, 1964, 28, 465-469 (a).

Rosenthal, R., Persinger, G.W., Mulry, R.C., Vikan-Kline, Linda and Grothe, M. Emphasis on experimental procedure, sex of subjects, and the biasing effects of experimental hypotheses. Journal of Projective Techniques and Personality Assessment, 1964, 28, 470-473 (b).

Rosenthal, R., Persinger, G.W., Vikan-Kline, Linda and Fode, K.L. The effect of experimenter outcome-bias and subject set on awareness in verbal conditioning experiments. Journal of Verbal Learning and Verbal Behaviour, 1963, 2, 275-283.

Rosenthal, R., Persinger, G.W., Vikan-Kline, Linda and Mulry, R.C. The role of the research assistant in the mediation of experimenter bias. Journal of Personality, 1963, 31, 313-335.

Sachs, Eleanor L. Intelligence scores as a function of experimentally establish social relationship between child and examiner. Journal of Abnormal and Social Psychology, 1952, 47, 354-358.

Shames, M.L. and Adair, J.G. Experimenter bias as a function of type and structure of the task. Canadian Psychologist, 1967, 8a, 2.

Silverman, I. The effects of experimenter outcome expectancy on latency of word association. Journal of Clinical Psychology, 1968, 24, 60-63.

Stanton, F. and Baker, K. Interviewer bias and the recall of incompletely learned materials. Sociometry, 1942, 5, 123-134.

Taylor, Janet A. A personality scale of manifest anxiety. Journal of Abnormal and Social Psychology, 1953, 48, 285-290.

Wartenberg-Ekren, Ursula. The effect of experimenter knowledge of a subject's scholastic standing on the performance of a reasoning task. Unpublished M.A. Thesis. Marquette University, 1962.

Wessler, R.L. The experimenter effect on a task-ability problem experiment. Dissertation Abstracts, 1966, 27, No. 6, 2173-B.

Williams, J.A. Interviewer-respondent interaction. A study of bias in the information interview. Sociometry, 1964, 27, 338-352.

A P P E N D I X A

EXPERIMENTAL PROCEDURE

In front of you, you will find the instructions you are to read to your subjects, a sheet of paper that each subject will use to record her ratings of the photos and a projector to present pictures on a screen.

After recording data from each subject at the top of the recording sheet and reading instructions to the subject, give the recording sheet to your subject.

When you are ready to begin, say, "This is a blank slide. This will be presented for only a short duration," then present the blank slide. S's will record their own rating. Thank the subject and get her to sign your experimental sheet and you sign hers.

Total the ratings of the ten photos and find the averages (mean) for each subject after the subject has left the room. Be sure to number your subjects from 1 to 12.

INSTRUCTIONS TO OPERATE PROJECTOR AND TIMER

1. PROJECTOR LIGHT ON

   Move switch up to Low. Light will go on.

2. TIMERS ON

   Turn left timer power switch on, right timer power switch on.

3. SET TIMES

   Set right hand timer at

   (a) 5 sec. Top dial on 5. All others at 0.

   OR

   (b) .5 sec. 2nd dial from top on 5. All others at 0.

   OR

   (c) .1 sec. 2nd dial from top on 1. All others at 0.

   Thus must be done for each S as indicated previously.

4. START EXPERIMENT

   Turn left timer interval switch on - then off - quickly.

5. CHANGE SLIDES

   Blank slide will appear first, after slides disappear from screen press forward button to change slide. Do this for all 10 slides.

6. STOP EXERIMENT

   Turn projector switch to fan. Turn both left and right timer power switches off. After S has left the room, using reverse button put slides back in original position.

NOTE: You must get the student number and signature of each S listed on the experimental sheet provided. You in turn must sign their sheet.

After completing 12 subjects turn machine on fan and come to Room 301, where my carrell, DAVID NOZICK, can be found.

A P P E N D I X B

DISTRIBUTION OF HIGH AND LOW DOMINANCE Ss

IN EACH EXPOSURE CONDITION

Dominance Condition	Exposure Condition: 5 sec	.5 sec	.1 sec
High	6	7	9
Low	16	14	15