AN INTERACTION BETWEEN VERBAL AND NONVERBAL BEHAVIOR IN KINDERGARTEN CHILDREN

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TABLE OF CONTENTS

LIST OF TABLES . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . iv

LIST OF ILLUSTRATIONS . . . . . . . . . . . . . . . . . . . . . . . v

Chapter

I. INTRODUCTION . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1

II. METHOD . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16

   Subjects
   Apparatus
   Initial Social Interactions
   Differential Treatment
   Treatment of Data

III. RESULTS . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 25

IV. DISCUSSION AND CONCLUSIONS . . . . . . . . . . . . . . . . . . 29

APPENDIX . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 40

BIBLIOGRAPHY . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 53
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Summary of Mean and Standard Deviation for Group 1 Baseline Procedures .......... 40</td>
</tr>
<tr>
<td>II. Summary of Mean and Standard Deviation for Group 2 Baseline Procedures .......... 40</td>
</tr>
<tr>
<td>III. Summary of Mean and Standard Deviation for Group 3 Baseline Procedures .......... 40</td>
</tr>
<tr>
<td>IV. Summary of Mean and Standard Deviation for Group 1 Probe Procedures .......... 41</td>
</tr>
<tr>
<td>V. Summary of Mean and Standard Deviation for Group 2 Probe Procedures .......... 41</td>
</tr>
<tr>
<td>VI. Summary of Mean and Standard Deviation for Group 3 Probe Procedures .......... 42</td>
</tr>
<tr>
<td>VII. Analysis of Variance: Overall Increase In Isolate Social Interaction Percentages .......... 43</td>
</tr>
<tr>
<td>Figure</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
</tbody>
</table>
CHAPTER 1
INTRODUCTION

Behavior, especially man's verbal behavior, has puzzled men throughout the ages. One of the most interesting aspects of verbal behavior is its relationship to, and interaction with, nonverbal behavior. For most of us what we are saying has a direct relationship to what we are doing. In fact, in this culture if our verbal behavior does not correspond directly with our nonverbal behavior, we are censured severely. It is our parents who first show us the correct relationship between verbal and nonverbal behavior. They reward us handsomely if we tell the truth, or keep our verbal behavior accurately related to our nonverbal behavior. Also they punish us severely if we lie, or have some disagreement between our verbal behavior and our nonverbal behavior. The great majority of people learn this lesson well; however, there are exceptions. If the two behaviors are grossly out of line and persist over a long period of time, it is usually taken to be a sign of mental illness, i.e., the psychopathic personality. Again this is relatively rare, in fact, most people will do all in their power to keep their verbal behavior in line with their nonverbal behavior. There is evidence,
both anecdotal and empirical, to indicate that verbal behavior is related to its nonverbal counterpart; but does verbal behavior have any control over nonverbal behavior?

Before preceding any further in the discussion of the relationship between verbal and nonverbal behavior, it is necessary at this point to define in most explicit terms what is meant by verbal behavior and nonverbal behavior. Skinner (13, p. 2) defines verbal behavior as "...behavior reinforced through the mediation of other persons...." Accordingly, this may include such diverse things as writing, sign language, and vocal verbal behavior. In fact, Skinner goes on to say anything capable of affecting another person may be verbal. However, throughout this paper the term verbal behavior shall mean vocal verbal behavior. Further, vocal verbal behavior shall, in this paper, be restricted to vocal behavior which produces audible speech.

Nonverbal behavior has been defined as anything that alters the physical environment through mechanical action (13). Morgan and King (10, p. 764) define nonverbal behavior as "any observable action of a person...." However accurate these definitions may be, they are too broad for this paper. For the purpose of clarity nonverbal behavior, in this paper, shall be defined as any response made by the person that does not involve or incorporate any form of
verbal behavior. More specifically, nonverbal behavior shall mean any motor behavior that does not produce or culminate in any audible speech or speech patterns. While the above definition tells more what the behavior is not than what it is, it is sufficiently clear to allow accurate distinctions between the two forms of behavior to be made. With these definitions firmly in mind, the question of whether verbal behavior has any control over nonverbal behavior can now be resumed.

Leon Festinger (4) has stated that nonverbal behavior can control verbal behavior. To explain the occurrence of this phenomenon Festinger developed the concept of "Cognitive Dissonance." In his theory of cognitive dissonance, he asserted that an individual finds it unpleasant to have his nonverbal behavior in disagreement with his verbal behavior. The individual will be in a state of dissonance until his verbal behavior and its nonverbal counterpart are brought into agreement. The state of dissonance will constitute a drive state for the individual which must be reduced. According to Festinger this drive state will be similar to the drive states of hunger or thirst in its potency. Festinger expounded further, if an attitude or behavior is forced upon the individual, and if the attitude or behavior is in opposition to currently held attitudes or behaviors, he will try to reduce the dissonance thus
produced. He will accomplish this by changing his current attitudes or behaviors to be consonant with the forced behavior or attitude. To summarize, if a person's nonverbal behavior is changed, he will change his verbal behavior to agree with the new nonverbal behavior.

By calling the need to reduce cognitive dissonance a drive state implies that it is unlearned. But if it is unlearned why does it not apply to all people under all circumstances? There appears to be some inconsistency on this point. A prime example of this inconsistency are the psychopathic individuals. However, it is not limited to this group alone. Most people at one time or another cause themselves to be in a state of dissonance. The hypocrite is well known for this behavior. Also, for many generations in this country parents have been keeping the myth of Santa Claus and other fairy tales alive. Further, we teach our children not to tell our best friend that he has a poor sense of taste or some other social faux pas; instead we teach him to say how well dressed he looks no matter what our eyes tell us. It would appear that the need to keep our verbal behavior in agreement, or disagreement, with our attitudes and behavior is a learned phenomenon.

In a slightly different vein, Scott (12) has shown that through the proper reinforcement it is possible to change attitudes, with the end results being similar to those obtained by Festinger (4). Scott accomplished this by
reinforcing verbal behavior about the attitude in question. He found by the proper reinforcement, he could change attitudes either positively or negatively. Studies by Weiss (15) and Page (11) have also shown that attitudes can be created and manipulated through the use of the proper reinforcement techniques.

In traditional psychoanalytic theory one can find a concept similar to cognitive dissonance. The psychoanalytic concept is called "rationalization." Like cognitive dissonance, rationalization attempts to explain how nonverbal behavior sometimes has control over verbal behavior. But unlike cognitive dissonance, which is basically a drive state, rationalization is a defense mechanism. By using rationalization "...an individual explains his behavior in such a way as to conceal the unacceptable motive it expresses..." (10, p. 479). In essence, the person changes his verbal behavior so that it agrees with and supports his nonverbal behavior. The major criticism of rationalization is that the concept embodies too many hypothetical internal states that cannot be observed or studied directly.

The concepts previously mentioned have dealt with the control of verbal behavior by nonverbal behavior. They have shown that it is possible under some conditions to control verbal behavior by manipulating nonverbal behavior. But is the reciprocal of these concepts true?
Research in the area of verbal control of nonverbal behavior, especially the ability of verbal behavior to control its nonverbal counterpart, has been scanty at best and neglected at worst. Bem, Lane, and Carlson (1) have commented that there is much anecdotal evidence that a relationship exists but not much empirical proof of such a relationship existing. Lovaas (6) also stated that the relationship between verbal behavior and its nonverbal counterpart has been neglected by researchers.

Due to the rather limited number of studies done in the area, it is necessary at this point to discuss those studies which are relevant in moderate detail. Not only will this clarify the work that has been done in the area, but it will also serve as a platform from which to evaluate the present study.

The first study to be discussed is one conducted by Greenspoon in 1955 which pointed out that verbal behavior may be controlled by reinforcement procedures. Greenspoon (5) reinforced the subject's verbal behavior through the use of verbal reinforcers. To be more specific, he reinforced plural nouns by saying "good" or "Mmm-hmm" directly after the subject had uttered them. His results showed a significant increase in the number of plural nouns uttered by the subject. While this study's main relevance is for nondirective therapy, it does point to the fact that verbal reinforcers, even though very subtle, can influence behavior to a certain degree.
Greenspoon did not show, however, that a change in verbal behavior effected the subject's nonverbal behavior.

Birch (2, p. 269) conducted a study in which the purpose was to see if nonverbal behavior could be controlled by the use of verbal commands. Birch used children as his subjects. Their ages ranged from 2 years 2 months to 7 years. The procedure was to have the subjects press down a bar and hold it down. To this end Birch gave the verbal command, "Push the bar all the way down." Also he formed a group in which instead of giving the verbal command, a buzzer signaled that they should push the bar down and hold it down. The verbal command and the buzzer were given every three minutes. The experiment yielded the following results: The older subjects were better able to follow both the verbal command and the buzzer than the younger children. The younger subjects were only able to maintain their performance under the verbal command only. All ages were able to depress the bar but the younger age levels, under five, had a tendency to let up on the bar before the end of the three-minute interval. One might interpret these results as indicating that older subjects who have had a longer history of making verbal behavior correspond with its nonverbal counterpart were in a better position to carry out the verbal commands of the experimenter than were the younger subjects who did not have such a history.
Lovaas (3) executed a study which has relevance to this area. He studied the effects of exposure to symbolic aggression upon the amount of aggressive behavior manifested by a child. Lovaas used 12 children, all five years of age. They were divided into two groups, one group was shown an aggressive and the other a nonaggressive film. Lovaas pointed out that exposure to the aggressive film may have had one of four effects. First, it may have satiated the subject on aggressive reinforcers. This appears very doubtful, since there was an increase, not a decrease in behavior. Second, exposure to the film may have raised the general drive level of the subject. However, Lovaas stated that the data did not support this hypothesis. Third, the film may have sensitized the subject, making aggressive behavior more probable. Fourth, "...the operation may provide discriminative stimuli...marking the occasion whether aggressive behavior can occur or not" (3, p. 42). In the summary of his paper he commented, "The education implication from this study is that aggressive films are likely to make children more aggressive rather than less aggressive" (3, p. 43). It is evident from Lovaas' study that violence on television and at the movies may be causing aggressive behavior. Needless to say, much more research is needed in the area before any conclusive statements may be made.
Ullmann, Krasner, and Collins (14) were able to modify behavior in a group therapy situation by reinforcing appropriate verbal behavior. The subjects in the experiment were three groups of ten male patients at a Veterans hospital. The results indicated a significant gain in adequacy of interpersonal relationships for the group that had been reinforced in a positive-personal manner. The results of this study point to the fact that by manipulating verbal behavior through reinforcement it is possible to change its nonverbal counterpart not only for individual subjects but for the group as a whole.

Another study conducted to study the interaction between verbal and nonverbal behavior was conducted by Lovaas (9). Like his earlier study of the same year, Lovaas chose aggressive behavior as the one he studied. His subjects were 14 children ages 3 years to 7 years. Lovaas' procedure for investigating the relationship was to have one group make aggressive verbal statements and reinforce them. The other group made nonaggressive verbal statements and was reinforced for them. Lovaas discovered that the group which had had their aggressive statements reinforced manifested more nonverbal aggressive behavior than the group that did not have the reinforcement for aggressive behavior. One possible reason for the observed results Lovaas explained might be that the verbal behavior took on a directing
influence with regard to the nonverbal behavior. Lovaas (9, p. 336) summarized his study by saying, "...some control of nonverbal aggressive behavior was achieved by manipulating verbal aggressive behavior."

In a study conducted by Lovaas (7) he has shown that the content of what is said has an effect on the rate of its emission. For example, the word faster was said at a much faster rate than the word slower. Also, the content of the verbal behavior has an effect on its nonverbal counterpart. When a subject simultaneously said faster and pushed a lever, the rate of lever pressing was significantly higher than when the subject was saying slower and pushing the lever. Lovaas comments about his study saying, "The study reported... gave evidence that verbal operants have properties which can control both the rate of their own recurrence as well as latency, rate, and choice of manual responding" (7 p. 254).

In two similar studies Lovaas (6) and Bern, Lane, and Carlson (1) were able to control the rate of food consumption and the choice of food consumed by reinforcing statements about food made by the subjects. In both studies the subjects were children. In each study the subjects were required to make positive statements about a particular food; and when they did so, they were reinforced. The rates of food consumption were measured against a baseline derived before the start of the experiment. In each study the rate of food consumption was substantially higher. These studies,
like the others mentioned, seem to indicate that verbal behavior may, under certain conditions, control nonverbal behavior. Again, the subject's history with regard to how often he was reinforced for having his verbal and nonverbal behavior in agreement and punished for having a disagreement between the two, may have and probably did effect the results.

To summarize the possible implications of these studies it would appear that the history of the subject with regard to the amount of reinforcement received for keeping his nonverbal behavior in agreement with his verbal behavior, has an effect on whether the experimenter can control nonverbal behavior by manipulating verbal behavior. Further, the studies have pointed out that it is possible to control nonverbal behavior by manipulating verbal behavior. This may be done either through reinforcement techniques or through direct verbal commands. It may be the case that by reinforcing verbal behavior about an event, one causes the verbal behavior to take on a directing influence in regard to the nonverbal behavior (9). Or it may sensitize the subject to that type of behavior thus promoting an increase in the behavior when the subject is put into a situation where the behavior may be manifested (8).

Lovaas' explanation in these terms seems dubious. To state that an organism is sensitized to a certain behavior only indicates that it has been exposed to a particular set of stimuli and that certain behavior patterns have a probability
of occurring. His explanation is more descriptive than explanatory. However, these possibilities are still in the realm of speculation. There has not been enough scientific investigation into these areas to make any conclusive statements. In fact, it has not been firmly established that one may control nonverbal behavior by controlling or manipulating verbal behavior. The importance of this aspect of human behavior and the lack of studies dealing with it has led to the present study.

The present study was designed to provide data bearing on the question of the relationship between verbal and nonverbal behavior. And, in particular, to see if it is possible to control human nonverbal behavior through the manipulation of verbal behavior. The behavior to be investigated in this study is social interaction. Specifically, the amount of social interaction manifested by group members toward the isolate of the group will be raised above a baseline rate. The amount of social interaction manifested by the group members will be raised by reinforcing positive statements about the isolate. Statements about social interaction with the isolate will also be reinforced.

The terms social interaction and isolate will be operationally defined. Both terms will be defined behaviorally. The term social interaction will be defined as any response,
by any member of the group, that promotes or maintains verbal or nonverbal behavior between two or more subjects. The term isolate will be defined as the subject with the least amount of social interaction. The amount of social interaction will be determined by using a time sampling technique as illustrated by Bock (3).

The methodological procedures and statistical design used to reach these ends will be presented in detail in Chapter II of this paper.
CHAPTER BIBLIOGRAPHY


CHAPTER II

METHOD

Subjects.--The subjects for the present experiment were 20 kindergarten pupils. They were enrolled at North Texas State University Lab School at the time of the experiment. The age range of the subjects was from 5.0 years to 6.5 years with a mean age of 5.86 years. Half were male and half were female.

Subjects were divided into three groups consisting of seven members in two groups and six members in one group. The assignment of subjects to the three groups was accomplished by referring to a table of random numbers (5). Group One consisted of three males and three females. Group Two consisted of three males and four females. Group Three consisted of four males and three females. Groups One and Two were used as the experimental groups and Group Three was used as the control group. All treatments were run in the morning hours, the approximate time being between 8:30 a.m. and 11:00 a.m.

Apparatus.--The apparatus used in the present experiment consisted of three items: a Kodak Slide Projector with screen and remote controls, a Wollensak Tape Recorder with two tape reels and remote controls, and candy. The slide projector contained only one slide, a picture of the isolate. The slide projector was run by the experimenter by means of a remote control device.
The tape recorder was equipped with two tape reels. The first reel was played to Group One and the second was played to Group Two. The first reel contained 25 statements about the subject who had the least amount of social interaction, i.e., the isolate, or statements about interaction with the isolate. The statements were so designed that the subject was required to respond verbally to the statements. The tape reel was not advanced from statement to statement until the subject responded to the statement put to him. For a written transcript of the statements presented to the subjects in Group One, see pages 48 and 49 of the appendix section of this paper.

The second tape reel contained 25 statements about the isolate or statements about interaction with the isolate. The statements were so designed that no verbal response was necessary. The reel advanced from statement to statement automatically after each statement. For a written transcript of this tape reel, see pages 50 and 51 of the appendix section of this paper.

No special tape reel or slides were made for Group Three because they did not take part in the actual experimental treatment.

Candy was used as a reinforcing agent. All apparatus was set up in a room at the North Texas State University Lab School.

Initial social interactions.—Each group of subjects was put in a free play situation. By free play situation is meant,
the children were placed in an unstructured play situation with limited adult supervision. The groups were seen one at a time. During the free play situation observers, which included the experimenter and two assistants, made notations on which children were interacting. Interacting was defined as "...speaking together, doing something cooperatively, or in some way having attention fixed on one another" (2, p. 266). The observers followed the following procedures in making their observations. The observers checked the children every 15 seconds for 30 minutes to see if they were interacting. This equaled a total of 120 separate observations per day. The number of times a subject was found to be interacting was divided into the maximum number of times he could have been interacting, yielding a percentage of time spent in social interaction. (Ex. Subject found to be interacting 60 times out of a possible 120 times obtains an interaction percentage of 50%). The subject with the lowest social interaction percentage was defined as the "isolate" of the group. To be sure that the isolate on any given day, based on this method, might not have occurred as the result of chance, the procedure was carried out for three days. This produced a total of 360 separate observations of each group. In this manner, a stable baseline was established for each group.

Differential treatment.—After the isolate had been determined for Group One, the remaining five members of Group One were exposed to tape reel No. 1. The subjects were seen
on an individual basis. Each subject was brought by the experimenter from the subject's classroom to the room containing the tape recorder, slide projector, and screen. The experimenter then read the instructions. The instructions were modeled after those used by Bem, Lane, and Carlson (1) for this type procedure. The instructions read to the subjects were as follows:

I am going to show you a picture of Melinda and ask you some questions about her. Every time you answer the right way, you will win a piece of candy. If you don't answer a question, the machine (tape recorder) will just wait until you do answer it. If you don't answer right away, the machine may ask you the same question again so you can try to give the right answer and win the candy. I shall start the machine now. Are you ready?

The reinforcement was contingent upon the subject saying any positive statement about interaction with the isolate.

After the tape reel had been completed, the experimenter told the subject what a good job he had done. The experimental procedure lasted six minutes per subject if no questions had to be repeated.

The above procedure began on a Monday and ran through Friday. Weekends were omitted as treatment days. The procedure lasted for 15 days. On every third day, or days 3, 6, 9, 12, and 15, a probe technique was used to determine the amount of social interaction being exhibited by the members of the group. By probe is meant an exact duplication of the technique used to derive the baseline (3). Thus, a social interaction percentage
was obtained for the isolate and the remaining members of the group.

After the isolate is determined for Group Two, the remaining six members of Group Two were exposed to tape reel No. 2. The subjects were seen on an individual basis. The experimenter brought each subject from his classroom to the room which housed the apparatus. The experimenter then read the instructions to the subject. The instructions were modeled after those used by Bern, Lane, and Carlson (1). The instructions read to the subjects of Group Two were as follows:

I am going to show you a picture of Virginia and tell you something about her. I want you to sit very quietly and listen to the things the machine (tape recorder) is going to tell you. The machine will only say things one time so listen carefully. I shall start the machine now. Are you ready?

There was no verbal response required of the subjects, and no reinforcement was given.

After the tape reel had been completed, the experimenter told the subject that was all for today. This was done in a matter-of-fact manner. The subject was then lead back to his classroom by the experimenter. The experimental procedure lasted four minutes per subject.

The above procedure began on a Monday and continued through Friday. Weekends were omitted as treatment days. The procedure lasted for 15 days. On every third day, or days 3, 6, 9, 12, and 15, a probe technique was used to determine the amount of
social interaction being exhibited by the members of the group. By probe is meant an exact duplication of the technique used to derive the baseline (3). Thus, a social interaction percentage was obtained for the isolate and the remaining members of the group.

After the isolate was determined for Group Three, all members of Group Three were returned to a "class-as-usual" status. They received no experimental treatment whatsoever, thus rendering them the control group. On days 3, 6, 9, 12, and 15, a probe technique was used to determine the amount of social interaction being exhibited by the members of the group. By probe is meant an exact duplication of the technique used to derive the baseline (3). Thus, a social interaction percentage was obtained for the isolate and the remaining members of the group.

Group One and Group Two were always run on the same days so that both groups started and finished the experimental treatment on the same day, while Group Three received no treatment. The members were observed at free play on the same days as were Group One and Group Two.

When the isolates from Group One and Group Two were due to receive the experimental treatments, they were shown slides of themselves and asked several questions of a demographic nature. A written text of these questions is shown in the appendix section of this paper on page 52. After viewing the slides, both were taken back to their classroom by the experimenter. This was done in a matter-of-fact manner.
Treatment of Data--The treatment of data derived from the baseline procedures and the probe procedures was handled in two ways. First, it was determined whether the social interaction of the isolate increased relative to the other members of the group. Secondly, it was determined whether the type of experimental procedures had any effect on the amount of social interaction manifested by each of the isolates.

To determine whether the amount of social interaction manifested by the isolate increased relative to the rest of the members in the group, the following procedure was used. An average social interaction percentage was derived for each group with the exception that the isolate's score was not included in the computation of the averages. This was done for each day of the baseline and each day of the probes. The averages were then compared to the isolate's social interaction percentage on each of the appropriate days. The results were then presented in graphic form.

The statistical treatment used to determine if the type of experimental treatment used had any effect on the amount of social interaction manifested by each of the isolates was a single classification analysis of variance for repeated measures (6, p. 105) and a Friedman two-way analysis of variance by ranks (4, p. 166). The Friedman analysis of variance by ranks was used because it was feared that some of the assumptions underlying the single classification analysis of variance for repeated measures might have been violated.
Before the data, which were in percentages, could be dealt with effectively, it had to be transformed into deviation scores. The following procedure was used to accomplish this end. An average social interaction percentage was derived for the group. The isolate's social interaction percentage was not used in the computation of the average. The isolate's data was then subtracted from the average social interaction time yielding a deviation score. Deviation scores were obtained for each day of baseline as well as each of the probe days. This was done for all three groups.

These deviation scores were sufficient when used for computation in the single classification analysis of variance for repeated measures. However, they were not sufficient to use with the Friedman two-way analysis of variance by ranks and had to be transformed still further. To accomplish this, the deviation scores were ranked. The largest absolute deviation score receiving a rank of one, the next largest a rank of two, and so on until all deviation scores for each individual group had been ranked.

The results of the statistical treatments are presented in detail in Chapter III.


CHAPTER III

RESULTS

The results of the comparison of the average group social interaction percentage with the isolate's social interaction percentage are revealed in Figures 1, 2, and 3, of the appendix. An inspection of Figure 1 will disclose a rather dramatic rise in the amount of time spent in social interaction by the isolate in Group One between the last day of baseline and the first day of the probes. Also it was noted that at this time the isolate had reached a plateau or asymptote which lasted through the second probe or the sixth day of treatment. Following this, the amount of time spent by the isolate in social interaction began to decrease until it returned to baseline.

Figure 2, of the appendix, also revealed a dramatic rise in the amount of time spent by the isolate of Group Two in social interaction. However, no plateau was found in the data derived from Group Two. After the amount of time spent in social interaction reached a peak on the first probe day, it began an immediate fall back to the baseline level.

It can also be seen in Figure 3, of the appendix, that the control group produced no rise in the amount of time spent by the isolate in social interaction, relative to the
The position of the isolate with respect to the rest of the group remained fairly constant throughout the experimental period.

Further noted from a comparison of Figures 1, 2, and 3, of the appendix, is the fact that all three groups showed a rise in the amount of social interaction manifested by their members. Also, Groups Two and Three appeared to have the most stable rates of social interaction. Group Three had the highest level of social interaction averaging 82.50% of their time being spent in social interaction as opposed to 78.50% for Group One and 76.50% for Group Two.

A graph of the absolute differences between the isolate's social interaction percentage and the mean social interaction percentage of the remaining members of the group is presented in Figure 4 of the appendix. As can be seen in Figure 4, the isolate of the control group differs very little from the mean of the remaining members of the group. The isolates in the two experimental groups differ quite a bit from their respective groups, however. It is from this data that the analysis of variance tests were computed.

Tables I, II, and III, of the appendix, reflect the means and standard deviations for each group on each day of the baseline procedures. Tables IV, V, and VI, of the appendix, reflect the means and standard deviations for each group on each of the days the probe procedure was used. From this data it was noted that Group Two had the widest range of scores as reflected by the large standard deviations obtained for this group.
Results of the single classification analysis of variance (2, p. 105) of overall increases in isolate's social interaction percentages are presented in Table VII of the appendix. The F-ratio obtained was significant at the .05 level. Also, the results of the Friedman two-way analysis of variance by ranks (1, p. 166) were significant at the .05 level. Thus suggesting that the amount of time spent by each isolate in social interaction was dependent upon the type of experimental treatment he was receiving.
CHAPTER BIBLIOGRAPHY


Results of the present study supported the assumption that verbal behavior can control or at least influence its nonverbal behavioral counterpart. In each of the experimental groups the amount of social interaction manifested by the isolate was substantially increased over a baseline rate. This was not true for the isolate in the control group which did not increase in amount of social interaction manifested relative to the rest of the group. Social interaction percentages for the isolates in both experimental groups did not remain constant after their initial rise but returned to the baseline rate by the time the last probe was made. It was noted from the data presented in Figures 1 and 2, of the appendix, that Group Two showed the most dramatic rise in the rate of the behavior and Group One sustained the change in behavior over a longer period of time. As previously stated, Group One was the group that was reinforced for saying positive statements about the isolate; and Group Two was the group that was exposed to positive statements about the isolate. Group Three, the group that received no experimental treatment at all, showed no such changes in the isolate's behavior when compared to the remaining members of the group. These results, along with the statistically significant
results from both the analysis of variance tests, suggest that the method of treatment had a definite effect on the amount of social interaction that was being manifested by the isolate. An inspection of Figure 2, of the appendix, will further indicate that Group Two showed the most change in the behavior of the isolate. However, the data from Group Two may be inflated due to the fact that on the last day of probe the isolate fell far below baseline, thus increasing the amount of absolute change. Such data suggest that the more direct method of treatment produces the quickest change in the rate of occurrence of the behavior. It was also noted from the data in Figures 1, 2, and 3, of the appendix, that all three groups increased in the amount of social interaction being manifested by the group members. Further, Group Three, the control group, showed the most increase in the amount of social interaction manifested by the group members. The data here suggest that all three groups were affected by some extraneous variable. Nevertheless, this variable did not affect the scores of the isolate relative to the rest of the group.

The research literature reviewed in Chapter I tends to agree with the findings of the present study. The work done by Lovaas (6, 8) and Bem, Lane, and Carlson (1) lead to the expectation that the nonverbal behavior would be able to be manipulated by its verbal counterpart. The data from the present study substantiate this point. Also, the study of
the effects of the exposure to aggression on the rate of aggressive behavior conducted by Lovaas (7) has been strengthened by the results of the data from Group Two.

Several of the results obtained in the present study need further explanation and elaboration. One such result that needs further explanation is the fact that the amount of social interaction manifested by the isolate did not remain constant after it reached asymptote but returned to baseline. One would expect it to remain fairly constant in at least Group One, which continued to be reinforced the entire experimental period. One possible explanation for the occurrence of this phenomenon in Group One is as follows. For a behavior to be maintained or increased it has to be reinforced (4). If the reinforcement is taken away, then the behavior will extinguish. This may have happened in Group One. The isolate may be considered to be the reinforcement for the behavior of interaction with the isolate. It can be assumed that by reinforcing verbal statements about interaction with the isolate the amount of interaction did initially rise. However, it is possible that the members of the group found playing with the isolate not to be rewarding or reinforcing. Thus the behavior of playing with the isolate extinguished. The fact that the group members found the interaction with the isolate not to be consistent with their verbal behavior about interaction with the isolate, i.e., fun, rendered the reinforcement of the verbal behavior ineffective in controlling or maintaining the behavior during the latter stages of the experiment.
The explanation for the occurrence of the phenomenon in Group Two is essentially the same. The members of the group found that playing with the isolate was not rewarding or reinforcing; thus the behavior extinguished. Further, since they were not being reinforced for their verbal statements about interaction with the isolate but merely being instructed that interacting with the isolate was fun, the behavior extinguished even more rapidly than in Group One.

Another finding that needs further explanation is the fact that Group Two showed the most dramatic rise in the rate of social interaction manifested by the isolate. As pointed out by Birch (2) most children respond rather rapidly to the commands of an adult. It is due to this fact that the children of Group Two reacted so dramatically to the instructions stating they liked to play with the isolate. But, as mentioned earlier, they found playing with the isolate not to be rewarding, thus causing the behavior to extinguish. The children in Group One were not exposed to exactly the same situation. They were only indirectly told to play more with the isolate, i.e., reinforced for saying they like to play with the isolate. As noted in the data from this group, the increased rate of social interaction with the isolate was sustained over a longer period than in Group Two.

One finding which still remains a puzzle to the experimenter is why all groups, and especially the control group, increased in the amount of social interaction manifested by the group.
members. It is possible that there was some initial shyness among the members of the group which caused the baseline to be irregular. Also, the idea of being observed might have caused some anxiety in some of the children; thus retarding the amount of activity being manifested by the children hence, lowering the level of social interactions. To avoid this possibility, however, the experimenter and two assistants spent three days prior to the baseline days in the classroom getting to know the children. Another possible explanation is that the children grew to enjoy their break from the classroom routine and began to play more and began their play more quickly, thus causing the amount of interactions among the children to increase. Or perhaps some unknown external variable entered in to confound the data derived after the second day of baseline observations. This is doubtful, however. A fifth possible explanation is the study was influenced by the occurrence of the Hawthorne Effect. By this is meant that the children simply knew they were part of an experiment and this may have caused their interaction level ot increase. Nevertheless, it is to be remembered that the results of the observations did indicate that the social interaction of the isolates, in Groups One and Two, did increase relative to the rest of the group. The control group saw no such increase in the amount of social interaction manifested by the isolate relative to the rest of the group. Also, the results of the analysis of variance tests were significant even with this unexplained rise.
The findings of the present study have several possible implications for the science of psychology, especially clinical psychology. If by manipulating verbal behavior one can control or at least influence its nonverbal behavioral counterpart, then a therapist might be able to control the behavior of a patient by reinforcing his verbal behavior. The therapist would have to find a way to reinforce verbal statements about stopping the maladaptive behavior or reinforce statements about behavior that is the opposite of the maladaptive behavior. Also, the therapist must make sure that the new behavior is more reinforcing to the individual than the maladaptive behavior or it will extinguish. Once the therapist has produced a rise in the rate of the desired behavior, more orthodox methods may be used to firmly secure the behavior, in the patient's response repertoire. The possibility exists that a therapist may actually be promoting or maintaining maladaptive behavior which he is trying to eliminate by inadvertently reinforcing verbal behavior about the maladaptive behavior. Letting the patient talk out his problem may actually be maintaining it.

Bem, Lane, and Carlson (1) point out that this method of controlling nonverbal behavior may not work with older subjects. They discovered a phenomenon which they called countercontrol, in which older subjects did the exact opposite of what they were reinforced for saying. Hence, the usefulness of the findings of these studies (1, 6, 8) for clinical
psychology may be limited by the age group with which one wishes to work.

The results of this study may also have importance for organizations such as Contact, Help, and Suicide Prevention. These are organizations in which the patient calls up a worker and talks over his problems. A skillful worker should be able to manipulate the caller's verbal behavior much in the same way as Greenspoon (5) did in his 1955 experiment. By controlling the caller's verbal behavior in this manner, it may be possible to exercise some control over his nonverbal behavior. However, an inexperienced worker could possibly increase the maladaptive behavior by allowing the caller to talk about it and possibly get reinforced. In an organization such as Suicide Prevention this could be quite disasterous!

Also, the "great movie" which emphasizes violence, that leaves people talking about it for weeks, has received growing criticism in recent years. Most of the criticism has stated that these movies increase the chances for the occurrence of violence in everyday life. The present study is in agreement with these criticisms. Lovaas (7) has shown that exposure to a particular behavior will often increase that behavior. It is logical to assume that to talk about a behavior and be exposed to the behavior will probably increase the chances of its occurrence. The data from the present study are congruent with and support these ideas. These ideas are still in the realm of speculation. Obviously much more research along these lines needs to be done.
In conclusion, the present study supports the assumption that the relationship which exists between verbal behavior and its nonverbal behavioral counterpart is a learned one. For most people if a certain verbal behavior is reinforced, thus increased, its nonverbal counterpart will also show a rise. The beginnings of this phenomenon can be traced back to childhood when one was praised for not lying, keeping verbal and nonverbal behavior in agreement, and punished for having some discrepancy between the two. The study has pointed out further that if the individual does not find the nonverbal behavior consistent with the verbal behavior, the relationship between the two behaviors will break down. This point can be seen readily in everyday life situations. For example, the child who says how much he wants a puppy and how much fun it will be to take care of it, often finds the actual taking care of the puppy not to be as much fun as he said it would be. Thus the behavior of caring for the puppy begins an extinction process and its verbal counterpart is no longer effective in controlling the behavior.

As discussed earlier in this paper, a serious breakdown in the relationship between the two behaviors is taken to be a symptom of mental dysfunctioning, i.e., the psychopathic individual. It is conceivable that other mental illnesses may have this breakdown between the relationship between verbal and nonverbal behavior as one of their precipitating factors. This is still in the realm of speculation and more research needs to be done before any conclusive statements may be made.
The ability to which one could generalize these findings is rather good. The study had some minor methodological problems which could be rather easily solved. For example, a longer baseline period would help in the accuracy of the data. Also, using children who knew each other before the experiment began might eliminate some of the problems encountered in this study. As mentioned previously the findings of this study have implication for many areas of psychology. Nevertheless, before any definite conclusions may be reached in this area much more research needs to be done. This area has received far too little experimental investigation.


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<thead>
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<th>Baseline Days</th>
<th>Mean</th>
<th>Standard Deviation</th>
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<tr>
<td>Day 1</td>
<td>60.50%</td>
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<td>Day 2</td>
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<tr>
<td>Day 3</td>
<td>83.90%</td>
<td>20.4261</td>
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<th>Mean</th>
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<th>Mean</th>
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<td>Day 2</td>
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### TABLE IV

**SUMMARY OF MEAN AND STANDARD DEVIATION FOR GROUP 1 PROBE PROCEDURES**

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<th>Probe Days</th>
<th>Mean</th>
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<tbody>
<tr>
<td>Day 1</td>
<td>77.16%</td>
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<td>91.17%</td>
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<td>Day 3</td>
<td>68.47%</td>
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<tr>
<td>Day 5</td>
<td>73.55%</td>
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### TABLE V

**SUMMARY OF MEAN AND STANDARD DEVIATION FOR GROUP 2 PROBE PROCEDURES**

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<th>Probe Days</th>
<th>Mean</th>
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<td>Day 1</td>
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<td>Day 2</td>
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<td>Day 3</td>
<td>69.38%</td>
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<tr>
<td>Day 4</td>
<td>78.19%</td>
<td>20.9913</td>
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TABLE VI
SUMMARY OF MEAN AND STANDARD DEVIATION
FOR GROUP 3 PROBE PROCEDURES

<table>
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<th>Probe Days</th>
<th>Mean</th>
<th>Standard Deviation</th>
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</thead>
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<tr>
<td>Day 1</td>
<td>86.42%</td>
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<tr>
<td>Day 2</td>
<td>74.09%</td>
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<td>88.21%</td>
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<td>Day 4</td>
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<td>Day 5</td>
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<td>Source of Variation</td>
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<td>df</td>
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<td>---------------------</td>
<td>------</td>
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<td>Between Groups</td>
<td>1144.03</td>
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<tr>
<td>Within Groups</td>
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<tr>
<td>Treatment</td>
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<td>4</td>
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<tr>
<td>Residual</td>
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<td>8</td>
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<tr>
<td>Total</td>
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*P = < .05
Fig. 1--Mean Social Interaction Percentages: Total Group One and Isolate Group One
Fig. 2—Mean Social Interaction Percentages: Total Group Two and Isolate Group Two
Fig. 3--Mean Social Interaction Percentages: Total Group Three and Isolate Group Three
Fig. 4--Absolute differences between isolate percentage and the mean percentage of the remaining members.
GROUP ONE ISOLATE QUESTIONS

1. Who is this?
2. Are you and Melinda friends?
3. Is playing with Melinda more fun than playing by yourself?
4. Which is more fun, playing with Melinda or doing homework?
5. Which would you rather do, go to the movies with Melinda or go by yourself?
6. Would you like to go to the lake with Melinda?
7. What would be more fun, going to the park with Melinda or taking a nap?
8. Would you like to go swimming with Melinda or go to the doctor?
9. Which do you like best, Melinda or rainy days?
10. Would you like to go to Six Flags with Melinda or by yourself?
11. Would you like to go to the zoo with Melinda or stay at home?
12. Which is more fun, playing with Melinda or staying at home by yourself?
13. Which is more fun, playing with Melinda or playing with someone else?
14. Which is more fun, playing with Melinda or washing the dishes?
15. Isn't playing with Melinda more fun than going to bed early?
16. Do you like Melinda?
17. Which is more fun, watching cartoons with Melinda or going to school?
18. Would you rather work with Melinda or with someone else?
19. Which would you rather do, fingerpaint with Melinda or by yourself?
20. Which is more fun, eating lunch with Melinda or eating lunch with someone else?

Fig. 5--Transcript of Tape Reel One
21. What would be more fun, giving a puppet show with Melinda or by yourself?

22. Which would you rather do, play ball with Melinda or with someone else?

23. Is playing on the swings more fun with Melinda or by yourself?

24. Is coloring more fun with Melinda or by yourself?

25. If you had to walk home, would you rather walk with Melinda or by yourself?
GROUP TWO ISOLATE QUESTIONS

1. This is Virginia.
2. You and Virginia are friends.
3. Playing with Virginia is more fun than playing by yourself.
4. Playing with Virginia is more fun than doing homework.
5. It is more fun to go to the movies with Virginia than by yourself.
6. It is more fun to go to the lake with Virginia than by yourself.
7. It is more fun to go to the park with Virginia than to take a nap.
8. It is more fun to go swimming with Virginia than to go to the doctor.
9. Virginia is better than rainy days.
10. It is more fun to go to Six Flags with Virginia than by yourself.
11. It is more fun to go to the zoo with Virginia than to stay at home.
12. It is more fun to play with Virginia than to stay at home by yourself.
13. It is more fun to play with Virginia than to play with someone else.
14. It is more fun to play with Virginia than to wash the dishes.
15. It is more fun to play with Virginia than to go to bed early.
17. It is more fun to watch cartoons with Virginia than to go to school.
18. It is more fun to work with Virginia than with someone else.
19. It is more fun to fingerpaint with Virginia than by yourself.
20. It is more fun to eat lunch with Virginia than to eat with someone else.

Fig. 6--Transcript of Tape Reel Two
21. It is more fun to give a puppet show with Virginia than by yourself.

22. It is more fun to play ball with Virginia than with someone else.

23. It is more fun to play on the swings with Virginia than by yourself.

24. It is more fun to color with Virginia than by yourself.

25. It is more fun to walk home with Virginia than by yourself.

Fig. 6--Continued
DEMOGRAPHIC QUESTIONS FOR ISOLATES
IN GROUP ONE AND GROUP TWO

1. Who is this?
2. How old are you?
3. When is your birthday?
4. Do you live in Denton?
5. Do you know your address?
6. Do you have any brothers or sisters?

Fig. 7--Transcript of questions put to isolate
BIBLIOGRAPHY

Books


Articles


