70-21,822

BRADSHAW, Jo Ann Taggert, 1933-
SITUATIONAL VARIABLES IN VERBAL CONDITIONING WITH CHILDREN USING A PAIRED-ASSOCIATE PARADIGM.

The University of Oklahoma, Ph.D., 1970
Psychology, general

University Microfilms, A XEROX Company, Ann Arbor, Michigan

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

Downloaded from SHAREOK. Persistent Handle URL: https://hdl.handle.net/11244/2765

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

SITUATIONAL VARIABLES IN VERBAL CONDITIONING WITH CHILDREN USING A PAIRED-ASSOCIATE PARADIGM

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

JO ANN TAGGERT BRADSHAW

Norman, Oklahoma

1970

SITUATIONAL VARIABLES IN VERBAL CONDITIONING WITH

CHILDREN USING A PAIRED-ASSOCIATE PARADIGM

APPROVED BY

Maurice K. Temerlin

Thomas M. Miller

C. W. Berenda

N. Jack Kanak

Mildred O. Jacobs

DISSERTATION COMMITTEE

ACKNOWLEDGEMENTS

I would like to express my appreciation to Dr. Maurice K. Temerlin, chairman of the dissertation committee, for his direction and constructive evaluation. I also wish to acknowledge my gratitude to Dr. N. Jack Kanak for his assistance in the statistical analyses, to Dr. Mildred Jacobs for her guidance throughout the doctoral program, and to the other members of the committee, Dr. Thomas N. Miller and Dr. Carlton Berenda.

A special note of thanks is extended to Mrs. Helen Petre who typed the manuscript and to Miss Guillarne Hamilton and Miss Christine Sheets who were the experimenters in this research. In addition I would like to acknowledge both the contribution of the 120 students who served as subjects, and the cooperation of their teachers and principals. Finally, a word of gratitude is expressed to my family and friends whose encouragement and support meant so much through this endeavor.

TABLE OF CONTENTS

	Page
LIST OF TABLES	v
LIST OF FIGURES	vi
Chapter	
I. INTRODUCTION	1
II. METHOD	30
III. RESULTS	35
IV. DISCUSSION	46
V. SUMMARY	58
REFERENCES	61
APPENDICES	71

LIST OF TABLES

Table		Page
1.	Design of Experiment	32
2.	Mean Number of Correct Responses and Standard Deviations (Eight Pair List)	36
3.	Summary of Analysis of Variance 8 Nonsense Syllables	37
4.	Sample Effects Analysis of Variance Experimenter and Mode Interaction	40
5.	Summary of Analysis of Variance 12 Nonsense Syllables	42
6.	Mean Number of Correct Responses and Standard Deviations Twelve Pair List	43

LIST OF FIGURES

Figure | Page

1. Total Number of Correct Responses Experimenter and Mode Interaction (Eight-Pair List) 39

SITUATIONAL VARIABLES IN VERBAL CONDITIONING WITH CHILDREN USING A PAIRED-ASSOCIATE PARADIGM

CHAPTER I

INTRODUCTION

The initial research in the area that has come to be designated verbal conditioning was conducted by Greenspoon (1951, 1955). His research was designed to create an experimental situation to study verbal behavior that paralleled the operant conditioning situation with animals. Since that time numerous studies have been conducted to study the variables of verbal conditioning and to delineate the similarities and differences between verbal conditioning and other areas of operant conditioning. Verbal conditioning studies have been of special interest to psychologists because the use of a verbal reinforcer introduces a relationship factor into the design which is analogous to such social interactions as psychotherapy or diagnostic interviews. Since verbal behavior has been conceptualized as behavior which develops in almost complete dependency on the social environment (Skinner, 1957) the experimental situation is one in which both the subject's (S's) and the experimenter's (E's) behavior must be closely scrutinized. There are many effects on verbal output, one of which may be the S's perception of the E, based on earlier experiences with

him or by direct generalization from experiences with people whom the E resembles in some way. Research to date makes it quite evident that the verbal conditioning phenomenon has not yet been sufficiently explored to account for variabilities between experimental procedures in terms of the presently known variables. Considering the great sensitivity and variability of the verbal conditioning data, it seems likely that a variety of situational variables may systematically affect the data of different investigators and produce differences in this way.

In the Greenspoon (1951) study, the Ss were college students who were instructed to say words individually and not to use sentences, phrases or numbers. Four different contingent stimuli were used: the verbal stimuli "mmm-hmm" and "huh-uh," a visual stimulus (a five-watt red light flash), and an auditory stimulus (a 190-cycle tone). Two different response classes were used, a plural noun response class and a response class that included all verbal responses except plural nouns. A control group responded for 50 minutes without any contingent stimulus introduced throughout the experimental session. The effect of all four contingent stimuli was a significant increase in the number of plural noun responses when compared to the control group.

Results similar to Greenspoon's were found by Cohen, Kalish et al. (1954). Instructing Ss to select 1 of 6 pronouns and to form a sentence with the verb that was also printed on a white card, they obtained a significant difference in the frequency of selection of the first person pronoun between the group that was

reinforced with the word "good" and a control group that received no reinforcement. Wilson and Verplanck (1956) obtained similar results in a study using college students. In their study, Ss were instructed as follows: "This is a study of the vocabulary of college students. Say words. Do not repeat. Do not count. Do not say sentences." Half of the Es used as a reinforcing stimulus a casual "mmm-hmm" or "good;" the other half wrote down "significant words" on a data sheet. (Es were instructed to make an obvious writing movement.) The responses which were reinforced were 'plural nouns' and 'adverbs.' Each S was kept at the task until he had said 800 words in all. There were 4 stages of the reinforcement: 1) No reinforcement was given for the first 100 words, 2) One response (either 'plural nouns' or 'adverbs') was reinforced during the next 300 words, 3) No reinforcement was given during the next 100 words, 4) The alternate response (either 'adverbs' or 'plural nouns,' respectively) was reinforced during the last 300 words. The number of plural nouns, adverbs, and other words was recorded minute by minute by ticking them off on data sheets. When each S was asked at the end of the experimental session to tell all he could about the experiment, 12 of the 14 Ss mentioned the reinforcing stimulus, 6 or 7 reported the fact in one way or another that E had said "mmm-hmm" and "good" during parts of the experiment and 6 or 7 reported that they noticed that E wrote down certain words during the experiment. Many Ss said something like, "I noticed that for a while you liked nouns and then you didn't care what I said." One, who showed positive

conditioning, thought it was "bad" for a word to be written down. None of the Ss made any statement to the effect that this was a conditioning experiment and Wilson and Verplanck applied this to the question of awareness by suggesting that while most Ss notice the reinforcing stimulus, conditioning in this study occurs whether Ss are aware of the reinforcement or not. In this study the total rate of saying words did not differ significantly under the various conditions of reinforcement and nonreinforcement, however, the rate of saying 'plural nouns' and 'adverbs' increased significantly, the median increase in rate being 95%. Both kinds of reinforcement, saying "mmm-hmm" and "good" and writing the word down, were effective.

Results similar to Greenspoon's were also obtained by Solley and Santos (1958) using a perceptual response class. In their study verbal reinforcement was employed to reduce perceived fluctuations in a Necker Cube (an ambiguous figure that consists of a line drawing of a cube showing all twelve edges as if the cube were transparent). There are two perceptions of the Necker Cube which can be seen and the employment of reinforcement in this study resulted in the reinforced aspect being reported more and more often. Ss were female students between 17 and 21 years of age. Initially Ss were instructed to identify verbally the direction of the presented cubes. Two line drawings of a Necker Cube were used. One was "improved" so that it was more likely to be seen as going from right to left, the other was a mirror image so modified that it was more likely to be seen as going from left to

right. After the right-to-left cube was shown and identified, the left-to-right cube was exposed and identified. Following this orientation phase, a total of 256 trials was given, including 54 test trials in which the balanced cube was exposed as a test figure. Test trials were randomly interspersed with the training trials. As soon as S identified a cube, E either said "uh-huh," "fine," or "good," or nothing. A partial reinforcement schedule was employed in which one aspect was randomly reinforced approximately 70% of the time and the other aspect was reinforced approximately 30% of the time. The results showed that the frequency of reports of the predominantly reinforced aspect of the cube increased with continued training for all Ss. Results also indicated the necessity for conditioning Ss against their initial preference instead of randomly assigning them to conditioning procedures. The reason for this was that some Ss had such a strong preference for one direction that little or no learning could be demonstrated. Therefore it was essential to assess and then to condition against this initial preference. Not only did Ss in this study report seeing the reinforced aspect of the test cube more and more often as conditioning progressed but it was also found that after conditioning a "rigidity" was revealed in perceiving the Necker Cube. That is, following conditioning, some Ss reported that they could not voluntarily reverse the perspective because they thought E was showing them only the reinforced aspect of the cube.

Salzinger and Pisoni (1960) extended the effect of verbal conditioning to the reinforcement of affect responses of schizo-

phrenics during the clinical interview. Their purpose was threefold: (1) to study the extent to which the interviewer can respond reliably with reinforcement to the patient's verbal behavior, (2) to study the effect of different sources of reinforcements (two different interviewers) upon the verbal behavior of the interviewee and (3) to investigate the relationship between the number of reinforcements and the number of responses in extinction. As they saw it, one value of such a study would be to help arrive at laws describing interview behavior and to furnish an objective method for the evaluation of "flatness" of affect. Ss in this study were thirty-six hospitalized schizophrenics. Twenty of them constituted the experimental group and they were interviewed for a period of 30 minutes each on two consecutive days by two interviewers. Each interview in the experimental group consisted of a 10-minute operant level, during which E only asked questions necessary to keep up the patient's talk but did not respond to the patient's speech content. The operant level period was followed by 10 minutes of conditioning during which E reinforced by agreement all self-referred affect statements (examples of such statements were those which began with pronouns "I" or "we" and were followed by an expression of affect such as "felt close," "am jealous," "enjoyed it," "am lonely"). The last 10 minute period of each interview was 10 minutes of extinction during which E withheld all further reinforcement. The other 16 Ss, composing the control group, were given one interview only consisting of 30 minutes of operant level. The results of this study were that the greatest

number of affect statements was emitted during the conditioning phase for the experimental group, the next greatest during the operant level and the least during extinction. When the three 10-minute periods of the control group interviews were compared it was found that the greatest number of affect responses was emitted during the last 10 minutes of the interview, the next greatest during the second 10 minutes and the smallest number during the first 10 minutes. Comparing the second 10 minute period of the experimental group to the second 10 minute period of the control group it was found that the experimental group emitted more affect responses than did the control group. This study by Salzinger & Pisoni demonstrated that a difference in interviewers or sources of reinforcement per se need not produce discrepant results during an interview when utilizing a standard procedure for interviewing. It further showed that a verbal response class can be reliably isolated and reacted to. Conditioning of a response class of self-referred affect statements was found to be possible with schizophrenics during an otherwise usual clinical interview. The relationship between number of reinforcements and number of responses in extinction was described by means of a straight line; i.e., the greater the number of reinforcements with the experimental group, the greater the number of responses during extinction.

Results contrary to those obtained by Greenspoon have also been reported. A contradictory report of verbal conditioning were submitted by Matarazzo, Saslow, and Pareis (1960) who investigated the importance of the response class as a variable in

verbal conditioning. They found that three different Es were not able to demonstrate verbal conditioning of plural nouns, but two different Es were successful in producing increases in the frequency of human responses. The same contingent stimuli, "good" or "that's good," were used for both the response classes. They offered several suggestions for their successful conditioning of human responses and their failure to condition plural responses. One explanation concerned the issue of awareness. In their study they found there was more awareness of the response contingency in Ss who were reinforced for human responses than there was for plural responses. They also discussed the concept of the discriminative stimulus, S^D, as it applies in this situation, i.e. that Ss have been reinforced in their past experience for being interested in people but may not have been reinforced for an interest in plural nouns. Another possibility involved the suggestion of the concept of expectancy-set. Since the research was conducted in the laboratories of the psychology-psychiatry service, Ss may have had a set to talk about people but not plurals.

The failure to obtain conditioning in either the free responding situation or in the selection of a response situation was reported by Mandler and Kaplan (1956). In their study Ss were each told that they were going to take part in a test of the total available vocabulary of college students. Each S was requested to say all the words he could think of, not to repeat words or to count or to give phrases or sentences. All responses by Ss were recorded on tape. During the reinforcement period,

E emitted the reinforcing stimulus "m-hmm" after each plural noun response. All Ss were stopped after they had given 100 responses. All Ss were interviewed after the response session to determine their reaction to the reinforcing situation. They were interviewed by means of 30 open-ended questions. All Ss indicated they were aware of E saying "m-hmm" every now and then. They were asked what they thought this behavior by E indicated. On the basis of this question, Ss were divided into positive and negative groups. The positive group thought that this behavior meant they were doing all right, and encouraging them to go on. The negative group thought it meant they were going too fast or giving the wrong kinds of words. The results of Mandler and Kaplan's research indicate that in human verbal learning, S's subjective evaluation of a reinforcing stimulus may provide an independent measure of the reinforcing value of a verbal reinforcer. Each S gave 100 responses to obtain the operant level, then 200 in which plural nouns were followed by a reinforcing stimulus, then another 200 in which no reinforcement was given to obtain extinction data. Mandler and Kaplan were unable to confirm Greenspoon's findings using group data. However, they did find that when they separated those Ss who felt that "m-hmm" was rewarding from those who had perceived it as having negative aspects, they were able to obtain evidence of conditioning during the first reinforcement period.

Another failure to replicate Greenspoon's results was demonstrated by Sullivan and Calvin (1959). Their Ss were female undergraduate students and the verbal conditioning was attempted

under conversational conditions when the response class was large and the responses within the class were not structurally similar. Each S was asked to discuss the topic of college education and to include the areas of Science, English and Fine Arts in their discussion of these subjects. The reinforcement "mmm-hmm" was used after every sentence that a S gave which dealt with the previously designated-to-be-reinforced topic. Statistical analysis of this study indicated no significant differences in time spent on the "reinforced" topic among the three categories.

Since some Es have reported no difficulty in obtaining clear-cut evidence of verbal conditioning while others have reported direct contradictory results there is a good deal of confusion in the area of verbal conditioning. Dulaney (1960) has even questioned the legitimacy of including verbal conditioning in the framework of operant conditioning. He argues that Ss who show an increase in plural noun responding in his research are those who demonstrate the transfer of a complex verbal habit and are essentially reinforced for associating. Ss however who do not associate do not show an increase in the frequency of plural noun responding. The essential issue raised by Dulaney is the question of what does transpire in the experimental situation called verbal conditioning.

To attempt to deal with some of the confusion in the area of verbal conditioning several variables have been investigated. Some of these are: 1) the effect of E, 2) the effect of Ss, and 3) the effect of the reinforcer used.

The Effect of the Experimenter

Binder, McConnel and Sjoholm (1957) studied the effect of Es who differed greatly in personal appearance. One of their Es was described as being an 'attractive, soft-spoken petite young woman who could have easily passed for a high school sophomore, while the other E was very masculine, 6'5" tall, 220 pounds in weight and was often mistaken for a faculty member. Their use of the two different experimenters was to test the hypothesis that differences in the characteristics of Es can lead to differential learning effects when the experimental session involves verbal conditioning without awareness. Two groups of Ss were run for the study, both groups consisting of students from an introductory psychology course. Ss were presented with 3" x 5" cards which contained the pronouns "he," "she," and "they" in random order and two verbs, in the past tense, a "neutral" one and a "mildly hostile" one. Each S was assigned the task of making up a sentence starting with one of the pronouns and utilizing one of the two verbs. A total of 20 neutral and 20 hostile verbs was used, arranged in seven blocks with random pairings of neutral and hostile words within blocks. Both Es said "Good" whenever S used the hostile verb rather than the neutral one in his freely constructed sentence. The results showed that the response "Good" was reinforcing for the class of behavior consisting of the use of hostile verbs in sentences. In addition, it was found that the rates of learning for the Ss of the two Es differed

significantly with a steeper slope for the group conditioned by the female E.

In Solley and Long's (1958) article "When is "Uh-huh reinforcing?" they reported some differences found in perceptual learning studies with partial verbal reinforcement (Solley and Santos (1958). They found that a verbal reinforcement from one E was not as effective as that of another E. They observed that one E applied a very loud verbal reinforcement while the other spoke very softly, and that the latter condition was more effective. However when both Es spoke at about the same soft, conversational level, their results were comparable. Another important variable was discovered by accident and made the subject of the study by Solley and Long. It was found that if E took time to chat with S before the experiment proper and presumably thus established a positive social relationship, then an "uh-huh" was effective; however if E did not do this, his "uh-huhs" were relatively ineffective as reinforcement. They suggest that a rapport-getting conversation before an experiment can largely affect the results of conditioning with verbal reinforcement.

Kanfer (1958) investigated the effect of reinforcement schedules and differences between Es on verbal responding. Ss in this study were 54 female student nurses who were required to say words continually. Verbs were reinforced by flashing a light which represented a point score. All Ss were asked to continue saying any and all separate words that came to mind, until told to stop. They were told that they would earn a point each time

they succeeded in turning on the light and that their job consisted of turning on the light as often as they could. After initial training all groups were given practice on their respective schedules for 15 minutes. Ss had previously been randomly assigned to a Fixed-ratio group, a Fixed-Interval group or a Variable Interval group. Half of each group was run by one E and half by a second E. The Es were both male and were trained to treat Ss in the same manner during the initial contact. Es were not visible to Ss during experimental sessions. Following the practice session on their respective schedules, Ss returned the following day and were given an additional 15 minute practice session. All Ss were then put on non-reinforcement for 30 minutes. The results of this study showed that the group on Fixed Ratio exceeded the Interval groups in number of verbs during non-reinforcement. Kanfer found that Es differed in their effect on verb rate during non-reinforcement despite standardization of procedures which allowed Es only the decision of assigning words to classes of verbs and non-verbs. Kanfer suggests that instability in verbal conditioning when compared to conditioning obtained with other responses in laboratory procedures may be due to the sensitivity of verbal behavior to a variety of concurrent controlling stimuli. Among such controlling stimuli are such general aspects of E in an interpersonal situation as the status of E, his physical characteristics, etc. Since in this study, the primary difference between Es seemed to be their decision of assigning words to classes of verbs and non-verbs,

Kanfer indicates that quick decisions by Es in terms of classifying verbal behavior may be an important source of variability, i.e. the modification of verbal behavior may be dependent not only on gross physical or status differences between Es but also on each E's perception of content. He goes on to suggest that the results of this study are indicative of the possibility that E's role as a reinforcing agent in less structured clinical situations such as test or therapy interviews may vary considerably as a function of each E's personal views and his perception of events or client attitudes as he infers them from the client's verbal behavior. Regardless of this interpretation, the results clearly support the previously cited findings of the importance of experimenter variables.

Kanfer and Karas (1959) studied prior experimenter-subject interaction in the verbal conditioning situation. In their study three groups of male undergraduate students were administered the Otis Intermediate Form D by a female E. One group, the Failure group, was critized for their "poor" performance. The Success group was congratulated on their "excellent" performance and the Control group was not given any evaluation of their performance on the prior task. A fourth group received no prior experience with E and was introduced immediately to the conditioning task.

Verbal conditioning involved all Ss being instructed to construct sentences from one verb and any one of six pronouns which were presented on each trial. Use of the pronouns "I" or "we" was reinforced by E's saying, "Good" at the end of the sentence.

Reinforcement was begun after 20 trials and continued for 140 trials. The results indicated that all groups with prior experience conditioned significantly better than the No-experience group did. Although no significant differences between the Failure group, Success group, and Control group were found in rate of conditioning or final level of responding, a questionnaire administered after the experimental sessions indicated that the three groups differed markedly with respect to their attitudes toward E. It would seem that prior experience not only produced better learning than did no experience, but also, despite differing attitudes, made all Ss more susceptible to E's interaction.

Rosenthal, Kohn, Greenfield and Carota (1966) studied the effect of Es' expectancies and hypotheses on results and the desirability to the Es of those results. Also they were interested in learning whether Es' expectancies and desires might be partial determinants of the results of studies of verbal conditioning. In their study 19 male Es conducted a verbal conditioning experiment with 60 female Ss. One half of the Es were led to expect their Ss to show verbal conditioning and one half were led to expect no verbal conditioning. One half of the Es in each of these groups were led to feel that it would be desirable if their Ss showed conditioning and one-half were led to feel that it would be undesirable. The results showed that those Es who (a) both wanted and expected, and (b) neither wanted nor expected their Ss to increase usage of "I" and "we" pronouns obtained significant conditioning.

This was the first experiment in which Es' expectancies were varied independently of the desirabilities of the outcomes. In most previous studies of this type, those Es who expected better performance from their Ss obtained better performance than did those who expected poorer performance. In this study opposite expectancies coupled with presumably congruent motives produced identical results that favorable expectancies coupled with congruent motives did, i.e. "not wanting" and "not expecting" produced as effective conditioning as did "wanting" and "expecting." Rosenthal's explanation is that perhaps those Es who both expected and wanted conditioning or neither expected nor wanted conditioning were told by the major investigators essentially that they were considered particularly clever in one case and that they had minds of their own in the other case; i.e. congruent Es were complimented by the investigators. On the other hand, Es in the incongruent conditions were told essentially that the investigators considered them to be either not too bright or to be like putty in the hands of the manipulators. This suggests the possibility that these Es could have been emotionally affected to the point that their verbal "reinforcements" lacked sufficient conviction to be positive reinforcers for their Ss. Es in the noncongruent conditions were in fact rated by Ss as less expressive-voiced than Es in the congruent conditions and expressiveness of voice was found to be positively correlated with successful conditioning. Rosenthal concluded that the E's affect or mood is a more important determinant of his effectiveness as a reinforcer than either his expectancy or the desirability of the outcome in

studies of verbal conditioning.

Among those Ss who showed some indication of awareness in this research, more clear awareness was shown by Ss whose Es had been led to expect no conditioning. This suggests the possibility that some of the ambiguity surrounding the question of awareness rates in studies of verbal conditioning may be associated with the E's expectancy regarding his Ss' conditionability as well as his expectancy about their subsequent awareness.

The results of the above studies suggest that E differences are a major source of variability in verbal conditioning research. The amount of conditioning achieved by Ss has been seen to be significantly affected by physical and personality characteristics of Es, method of interaction with Ss, possibility of prior interaction between Es and Ss, and Es' expectancies of results. There are doubtless other areas of differences which need to be investigated, such as ability to establish rapport with Ss, attitude toward Ss and physical and personality differences between Es and Ss.

The Effect of Subjects

Terrell et al (1959) studied the effect of social class of Ss and the nature of incentive in discrimination learning. Their study revealed that middle class children learn more quickly when given a non-material incentive (a light flash contingent on a correct response) than when given a material one (a small piece of candy in addition to the light flash). They found however that

the reverse was true of lower class children.

Pishkin et al (1967) studied age, sex, amount and type of memory information in concept learning. The Ss in this study were 135 male and 135 female students between the ages of 10 and 18 years from the Casady School in Oklahoma City. The amount and type of memory information consisted of three levels of availability of correctly and incorrectly sorted instances in a 4-choice concept-learning task. Two significant results of this study were: 1) in the condition where memory requirements were greatest, the youngest Ss showed a marked deficiency in learning as compared to the older groups suggesting that Ss in the age range from 9 to 12 years of age are less able to retain and utilize previous information; and 2) sex significantly interacted with number and type of instances available, demonstrating superior performance of females.

Another effect that Ss may have on experimental results comes from the expectancies of the Ss. Orne (1962) cited some experiments in which Ss performed as they believed they were expected to perform. One example was a task of performing serial additions of each adjacent two numbers on sheets filled with rows of random digits. In order to complete just one sheet, each subject would be required to perform 224 additions. A stack of some 2,000 sheets was presented to each S with the instructions to keep working until E returned. The task was intended to be psychologically noxious, meaningless and boring and the expectation was that Ss would either refuse to do the task or would work at it only for a short period of time. However Ss kept at the task until eventually

E gave up and terminated the task after five and one-half hours. Orne's interpretation of this result is that once S has agreed to participate in a psychological experiment, he implicitly agrees to perform a wide range of actions on request without inquiring as to their purpose, often without even inquiring as to their duration. In another example, when a number of casual acquaintances were asked to do E a favor, which was to perform five push-ups their response tended to be the question "Why?". However when a similar group of Ss were asked to take part in an experiment and were also asked to perform five push-ups, their typical response was "Where?".

Orne also cites the evidence that post-experimental inquiry often involves S asking if he performed well in his role as an experimental S. Apparently, in so far as S is able, he will behave in an experimental context in a manner designed to play the role of a "good subject" or, to validate the experimental hypothesis. Orne feels that the implicit demand comes largely from the Ss' hope and expectation that the study in which they participate will in some material way contribute to science and perhaps ultimately to human welfare in general. If S has a stake in the outcome of the study in which he is participating, in order for him to feel that he has made a useful contribution, it is necessary for him to assume that E is competent and that he himself is a "good" S.

Racial class of Ss has not been studied in verbal conditioning studies with children; however, it would seem to be of importance in terms of interaction between race of E and of Ss and would have applicability to classroom teaching situations.

McDaniel and Babchuk (1960) studied black conceptions of white people in a northeastern city. A sample of one hundred blacks representing three social classes as designated through occupation and education in a Northern community was confronted with stereotyped conceptions of white people, conceptions which had been found to be widely known among a black sample in the South, in a study by Cothran (1951). These conceptions were found to be equally well known in the North, as in the South. There was considerable consensus between the samples in the two communities with regard to the degree of uniformity in the responses, and in most instances the direction of the responses was unfavorable. The lower-class groups in both communities were more intensely unfavorable to whites than either the middle or upper-class groups and this was especially true of the lower-class group in the North. Another aspect of S differences is supplied by Goodman (1952) who studied racial awareness in young children and found that a large percentage of black as well as white youngsters preferred white dolls and story-book characters.

Mitzell and Rabinowitz (1953) assessed the social-emotional climate in classrooms using Withall's technique (1949). Withall's method assesses the social-emotional climate in the classroom through an analysis of the statements made by the teacher as she conducts classroom activities. It is possible, employing this technique, to place each statement made by a teacher into one of seven categories:

1. Learner-supportive statements

2. Acceptant or clarifying statements
3. Problem-structuring statements
4. Neutral statements
5. Directive statements
6. Reproving, disapproving or disparaging statements
7. Teacher-supportive statements

In the Mitzel and Rabinowitz study, two observers rated the statements of two fourth-year and two fifth-year teachers in an elementary school located in an economically underprivileged area of New York City. Each class contained approximately 30 children many of whom were foreign born. The observers rated the teachers over a period of 8 consecutive weeks. Their results indicated that teachers vary in the typical classroom climate they provide and that, in addition, teachers differ in the consistency of classroom climate which they provide from one occasion to another. Overall they found that teachers' differences represented the major source of variation in the social-emotional climate of the classroom.

Sex, age and social class of Ss, and S expectancies are some variables that have been studied, however other sources of S differences need to be investigated since the role of the S in an experiment has been demonstrated to be one of the major sources of variability.

The Effect of the Reinforcer Used

Buss, Gerjuoy and Zusman (1958) studied the effect of a verbal reinforcer "Good" and nonverbal reinforcers Cigarettes-

Candy and Poker Chips on operant verbal conditioning and extinction. In this study the task was to select one of six pronouns plus the verb on a 3 x 5 inch card and make up a sentence. Each card constituted a trial, and there were 20 free responding trials, 60 acquisition trials, and 80 extinction trials. A total of 156 Ss were used including psychiatric patients and college students. It was found that Poker Chips were ineffective as a reinforcer but that "Good" and Cigarettes-Candy were effective.

Pishkin and Blanchard (1963) studied the effect of stimulus and social cues in concept identification with schizophrenics and normals. In their study 162 Ss (90 schizophrenics and 72 normals) solved a two-choice concept identification problem by matching their responses to the relevant dimension of the geometric patterns. There were six conditions involving relevant and/or irrelevant stimulus cues and social cues. The social cues were provided by feedback from responses by a stooge who served as S's partner. In addition to the basic variations of six conditions there were three different problem types involving form, size or number as the relevant dimension. Results of this study showed that for both populations the most difficult condition was where Ss operated under relevant stimulus cues along with irrelevant social cues. This was the only condition where normals produced significantly more errors than did schizophrenics. One of the major findings of the study was that for normals a social cue has 10 times the weight of a nonsocial cue, and that schizophrenics tend to be less influenced by social cues than do normal Ss. Pishkin

et al propose that social cues are of less value in schizophrenic learning due to the lack of interference by these cues.

Gerwitz et al (1958) studied the effects of low social availability of an adult and brief social deprivation on young children's behavior and found that conditioning could be achieved and responses maintained using opportunity for social reinforcement from adults as the reinforcer. In one study children ranging in age from 4-0 to 5-7 worked individually at easel painting in the presence of an adult. They could emit attention-seeking responses to the adult under conditions of the apparent low and high availability of the Ss, the adult appeared continually available (high-availability) i.e. he sat passively in back of the child, attending completely to him. The child was told that the adult would sit and watch him paint. With the remaining 28 children, the adult sat at a desk farther away, apparently engrossed in paper work (low availability) and the child was informed that the adult had work to do but that upon request he would be happy to supply all the materials the child needed. In the other study 32 children (3-10 to 5-3) played a two-response marble game individually in the presence of the adult experimenter. By reinforcing the initially less frequent response with approval ("Good" or "Um-hmm") the relative frequency of the response could be increased. Each child played the game in the adult's presence on two separate occasions. One occasion, defined as Social Deprivation, was preceded by a 20-minute period of isolation during which time the child waited alone, in a bare room, while the game was "repaired" by the adult in an

adjoining room. On the other occasion, defined as Non-deprivation, the child played the game immediately upon his arrival from his play group. Low availability of the adult and social deprivation in these 2 studies both effected similar increases in the incidence of behaviors by the children for social reinforcers from the adults. In the first study the mean frequency of attention-seeking responses was greater under the Low Availability condition than under the High Availability condition. And, similarly, in the second study the mean relative frequency of behaviors for approval was reliably increased by the Deprivation condition when compared to the Non-deprivation condition.

The effect of type of reinforcer has also been investigated by the manipulation of various verbal reinforcement combinations. Three frequently used reinforcement combinations have been: Right-Nothing in which E says "right" if S makes a correst response and nothing if he makes an incorrect response; Nothing-Wrong in which E says nothing if S makes a correct response and "wrong" if he makes an incorrect response; and Right-Wrong in which E says "right" if S makes a correct response and "wrong" if he makes an incorrect response. Much of the recent literature on the effect of these reinforcement combinations has tended to support the positions of Buss (1956) and Buchwald (1959). Buss (1956) found that the groups receiving Nothing-Wrong and Right-Wrong made the greatest number of correct responses and concluded that "wrong" was a stronger negative reinforcer than "right" was a positive reinforcer. Buchwald (1959) reported better performance by the groups receiving

Nothing-Wrong and Right-Wrong reinforcement and concluded that the differential effect between "right" and "wrong" could be attributed to the stronger value of saying nothing when it is combined with "wrong" than when it is combined with "right." Bradshaw (1967) investigated the effects of Right-Nothing versus Nothing-Wrong feedback in a paired-associate learning task with college students. The task involved 8 nonsense syllables and better learning was produced under the Right-Nothing verbal feedback condition. On the basis of a theoretical analysis of conceptual learning by Hovland (1952) the discrepancy between effectiveness of these reinforcement combinations can be explained in terms of amount of information conveyed (Bradshaw, 1967). The results of the work by both Buss and Buchwald was found to be in accord with Hovland's theory since in both their studies the Right-Nothing condition conveyed less information than did the other two combinations. While Hovland's analysis was not applicable to a study using paired-associate learning the effect of amount of information conveyed was found to hold up here also. In this investigation the first "right" under R-N reinforcement tells S that the number he has guessed is the appropriate number for that nonsense syllable and leaves him free to concentrate on the other seven nonsense syllables and numbers. That is, a single "right" reduces the number of possible number-syllable combinations from 8! to 7! or from 40320 to 5040. For the S under N-W reinforcement the first "wrong" tells him that the number he has guessed is not the appropriate number for that nonsense syllable. A single "wrong" therefore only

reduces the number of possible number-syllable combinations from 40320 to 40319.

With regard to the parameters of verbal conditioning, the bulk of the above evidence suggests that further research is needed to account for variabilities between experimental procedures and in particular to evaluate the effect that the phenomenon of the reinforcer, the E and the S have on verbal conditioning.

Statement of the Problem

The previously cited findings noting differences in learning which are produced through the effect of E, e.g., Binder, McConnel & Sjoholm (1957); Kanfer (1958); Solley & Long (1958); through the effect of S, e.g. Orne (1962); Pishkin *et al* (1967); Terrell *et al* (1959) and through the effect of the reinforcer, e.g. Buchwald (1959); Buss (1956) all point to the need for further research into these areas. Further support for the importance of the effect of such variables on verbal learning comes from the suggestions of Greenspoon (1962); Kanfer and Karas (1959); Krasner (1962) that verbal conditioning furnishes an analogue for studying such social interactions as psychotherapy or diagnostic interviews.

Interpretation of work such as that of Lovaas (1966) requires some understanding of the effects of verbal reinforcement also. As he states: "the term reinforcement has taken on many unfortunate connotations when extended to the human condition, in part because its meaning has been prematurely fixed on the basis of food delivery for pigeons and rats. It is often of considerable

surprise to people who visit our treatment setting to observe that we kiss, hug, and fondle the children when the description of these operations has been made in terms of reinforcement." (p. 106-107) Often when behavior therapy work is reported the data include only the objective measures of verbal reinforcement and fail to mention the extra reinforcements of attention, affection, smiles, etc. Again from Lovaas (1966, p. 113): "We did not objectively score these smiles, but filmed recordings of the children's behavior during shock avoidance training were made so that the appearance of these rather dramatic changes can be observed."

To study verbal conditioning as an analogue for other social interactions is to soon become aware of the difficulty in sharply delineating the measurable, objective data of interaction from the more subjective aspects of social interaction. Again from Lovaas (1966, p. 119): "The second kinds of problems which we face at the present time are conceptual problems. Let me illustrate this by giving you an example of a conversation I had with one of the children who has been in our treatment for about 2 years. Ricky, who now has come to the point of being rather facile with language, in response to one of my questions as to why he was making such crazy faces, replied that he was trying to scare away that particular school task which had given him considerable difficulty. I see this as a conceptual problem for us, since I don't see how this interaction could be handled within reinforcement therapy. It demands empathy."

The usage of teaching machines in the educational system

provides additional significance to the area of investigation of situational variables affecting verbal conditioning. There have been many reports of the effectiveness of programmed teaching (e.g. Bell, 1962; Carpenter & Fillmer, 1965; Fincher & Fillmer, 1965; Keisler & McNeil, 1961) but the effect of social versus mechanical reinforcement has not been studied in a simple learning paradigm in which the teacher provides similar feedback to the pupil as that provided by the teaching machine. Such an approach would allow inspection of the differences in effectiveness in a similarly-matched feedback program.

The present study was concerned with the different reinforcement effects in verbal conditioning as a function of variables such as the type of feedback (positive or negative) and the mode of feedback (social or mechanical) and the interactions among these two types of feedback. The variable of type of feedback was chosen because the literature on the effectiveness of positive versus negative feedback on verbal behavior shows conflicting results and because of the importance of understanding the motivational techniques of praise and reproof in learning situations. Mode of feedback was chosen as a variable because it is relevant to the issue of the effectiveness of different types of sensory reinforcement and because it affords an opportunity to compare and evaluate a learning situation which is an analogue for mechanical instruction versus teacher instruction.

It was predicted that: (1) positive feedback would elicit more correct responses than negative feedback, (2) social feedback

would elicit more correct responses than mechanical feedback. A third variable was race of Es and Ss. Black Ss were chosen as the population and an E of each race was chosen in order to explore the possibility of demand characteristics existing for the black child in a learning situation such as this. As the racial factor was an exploratory aspect of this study, no directional hypothesis was made for this variable. An additional question pertaining to the effect of length of list on the experimental variables was examined.

CHAPTER II

METHOD

Subjects

One-hundred-twenty students from 4th and 5th grade classes in the Oklahoma City Schools served as Ss. These grades were chosen because earlier research (Pishkin et al, 1967) has indicated that children in the age range from 9 to 12 years are less able to retain and utilize prior information and in this study the variation of length of material to be learned provided an opportunity to investigate this further. All Ss were black males and the criterion for selection was recommendation from their teacher that they were well behaved in class, socially accepted by their peers, and performed at an acceptable level academically. Only male Ss were chosen because of previous research (Pishkin et al, 1967) indicating superior performance of females.

Apparatus

The experiment was conducted in a quiet, well-lighted room containing two chairs and a small table holding a slide projector.

The slide projector used was a Kodak Carousel 80-cartridge slide projector. There were seventy-two slides in the condition

using eight nonsense syllables, and seventy-two slides in the condition using twelve nonsense syllables. The nonsense syllables varied in association value from 49% to 51%.

A movie screen was used as a screen between S and E in the mechanical feedback condition. The mechanical feedback was provided by means of a 6" x 12" formboard panel on which a 25 watt light bulb was mounted and this light was hand-operated by an off-on switch by E.

Experimenters

Es were two attractive female graduate students, one black and one white. Both students were in their mid-twenties and were first year graduate students. The Es were chosen because of their similarity in the following traits, based on the subjective evaluation of the author: 1) estimated level of intellectual functioning, 2) emotional stability, 3) open-ness, genuine-ness, warmth, 4) feminity, 5) general activity level, 6) friendliness, sociability, 7) dependability, 8) ability to establish rapport with children.

Procedure and Design

Ss were randomly divided into twelve different groups according to the design in Table 1. There were approximately an equal number of 4th and 5th grade Ss in each group. Groups 1, 2, 3 and 4 were conducted by the black E and groups 5, 6, 7 and 8 were conducted by the white E. Groups 9, 10, 11 and 12 were divided in half and each E worked with half of each group.

Table 1

Design of Experiment

Eight Nonsense Syllables

	Social		Mechanical	
	Positive	Negative	Positive	Negative
Black	Group 1 10 Ss	Group 2 10 Ss	Group 3 10 Ss	Group 4 10 Ss
White	Group 5 10 Ss	Group 6 10 Ss	Group 7 10 Ss	Group 8 10 Ss

Twelve Nonsense Syllables

Social		Mechanical	
Positive	Negative	Positive	Negative
Group 9	Group 10	Group 11	Group 12
5 Ss Black E 5 Ss White E	5 Ss Black E 5 Ss White E	5 Ss Black E 5 Ss White E	5 Ss Black E 5 Ss White E

When S entered the room the following instructions were read by E:

> I am going to show you some three letter words that look like words but they aren't like words you're used to seeing. I call them nonsense words. You'll see what I mean in just a minute because I'm going to show them to you, one at a time, up on the wall with this slide projector. Now there's 8 (12) different nonsense words and I've picked out a number that goes with each of these and it's some number between 2 and 9 (2 and 13). Each one has a different number and the numbers don't change so when you get one right try to remember it.
>
> What you have to do is to learn which number goes with which word. The only way you can do that is to guess. I will tell you (the light will come on) when you are right (wrong). Now once you guess one right, try to remember that that number goes with that word so the next time you see the word you can say that number again. Okay? You may guess several before you get one right but don't be discouraged, everyone has to guess a lot at first. And remember you don't make up a number, you try to guess which one I've assigned to each word and once you guess right then try to remember that that word and that number go together.

Social feedback consisted of E sitting alongside the child and saying "right" when S guessed correctly and nothing when he guessed incorrectly (R-N condition); or "wrong" when the child guessed incorrectly and nothing when he guessed correctly (N-W condition). Mechanical feedback consisted of E sitting on the opposite side of a movie screen from S, with the light panel in front of S. The light was turned on when S guessed correctly in the R-N condition; or when S guessed incorrectly in the N-W condition.

Instead of learning to criterion, there were a set number of trials and each S's score consisted of total number of correct responses.

In the eight nonsense syllable condition each S saw the eight different nonsense syllables 27 different times, with the trials presented in 9 random orders. In the twelve nonsense syllable condition each S saw each of the twelve different syllables 30 different times, with the trials presented in 6 random orders.

After the instructions were read, the projector was turned on and S was told to begin. Each slide was presented for 5 seconds and then changed automatically. If E did not respond during the 5 second presentation period E said nothing and marked a "zero" beside that nonsense syllable on the data sheet. If S responded late more than two times in succession E reminded him to respond faster as E could not answer his response if the slide had changed. If S failed to respond 2 times in succession he was prompted by E to guess on every slide. As S guessed numbers to match the nonsense syllables, E responded appropriately according to which feedback condition was operating. If an extra-list intrusion occurred, E recorded that response on the data sheet. Running time for the 8 nonsense syllable condition was approximately 20 minutes and for the 12 nonsense syllable condition was approximately 35 minutes.

CHAPTER III

RESULTS

Table 2 presents the overall means and standard deviations of the correct responses for the eight-pair list of this study. Raw data of total number of correct responses by groups are presented in Appendices 1 and 2. The summary of the three-way analysis of variance is presented in Table 3.

The means and standard deviations, respectively, of correct responses for the eight-pair list under conditions of positive and negative feedback were 64.3, 37.62 (positive) and 51.3, 25.55 (negative), a difference which was statistically significant, F (1,72) = 4.07, $p < .05$. Thus the predicted effect of more correct responses under conditions of positive feedback was obtained. The effect, type of feedback, was independent of any significant interaction with either Experimenter ($F < 1$) or Mode, F (1,72) = 1.34, $p > .25$. In addition, the three-way interaction was also nonsignificant, F (1,72) = 1.36, $p > .25$.

As indicated in Table 3, the hypothesis that more correct responses would be given under the condition of Social Mode of feedback than under the Mechanical Mode was not supported, F (1,72) = 1.98, $p > .10$. The means and standard deviations, respectively were 62.4, 35.15 (Social) and 53.2, 29.61 (Mechanical). As noted

Table 2

Mean Number of Correct Responses and Standard Deviations (Eight-pair list)

		Social		Mechanical	
		Positive	Negative	Positive	Negative
Black	$\bar{X}$	61.8	54.5	37.6	30.2
	SD	48.075	18.887	17.889	10.207
White	$\bar{X}$	83.5	49.6	74.4	70.7
	SD	35.908	25.526	29.815	28.092

Table 3

Summary of Analysis of Variance

Eight Nonsense Syllable List

Source of Variation	Sum of Squares	df	Mean Square	F	Prob.
A: Experimenter	11,068.5	1	11,068.5	13.10	<.001
B: Mode (Social-mechanical)	1,665.3	1	1,665.3	1.09	N.S.
C: Type (Positive-negative)	3,419.1	1	3,419.1	4.07	<.05
AxB: Experimenter x Mode	4,575.3	1	4,575.3	5.45	<.025
AxC: Experimenter x Type	655.5	1	655.5	<1	N.S.
BxC: Mode x Type	1,132.5	1	1,132.5	1.34	N.S.
AxBxC: Experimenter x Mode x Type	1,147.7	1	1,147.7	1.36	N.S.
Error	60,401.5	72	838.9		
Total	84,065.4	79			

earlier, the interaction of Mode of feedback and Type and the three-way interaction were both nonsignificant. The interaction, however, of Mode with Experimenter was significant, F (1,72) = 5.45, p <.025. This interaction will be given further attention below.

The third variable investigated was the number of Ss' correct responses as a function of the race of E. Examination of this variable (main effect, Experimenter, Table 3) reveals a significant difference, F (1,72) = 13.19, p <.001. The means and standard deviations of the numbers of correct responses under conditions of black versus white E were 46.0, 28.49 (black) and 69.6, 31.52 (white) respectively.

The interaction of Experimenter and Mode of feedback is presented graphically in Figure 1. A simple Effects Analysis of Variance was performed on this interaction (Table 4). This analysis revealed that the interaction between the white E and the black E on the condition of mechanical feedback was highly significant, F (1,72) = 17.81, p <.005. In addition the interaction of the black E with the Mode of presentation of feedback was significant, F (1,72) = 7.01, p <.025. This interaction indicates that mechanical feedback resulted in more correct responses than social feedback under conditions of the white E, while the reverse was true for the black E.

An additional question was raised as to whether there were significant group differences in number of response omissions or no-response errors. This data was recorded by entering a "0" each time a subject failed to respond. Comparisons were made

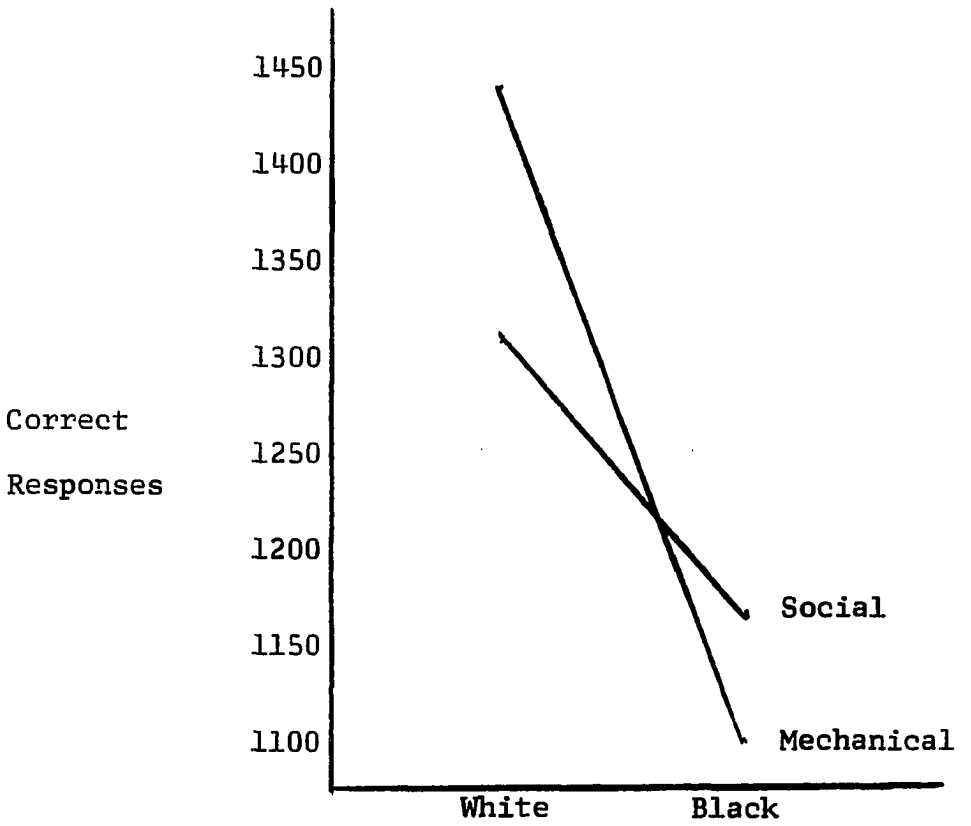

Figure 1. Total Number of Correct Responses Experimenter and Mode Interaction (Eight-Pair list).

Table 4

Simple Effects Analysis of Variance

Experimenter and Mode Interaction

Source of Variation	Sum of Squares	df	Mean Squares	F	Prof.
Experimenter vs Social	705.60	1	705.60	<1	
Experimenter vs Mechanical	14,938.23	1	14,938.23	17.81	<.005
Mode vs Black	5,880.62	1	5,880.62	7.01	<.025
Mode vs White	360.00	1	360.00	<1	
Error		72	838.90		

between Experimenter and Type, Experimenter and Mode, and Mode and Type. For Experimenter and Type the obtained scores were: Black: positive, 41, negative, 14; White: positive 33, negative, 58. This difference was not significant, X^2 (1) = 1.45, p. $>$.3. On the Experimenter and Mode comparison the obtained scores were, Black: social, 23, mechanical, 32; White: social, 54, mechanical 37. This difference was significant, X^2 (1) = 4.2, p. $<$.05. On the Mode and Type comparison the obtained scores were, Social: positive, 32, negative, 45; Mechanical: positive, 42, negative, 27. This difference was significant, X^2 (1) = 5.39, p $<$.05. Examination of omission data indicates that social feedback resulted in more omissions than mechanical feedback under the conditions of the white E, while the reverse was true for the black E. Another observation from this data is that negative feedback resulted in more omissions than positive feedback under the conditions of social feedback, while the reverse was true for mechanical feedback. The interaction of Experimenter and Mode of feedback for number of omissions was also significant which is in agreement with the Experimenter and Mode of feedback interaction for the number of correct responses.

The additional question pertaining to the effect of length of list on the experimental variance was examined by a three-way analysis of variance (Table 5). The overall means and standard deviations for the twelve-pair list are presented in Table 6. The means and standard deviations, respectively, of correct responses for the twelve-pair list under conditions of positive and negative

Table 5

Summary of Analysis of Variance

Twelve Nonsense Syllables

Source of Variation	Sum of Squares	df	Mean Square	F	Prob.
A: Experimenter	2,673.23	1	2,673.23	6.91	<.025
B: Mode	680.63	1	680.63	1.75	<.20
C: Type	1,729.23	1	1,729.23	4.47	<.05
AxB: Experimenter x Mode	1,032.22	1	1,032.22	2.66	<.20
AxC: Experimenter x Type	56.02	1	56.02	<1	N.S.
BxC: Mode x Type	632.02	1	632.02	1.63	N.S.
AxBxC: Experimenter x Mode x Type	418.03	1	418.03	1.08	N.S.
Error	12,378.40	32	386.83		
Total	19,599.78	39			

Table 6

Mean Number of Correct Responses and Standard Deviations for the Twelve-Pair List

		Social		Mechanical	
		Positive	Negative	Positive	Negative
Black	$\bar{X}$	48.2	60.4	51.6	60.8
	SD	14.81	14.04	5.73	5.81
White	$\bar{X}$	65.8	95.8	61.8	63.0
	SD	37.72	27.39	16.30	13.13

feedback were 56.9, 21.52 (positive) and 70.0, 21.85 (negative), a difference which was statistically significant, F (1,32) = 4.47, $p < .05$. Thus, while Type of feedback was again a significant variable, on the twelve-pair list more correct responses were obtained under conditions of negative feedback. This result is in opposition to the finding of superior performance under positive feedback in the eight-pair list.

The above effect, Type of feedback, was independent of any significant interaction with either Experimenter ($F < 1$) or Mode, F (1,32) = 1.63, $p > .10$. In addition, the three-way interaction was also nonsignificant, F (1,32) = 1.08, $p > .250$. Again, as indicated in Table 5, the hypothesis that more correct responses would be given under the condition of social mode of feedback than under the mechanical mode was not supported, F (1,32) = 1.75, $p < .20$. The means and standard deviations, respectively, were 67.6, 29.46 (social) and 59.3, 11.30 (mechanical). This result is in agreement with the null effect for Mode of feedback for the eight-pair list.

The means and standard deviations of the number of correct responses under conditions of black versus white Es were 55.3, 11.55 (black) and 71.6, 27.52 (white). Examination of this variable (main effect, Experimenter, Table 5) reveals a significant difference, F (1,32) = 6.91, $p < .025$. This finding is consistent with the result of the eight-pair list. Thus it may be concluded that in this study the same variables (Type of feedback and Experimenter) were significant on both the eight-pair list and

the twelve-pair list, but for Type of feedback the direction was reversed in the twelve-pair list.

Examination of the omission data for the twelve-pair list reveals that on the Experimenter and Type comparison the obtained scores were Black: positive, 5, negative, 3; White: positive, 28, negative, 31. This difference was not significant X^2 (1) = .56, $p > .30$. On the Experimenter and Mode comparison the obtained scores were, Social: positive, 16, negative, 8; Mechanical: positive, 17, negative, 26. This difference was significant X^2 (1) = 4.14, $p < .05$. The analysis of this data revealed that positive feedback resulted in more omissions than negative feedback under the conditions of social feedback, while the reverse was true for mechanical feedback. This result is in agreement with the Mode and Type comparison on the eight-pair list.

CHAPTER IV

DISCUSSION

Verbal behavior has been defined by B. F. Skinner (1957) as behavior whose reinforcement is delivered through the mediation of another individual. Many verbal conditioning studies have emphasized the importance of Experimenter (E) variables and have offered techniques for investigating in detail these variables in interpersonal situations. Implicit in these studies has been the assumption that various gross E variables, such as sex, appearance, and status, can be reduced to a few dimensions of E's influence on S and can be investigated independently. Also implicit is the idea that there is no aspect of the reinforcement "machine" which cannot be broken down to see what makes it tick. This study has attempted to take a closer look at some of the parts of the reinforcement machine. It was planned specifically to compare the variables of positive and negative feedback, the effectiveness of mechanical feedback and social feedback and to take a closer look at some of the interpersonal differences between experimenters and subjects.

Effects of Feedback

Positive versus Negative Feedback. The first hypothesis was that positive feedback would elicit more correct responses

than negative feedback. This hypothesis was supported on the eight-pair list, although the reverse was found on the twelve-pair list, i.e. negative feedback was more effective than positive. The literature on the effectiveness of negative feedback on verbal behavior shows conflicting results. Buss and Buss (1956) reported results which indicated that negative feedback was more conducive to the acquisition of the correct response than was positive feedback. Greenspoon (1951) and Kirman (1958) however, found better learning rates for subjects receiving positive feedback than for those receiving negative feedback.

Salzinger (1959) has interpreted Buss's results as an example of the strengthening of behavior through the avoidance of negative reinforcement. While this result has been found often in animal studies there are very few studies on verbal behavior which report on the use of negative reinforcement. It is the author's suggestion that it is difficult to generalize from animal to human studies and from concept identification to paired-associate paradigms. In the author's earlier (1967) study and in the present one, positive feedback proved to be significantly better than negative reinforcement on the eight nonsense syllable task. Both of these studies involved a paired-associate task. The study by Buss (1956), involved a concept identification task while conflicting results have come from studies which used paired-associate learning. Therefore it seems likely that the variable of verbal feedback operates differently on different tasks. Bradshaw (1967) found positive feedback more effective than negative on a longer

list, i.e. on a 12 nonsense syllable paired associate paradigm. The present study reveals that while positive feedback was significantly better than negative feedback on the eight nonsense syllable task the reverse was true on the twelve nonsense syllable task. The confounding factor here may be the population of each study. In the 1967 study the population was college students whereas in the present study the population was fourth and fifth grade elementary students. While it is difficult to account for the differential effects in the present research one possibility is that a longer list was more difficult for elementary students to handle and made the information conveyed less useful to them.

Auble and Mech (1953) have discussed the role of motivational techniques of praise and reproof in classroom situations. In their study elementary school students performed a routine task of addition and subtraction problems and the control group, which received no reinforcement, compared favorably with the reinforced group. This is contradictory to Hurlock's study (1925) which found that the "praised" group did the better work. Perhaps as Auble and Mech suggested verbal reinforcement has the property of reducing variability of performance of a routine task.

Verbal versus Nonverbal Feedback. The second hypothesis was that more correct responses would be elicited under the condition of social feedback than under the condition of mechanical feedback. Hypothesis 2, while not supported at an acceptable level of significance, dealt with a measurable aspect of social interaction and raised some interesting additional questions. One of

these questions concerns the effectiveness of sensory reinforcement. Greenspoon (1951) was able to use sound effectively as a reinforcing stimulus but some other experimenters have not found that result. Ball (1953) using a light and Taffel (1955) using sound were not able to demonstrate conditioning for responses which consisted of sentences. Nuthmann (1957) found that a light stimulus did not constitute a reinforcing event in an experiment using statement of self acceptance as a response class. Although neither mode of feedback in the present study proved superior to the other, it is clear that both were effective in producing learning.

Another question that the topic of verbal versus nonverbal reinforcement brings to mind is its application to the classroom, especially the comparison of programmed instruction to teacher instruction. Although the role of a teacher and an experimenter are not the same, the present investigation provided a simple learning paradigm in which the E provided feedback to the pupil similar to that provided by the apparatus. Often studies which have attempted to compare programmed instruction to teacher instruction have not evaluated or controlled for the study time of the experimental and control groups. In this study the same amount of time was spent in learning under the condition of mechanical feedback as in the condition of "teacher" or experimenter-social feedback. The level of achievement was measured in the same way for each group, e.g. total number of correct responses. Also the type of feedback information (whether the subject had guessed correctly or incorrectly) was the same for both modes of feedback.

This then gives a close comparison for evaluation of a learning situation similar to that involving mechanical instruction versus teacher instruction. Lieb (1967) suggested other questions to be answered by research in order to make programmed instruction more effective in the classroom. Some of these were: at what point in learning to introduce programmed instruction, the prerequisites which are needed before programmed instruction is begun, and whether or not the effectiveness of programmed instruction differs with varying levels of intelligence. In view of some of these questions it would be useful to replicate the results of this study, matching Ss on important variables such as intelligence, and to compare the results of mechanical instruction to teacher instruction on this basis. Another line of investigation would be to determine which method of instruction produces the greatest amount of retention.

Another issue related to verbal versus nonverbal reinfrocement is the variation of types of reinforcement. Wickes (1956) contrasted the effect of verbal reinforcements with nonverbal reinforcements in a study in which the dependent variable was reporting movement in response to inkblots. The verbal reinforcements consisted of the following repetitive sequence: "fine" for the first response, "good" for the next, and "all right" for the next. The nonverbal reinforcements consisted of the following repetitive sequence: for the first response E nodded his head three times, for the second he smiled, for the third he leaned forward in his chair after the response and then returned to his initial position. In Wickes' study both types of reinforcements were effective

but the non-verbal ones were more effective than the verbal ones. Verplanck (1956) demonstrated discriminative behavior in the absence of S's awareness by using the presence of a cigarette in an ash tray, E crossing his legs and E putting a pencil down, all as discriminative stimuli. These studies, as well as the present one, are interesting from the standpoint of the mediating effects non-verbal reinforcements have on verbal behavior and the study of such reinforcements can shed much light on understanding of social interactions, such as a clinical interview, for which verbal conditioning studies are an analogue.

Although in this study social versus mechanical feedback did not prove to be a significant variable, the Mode (social-mechanical) versus Experimenter interaction was significant. An interpretation of this result is that since Experimenter difference proved to be a highly significant variable, the social-interaction with one E was confounded by or cancelled out by the social interaction with the other E. This would explain the significance found on the Mode versus Experimenter interaction with the lack of significance on the social-mechanical variable alone.

Effect of Experimenters

While race of E was the third variable, it was not expected that the difference in Es would be a great as it was or that it would be in the direction of greater learning achieved by the groups with the white E. There are many possible explanations of this result, the first being that there is a difference

according to race, another being that there is an interpersonal difference which has nothing to do with race but which was not measured.

An attempt was made to measure interpersonal differences by means of a rating scale designed by the author (see Appendix 3). Two clinical psychologists interviewed the Es and then evaluated them on the basis of this rating scale. This method of measuring interpersonal differences however showed no reliable differences between Es.

If the difference in Es was due to race it may be that the Ss perceived the negative feedback given socially by the black E as less discouraging than negative social feedback given by the white E. This might account for the fact that the groups receiving negative social feedback from the white E achieved fewer correct responses than did any of the other three groups with which she worked, whereas the group receiving negative social feedback from the black E was the second highest of the four groups with which she worked, in terms of number of total correct responses. This might be interpreted as an indication that social feedback is more influential from a white E than from a black E which suggests the possibility that with an E of the same race, the feedback may have less of an "emotional" quality.

Effect of Subjects

An alternative explanation of the difference between the learning rate produced by groups run by the white E and the rate

produced by groups run by the black E is the interaction between race of E and the Ss' susceptibility to influence. Inspection of the number of omissions made in the presence of each E on the eight-pair list reveals that significantly more omissions occurred in those groups with a white E than in those with a black E in the social versus mechanical feedback condition, and in the negative-social and positive-mechanical conditions where E differences were ignored. The effect of E and of social feedback seems to be even greater on the twelve-pair list than on the eight-pair list. The mean number of correct responses was higher and the standard deviations showed the most variability for those Ss who received either positive ($\bar{X}$ = 65.8, S.D. = 37.72) or negative ($\bar{X}$ = 95.8, S.D. = 27.39) social reinforcement from a white E on the twelve-pair list. Benton (1955), Davids (1955) and Taffel (1955) have suggested anxiety as a drive in reference to verbal behavior. In Benton's study it was found that individuals with high anxiety uttered more words in response to TAT cards. Davids' study revealed that highly anxious individuals gave more chained verbal associations than individuals who were less anxious. Taffel's study showed that only individuals with high or medium amounts of anxiety showed verbal conditioning, with highly anxious Ss conditioning more than Ss with medium anxiety. Gerwitz and Baer's (1959) interpretation of this is that anxious individuals behave as if they had been deprived of social reinforcement. To broaden this somewhat before relating it to this research, an additional suggestion is made by Kanfer and Karas (1959) who offer the idea that one effect on the patient's

verbal output may relate to his perception of E, based on earlier experiences with him, or by direct generalization from experiences with people whom E resembles in some way. To bring these two suggestions together to bear on the results of this study, the idea is offered that a black student may initially behave toward a white teacher or E in a way which reflects the student's expectation as to how he will be perceived. That is, there may be a challenge for a black student to show a white teacher that he is better than she expects him to be. This could be especially true if a particular child feels he has been less accepted by white people he has experienced than by black people he has experienced. It is the author's suggestion that if this is the case, the expectation resulting from racial difference may be a temporary effect which is no longer present once the child feels accepted by the particular white teacher and that as he feels more accepted he may become less anxious. Due to the brief amount of time spent with Es in this study, if this were the explanation, any anxiety along these lines would not have had time to dissipate. If this were not true, if as this experiment demonstrates, black students learn more effectively in the presence of white teachers or Es than in the presence of black teachers or Es, there would be a great deal of evidence of the difference in teacher effectiveness and examination of the literature does not support this.

Heller (1959) has suggested that susceptible Ss are more dependent, more anxious, more compliant, have a higher need for social approval, a lower degree of ego strength and are more

susceptible to verbal conditioning than others. These characteristics Heller suggests are also attributable to psychotherapy patients. He indicated that the most potent determinant of the effectiveness of influence may lie within the characteristics of the S to be influenced rather than being a function of the experimental manipulations imposed on him.

Implications for Future Research

The study of situational variables affecting verbal conditioning can add much to the understanding of verbal behavior. Research to date makes it clear that the verbal conditioning phenomenon has not yet been sufficiently explored to account for variabilities between experimental procedures in terms of the presently known variables. The laboratory provides a situation in which the verbal output of Ss and the mediating effect of Es and reinforcers can be studied. The sensitivity and variability of verbal behavior indicate that there is much to be learned yet in this area.

Further study should be given to the effects of verbal feedback on different types of tasks, routine and complex, in order to gain understanding about verbal reinforcers particularly for use in classroom situations where praise and reproof interact so much with students' performance. The use of a control group would seem advisable to investigate further the idea that verbal feedback reduces the variability in performance of Ss. The finding that positive feedback was more effective on the

eight-pair list and negative feedback was more effective on the twelve-pair list suggests the need for studies to investigate the differential effectiveness of positive versus negative verbal feedback and complexity of task.

The effectiveness of different types of non-verbal feedback versus different types of verbal feedback needs further study and can add much to the understanding of verbal conditioning phenomena. This has application not only to better research techniques in the study of verbal behavior but also to the comparison of mechanical instruction versus teacher instruction. Teaching machines and programmed instruction seem likely to play an increasingly important role in education and there are many areas that need exploration, for example; matching Ss on intelligence. Personality and attitude scales would provide additional information on the proper use of mechanical instruction, as to which students can profit best from it. Other comparisons of mechanical instruction to teacher instruction might include variations in time spent, retention of material learned, and the point in learning at which these methods are instituted.

With many of the problems of racial integration in classrooms still to be solved, the comparison of black and white Es seems to be a particularly fruitful area of research. The question of why the groups who had a white E had more correct responses than the groups who had a black E is still not satisfactorily answered. A valuable replication of the present study would involve using the same Es with a matched population of white Ss and black Ss in order

to better understand the differential interpersonal or inter-racial effectiveness. Investigation of other interpersonal differences in Es and in Ss should also be undertaken. Data on E differences to date have revealed differences in conditioning due to status, age, and sex of Es. Race, personality differences and ability to establish rapport with Ss should also be investigated. Similar information regarding Ss would be valuable and in particular a measure of subjectivity or anxiety would be useful.

CHAPTER V

SUMMARY

This study evaluated the differences in learning due to the effect of experimenters, the effect of subjects and the effect of reinforcers. The purpose of the investigation of these variables was to provide more information and understanding about verbal conditioning and verbal behavior and to furnish analogues for social interactions such as psychotherapy or diagnostic interviews. Interpretation of the work of Lovaas (1966) and other behavior therapists would be benefitted by such research findings.

Ss in this study were fourth and fifth grade black male students and the learning task was a paired-associate paradigm. Eight groups of 10 Ss each learned a paired-associate list of eight nonsense syllables with reinforcement being delivered either socially by an E responding verbally, or mechanically by the onset of a light on a panel placed in front of S. Groups were divided according to Type of feedback (positive or negative) and Mode of feedback (social or mechanical). A black E worked with four of the groups and a white E worked with four of the groups.

An additional four groups of 10 Ss each learned a paired-associate list consisting of 12 nonsense syllables. These groups were divided according to Type and Mode of feedback and half of

each group was run by each E.

It was found that positive feedback elicited more correct responses than negative feedback on the eight nonsense syllable task but not on the twelve nonsense syllable task. This discrepancy was explained on the basis that the more complex task made the effect of feedback more variable.

It was hypothesized that more correct responses would be elicited under the condition of social feedback than under the condition of mechanical feedback. While this hypothesis was not supported, a significant interaction effect was found between race of E and mode of feedback. This was interpreted in terms of the fact that since E difference proved to be a highly significant variable, the social-interaction with one E was confounded by or cancelled out by the social-interaction with the other E. Since teaching machines and programmed instruction seem likely to play an increasingly important role in education, a fruitful area of research would be the comparison of mechanical feedback to social feedback in other analogues to the learning situation.

While race of E was investigated to see if there might be demand characteristics existing for the black child in this learning situation it was not expected that the variable would be as significant as it was or that it would be in the direction of greater learning in groups with the white E. This variable is suggested for further research as it is not clear whether it was a racial difference or merely an interpersonal difference.

Personality and racial differences in Es and in Ss are

suggested as significant variables that need further research and have wide application to the current educational system.

REFERENCES

Auble, D. & Mech, E. V. Quantitative studies of verbal reinforcement in classroom situations: I. Differential reinforcement related to the frequency of error and correct responses. Journal of Psychology, 1953, 35, 307-312.

Auble, D. & Mech, E. V. Partial verbal reinforcement related to distributed practice in a classroom situation. Journal of Psychology, 1953, 36, 165-186.

Ball, R. S. Reinforcement conditioning of verbal behavior by verbal and nonverbal stimuli in a situation resembling a clinical interview. Unpublished Ph.D. Dissertation, Indiana Univ., 1953.

Benton, A. L., Hartman, C. H., & Sarason, J. G. Some relations between speech behavior and anxiety level. Journal of Abnormal and Social Psychology, 1955, 51, 295-297.

Bijou, S. W. Patterns of reinforcement and resistance to extinction in young children. Child Development, 1957, 28, 47-54.

Bijou, S. W. & Sturges, P. T. Positive reinforcers for studies with children: consumables and manipulatables. Child Development, 1959, 30, 151-170.

Binder, A., McConnell, D., & Sjoholm, N. A. Verbal conditioning as a function of experimenter characteristics. Journal of Abnormal and Social Psychology, 1957, 55, 309-314.

Bourne, L. E., Guy, D. E., Dodd, D. H. & Justeen, D. R. The effect of varying length and informational components of the intertrial interval. Journal of Experimental Psychology, 1965, 69, 624-629.

Bourne, L. E., Guy, D. E. & Wadsworth, N. Verbal-reinforcement combinations and the relative frequency of informative feedback in a card-sorting task. Journal of Experimental Psychology, 1967, 73, 220-226.

Bourne, L. E. & Lang, D.S. Performance in a verbal-conditioning situation as a function of shifts in reinforcement ratio. Journal of General Psychology, 1960, 63, 211-218.

Bradshaw, J. T. The effect of pre-training on reinforcement combinations in verbal learning. Unpublished M. A. Thesis, Arizona State Univ., 1967.

Buchwald, A. M. Experimental alterations in the effectiveness of verbal reinforcement combinations. Journal of Experimental Psychology, 1959, 57, 351-361.

Buchwald, A. M. Extinction after acquisition under different verbal reinforcement combinations. Journal of Experimental Psychology, 1959, 57, 43-48.

Buchwald, A. M. Supplementary report: Alteration in the reinforcement value of a positive reinforcer. Journal of Experimental Psychology, 1960, 60, 416-418.

Buchwald, A. M. The effect of some variations in procedure on response repetition following verbal outcomes. Journal of Verbal Learning and Verbal Behavior, 1966, 5, 77-85.

Buss, A. H. A study of concept formation as a function of reinforcement and stimulus generalization. Journal of Experimental Psychology, 1950, 40, 494-503.

Buss, A. H., Braden, W., Orgel, A., & Buss E. Acquisition and extinction with different verbal reinforcement combinations. Journal of Experimental Psychology, 1956, 52, 288-295.

Buss, A. H. & Buss, E. The effect of verbal reinforcement combinations on conceptual learning. Journal of Experimental Psychology, 1956, 52, 283-387.

Buss, A. H., Weiner, M. & Buss, E. Stimulus generalization as a function of verbal reinforcement combinations. Journal of Experimental Psychology, 1954, 48, 433-436.

Buss, A. H., Gerjuoy, I. R., & Zusman, J. Verbal conditioning and extinction with verbal and nonverbal reinforcers. Journal of Experimental Psychology, 1958, 56, 139-145.

Buss, A. H. & Lang, P. J. Psychological deficit in schizophrenia: I. Affect, reinforcement, concept attainment. Journal of Abnormal Psychology, 1965, 70, 2-24.

Cantor, Gordon. Effect of 3 types of pretraining on discrimination learning in preschool children. Journal of Experimental Psychology, 1955, 49, 339-342.

Carpenter, P. W. & Fillmer, H. T. A comparison of teaching machines & programmed texts in teaching of Algebra I. Journal of Educational Research, 1965, 58, 218-221.

Carroll, J. B. & Burke, M. L. Parameters of paired-associate verbal learning: length of list, meaningfulness, rate of presentation, and ability. Journal of Experimental Psychology, 1965, 69, 543-553.

Cohen, B. D., Kalish, H. I., Thurston, J. R. & Cohen, E. Experimental manipulation of verbal behavior. Journal of Experimental Psychology, 1954, 47, 106-110.

Cothran, T. C. Negro conceptions of white people. American Journal of Sociology, 1951, LVI, 458-467.

Criswell, J. H. Racial cleavage in negro-white groups. Sociometry, 1937, 1, 81-89.

Criswell, J. H. Social structure revealed in a sociometric re-test. Sociometry, 1939, 2, 69-75.

Davids, A. & Eriksen, C. W. The relation of manifest anxiety to association productivity and intellectual attainment. Journal of Consulting Psychology, 1955, 19, 219-222.

Dreikurs, R. The cultural implications of reward and punishment. International Journal of Social Psychiatry, 1958, 4, 171-178.

Edwards, A. L. Experimental design in psychological research. New York: Rinehart & Company, Inc., 1960.

Essman, W. B. Awareness of reinforcement in "learning without awareness." Psychological Reports, 1957, 3, 399-400.

Essman, W. B. "Learning without awareness" of responses to perceptual and verbal stimuli as a function of reinforcement schedules. Perceptual and Motor Skills, 1959, 9, 15-25.

Ferguson, E. L & Buss, A. H. Supplementary report: Acquisition, extinction, and counter-conditioning with different verbal reinforcement combinations. Journal of Experimental Psychology, 1959, 58, 94-95.

Fincher, G. & Fillmer, H. T. Programmed instruction in elementary arithmetic. Arithmetic Teacher, 1965, 12, 19-24.

Gerwitz, H. B. Generalization of children's preferences as a function of reinforcement and task similarity. Journal of Abnormal and Social Psychology, 1959, 58, 111-118.

Gerwitz, J. L. & Baer, D. M. The effects of brief social deprivation on behaviors for a social reinforcer. Journal of Abnormal and Social Psychology, 1958, 56, 49-56.

Gerwitz, J. L., Baer, D. M. & Roth, C. H. A note on the similar effects of low social availability of an adult and brief social deprivation on young children's behavior. Child Development, 1958, 29, 149-152.

Goodman, M. E. Race awareness in young children. Cambridge, Mass.: Addison-Wesley, 1952.

Goss, A. E., Morgan, C. H. & Golin, S. J. Paired-associate learning as a function of percentage of occurrence of response members (reinforcement). Journal of Experimental Psychology, 1959, 57, 96-104.

Goulet, L. R. Verbal learning in children: implications for developmental research. Psychological Bulletin, 1968, 69, 359-376.

Greenspoon, J. The effect of verbal and nonverbal stimuli on the frequency of members of two verbal response classes. Unpublished Ph.D. Dissertation, Indiana Univ., 1951.

Greenspoon, J. The reinforcing effect of two spoken sounds on the frequency of two responses. American Journal of Psychology, 1955, 68, 409-416.

Gross, L. J. Effects of verbal and non-verbal reinforcement in the Rorschach. Journal of Consulting Psychology, 1959, 23, 66-68.

Heller, K. Experimental analogues of psychotherapy: the clinical relevance of laboratory findings of social influence. Journal of Nervous and Mental Diseases, 1959, 129, 375-384.

Hildum, D. C. & Brown, R. W. Verbal reinforcement and interviewer bias. Journal of Abnormal and Social Psychology, 1956, 53, 108-111.

Hovland, C. I. A communication analysis of concept learning. Psychological Review, 1952, 59, 461-472.

Hovland, C. I. & Weiss, W. Transmission of information concerning concepts through positive and negative instances. Journal of Experimental Psychology, 1953, 45, 175-182.

Hurlock, E. B. An evaluation of certain incentives used in school work. Journal of Educational Psychology, 1925, 16, 145-159.

Kanfer, F. H. Verbal conditioning: reinforcement schedules and experimenter influences. Psychological Reports, 1958, 4, 443-452.

Kanfer, F. H. & Karas, S. C. Prior experimenter-subject interaction and verbal conditioning. Psychological Reports, 1959, 5, 345-353.

Kanfer, F. H. & Matarazzo, J. D. Secondary and generalized reinforcement in human learning. Journal of Experimental Psychology, 1959, 58, 400-404.

Keislar, E. R. & McNeil, J. D. Teaching scientific theory to 1st grade pupils by auto-instructional device. Harvard Educational Review, 1961, 31, 73-83.

Keller, F. S. Animals and children. Child Development, 1950, 21, 7-12.

Kepros, P. G. & Bourne, L. E. Identification of biconditional concepts: effects of number of relevant and irrelevant dimensions. Canadian Journal of Psychology, 1966, 20, 198-207.

Kirman, W. J. The relationship between learning, with and without awareness, to personality needs. Unpublished Ph.D. Dissertation, Columbia Univ., 1958.

Kogan, C. L. Withdrawal of a positive reinforcer and strength of behavior in children. Dissertation Abstracts, 1956, 16, 1000.

Krasner, L. Therapist as a social reinforcement machine. In H. H. Strupp & L. Luborsky (Eds) Research in Psychotherapy, Washington, D. C.: American Psychological Association, Inc., Sept. 1962, 61-94.

Krasner, L. Studies of the conditioning of verbal behavior. Psychological Bulletin, 1958, 55, 148-170.

Leib, J. W., Cusack, J., Hughes, D., Pilette, S. & Werther, J. Teaching machines and programmed instruction: areas of application. Psychological Bulletin, 1967, 67, 12-26.

Leventhal, A. M. The effects of diagnostic category and reinforcer on learning without awareness. Journal of Abnormal and Social Psychology, 1959, 59, 162-166.

Long, E. R., Hammack, J. T., May, F. & Campbell, B. J. Intermittent reinforcement of operant behavior in children. Journal of Experimental Analysis of Behavior, 1958, 1, 315-339.

Lord, E. Experimentally induced variation in Rorschach performance. Psychological Monographs, 64: No. 10 (whole no. 316), 1950.

Lovaas, O. I. Some studies on the treatment of childhood schizophrenia. In J. M. Shlien (Ed). Research in Psychotherapy, Washington, D. C.: American Psychological Association, Inc., June 1966, 103-121.

Lovaas, O. I. Control of food intake in children by reinforcement of relevant verbal behavior. Journal of Abnormal and Social Psychology, 1964, 68, 672-678.

Lovaas, O. I., Freitag, G., Gold, V. J. & Kassorla, I. B. Experimental studies in childhood schizophrenia: analysis of self-destructive behavior. Journal of Experimental Psychology, 1965, 2, 67-84.

Lydecker, W. K., Fishkin, V. & Martin, B. Effects of different feedback conditions on the concept identification of schizophrenics. Psychological Reports, 1961, 9, 557-563.

McDaniel, P. A. & Babchuk, N. Negro conceptions of white people in a north-eastern city. Phylon, 1960, 21, 7-19.

McNair, D. M. Reinforcement of verbal behavior. Journal of Experimental Psychology, 1957, 53, 40-46.

Mandler, G. & Kaplan, W. K. Subjective evaluation and reinforcing effect of a verbal stimulus. Science, 1956, 124, 582-583.

Matarazzo, J. D., Saslow, G., & Pareis, E. N. Verbal conditioning of two response classes: some methodological considerations. Journal of Abnormal and Social Psychology, 1960.

Morland, J. K. Racial acceptance and preference of nursery school children in a southern city. Merrill-Palmer Quarterly, 1962, 8, 271-280.

Mussen, P. H. Differences between the TAT responses of negro and white boys. Journal of Consulting Psychology, 1953, 17, 373-376.

Mitzel, H. E. & Rabinowitz, W. Assessing social-emotional climate in the classroom by Whitehall's technique. Psychological Monographs, 1953, 67, 1-19. No. 18.

Nuthmann, A. M. Conditioning of a response class on a personality test. Journal of Abnormal and Social Psychology, 1957, 54, 19-23.

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.

Oseas, L. & Underwood, B. J. Studies of distributed practice: V. learning and retention of concepts. Journal of Experimental Psychology, 1952, 43, 143-148.

Palermo, David S. Association value of responses in PA learning of children and adults. Journal of Verbal Learning and Verbal Behavior, 1964, 3, 171-175.

Peterson, M. J. Verbal responses strength as a function of cultural frequency, schedules of reinforcement and number of trials. Journal of Experimental Psychology, 1956, 52, 371-376.

Pishkin, V. Experimenter variables in concept identification feedback of schizophrenics. Perceptual and Motor Skills, 1963, 16, 921-927.

Pishkin, V. Perceptual judgment of schizophrenics and normals as a function of social cues and symbolic stimuli. Journal of Clinical Psychology, 1966, 22, 3-10.

Pishkin, V. & Blanchard, R. J. Stimulus and social cues in concept identification of schizophrenics and normals. Journal of Abnormal and Social Psychology, 1963, 67, 454-463.

Pishkin, V. & Shurley, J. T. Auditory dimensions and irrelevant information in concept identification of males and females. Perceptual and Motor Skills, 1965, 20, 673-683.

Pishkin, V., Wolfgang, A. & Rasmussen, E. Age, sex, amount and type of memory information in concept learning. Journal of Experimental Psychology, 73, 1967, 121-124.

Quay, H. The effect of verbal reinforcement on the recall of early memories. Journal of Abnormal and Social Psychology, 1959, 59, 254-257.

Reidy, M. E. A study of the unconscious effects of approval and disapproval on verbal behavior. Washington, D.C.: Catholic Univ. America Press, 1958, 43, 13-28.

Rogers, J. Maurice. Operant conditioning in a quasi-therapy setting. Journal of Abnormal and Social Psychology, 1960, 60, 247-252.

Rosenthal, R. On the social psychology of the psychological experiment: The experimenter's hypothesis as unintended determinant of experimental results. American Scientist, 1963, 51, 268-283.

Rosenthal, R. Experimenter outcome-orientation and the results of the psychological experiment. Psychological Bulletin, 1964, 61, 404-412.

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

Rosenthal, R., Fode, K. L., Friedman, C. J. & Vikan-Kline, Linda. Subjects; perception of their experimenter under conditions of experimenter bias. Perceptual and Motor Skills, 1960, 11, 325-331.

Rosenthal, R., Fode, K. L., Vikan-Kline, Linda & Persinger, G.W. Verbal conditioning: Mediator of experimenter expectancy effects? Psychological Reports, 1964, 14, 71-74.

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

Rosenthal, R., Kohn, P., Greenfield, P. M., & 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. & Fode, K. L. Experimenter bias, anxiety and social desirability. Perceptual and Motor Skills, 1962, 15, 73-74.

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

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

Runquist, W. N. Order of presentation and number of items as factors in paired-associate verbal learning. Journal of Verbal Learning and Verbal Behavior, 1965, 4, 535-540.

Salzinger, K. Experimental manipulation of verbal behavior: A review. Journal of General Psychology, 1959, 61, 65-94.

Salzinger, K. & Pisoni, S. Reinforcement of affect responses of schizophrenics during the clinical interview. Journal of Abnormal and Social Psychology, 1958, 57, 84-90.

Salzinger, K. & Pisoni, S. Reinforcement of verbal affect responses of normal subjects during the interview. Journal of Abnormal and Social Psychology, 1960, 60, 127-130.

Sapolsky, A. Effect of interpersonal relationships upon verbal conditioning. Journal of Abnormal and Social Psychology, 1960, 60, 421-426.

Shapiro, S. S. Paired-associate learning in children. Child Development, June, 1966.

Sidowski, J. B. Influence of awareness of reinforcement on verbal conditioning. Journal of Experimental Psychology, 1954, 48, 355-360.

Siegel, P. S. & Foshee, J. G. The law of primary reinforcement in children. Journal of Experimental Psychology, 1953, 45, 12-14.

Skinner, B. F. Verbal behavior. New York: Appleton-Century Crofts, 1957.

Solley, C. M. & Long, J. When is "uh-huh" reinforcing? Perceptual and Motor Skills, 1958, 8, 277.

Solley, C. M. & Santos, J. F. Perceptual learning with partial verbal reinforcement. Perceptual and Motor Skills, 1958, 8, 183-193.

Stevenson, H. W., Weir, M. W. & Zigler, E. F. Discrimination learning in children as a function of motive-incentive conditions. Psychological Reports, 1959, 5, 95-98.

Sullivan, M. W. & Calvin, A. D. Further investigation of verbal conditioning. Psychological Reports, 1959, 5, 79-82.

Taffel, C. Anxiety and the conditioning of verbal behavior. Journal of Abnormal and Social Psychology, 1955, 51, 496-501.

Terrell, G. R., Durkin, K. & Wresley, M. Social class and the nature of incentive in discrimination learning. Journal of Abnormal and Social Psychology, 1959, 59, 270-272.

Verplanck, W. S. The control of the content of conversation: Reinforcement of statements of opinion. Journal of Abnormal and Social Psychology, 1955, 51, 668-676.

Verplanck, W. S. The operant conditioning of human motor behavior. Psychological Bulletins, 1956, 53, 70-83.

Wagner, A. R. The role of reinforcement and nonreinforcement in an apparent frustration effect. Journal of Experimental Psychology, 1959, 57, 130-136.

Waite, R. R., Sarason, S. B., Lighthall, F. & Davidson, K. S. A study of anxiety and learning in children. Journal of Abnormal and Social Psychology, 1958, 57, 267-270.

Wickes, T. A., Jr. Examiner influence in a testing situation. Journal of Consulting Psychology, 1956, 20, 23-25.

Wilson, W. C. & Verplanck, W. S. Some observations on the reinforcement of verbal operants. American Journal of Psychology, 1956, 69, 448-451.

Withall, J. G. The development of a technique for the measurement of social-emotional climate in classrooms. Journal of Experimental Education, 1949, 17, 347-361.

APPENDICES

APPENDIX I

Eight Nonsense Syllables

		Social		Mechanical	
Black	Ss	Positive Group 1	Negative Group 2	Positive Group 3	Negative Group 4
	1	82	62	26	29
	2	33	33	15	19
	3	27	33	29	26
	4	22	72	41	18
	5	53	29	65	25
	6	33	38	31	45
	7	154	76	40	21
	8	139	62	72	38
	9	48	69	28	45
	10	27	71	29	36
White		Group 5	Group 6	Group 7	Group 8
	1	124	69	71	72
	2	137	41	74	92
	3	73	29	61	83
	4	39	13	35	29

APPENDIX I (continued)

White	Ss	Social Positive Group 5	Social Negative Group 6	Mechanical Positive Group 7	Mechanical Negative Group 8
	5	131	42	77	127
	6	86	52	40	53
	7	59	36	111	39
	8	43	35	62	65
	9	82	88	134	63
	10	61	91	79	84

APPENDIX II

Twelve Nonsense Syllables

Es	Ss	Social		Mechanical	
		Positive Group 9	Negative Group 10	Positive Group 11	Negative Group 12
Black	1	29	43	48	58
	2	49	75	44	60
	3	53	74	58	57
	4	69	59	52	58
	5	41	51	56	71
White	6	122	78	41	54
	7	39	94	82	52
	8	59	115	73	61
	9	27	62	61	63
	10	82	130	52	85

APPENDIX III

Experimenter Rating Scale

1. Rating of estimated level of intellectual functioning:

1	2	3	4	5

2. Rating of emotional stability:

1	2	3	4	5

3. Rating of open-ness, genuine-ness, warmth:

1	2	3	4	5

4. Rating of feminity:

1	2	3	4	5

5. Estimation of general activity level:

1	2	3	4	5

6. Rating of friendliness, sociability:

1	2	3	4	5

7. Dependability; ability to perform duties conscientiously:

1	2	3	4	5

8. Rating of estimated ability to establish rapport with children:

1	2	3	4	5

Subject _____ Rater _____ Date _____