

THE EFFECT OF DIRECT AND INDIRECT
REINFORCEMENT ON GROUPS
AND NON-GROUPS

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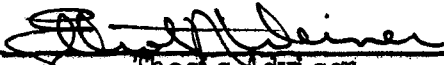
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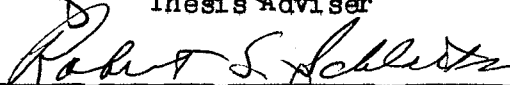
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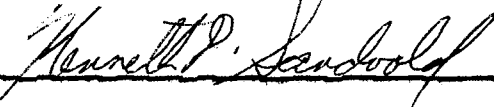
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CHAPTER I

REVIEW OF THE LITERATURE

Introduction

New modes of behavior can be acquired and existing response patterns modified through observation of other people's behavior and its consequences for them, in both simple instrumental learning (Miller and Dollard, 1941) and classical conditioning paradigms (Mowrer, 1960). It also has been demonstrated in more complex situations utilizing stimulus contiguity and mediational theory (Bandura, 1965).

Miller and Dollard (1941) suggest that observational learning can be accounted for in terms of instrumental conditioning. They hold that the observer learns to match the response of the model as a result of reinforcement. This reinforcement is either experienced vicariously, that is, through watching the model receive reinforcement, or directly, in which case the reinforcement is applied to the observer. Although this theory explains certain phenomena in imitation, it fails to account for imitated responses that occur before the reinforcement is administered, and imitation which occurs in the absence of reinforcement.

Mowrer, in emphasizing the classical conditioning of positive and negative emotions, proposed a sensory feedback theory of imitation (1960). Mowrer proposed two forms of imitation which depended on whether the observer was reinforced vicariously or directly. He

suggested that the model's behavior took on a positive value for the observer as a result of its repeated associations with positive reinforcement. Thus, the observer could later reproduce these positively rewarding experiences by reproducing the model's behavior. Bandura (1969) states in regard to affective feedback theory that even though the model's rewarding qualities are equally associated with different behaviors performed, modeling effects tend to be specific rather than general. For example, a nurturant model may improve reproduction of some responses, have no effect on others, and may diminish others (Bandura, Grusec, and Menlove, 1967).

Bandura (1965) presented a stimulus contiguity and mediational theory of imitation. In this theory, sensory images elicited by the modeling stimuli become structured perceptual responses through association by contiguity. There are also verbal representations which become associated with the perceptual images. These verbal representations facilitate later reproduction of the modeled behavior through response produced cues. According to this theory, neither vicarious nor direct reinforcement is necessary for observational learning to occur. Bandura (1965) showed that children watching a model being aggressive to a plastic doll will repeat the model's actions regardless of whether the model is rewarded or not. He found no significant difference between the group who watched the model receiving positive rewards and the group watching the model receive no reward.

Much work in the area of vicarious reinforcement has focused on the problem of transmitting standards of self reinforcement via imitation (Bandura and Krupers, 1964; Marston, 1965; Mischel and Liebert, 1966). Representative of these is the study of Bandura and

Krupers (1964). This study, using both peer and adult models, demonstrated that the children who had observed the model's self-reinforcing behavior displayed self-reinforcing behavior of their own which closely resembled that of the model. The adult model was found to be more potent than the peer model, which can be attributed to the greater status and prestige of the adult model.

It has been shown that imitation does generalize in young children. Baer (1964) found that when certain behaviors of a puppet being watched by young children were reinforced while others were not, the children imitated the behaviors that were reinforced and showed an increase in performance of the behaviors which were not. In this way he has shown that incidental learning does take place and one becomes conditioned to cues in the reinforcement situation.

Bitterman (1956) extended the study of vicarious reinforcement to college students. He devised an experimental situation in which the subject could not be directly reinforced. The experiment took the form of an E.S.P. study where the experimenter read a list of words to the subject and asked him to guess which of ten numbers had been assigned to that word. After the first trial in which he gave different responses to each of his three experimental groups, he repeated the same list of words in different order. He measured the amount of incidental learning on the second trial and used it as an indicator of the effects of reinforcement.

In a later study Berger (1961) employed a variation of Bitterman's procedure. He attempted to demonstrate that learning does occur in the absence of any direct reinforcement. This was done by leading the subjects to believe they were part of an E.S.P. experiment in which

one subject was to guess which number was associated with certain nonsense syllables. The observer did not participate directly except to read the syllables to the subject. Only certain prearranged syllables were reinforced by the experimenter. The reinforcement consisted of the experimenter verbalizing "correct" during the course of the experiment. Post session measurement of retention showed that the observer recalled significantly more syllables which had been positively reinforced, which apparently demonstrated that learning does occur in the absence of direct reinforcement.

In a later study (Kanfer and Marston, 1963) it was proposed that the observer in the Berger (1961) study was actually receiving direct reinforcement from being directly associated with the subject. Thus, a series of studies to eliminate this factor were performed (Kanfer and Marston, 1963; Marlatt, 1970).

Kanfer and Marston (1963) were interested in determining whether observing others in a group being reinforced could engender learning in the observer. Using simulated groups to accomplish this, they had the observer listen to tapes that the observer thought to be the voices of other group members doing the task and being reinforced. The subject was asked to participate intermittently with the other "group" members. Learning was then measured by assessing the number of critical responses given by the subject. They found that learning did occur.

Kanfer and Marston (1963), in another study, varied the size of the group and the percentage of reinforcements. They found that decreasing proportion of reinforcement by increasing group size resulted in significantly lower learning. They also found that adding

direct reinforcement to vicarious reinforcement did not significantly increase the learning at any level of group size.

Thus far, this review has been concerned with imitation and vicarious reinforcement. However, another aspect of reinforcement which is related to these phenomena is the concept which Sechrest (1963) termed implicit reinforcement. He felt that it was possible to have an observer watch a model receive reinforcements and have his own behavior tendencies altered such that they were directly opposite to those produced for the model. For example, if two boys are each making a model airplane and the father comments to one that his plane is very good but says nothing to the other, the second child will most likely feel that his plane is inferior, and thus act as if he has been negatively reinforced. Positive reinforcement, then, for the first child, could produce implicit negative reinforcement for the second. Implicit reinforcement theory also holds that when direct negative reinforcement is given to one child the other would receive implicit positive reinforcement, at least when the children are competing with each other.

There are some studies which were forerunners of implicit reinforcement which embodied the concept but did not directly define it (Kounin and Gump, 1958, 1961; Sechrest, 1962). Kounin and Gump (1958), while observing a classroom and evaluating the effects of behavior control variables, reported what they termed the "ripple effect". They found that when a child engaged in misbehavior was reprimanded the behavior of other children in the classroom was affected. Specifically, they found the nearer the observing child was to the target the stronger the effect, and children also engaged in misbehavior were likely to show the strongest reactions. This study, while being one

of the first to report this effect, was only observational in nature and did not provide for statistical analysis.

Gagey (1960) explored one of the variables of the "ripple effect" further. He found that the status of the target, as determined by his classmates, had a significant effect on their behavior. High status deviants had more effect on the observer's behavior than did low status deviants.

Sechrest (1962) interviewed children at four grade levels: kindergarten, first, second and third. He was trying to determine the conditions which were most likely to facilitate learning. He discovered that even at young ages the child is aware and responsive to the teacher as a person, and is likely to report that attention and assistance from her is important in sustaining appropriate behavior. He found that these children were sensitive to the experience of other children, but in a "curious way". He found older children were less inclined to report positive feelings when another child was verbally rewarded. Rather, they reported neutral feelings for both reward and reproof administered to another, but Sechrest observed that they did so guardedly and defensively. It was this interview data that led Sechrest to postulate the concept of implicit reinforcement.

Much of the literature in the area of implicit reinforcement deals with its effectiveness in classroom discipline. Broden, Bruce, Mitchell, Carter, and Hall (1970) investigated the effect of teacher attention on two boys seated at adjacent desks. These will be referred to as boy "A" and boy "B". In effect, they were only interested in explicit positive and implicit negative reinforcement. The teacher, after obtaining a base rate of attending behavior (Phase I), positively

reinforced boy A for a period of time (Phase II). It was found that both boy's attending behavior increased over the base rate. It was felt that boy B was receiving implicit negative reinforcement and thus improved his behavior. In Phase III, the reinforcement contingencies were reversed, and boy B's attending behavior increased even beyond that of A's when he had been receiving explicit positive reinforcement. Also in Phase III, boy A's behavior was reduced, but not to the base line. Phase IV consisted of no reinforcement for either boy and a drop in attending behavior was found for both boys. During Phase V both boys were explicitly reinforced, and this resulted in a rise in their attending levels. The results of this study are clear: explicit positive reinforcement produced the highest percentages of attending for each boy, both when reinforced individually and jointly. No test of significance of differences between data was reported, however, and consequently there is some question as to how real the obtained differences in the study are.

The literature dealing with implicit reinforcement and task motivation is sparse and contradictory. Sechrest (1963) conducted a preliminary study which found that it was possible to affect the speed* with which a child would work a puzzle. He did this by the use of general verbal reinforcement. Sechrest used two jigsaw puzzles as his task and ran his subjects in pairs. Each child was given a puzzle and asked to work it. When both children were finished the experimenter gave one of the pair either explicit positive, explicit negative or no reinforcement. The subjects then exchanged puzzles and worked this new puzzle with their completion time being again recorded. Results showed that whether or not the reward was implicit or explicit was of

no consequence. Positive and negative rewards, however, did produce a significantly different effect, with positive reinforcement facilitating performance speed on the second puzzle. It was also found that only the implicit positive group is significantly different than the controls.

Sugimura (1966) obtained results which seem to agree somewhat with the Sechrest (1963) results. Sugimura found that in a competitive classroom situation those children who received implicit positive reinforcement and explicit positive reinforcement performed better than either the explicit or implicit negative groups. In this same study he found that implicit positive was more effective for sixth grade children and explicit positive reinforcement was more effective with fourth and fifth graders indicating a possible age differential. Barnwell and Sechrest (1965) also found what was interpreted as an age differential, where first graders did not respond to implicit cues but third graders did. They hypothesized that the outcome of the first three years of school may be a growth in sensitivity to the competitive nature of the classroom.

Sugimura (1965) examined the effect of sociometric status of the explicitly reinforced child on his classmates. It was assumed that praise and reproof administered to high sociometric children will produce a greater effect on their classmates than that administered to low sociometric children. Thus, the implicit reinforcement effect would be a function of the sociometric status of the child subjected to reinforcements. The subjects were four classes of fourth and sixth grade children. At each grade level ten low status and ten high status children were chosen. A digit symbol task was administered

in the classroom on day one. On day two, five high status and five low status names were called in each grade and they were either praised or reproved for their performance on the previous day. The digit symbol task was then immediately given again. The results confirmed the expected interaction between reinforcement and sociometric status. That is, children receiving implicit positive reinforcement from watching the high status classmate reprovved performed better than those who were subject to implicit negative reinforcement from watching high status children praised. No significant difference was found in the case of the low sociometric student. Sugimura (1965) feels that the improved performance of the implicit positive group can be explained. He feels that the observers were motivated by unexpected information (reproof to their high status classmates). When a high status student is praised, however, an increase in motivation is not evident, since this is an expected consequence. Sugimura (1965) once again found that age was a significant variable. The sixth grade children were more affected by implicit reinforcement than the fourth graders. He attributes this to the greater ability of sixth grade children to make inferences about their own performance indirectly from information given to other children.

In contrast to all the previous literature reviewed, Weiner, Weiner, and Hartsough (1971) and Weiner and Weiner (1973), while investigating what they termed the "indirect reinforcement" paradigm, found both direct negative and indirect negative reinforcement more effective in increasing performance than direct or indirect positive reinforcement. Weiner, Weiner, and Hartsough (1971) examined the paradigm utilizing small groups of kindergarten children. They

hypothesized that direct reinforcement to some children would have an indirect reinforcing effect of the others, and since the child had only minimal information about the performance of the other children, the indirect reinforcement would have effects opposite that of the direct reinforcement. The effect was examined in both pairs and groups of four to allow for a comparison of treatment effects between different size groups. There were five treatment conditions in the study: (a) direct positive, (b) direct negative, (c) indirect positive, (d) indirect negative, (e) neutral control group. The task consisted of copying three different geometric shapes into rectangles provided on the work sheet. The experiment was conducted by the teacher in a setting which was familiar to the children. The procedure for each group was the same. When the experiment was dealing with small groups two children were praised or reproved, and when the experiment dealt with pairs of children only one was reinforced. In phase I, the task was explained and the children worked for three one-minute periods. During the third rest period the teacher either commented favorably, unfavorably, or said nothing about one or two of the student's papers. Then, the task was performed again for three more one-minute trials. Phase II was performed on the following day. The same pairs and groups were once again brought in and given the task to perform for three one-minute periods. No comment was made to any student on this day. The results showed that indirect negative reinforcement was the most effective in increasing performance and was significantly different from the other four conditions. A further analysis revealed that there was a significant main effect over days with the second day's performance being significantly higher than the first day's performance.

Contrary to Sechrest (1963) and Sugimura (1965), Weiner et al. (1971) found that positive reinforcement did not have a facilitating effect on performance but rather a maintenance effect. Weiner et al. (1971) also found, contrary to Sechrest (1963) and Sugimura (1965), that young children are capable of receiving and evaluating indirect reinforcing information.

Weiner and Weiner (1973) examined this same paradigm with college students. It was hypothesized that both direct and indirect negative reinforcement would facilitate performance over trials and both direct and indirect positive would maintain the level of performance, due to the fact that the demand characteristics of the experiment would appear to be fulfilled. Subjects were grouped randomly into pairs, with one pair participating in each session. The task consisted of drawing circles on sheets of gridded paper. After three two-minute base line trials, the experimenter during the third rest period administered direct positive or negative reinforcement to one subject or in the control condition said nothing. The subjects then completed three more two-minute trials. Results supported the hypothesis that both direct and indirect negative reinforcement increased performance significantly over the baseline, and the other conditions increased very little or remained constant.

Statement of the Problem

It can be seen that the results of Weiner, Weiner, and Hartsough (1971) and Weiner and Weiner (1973) directly contradict the results Sechrest (1963) obtained. This is assuming that Weiner and associates' "indirect and direct reinforcement" are equivalent to Sechrest's

"implicit and explicit reinforcement". A close examination of the designs of the two studies leads this author to believe that they are the same phenomena. The reason or reasons for the differences in the results of these experiments is not presently known. There are differences in the designs of the two experiments. For instance, Sechrest (1963) had the subjects put together two different puzzles which he claims are of equivalent difficulty, while Weiner et al. (1971) had the subjects do a simple figure reproduction task. This task was chosen because it was well within the capacity of the subjects. This is important because all of these studies are concerned with direct or indirect, implicit or explicit reinforcement facilitating performance. Presumably, in these situations, performance is to be facilitated through increased motivation. To do this a task would be needed, which when completed would reflect levels of motivation acquired but not reflect intelligence. It would appear that a simple figure reproduction task would be more suited to demonstrating changes in levels of motivation than puzzle completion which might indicate different levels of intelligence. It is not at all clear how these two different types of tasks might bias outcomes, if in fact, they would. It does appear, however, that the simpler the task, the more sensitive and reliable it would be in recording changes in levels of motivation. This would certainly be a thing to focus on in further efforts to demonstrate the effects of direct or indirect reinforcement. These are efforts that need to be undertaken.

Unrelated to the above considerations is a new one of practicality. Provided that it has been, or can be, demonstrated that direct or indirect positive or negative reinforcement is more efficient in

increasing motivational levels of subjects in certain situations, is it possible to generalize these situations to the classroom in general? In this respect there are some variables that should be considered. A classroom appears to be composed of two separate but interrelated dimensions. Sheriff and Sheriff (1969) view the classroom as a transitory togetherness situation. They define this as interaction among individuals who have not previously established role and status relations or common norms through interaction with one another. This appears to represent one aspect of classroom composition. The other that should be examined is what Jensen (1955) termed the friendship dimension. This is what Sheriff and Sheriff (1969) would define as a group as it originated from a togetherness situation. In any typical grade school situation, one would expect to find both of these dimensions at work. Taking into consideration these two dimensions, the question that needs to be answered is how are subjects going to respond given indirect reinforcement?

Sheriff and Sheriff (1969) define groups as having these four characteristics that identify them:

1. They have a motivational base shared by individuals which is conducive to recurrent interaction among them over time.
2. Formation of an organization (group structure) consisting of differentiated roles and statuses and delineated in some degree from that of non-members.
3. Formation of a set of norms (i.e., values, rules and standards for behavior).
4. More or less consistent differential effects on the attitude and behavior of individual members produced by the group properties.

Because of these characteristics groups may react differently in

different situations. The author, however, feels that the indirect reinforcement paradigm will hold with groups as well as non-groups. There is evidence in the literature that group functioning breaks down when group members are placed in competitive situations. Berkowitz (1956) reported that individual evaluation of a group's members tended to divide the group. Julian and Perry (1967) found that group competition as well as individual competition produced higher motivation and quantity, but that it also improved the quality of the performance.

Therefore, since the indirect reinforcement paradigm works in competitive situations, and competition tends to break down groups, it would be expected that the phenomena would work equally well in groups and non-groups. If the paradigm does work for both dimensions, this is valuable information for a teacher placed in a classroom situation where she wants to motivate the performance of her class. If it works differentially, this is also good information as she would be aware of its possible outcomes and could apply it prudently. Due to the conflicting accounts, the paradigm also might not work at all.

List of Hypotheses

The following are a list of hypotheses that will be examined in this research.

1. After reinforcement, subjects receiving indirect negative reinforcement will perform at a higher level than subjects receiving direct positive reinforcement.
2. The performance of both groups and non-groups will be the same for all treatment conditions.

CHAPTER II

METHODOLOGY

Subjects

The subjects were 48 female college students who were enrolled in a sophomore level psychology class which uses a small group work format. There were eight subjects in each of the six treatment conditions. The class from which the subjects were chosen was primarily a discussion class in which the students were required to lead the discussion. At the beginning of the semester they were placed in work groups of four to five people and assigned a topic and time of presentation. They were then encouraged to work together on this project. It has been observed by instructors of these classes that this format promotes close relationships between the small group members as evidenced by their sitting together in class and their reported contact outside of class.

Task

In the interest of equalizing both ability and motivation, a simple manual task was used as a performance measure. Each subject was given six pages of gridded paper with one page used for each trial. The subjects were asked to fill in each successive box with an "X". They were told that they were participating in a study examining facial expressions of people engaged in a menial task and were being video-

taped.

Procedure

Subjects in the group conditions were asked to volunteer for the experiment with someone from their small work groups. Only groups who had presented their discussion prior to the experiment were used to insure that the subjects had worked together. Subjects in the non-group conditions were randomly selected and paired from the volunteers with the restrictions that each member of the pair was from a different section, and that the two subjects were not acquainted.

Only one pair of subjects participated in each session. They were seated at opposite ends of a table which was divided by a partition so that comparisons of performance on the task could not be made.

Each subject was given a booklet of gridded paper and instructed to mark "X's" in successive boxes for six two minute trials with a one minute rest between trials. Subjects were seated randomly at either position P1 or P2. During the rest period between trials three and four the experimenter leafed through the booklets of each of the subjects and administered one of the following conditions to P1 or P2 in a randomized order.

1. Silence as in the manner given to the other subject--Neutral Condition.
2. A comment telling the subject that she had performed above average--Direct Positive Reinforcement.

The subjects were then told to begin the task again and to complete trials four through six. It was assumed that in each pair, with the exception of the neutral group, two treatments were present. That

is, when one subject received direct positive reinforcement the other received indirect negative reinforcement.

Data Analysis

The data were analyzed with a 2x3x3 repeated measures analysis of covariance. The independent variables in this study were the group/non-group condition, and the three treatment conditions: direct positive reinforcement, indirect negative reinforcement and the neutral condition with trials repeated within subjects. The neutral condition was used as a comparison measure for treatment effects as well as control for fatigue and practice effects. The dependent variable was the number of successive boxes filled with "X's" during the base rate, trials one through three and post treatment, trials four through six.

CHAPTER III

RESULTS

The data were analyzed using a 2x3x3 repeated measures analysis of covariance with repeated measures over the three trials. Subjects were nested under each of the six combinations of the three treatment conditions and the group/non-group dimension. Because the same covariate was used for each level of the repeated measure, the covariance adjustment had an effect on the between subjects effects. The within subjects tests were identical to a repeated measures analysis of variance.

Results showed a significant main effect over trials with all groups increasing performance from trial four to trial six ($F = 372.979$, $df = 2/84$, $p < .01$ see Table I). There were no significant effects in the analysis of groups versus non-groups, nor was there a significant effect among treatment conditions. Although the treatment x group/non-group x trials interaction was significant, the statistical significance did not appear in any of the computed simple effects tests (see Appendix B).

Since it had been hypothesized that indirect negative reinforcement would increase performance significantly more than direct positive reinforcement, an a priori t-test was performed to examine these differences over combined trials. Results were significant ($t = 2.679$, $df = 14$, $p < .02$), indicating that for both groups and non-groups

TABLE I
 SUMMARY TABLE FOR ANALYSIS OF VARIANCE AND
 ANALYSIS OF COVARIANCE FOR
 COMBINED DATA

Source	df	MS	F	p<
<u>Between Subjects</u>				
A (group/non-group)	1	327	.27086	.75
B (treatment)	2	659.11	.5495	.75
A x B	2	7.695	.00637	.99
Subjects within groups	42	1207.255		
<u>Within Subjects</u>				
C (trials)	2	1354.715	372.979	.01
A x C	2	72.925	2.008	.25
B x C	4	19.611	.54014	.75
A x B x C	4	93.923	2.5868	.05
C x Subjects with groups	84	36.308		
<u>Between Subjects</u>				
A	1	296.294	.247	.75
B	2	669.378	.5596	.75
A x B	2	6.570	.0549	.95
Subjects within groups	41	1196.038		

indirect negative reinforcement was more effective in increasing performance than direct positive reinforcement as can be seen in Figure 1.

An examination of the neutral condition and the indirect negative reinforcement condition showed no significant effect. The difference between treatment effects on performance are shown in Figure 2.

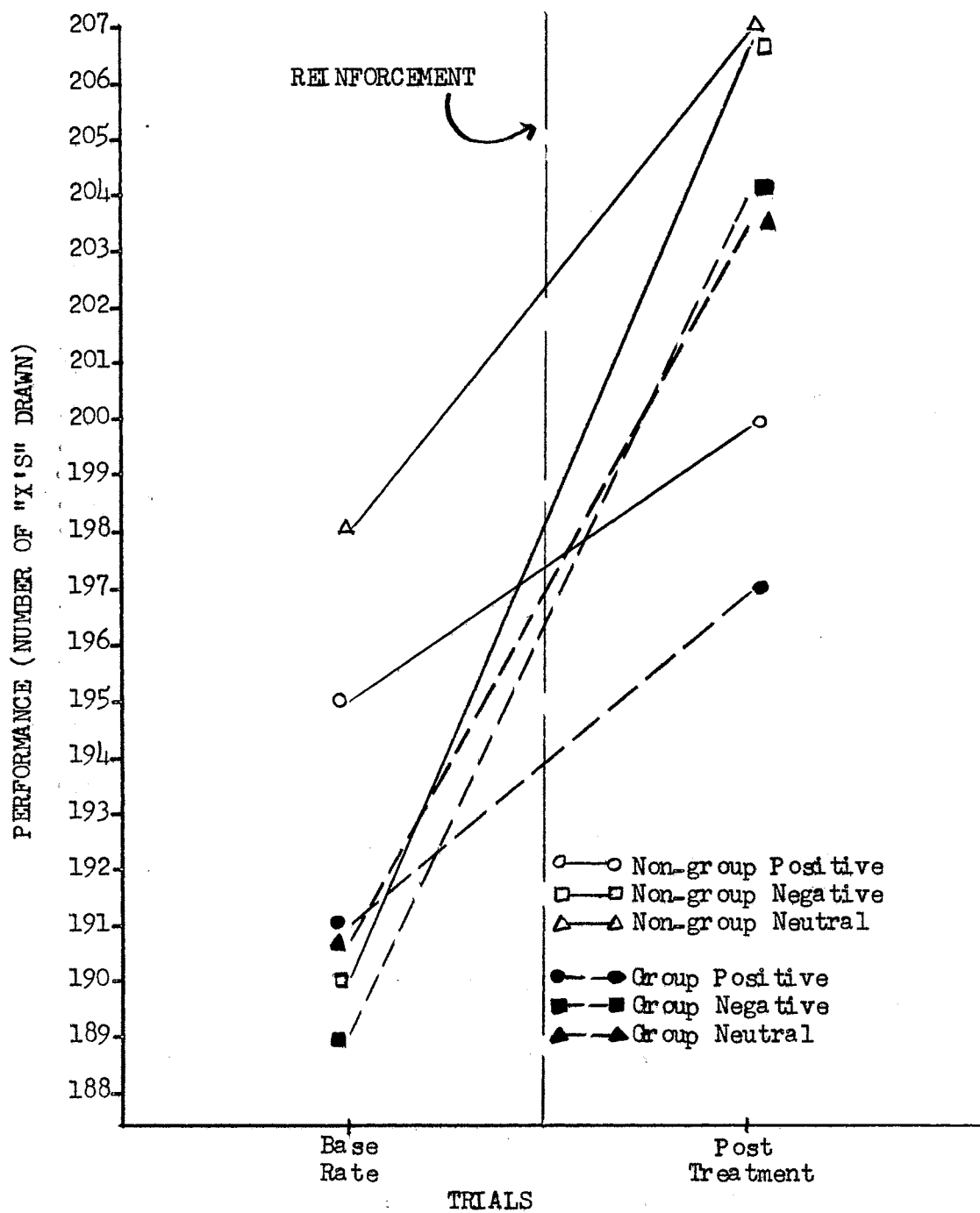


Figure 1. Average Performance Pre- and Post-Reinforcement for All Treatment Conditions

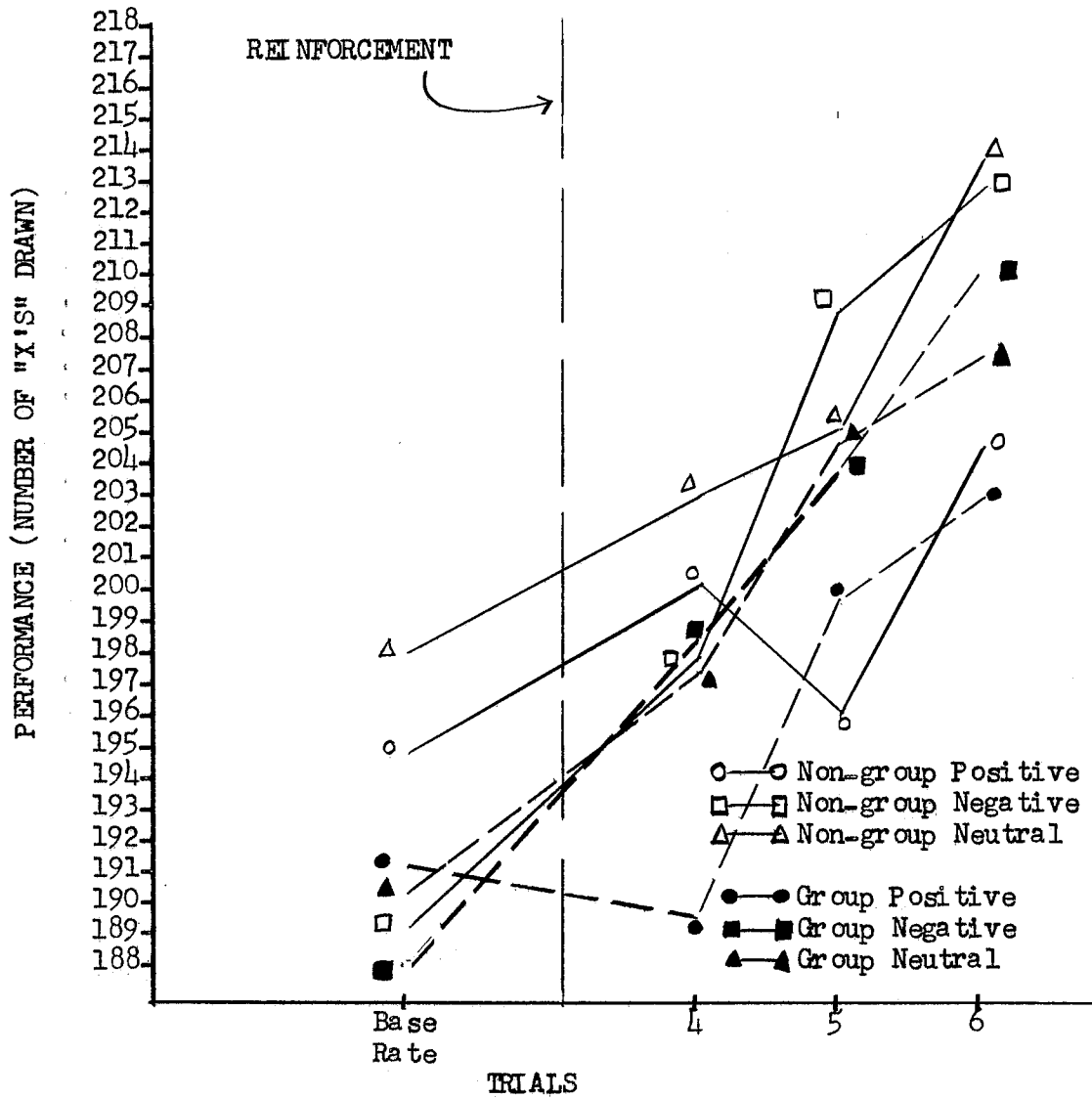


Figure 2. Average Performance of Subjects in Groups and Non-Groups Under All Treatment Conditions

CHAPTER IV

DISCUSSION

An examination of the over all analysis does not reflect a difference between treatment conditions. Comparisons between selected treatments, however, do show that over all trials the use of indirect negative reinforcement increased subjects' performance significantly more than direct positive reinforcement. It was expected that the performance of subjects in the neutral condition would not change over trials. It was found, however, that there was no significant difference between the neutral condition and the indirect negative condition (see Appendix B). An examination of Figure 3 shows that the neutral group acted in the same manner as the negatively reinforced group. This may indicate that the subjects perceived no reinforcement as being a negative condition and increased their performance according to the paradigm. This interpretation becomes more plausible when the experimental situation as a whole is examined. When the subjects entered the test room they were warmly greeted by the experimenter who then gave them the instructions. During the experiment their work was examined, and no comment was made on their performance by the previously "warm" experimenter. They may have interpreted the silence, and the experimenter's effort to remain neutral as a negative reinforcer. This would then explain their accelerated performance similar in effect to that achieved by the intended indirect negative rein-

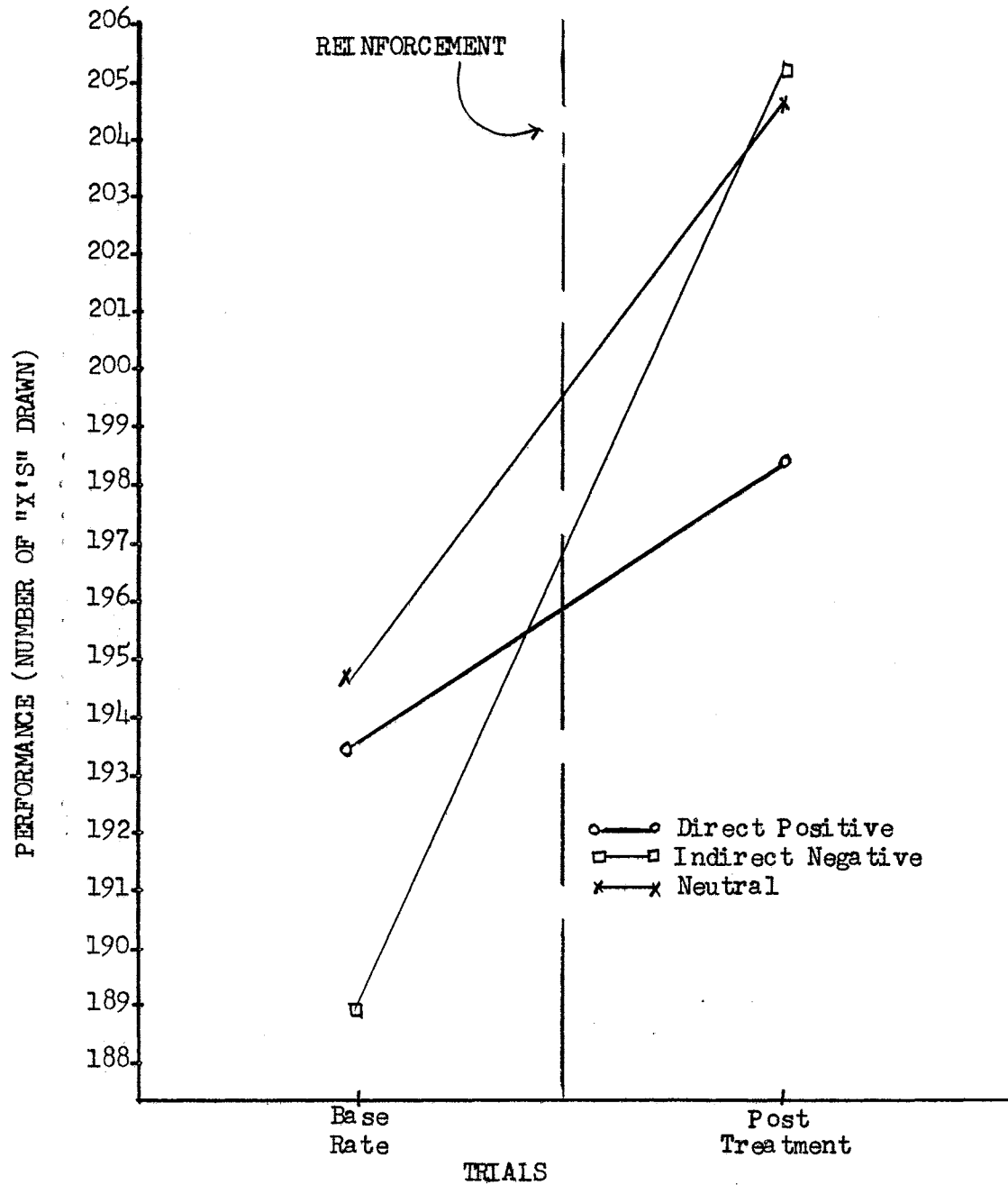


Figure 3. Average Performance Pre- and Post-Reinforcement of the Three Treatment Conditions Combined Over Groups and Non-Groups

forcement.

In examining the direct positive condition, it becomes apparent that performance did not increase as markedly under this condition as it did under the indirect negative reinforcement condition or the neutral condition. An examination of Figure 2 shows that performance dropped either to or below the established base rate after the positive reinforcer was administered. In the non-group condition the drop occurred on the second trial after reinforcement. In the group condition performance fell immediately after reinforcement. It can also be seen from Figure 2 that after the drops in performance there are increases on the next trials. It was predicted that there would be no significant increase in performance for the positive reinforcement condition. The slight decrease in performance could be accounted for in view of this hypothesis. The increase in performance after the drop might be explained in terms similar to those used in discussing indirect negative reinforcement. The subject's performance on trials four to six was not positively reinforced after the initial reinforcement. This absence of positive reinforcement, coupled with a decrease in performance, may have caused the subjects to perceive the lack of positive reinforcers as negative. Consequently, subjects may have increased their performance in order to regain the positive reinforcement. This is similar to the neutral conditions which also showed an increase in performance after receiving no reinforcement.

It was hypothesized that there would be no significant difference between the group and non-group condition. The lack of significance for the treatment x group/non-group interaction in Table I supports this hypothesis. Direct positive reinforcement for one subject

apparently does act as indirect negative reinforcement for another subject and this is equally true under both group and non-group conditions. The fact that this principle can be effectively applied to groups of people as well as individuals outside a group context has important implications. In a situation where the work being done by a number of people is similar, this direct-indirect reinforcement paradigm, if it is applicable to larger groups, can be used to increase their efficiency. If, for instance, an executive is unhappy with the quality of the work exhibited by some workers in his steno pool and he chooses to compliment one of the better members on her speed of transcription, he is indirectly giving the other members of the pool negative reinforcement. They in turn should increase their speed. The implications this principle has for school children is obvious.

One of the ramifications of using direct positive reinforcement is the fact that the administration of positive reinforcement is more pleasant for both the giver and the receiver. The use of this paradigm, then, can make the job or school situation more pleasant for those involved.

It was previously stated that there were conflicting results in the literature concerning this paradigm. The results of the present study are similar to those reported by Weiner, Weiner and Hartsough (1971), and Weiner and Weiner (1973), with indirect negative reinforcement being more potent than direct positive reinforcement. Sechrest (1963), however, has reported apparently opposite results with direct positive reinforcement being the more effective mode. The critical difference in these studies can be explained in terms of the conditions under which the subjects were reinforced. In the present study, and

also the Weiner, Weiner and Hartsough (1971), and the Weiner and Weiner (1973) studies the subjects could view each other, but one could not view the other subject's performance. In all of these studies the subjects kept performing the task until the experimenter told them to stop. In the Sechrest (1963) study, as in the above studies the subjects could see each other but could not observe the performance of the other subject per se. However, Sechrest (1963) did not have the subjects necessarily keep performing the task until the experimenter told them to stop. Some subjects probably did finish the task before the allowed time had elapsed. Thus, even though the actual performance was not observable, it would become obvious when one person had completed the task. Then if reinforcement was given randomly, there would be inconsistencies perceived by the subjects. For example, if subject A finished 30 seconds before subject B, but subject B received positive reinforcement, subject A might be influenced to score lower on the next trial since subject A was not rewarded for his obviously better performance. This variable of viewing or not viewing the other subject's performance needs further consideration. If a subject is allowed to view and assess performance of a competing subject, results different from those found in the present study may be obtained.

This study showed that the direct positive/indirect negative reinforcement paradigm worked with dyads. Would it work with larger groups? That is to say, if one person in a group of 8 or 10 or 15 were positively reinforced, would this act as indirect negative reinforcement on the other members of the group with the resulting increase in performance? In essence it is not known if this paradigm is

restricted to small groups and non-groups or whether it also applies to larger groups. This needs to be determined through further research.

Finally, race, status, age, sex, and socioeconomic groups need to * be considered as variables. There may be differential effects in performance in the direct positive/indirect negative reinforcement paradigm if the subjects receiving the reinforcements differ in these variables.

CHAPTER V

SUMMARY

The purpose of this study was to examine the effects of indirect negative reinforcement on performance during a simple task and to determine if the effects held when administered to groups and non-groups. Indirect negative reinforcement is postulated as acting on one subject in a dyad when the other subject is receiving direct positive reinforcement. Forty-eight female undergraduate college students were used as subjects. Twenty-four were paired and placed in the group condition. They had all worked together prior to the experiment. The other 24 were paired and placed in the non-group condition. Each of these pairs were strangers prior to the experiment. There was a control group for both group and non-group conditions. Subjects were given six two-minute trials consisting of a simple paper and pencil task. After trial three direct positive reinforcement was administered to one subject in each pair. Performance on the first three trials, the base rate, were compared to the three post treatment trials.

Two major hypotheses were tested and supported. It was found that subjects receiving indirect negative reinforcement increased their performance on the post treatment trials, and that subjects who received direct positive reinforcement did not significantly increase their performance over the established base rate. It was also found

that there was no significant difference in the performance of the group and the non-group conditions. The neutral condition which was not expected to show an increase in performance over the base rate acted in the same manner as the indirect negative reinforcement condition showing a significant increase in the post treatment trials.

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APPENDIXES

APPENDIX A

RAW DATA

		TRIALS				
		AVERAGE BASE RATE	POST TREATMENT			TOTAL POST TREATMENT SCORES
SUBJECT		X	Y ₄	Y ₅	Y ₆	P _y
GROUP	1.	182.666	183	194	197	574
CONDITION	2.	178.	175	178	178	531
	3.	141.666	150	158	157	465
DIRECT POSITIVE	4.	197.666	219	226	227	672
REINFORCEMENT	5.	215.666	207	224	223	654
	6.	181.666	183	172	186	541
	7.	218.666	217	224	232	673
	8.	214.	184	226	226	636
GROUP	1.	209.666	213	213	220	646
CONDITION	2.	157.666	185	185	180	550
	3.	171.	182	195	196	573
INDIRECT	4.	191.333	200	198	205	603
NEGATIVE	5.	188.	200	207	211	618
REINFORCEMENT	6.	157.666	165	164	170	499
	7.	197.666	200	207	226	633
	8.	237.666	243	261	265	769
GROUP	1.	214.	204	212	219	635
CONDITION	2.	204.666	203	220	225	648
	3.	198.333	199	212	210	621
	4.	175.333	177	179	185	541
NEUTRAL	5.	180.	207	206	202	615
	6.	162.666	175	179	182	536
	7.	179.	205	211	210	626
	8.	214.	215	222	224	661
NON-GROUP	1.	196.333	197	196	206	599
CONDITION	2.	194.333	198	194	200	592
	3.	198.666	207	208	218	633
	4.	211.333	220	220	222	662
DIRECT POSITIVE	5.	199.666	192	177	201	570
REINFORCEMENT	6.	210.666	218	217	212	647
	7.	192.666	196	197	210	603
	8.	160.666	166	160	169	495

		TRIALS				
		AVERAGE BASE RATE	POST TREATMENT			TOTAL POST TREATMENT SCORES
SUBJECT		X	Y ₄	Y ₅	Y ₆	P _y
NON-GROUP CONDITION	1.	182.666	193	211	223	627
	2.	193.333	196	202	205	603
	3.	159.	169	171	185	525
INDIRECT NEGATIVE REINFORCEMENT	4.	220.666	232	242	245	719
	5.	198.	209	210	221	640
	6.	167.	187	214	214	615
	7.	197.666	197	204	207	608
	8.	198.666	205	214	204	623
NON-GROUP CONDITION NEUTRAL	1.	208.	222	215	226	663
	2.	170.	178	177	189	544
	3.	205.666	211	196	200	607
	4.	211.333	220	226	234	680
	5.	192.	203	213	234	640
	6.	196.	200	201	209	610
	7.	199.333	198	208	214	620
	8.	203.666	193	205	214	612

APPENDIX B

OTHER COMPARISONS

COMPARISON	F	df	p <
<u>Post Hoc</u>			
<u>A x B x C</u>			
Difference between group/non-group and treatments at trial 4	.210	2,84	.90
Difference between group/non-group and treatments at trial 5	.185	2,84	.90
Difference between group/non-group and treatments at trial 6	.053	2,84	.99

	<u>t</u> (one-tailed)	df	p <
<u>A priori</u>			
Difference between indirect negative and direct positive reinforcement over all trials	2.679	42	.02
Difference between indirect negative reinforcement and the neutral condition over all trials	.070	42	.99
Difference between indirect negative and direct positive reinforcement on trial 6	.9589	42	.15
Difference between indirect negative reinforcement and the neutral condition on trial 6	.078	42	.99

V I T A

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