COMPARISON OF NORMAL AND FAMILIALLY-RETARDED CHILDREN'S RESPONSES TO INDIRECT SOCIAL REINFORCEMENT

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CHAPTER I

REVIEW OF THE LITERATURE AND THEORETICAL ORIENTATION OF THE PRESENT STUDY

Indirect Social Reinforcement Literature

Attention to the learning phenomenon under investigation in the present study, indirect social reinforcement, can be traced from the literature on vicarious reinforcement. More specifically, the phenomenon seems first to have been implicated by studies such as those by Kounin and Gump (1958, 1961) and Sechrest (1962), with Sechrest (1963) attaching the label of "implicit reinforcement" and Weiner, Weiner, and Hartsough (1971) attaching the label "indirect reinforcement." (Both labels, "implicit reinforcement" and "indirect reinforcement," appear to be a description of the same basic concept though differences may exist in the experimental paradigm.)

Kounin and Gump (1958), while observing the behavior of classroom children, described what they termed the "ripple effect," or the influence that behavior control techniques have, not on the children who are being

disciplined, but on the other children who are watching and listening. More simply stated, the Kounin and Gump study attempted to find answers to the following question: While the teacher is praising or correcting Sally, what effect do these teacher behaviors have on Ruth, who is sitting nearby, taking in what is happening? Kounin and Gump did in fact observe a "ripple effect." Specifically, children observing another child being corrected or reprimanded were seen to respond with special efforts to be good, such as stopping a misbehavior of their own, sitting up taller, or paying closer attention. Moreover, it was found that the physically nearer the observing child was to the target child the stronger was this effect. This study, although being one of the first to report this effect, was only observational in nature, was limited to the study of reactions to negative types of reinforcement, and did not provide for statistical analysis.

Sechrest (1962), using an interview technique, attempted to gain knowledge about the motivational factors operating in the classroom and their effects on children. He discovered that even at young ages (kindergarten) the child is generally aware of and able to report reasonably well the things that go on in school. A similar view was offered in a later study by Weiner, Weiner, and Hartsough (1971). Sechrest was particularly interested in the sensitivity of children to each other, and so asked the question, "How do you feel when your teacher tells another

child that he has the best paper or has done a good job?" He found older children (i.e., third and fourth graders) were less inclined to report positive feelings. Rather, they reported feeling neutral or indifferent, but Sechrest noted that they tended to do so guardedly or defensively.

Following up on this interview data, Sechrest (1963) coined the term "implicit reinforcement." He felt that an observer watching a model receive reinforcements would have his own behavior tendencies altered such that they would be opposite to those received by the model. An often presented example involves two boys each making model airplanes. The father makes favorable comments to one but says nothing to the other. The indirect reinforcement model would hold that the second child would feel as though he had been negatively reinforced, either through feeling as though his plane were not as good and/or through feeling hurt that his father did not pay any attention to him. Positive reinforcement, then, for the first child, could produce indirect negative reinforcement for the second. Indirect reinforcement theory also holds that when direct negative reinforcement is given to one child, the other could receive indirect positive reinforcement. As an example of this, a father may remark to one of his boys that he thinks he is doing quite a sloppy job of building his model airplane. In this instance, the other boy is likely to assume that his father thinks he is doing a good job since he was not reprimanded.

The literature dealing with indirect reinforcement and its effects on task motivation is sparce and contradictory. In Sechrest's 1963 study, jigsaw puzzles were employed as the tasks and reinforcement was verbal. Subjects were run in pairs with each child given a puzzle and asked to work it. When both children were finished the experimenter gave one of the pair either direct positive, direct negative, or no reinforcement. The subjects then exchanged puzzles and worked this new puzzle with their completion time being again recorded. Results showed that only the indirect positive group was significantly different from the controls. The effect of reinforcement for this group was to facilitate performance on the second puzzle.

Sugimura (1966) obtained results which agree with Sechrest's 1963 findings. Sugimura found that indirect positive reinforcement was more effective for sixth grade children while direct positive reinforcement was more effective with fourth and fifth graders, thus 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 indirect cues but third graders did, thus supporting the earlier observations of Sechrest (Sechrest, 1962) in which he had also noted differential response between third graders and first graders in reaction to a classmate's reception of praise.

Sugimura (1965) examined the effect of sociometric status of the directly reinforced child on his classmates. 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. Children receiving indirect positive reinforcement from watching the high status classmate reproved performed better than those who were subject to indirect negative reinforcement from watching high status children praised. No significant difference was found in the case of the low sociometric child. Sugimura hypothesized that the improved performance of the high status, indirect positive group might have been due to the possibility that the observers were motivated by unexpected information (i.e., reproof to a high status classmate). When a high status student is praised, however, an increase in motivation will not be evident, since this is an expected occurrence. Sugimura once again found that age was a significant variable. The sixth grade children were more affected by indirect reinforcement than the fourth graders.

Thus, it can be seen that both Barnwell and Sechrest (1965) and Sugimura (1966 and 1965) have obtained results

which support the view that children in the higher elementary grades are more affected by indirect reinforcement than are children in the early grades. Within these studies, however, a contradiction exists, with Barnwell and Sechrest holding that third graders respond to indirect reinforcement while first graders do not, and Sugimura finding that sixth graders respond to indirect reinforcement while fourth and fifth graders do not. It is thus apparent that a question exists concerning the ages at which children are sensitive enough to their surrounds to be affected by indirect reinforcement. Adding to the contradictory findings in this area is the work of Weiner et al. (1971) in which support was found for the view that even kindergarten children are able to evaluate and respond to indirect reinforcement.

In a more basic area, conflict is also apparent with regard to whether children are more affected by negative or positive reinforcement in the indirect/direct paradigm. In contrast to all the previous literature reviewed, Weiner et al. (1971), Weiner and Weiner (1973), and Drummond (1973) have found both direct and indirect <u>negative</u> reinforcement more effective in increasing performance than either direct or indirect positive reinforcement. Their results indicated that children or adults observing another receive praise will work harder following that reinforcement possibly in the hope of gaining praise for themselves. This view was further

supported in these studies in light of the fact that the performance of subjects in the indirect negative condition leveled off after the immediate post-reinforcement increase in performance. Here, presumably, the subject saw that the extra work did not result in praise so motivation to keep increasing performance was reduced.

Contrary to Sechrest (1963) and Sugimura (1965), the findings of Weiner et al. (1971) and Weiner and Weiner (1973) also gave evidence for the view that positive reinforcement in situations similar to the ones in these studies serves to maintain performance levels rather than to increase performance levels. It is as if the subjects in the positive reinforcement conditions say to themselves, "I'm obtaining positive reinforcement for performing in this particular way, so my best bet to continue receiving positive reinforcement will be to attempt to maintain this performance."

In the Weiner et al. (1971) study, indirect/direct reinforcement effects were 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: 1) direct positive, 2) direct negative, 3) indirect positive, 4) indirect negative, and 5) neutral control group. The task consisted of copying three different geometric shapes into rectangular spaces provided on a work sheet. When the experiment was dealing with small groups two children were

praised or reproved; when the experiment dealt with pairs of children only one was reinforced. The procedure for each group was the same. In Phase I, the task was explained and the children worked for three one-minute periods. During the third rest period the experimenter either commented favorably, unfavorably, or said nothing about one or two of the students' 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 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.

Weiner and Weiner (1973) examined this same paradigm with college students, using a task which consisted of drawing circles on sheets of gridded paper. They got essentially the same results as did Weiner et al. (1971)

It can thus be seen that the results of Weiner et al. (1971) and Weiner and Weiner (1973) do contradict the results that Sechrest (1963) and Sugimura (1966) obtained. However, an examination of the tasks and methodology involved give some indication that these apparently

contradictory results are possible. Sechrest (1963) had subjects put together two different puzzles which he claimed were of equal difficulty, while Weiner et al. (1971) had 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 indirect or direct reinforcement facilitating performance. Presumably, in these situations, performance is to be facilitated only through increased motivation. To do this a task would be needed which, when completed, would reflect levels of motivation acquired but not reflect intelligence or learning. 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 appears that the simpler the task, the more sensitive and reliable it would be in recording changes in levels of motivation. In sum, tasks in the Sechrest and Sugimura studies were of such a nature that intelligence levels as well as the inherent meaning and challenge of the task to the subjects may have played important roles. In the Weiner et al. (1971) study, however, a task was selected well within the ability range of all subjects and was meaningless enough that changes in performance could be minimally associated with the children's interest in the task itself. It seems conceivable that the differential findings regarding the

effects of indirect/direct reinforcement could be explained by this differential presence of factors in the studies.

Mental Retardation Literature

The present study, much like the Weiner et al. (1971) study, was concerned with changes in performance levels as a function of changes in motivational levels. Furthermore, the study involved a comparison between the motivational levels of normal and retarded children. It therefore becomes important to discuss possible basic motivational differences between normal and retarded children, which are themselves the result of differences in their environmental histories.

Several characteristics of the task-orientation and problem-solving behaviors which originate in the motivational sphere of the mentally retarded have been isolated experimentally by Zigler (1966a, 1966b, 1967, 1972). Zigler (1972) delineates four important motivationally related factors which have received increasing attention: 1) expectancy of success and expectancy for failure, 2) outer-directedness, 3) social deprivation and motivation for social reinforcement (the positive reaction tendency), and 4) social deprivation and the tendency to avoid social reinforcement (the negative reaction tendency). In Zigler's treatment, the additional variable of institutionalization as an environmental factor in the

personality functioning of the retardate is dealt with as a particular case or as an offshoot of the more general factor of social deprivation.

1. Expectancy of success and expectancy for failure. Failure expectancy has been viewed as an outgrowth of a lifetime characterized by frequent confrontations with tasks with which the retarded child has been intellectually ill-equipped to deal. Sternlicht and Deutsch (1972) give a general description of the possible failure history of the retarded child:

> Owing to his limited intellectual abilities, the retarded child, in constant competition with intellectually superior individuals, is likely to fail in much of his goal-directed activity. Having experienced a disproportionately great number of failures and only a minimal number of successes in a wide variety of life situations, he comes to hold a rather low level of expectancy for the successful attainment of goals... Such low expectancy itself acts to decrease his performance still further, since expectancy is one of the factors that operate to set the general level of potential in an individual's performance. The resulting lowered performance leads to yet further failure and to consequent lower expectancies in a viciously circular process. Thus, the experience of failure, per se, compounds the situation and creates an additional factor in lowered performance above and beyond the actual intellectual deficit itself (p. 59).

Early work in this area of research concentrated on what was termed the success-striving vs. failure-avoiding (SS-FA) formulation. As described by Moss (1958), the success-striving individual will be oriented toward the cues which represent success, whereas the failure-avoiding individual will be oriented toward cues which allow him to

avoid the greatest amount of failure. Cromwell (1961) hypothesized that individuals with a long history of failure experiences such as retardates would respond more modestly to infrequent successes and would be relatively immune to failure since failure would be what they would expect. Davids and White (1958), on the other hand, presented the view that retardates, needing to avoid failure, would show greater losses under failure conditions than would normals. In general, research has supported the proposition that retardates have a higher level of expectancy for failure than do normals (reviewed in Cromwell, 1963). Before even attempting a new task, the child with a history of failures expects to fail (MacMillan and Keough, 1971). In a study involving prolonged failure, Zeamon and House (1963) found that retardates were unable to even solve an extremely simple discrimination problem although they had previously been able to do so.

Gruen and Zigler (1968) found that success or failure experience needs to be interpreted in light of the individual's prior reinforcement history. Stevenson and Zigler (1958) had previously found that retardates were willing to settle for a lower degree of success than were normals, as measured by greater maximizing behavior (i.e., a greater frequency of choice of a partially reinforced stimulus). Gruen and Zigler (1968) hypothesized that if it was the lowered expectancy of success stemming from a high incidence of failure experiences that caused

the retardates to manifest maximizing behavior, then this same type of behavior should be found in normal children who have also experienced relatively high amounts of failure, such as lower-class children. Results of the study showed that both the normal lower-class and the retarded children made more maximizing responses than did the normal middle-class children. This study, it seems, quite strongly implicates the particular incidence of success or failure experienced by the child as a determinant of his expectancy of success, irrespective of social class or intellectual level. A further illustration of this would be the case of the very protected retarded child who may not experience as much failure as one who is less well protected, and who would thus have a higher expectancy of success.

Viewing the failure history of the retardate from an entirely different angle, Rosenthal and Jacobson (1968) reported that teacher expectations of poor results may affect the performance not only of children of average intelligence, but also of a group of retarded boys.

Thus far, the review of the literature has discussed only the excessive failure history of the retarded child. For a retardate to function optimally in society, his everyday world must, at least to some extent, be structured and planned for him in order to provide the necessary degree of protection and shelter from the fortuities and vicissitudes of life which are a part of normal existence.

At the same time, however, care must be taken not to create a pattern which would be overly protective of the retardate's personality. Such a pattern could act to inhibit the retardate's strivings for autonomy by setting off a vicious cycle of protection-dependence-further protection. It seems then that a mean formula should be followed which eliminates the extremes of both social overexposure and social overprotection.

Related to the above notion of social overprotection is the extreme view that the retarded individual need be sheltered from failure experiences, as they can only be detrimental to him. Recent research goes against this theory by showing that failure can indeed have motivating valence for the retarded individual (Bialer and Cromwell, 1965; Lingren, 1967; Sternlicht, Bialer, and Deutsch, 1970; and Kazdin, 1973).

Bialer and Cromwell (1965) divided a group of retarded children into success-strivers and failure-avoiders. Success-strivers were thought of as those whose performance would increase after failure, while failure-avoiders were described as those whose performance would decrease after failure. Within this particular experiment, a repetition-choice technique was employed to identify failure-avoiders and success-strivers. Within this context, a failure-avoider was defined as one who given the opportunity sought to avoid a failure experience by repeating a previously successful experience. Conversely, a

success-striver was defined as one who chose to repeat a previously failed task with the apparent goal of completing it successfully. Bialer and Cromwell predicted that retarded children identified as success-strivers would gain in performance following interpolated failure, while those characterized as failure-avoiders would show a performance decrement. Results, however, showed a significant increment for both groups, although the difference between group means was marginally significant in favor of the success-striving group. It was concluded that moderate failure experience can motivate both the success-striving retardate and (albeit to a lesser degree) the failure-avoiding retardate.

Lingren (1967) evaluated the effects of praise and reproof upon the learning and recall of a complex paired-associates task by low-anxious and high-anxious retarded boys. At the completion of each learning trial, subjects were either praised or reproved. Reproof was found to be superior to praise in facilitating performance, irrespective of anxiety level. Lingren offered an explanation for his results by postulating that, since the retarded child has learned to expect a low level of performance from himself, reproof may serve to weaken this expectation and increase drive level, while praise may serve merely to reinforce the subject's low level of performance.

Sternlicht et al. (1970), in an effort to introduce a new, and perhaps, critical parameter (i.e., level of

aspiration), undertook an examination of the effects of varying conditions of mild praise, mild censure, and the subject's stated level of aspiration on the performance of institutionalized adolescent retardates in a simple manipulative task. The task used was the Placing subtest of the Minnesota Rate of Manipulation Test (MRMT). This instrument was selected because it can be easily understood and executed by retardates. Subjects in the study were randomly assigned to one of six incentive conditions which were to be interpolated between two successive trials on the MRMT: 1) neutral control, 2) praise, 3) censure, 4) aspiration, 5) praise and aspiration, and 6) censure and aspiration (For the aspiration incentive group, at the completion of trial 1, each subject was told the time it took him to do the placing test and then asked to express an estimate of his speed of performance on the second trial). Results indicated that censure dominated other incentives even when combined with aspiration. It was noted, however, that each incentive condition produced some increment in performance. Sternlicht, Bialer, and Deutsch postulated that the superiority of censure was a function of the "whole" situation, including the particular nature of the task involved, the mild quality of the censure applied, and the fact that the possibility of committing errors, per se, was eliminated as a psychological feature of the situation.

The study by Kazdin (1973) is of particular relevance to the present investigation. It was found that verbal reinforcement of attentive behavior of target subjects not only increased the attentive behavior of the target subjects but also increased this behavior in adjacent peers. Although not identified by Kazdin as such, this study appears to be a clear demonstration that indirect negative reinforcement can motivate performance increments in moderately retarded children. However, only four subjects comprised the total study (two who received positive reinforcements and two who received indirect negative reinforcements). Thus, there is a need to replicate this finding with a larger subject population.

2. Outer-directedness. Another line of investigation has indicated that, in addition to a lowered expectancy of success, the high incidence of failure experienced by the retardate generates a style of problem-solving characterized by outer-directedness. That is, the retarded child comes to distrust his own solutions to problems and, therefore, seeks guides to action in the immediate environment.

In an early study, Zigler, Hodgden, and Stevenson (1958) found that the institutionalized retardate tended to terminate his performance on experimental games following a suggestion from an adult experimenter that they might do so. Normal children tended to ignore such suggestions, stopping instead of their own volition.

Originally, Zigler et al. discussed these findings in terms of social deprivation and heightened motivation for social reinforcement and interpreted their results as reflecting a greater compliance on the part of the institutionalized retarded. The position here was that social deprivation resulted in an enhanced motivation for social reinforcers and, hence, greater compliance in an effort to obtain such reinforcement. However, Turnure and Zigler (1964) found evidence that this was an inadequate explanation of the outer-directed behavior of the retardate. They suggested instead that such sensitivity to external cues is more appropriately viewed as a general component of problem-solving, having its antecedents in the child's history of success or failure. Specifically, Turnure and Zigler found retarded children to be generally more imitative than normals, and that all children were more imitative following failure experiences than following success experiences.

There is also evidence that, developing concomitantly with the heightened susceptibility to imitation and suggestion, is a lowered self-image. The retardate learns to accept the suggestion of his social contacts, that he should look down upon himself; that there is something odd and repulsive, something that causes people to treat him differently. Along these lines, MacMillan(1969), employing an interrupted task paradigm, asked his subjects,

"Why weren't the designs completed?" He found that the retarded groups placed blame on themselves for the tasks not being completed whereas normals did not.

3. Social deprivation and the motivation for social reinforcement (the positive reaction tendency). Closely related to the concept of outer-directedness of the retardate is the view that the institutionalized retarded have been deprived of adult social reinforcement and are, therefore, highly motivated to obtain this particular class of reinforcers. What may appear to be disinterest or a low level of aspiration may instead reflect the retarded child's attempts to obtain attention and approval lacking in other settings. His energies may be expended in attempts to satisfy emotional needs rather than in the solution of experimental problems. The results of several studies (Butterfield and Zigler, 1965; Green and Zigler, 1962; Stevenson and Fahel, 1961; Zigler, 1961; Zigler, 1963; Zigler et al., 1958) have lent experimental support to this position. Similarly, survey studies by Towne and Joiner (1966), DeMartino (1954), and Sternlicht (1966) have been interpreted as supporting this view.

Towne and Joiner (1966) found that, in answer to the question, "Who are the people you feel are important in your life?", thirteen-to fifteen-year-old retardates named their parents most frequently, followed next by relatives. Both DeMartino (1954) and Sternlicht (1966)

demonstrated that the dreams of institutionalized retardates are replete with motifs of returning home and being reunited with the family.

In an early experimental study of the social deprivation hypothesis, Green and Zigler (1962) used three groups of subjects: institutionalized retardates, noninstitutionalized retardates, and normals. They assumed that the noninstitutionalized retarded child had suffered less social deprivation than the institutionalized retarded child. All three groups were equated on MA, and the two retarded groups were also equated on CA. The social deprivation hypothesis would generate the prediction that the performance of the normals and the noninstitutionalized retarded would be similar and that their performance would differ from that of the institutionalized retarded. This hypothesis was supported with no significant differences in performance found between the noninstitutionalized retarded and normals, with both of these groups differing significantly from the institutionalized retarded.

Stevenson and Fahel (1961) conducted a more complete test of the social deprivation hypothesis than did Green and Zigler by including a group of normal institutionalized children in their study, in addition to the groups used in the Green and Zigler study. Significant differences in increment of response were found as a function of institutionalization, but not as a function of reward.

4. Social deprivation and the tendency to avoid social reinforcement (the negative reaction tendency). A phenomenon which appears to be at considerable variance with the retarded individual's increased desire for social reinforcement has been noted (Shallenberger and Zigler, 1961): The retarded child's reluctance and wariness to interact with adults, since in their histories adults have reacted negatively toward them. As a consequence, the retarded child may thus spend more time protecting himself from perceived potential harm than he does in solving experimental problems.

Statement Of The Problem

The present study is the first to specifically extend the experimental investigation of indirect social reinforcement to the study of retarded children.

The purposes for the present study were multiple. At the most basic level, it was desired to find out whether or not the familially-retarded child would respond to and be motivated by indirect reinforcement cues. More specifically, the study hoped to show, not only that the retardate can respond to indirect reinforcement, but that he can respond to and be motivated by indirect negative reinforcement cues.

Both the research of Bialer (1961) and Zigler (reviewed in Zigler, 1972) indicate that retarded children do not differ quantitatively (mental age) from

normals in their ability to conceptualize success and failure experiences. In light of this and the findings of Weiner et al. (1971), which indicated that normal children as young as kindergarten age can respond to indirect reinforcement, it was suspected that retarded children with a mental age of 9 years also would be able to evaluate and respond to indirect reinforcement cues. Also, in view of the findings by Bialer and Cromwell, 1965; Lingren, 1967; Sternlicht et al., 1970; and Kazdin, 1973 that retardates can be motivated by negative types of reinforcement, it was further suspected that retardates would be able to respond to indirect negative reinforcement.

A second hypothesis of the study was that performance of the retarded children would also increase after reception of direct positive reinforcement. Support for the view that retarded children can be expected to evidence performance increments under both direct positive and indirect negative reinforcement conditions is found in the recent study by Kazdin (1973).

Over and above the question of the retardate's ability to respond to direct and indirect social reinforcement is the question of differential response to these types of reinforcement by normal and retarded children. It is hypothesized in the present study that both normal and retarded children will respond to both direct positive and

indirect negative reinforcement by increasing their levels of performance.

List Of Hypotheses

The following are a list of the hypotheses that were examined in this research:

1. Familially-retarded will respond to indirect negative reinforcement by increasing level of performance.

2. Familially-retarded children will respond to direct positive reinforcement by increasing level of performance.

3. Normal children will respond to indirect negative reinforcement by increasing level of performance.

4. Normal children will respond to direct positive reinforcement by increasing level of performance.

CHAPTER II

METHODOLOGY

Subjects

A total of sixty subjects were drawn from two sources. Thirty normal children employed were drawn from a rural elementary school system in central Oklahoma; and thirty familially-retarded children were drawn from an institution for mentally deficient children in Oklahoma (Enid State School for the Mentally Deficient).

Familially-retarded children used in the study were only those evidencing no organic retardation and no visual, auditory, or motor problems. These criteria were checked upon prior to the running of subjects by viewing individual case records. The retarded children employed were in the IQ range 50-70 (Stanford-Binet IQ's administered within the past year as part of an annual evaluation procedure).

Available school records were also checked to insure that all normal children were within the average range of intellectual functioning (specifically, between IQ's of 85 and 115). Where this information was not available, the Kuhlmann-Anderson Group Intelligence Test (Kuhlmann and Anderson, 1963) was administered by an experimenter

not involved in the remainder of the study. All intellectual examinations of the normal children were administered within the past year, with the majority having been administered within the past month.

Both the normal and retarded groups of children had a mean MA of approximately nine years (specifically, the normal group had a mean MA of 9 years and 2 months while the retarded group had a mean MA of slightly above 8 years and 11 months). The retardates ranged in CA from 13.33 years to 18.08 years with a mean age of 15.59 years. The normal children ranged in CA from 7.33 years to 11.17 years with a mean age of 8.98 years.

Only same-sexed pairs of subjects were used to eliminate between-sex variables, such as competition between the sexes, and to allow for inspection of performance differences between sexes.

There were ten subjects in each of six treatment conditions. Subjects within each major classification (i.e., normal or retarded) were randomly assigned to one of three reinforcement conditions. The six groups of ten subjects were as follows:

Group I - Normal, direct positive reinforcement

Group II - Normal, indirect negative reinforcement

Group III - Normal, neutral condition (no reinforcement)

Group IV - Familially-Retarded, direct positive reinforcement

Group V - Familially-Retarded, indirect negative reinforcement

Group VI - Familially-Retarded, neutral condition (no reinforcement)

The restrictions involved in group assignment were such that the mean MA of the groups be similar. All treatment groups contained an equal number of males and females, with the exception of Group III which was composed of six males and four females.

Performance Task

In order to investigate differential reinforcement effects, it was necessary to have a task both interesting to children and well within their abilities. The experimental task used involved the copying of three geometric designs similar to that used by Weiner et al. (1971): a cross, a circle, and a horizontal line. One hundred ½" x 1" vertical rectangular spaces were presented on a sheet of paper. The top half of each rectangle contained one of the three geometric shapes; the bottom half was empty. The task involved was to copy the designs into the lower half of the rectangle. These designs were selected from the Developmental Test of Visual Motor Integration (Beery, 1967). The reported age norms for accurate reproduction of the designs are:

Cross: Beery norms - female 3-8, male 4-0; Gesell norms (1956) - 4-0.

Circle: Beery norms, Gesell norms, Binet norms (Terman and Merrill, 1960) - 3-0.

Horizontal Line: Beery norms - 3-0.

Procedure

Subjects were run in pairs, one pair at a time. Subjects were seated on opposite sides of a table with a partition between them so neither could see the other's actual work but such that they could see the face of the other subject. Subjects were seated randomly at either position one or position two. After simultaneously instructing the two subjects regarding the nature of the performance task, they were asked if they had any questions. After questions were answered, or if there were no questions, the subjects were told to go ahead and do the first few rectangles, stopping at the thick black line (see Appendix A for a sample of the specific task used). These first ten rectangles were used for practice. The experimenter checked each subject's work on the practice designs and corrected them, if necessary, in as neutral a way as possible. Following this, the subjects were asked not to talk to each other, ask any questions, or look over the partition at any time during the remainder of the experiment. Subjects were then instructed

to begin and continued on the task for one minute. Following trial one, the experimenter picked up the papers and gave the subjects another sheet, telling them to begin again. This format was continued for a total of four one-minute trials. Trials one and two were used for a baserate measure. Following trial two, the experimenter presented the randomly predetermined subject with direct positive reinforcement. Reinforcement was administered by the experimenter leaning over in the direction of the subject being reinforced, looking at him, smiling, and saying, "Say, (the individual's first name was used here), you've done a very good job! You've filled in a lot of these boxes." The experimenter did not comment to the other subject. It was assumed here that this subject was experiencing indirect negative reinforcement. For the neutral condition, the experimenter continued as he had done between trial one and trial two, picking up the previous trial's paper, and giving the subjects paper for the next trial. Following trial three, no reinforcement was administered to any subjects. Here again the experimenter did as he had done between trial one and trial two, merely picking up the completed previous trial's papers, and giving the subjects paper for the next trial. The intertrial interval employed was forty seconds (see Table I for a diagram of the experimental paradigm).

TABLE I

A DIAGRAM OF THE EXPERIMENTAL PARADIGM

Group	Base Rate			Experimental Treatment			
	Trial 1	ITI	Trial 2	ITI	Trial 3	ITI	Trial 4
I - N,+		0		+		0	
II - N,(-)		0		(-)		0	
III - N,0		0		0		0	
IV - R,+		0		+		0	
V - R,(-)		0		(-)		0	
VI - R,0		0		0		0	

N = Normals

R = Retardates

\+ = Direct Positive Reinforcement

(-)= Indirect Negative Reinforcement

0 = No Reinforcement

ITI = Intertrial Interval (40 seconds)

Data Analysis

The overall design of the study was a 3x2x2 repeated measures analysis of covariance, with trials repeated within subjects. Independent variables were the normal/familially retarded conditions, and the three treatment conditions: direct positive reinforcement, indirect negative reinforcement, and the neutral condition. The neutral conditions were used both as a comparison measure for treatment effects as well as for a control measure for practice and fatigue effects. The dependent variable was the number of successive designs reproduced during the baserate (trials one and two), the experimental treatment (trial three), and the post-treatment trial (trial four).

Additionally, the data was inspected for detection of possible differential performance between sexes.

CHAPTER III

RESULTS

The data were analyzed using a 3x2x2 repeated measures analysis of covariance with repeated measures over trials three and four (the experimental trials). Trials one and two were used only to compute an average baserate level of performance.

Because the same covariate was used for each level of the repeated measure, the covariance adjustment had an effect only on the between subjects effects. The within subjects tests were identical to a repeated measures analysis of variance.

1. For all groups combined, performance on trial three (the experimental trial) was significantly higher than baserate performance ($p < .01$, see Appendix B).

2. For all groups combined, performance on trial three (the experimental trial) was significantly higher than performance on trial four (the post-treatment trial) ($p < .03$, see Table II).

3. After reinforcement, retarded children who had received indirect negative reinforcement performed at a higher level than retarded children in the neutral control condition ($p < .05$, see Appendix B and Figure 1).

TABLE II

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

Source	df	MS	F	p<
Between Subjects				
A (Reinforcement	2	893.433	3.560	.04
B (Normal/Retarded)	1	806.008	3.199	.08
AB	2	240.033	.953	n.s.
Subjects within Groups	54	251.929		
Within Subjects				
C (Trials)	1	95.408	5.460	.03
AC	2	10.533	.603	n.s.
BC	1	52.008	2.976	.09
ABC	2	5.633	.322	n.s.
C x Subjects within Groups	54	17.477		
Between Subjects (Adjusted)				
A (Reinforcement)	2	502.054	8.337	.01
B (Normal/Retarded)	1	41.279	.686	n.s.
AB	2	53.682	.891	n.s.
Subjects within Groups	53	60.221		

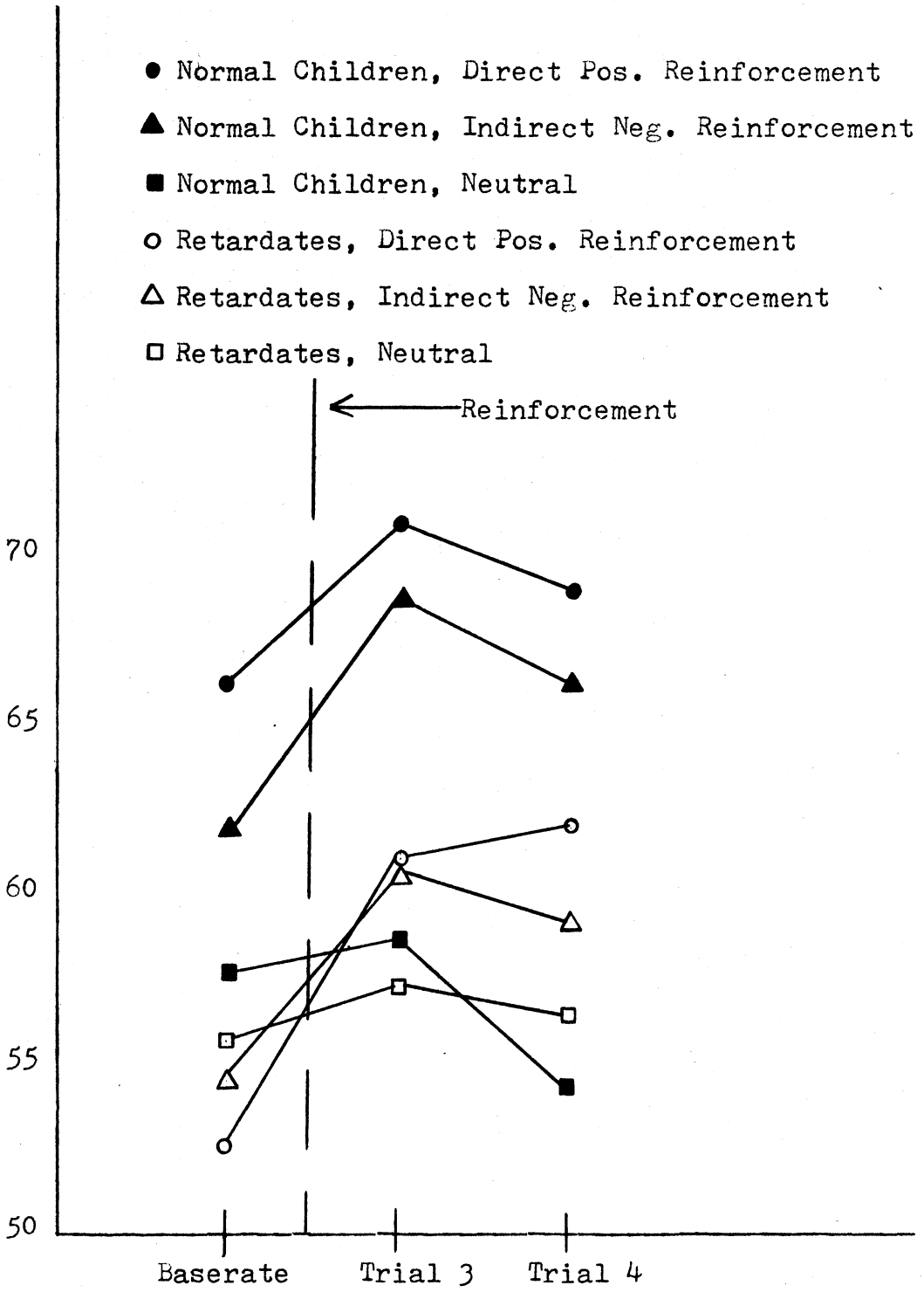

Figure 1. Mean Number of Boxes Filled in Across Trials.

4. After reinforcement, retarded children who had received positive reinforcement performed at a higher level than retarded children in the neutral control condition ($p < .01$, see Appendix B and Figure 1).

5. After reinforcement, normal children who had received indirect negative reinforcement performed at a higher level than normal children in the neutral control condition ($p < .01$, see Appendix B and Figure 1).

6. After reinforcement, normal children who had received direct positive reinforcement performed at a higher level than normal children in the neutral control condition ($p < .01$, see Appendix B and Figure 1).

7. No significant differences were found between direct positive and indirect negative reinforcement (see Figure 2 and Appendix B).

8. No significant differences in performance were found between normals and retardates on trial three, the experimental trial (see Figure 3 and Appendix B).

9. Differential performance between normals and retardates was found on trial four, the post-treatment trial (see Figure 3). Specifically, retarded children maintained a level of performance on trial four which was similar to the level of performance of both the normals and the retardates on trial three, the experimental trial. Normal children, however, showed a significant decrement in performance on trial four ($p < .05$, see Appendix B).

10. No significant interaction effects were found (see Table II). More specifically, no interaction effects were found between reinforcement conditions and trials, types of subjects (i.e., normal and familially-retarded children) and trials, reinforcement conditions and types of subjects, or among reinforcement conditions, types of subjects, and trials.

11. An examination of the neutral condition showed no significant effect for either the normal children or the familially-retarded children.

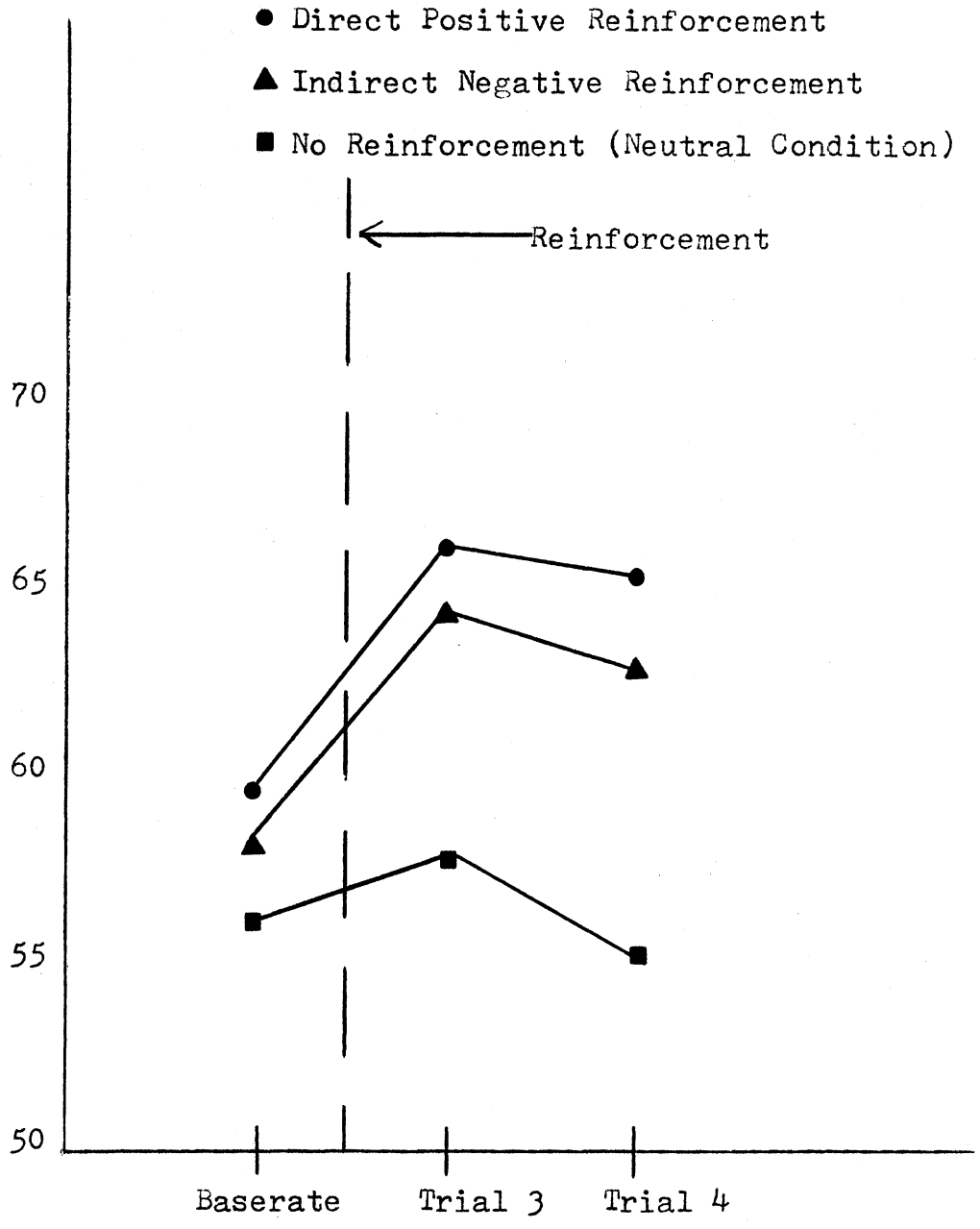

Figure 2. Mean Number of Boxes Filled in Across Trials as a Result of Type of Reinforcement Employed Irrespective of Type of Child (Normal or Retarded).

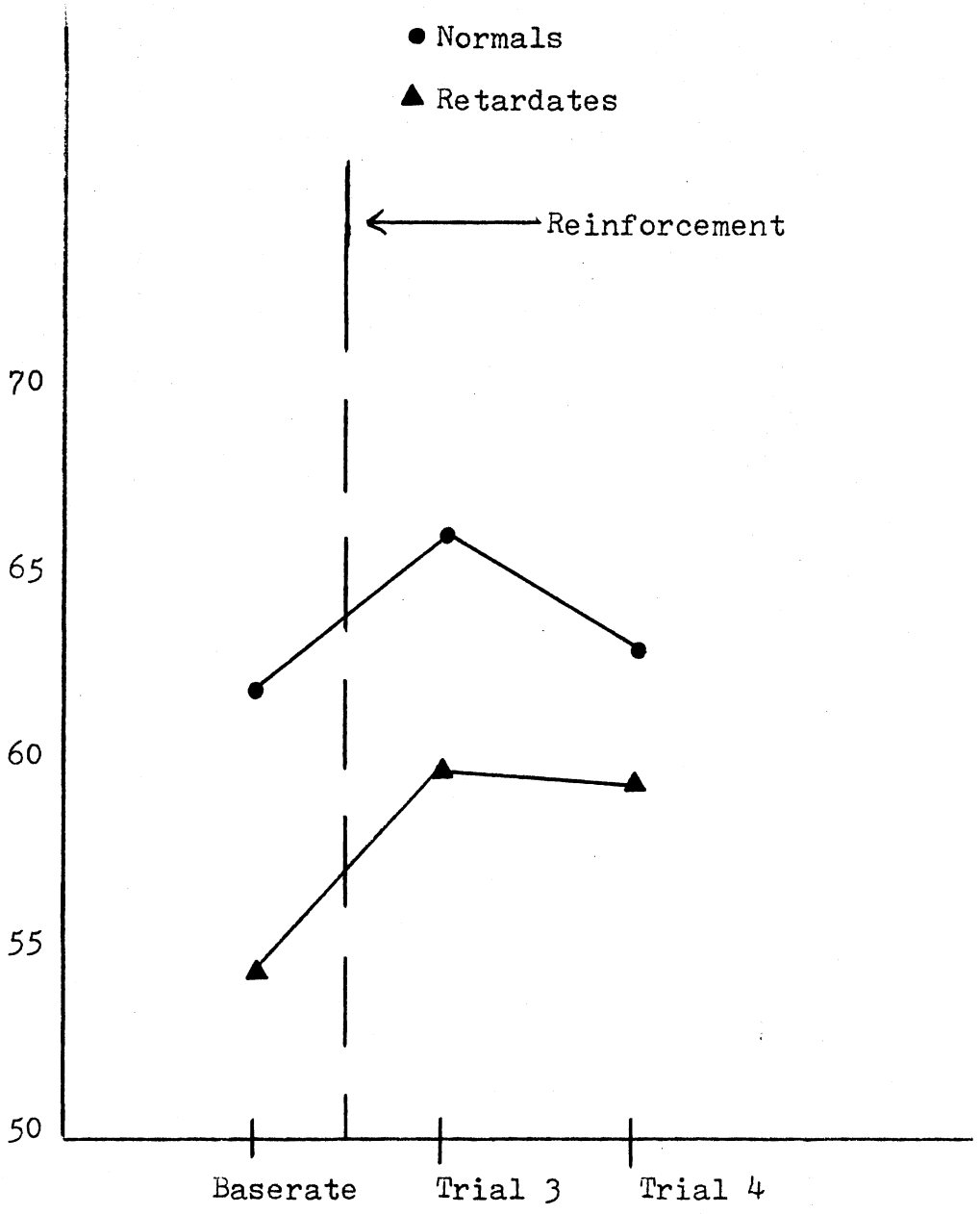

Figure 3. Mean Number of Boxes Filled in by Normal and Retarded Children Across Trials, Irrespective of Type of Reinforcement Used.

CHAPTER IV

DISCUSSION AND CONCLUSIONS

All of the hypotheses were supported by the results. Results not only demonstrated that familially retarded children respond to both direct and indirect social reinforcement cues, but also that they appear to respond to these cues much the same way as normal children of similar MA respond to these cues (see Figure 2).

The only differential performance seen between normals and retardates is on trial four, the post-treatment trial. On trial four, when no longer reinforced, the normals show a decrement in performance. However, the retardates on trial four maintain the same level of performance which they exhibited on trial three, even though they are not being reinforced.

One possible explanation of the retardates' behavior on trial four would seem to be in terms of Zigler's concepts of positive and negative reaction tendencies (Zigler, 1972). The positive reaction tendency is defined as a motivation for social reinforcement due to social deprivation, whereas the negative reaction tendency is

defined as a motivation to avoid social reinforcement due to past experiences in which adults have reacted negatively toward them.

Perhaps the positive reaction tendency was relatively high and/or the negative reaction tendency low in these particular retarded children. The notion of an increased positive reaction tendency is supported by the fact that the retardates who received direct positive reinforcement slightly increased their performance on trial four whereas the retardates who received indirect negative reinforcement slightly decreased their performance on trial four. In fact, upon close inspection of performance on trial four (see Figure 2), it can be seen that the above noted differential performance by normals and retardates on this trial is due primarily to the fact that performance increased for the retardates who received direct positive reinforcement, whereas performance decreased on trial four for all other reinforcement groups (normals who received direct positive reinforcement; normals who received indirect negative reinforcement; and retardates who received indirect negative reinforcement). It can be seen that the performance graphs for these three treatment conditions parallel each other.

In sum, these retarded children may have been especially looking for positive social reinforcements.

Conceivably, there are other factors which might also account for the differential performance between normals

and retardates, such as behavioral and psychological adaptiveness and differential levels of intellectual functioning.

However, level of intellectual functioning did not appear to be a significant factor in the present study. Although IQ's of children employed in the study ranged from 50 to 115, the correlation of IQ with baserate performance level was only .294, thus accounting for less than nine percent of the total variance. Intelligence not only seems to play a small part in baserate levels but it also appears to have little to do with performance increments after reception of reinforcement. By inspection of Figure 2, it can be seen that performance increments from baserate levels to post-reinforcement levels (i.e., trial three) parallel each other for all reinforcement conditions (i.e., normal, direct positive; normal, indirect negative; retarded, direct positive; and retarded, indirect negative). If anything, the performance increments are slightly greater for the retardates than for the normal children, which would be the opposite of what would be expected if intelligence was a major factor influencing performance.

While level of intelligence may be ruled out as a significant factor in the present study, the effects of behavioral and psychological adaptiveness or maladaptiveness are largely unknown. One might speculate that the normal children's decrement in performance when

reinforcement is no longer given is a demonstration of adaptive behavior. Applying this assumption to the behavior of the retardates, one might also assume that their maintenance of performance when reinforcement is no longer present is a demonstration of unadaptive behavior.

It should be remembered that the retardate population is a very heterogeneous one, especially in terms of degree of behavioral and psychological adaptiveness. The present research does not take this into consideration. However, Painton, Lippert, and Weiner (1974) do take this into consideration. In an effort to take a more in-depth view of the retardate responsivity to social reinforcement, this study categorized retardates into various groups according to their degree of behavioral and psychological adaptiveness or maladaptiveness. Preliminary results indicate that retardates who exhibit high behavioral adaptivity and retardates who exhibit low psychological maladaptiveness respond to direct and indirect social reinforcements much like the normal children employed in the present study.

It was previously stated that there were conflicting results in the literature regarding the indirect reinforcement paradigm, and possible explanations for this were delineated, one being the fact that different types of tasks were employed. However, even within the studies of indirect reinforcement which use a more purely motivational

type of task (such as a simple coding task or filling in blank spaces with "X's") there are differential findings.

Weiner et al. (1971) studied kindergarten children using the kindergarten teacher as the experimenter. They obtained a significant performance increment with indirect negative reinforcement, while getting only maintenance of performance with direct positive reinforcement. In explanation of the lack of a positive reinforcement effect, the authors reasoned that subjects receiving positive reinforcement may have assumed that they were performing well enough so that they needed only to maintain this standard of performance to keep receiving reinforcement in the future. Admittedly, it seems sensible that some subjects might reason in such a manner. However, this reinforcement situation is one in which the subject does not know whether or not competition or improvement of performance is a factor influencing future reinforcements. Consequently, it would seem that the most adaptive response (i.e., the response which would have the "best bet" of being reinforced in the future) would be to increase the level of performance if able to do so. This is what was found in the present study. A possible reason why it was not found in the Weiner et al. study is because the children, being quite familiar with the experimenter and her contingencies for administration of reinforcements, may have learned that maintenance of performance after

positive reinforcement was adequate to maintain reception of reinforcements. The subjects in the present study had had no previous contact with the experimenter.

It should be pointed out that Weiner and Weiner (1973) and Drummond (1973) also obtained a maintenance of performance with positive reinforcement. Subjects in these studies were college students who were required to fill in empty boxes either with "X's" or circles. In these studies, it is questionable as to whether these simple tasks could evoke enough ego involvement on the part of subjects for them to be able to take the positive reinforcement seriously. On the other hand, the subjects in these two studies did respond to indirect negative reinforcement. However, it seems quite possible that low ego-involved subjects would be surprised to receive negative reinforcement for such a task. The unexpected aversive reinforcement may then have served to stimulate task involvement.

Although results were for the most part as had been anticipated in this study, it can be noticed that there was a consistent difference between the normal and retarded groups in their beginning baserates. Specifically, the baserates for the normals who received reinforcement were significantly higher than the baserates for the retardates and for the normals who received no reinforcement.

The variability among the baserates of the normal group was largely unanticipated, since assignment to reinforcement groups was done randomly. However, there is evidence that the normal group was a more variable group than the retarded group, especially in mental ages. The standard deviation of the mean normal mental age was eight months, whereas the standard deviation of the mean retardate mental age was only four months.

It is well known that on tasks such as the one employed in this study that performance differences are to be expected with differential MA levels. For example, on the Wechsler coding task (Wechsler, 1974) it has been shown that performance increases with increasing MA, even for MA differences as small as three months. Thus, since the normal group exhibited a wider variation in MA levels, one could also expect a wider variation in baserate performances. For this reason, future studies in this area should make an effort to control variation in MA levels.

Explanation of the differences in baserates between the normals and the retardates is less apparent. Level of intellectual functioning is largely ruled out as a factor since the correlation of IQ with baserate performance level was only .294. However, there is some reason to suspect a higher baserate for the normal children employed in the present study. For one, the MA's of the two groups were not exactly the same. The normals' average MA exceeded the average MA of the retarded

subjects by three months (average MA of normals: 9-2; average MA of retardates: 8-11). As mentioned above, Wechsler (1974) has demonstrated that performance increments occur on coding tasks for MA differences of three months.

The previously mentioned factor of degree of behavioral and psychological adaptiveness may also have influenced the baserate performance levels. Preliminary results from the Painton et al. (1974) study indicate that baserate scores of behaviorally high adaptive retardates were considerably higher than those of behaviorally low adaptive retardates and psychologically maladaptive retardates.

The results of this study raise important questions regarding practicality and applicability in real life situations. Is it possible to generalize from the present experimental situation to the institutional setting of the retardate and to the classroom of the normal child? If the paradigm does work for both dimensions of subjects, this could be very valuable information for either an administrator, a teacher, an aid, or a nurse placed in either of the above named settings where it is his desire to motivate the performance of his children. The above considerations have particular input on the question of using direct negative reinforcement in either of the above settings. A careful and systematic use of select direct positive reinforcement may have an even greater motivating

effect for some children than direct negative reinforcement, while possibly affecting a much larger number of children. Further, this may well be accomplished in this paradigm without creating a questionable atmosphere for the child's personality development and self-esteem, and possible withdrawal from competition in failure situations. Thus, if applicable to larger groups, this paradigm would seem especially suitable for ward and cottage settings, and classrooms. Whether or not this paradigm actually applies to larger groups is not known, and needs to be determined through further research.

Viewed from another angle, the results of the present study give indication of possible underlying factors in poor performance and underachievement. Excessive direct negative reinforcements may lead to lowered self-esteem with subsequent decrements in performance. Selected use of direct positive reinforcements, on the other hand, avoids the problem of lowered self-esteem, and may often have much more motivating valence.

Finally, cultural and socioeconomic groups need to be considered as variables. There may well 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 the study was to compare and contrast normal and familially-retarded children's responses to direct and indirect social reinforcement. More specifically, the comparison was made between a population of non-institutionalized normal children and a population of institutionalized familially-retarded children. Subjects were assigned to either a direct positive reinforcement, indirect negative reinforcement, or neutral condition. Subjects were further paired and presented with four one-minute trials consisting of a coding task. Between trials two and three, the experimenter verbally praised (direct positive reinforcement) one of the subjects and did not comment on the other's performance (indirect negative reinforcement). Performance changes over trials were measured and evaluated for differential effects of type of reinforcement and type of individual (i.e., normal or retardate).

Three major hypotheses were tested and supported. At the most basic level, it was shown that the retarded child can respond to and be motivated by indirect negative reinforcement cues. Performance of the retarded child was

also shown to increase after reception of direct positive reinforcement. Over and above the question of the retardate's ability to respond to direct and indirect social reinforcement was the question of differential response to these types of reinforcement by normal and retarded children. It was demonstrated in the present study that both normal and retarded children respond to both direct positive and indirect negative reinforcement by increasing their levels of performance.

Results were interpreted in terms of creating the optimal institutional and educational milieus within which normal and retarded children can function most beneficially.

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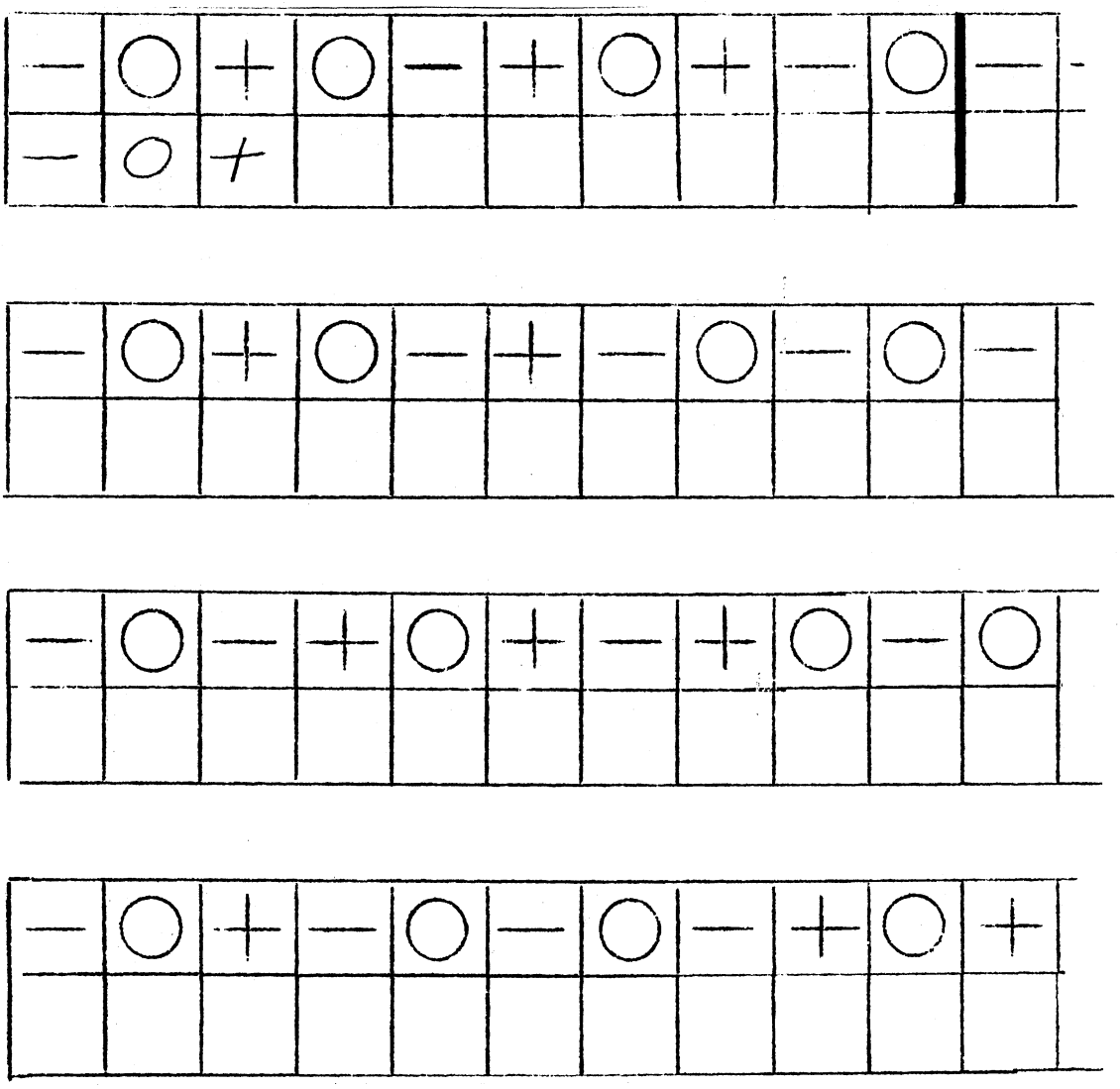
APPENDICES

APPENDIX A

A SAMPLE OF THE SPECIFIC TASK USED

THE SPECIFIC TASK SHEET USED



APPENDIX B

OTHER COMPARISONS

COMPARISON	t	df	p<
A Priori			
Difference between trial 3 and baserate	6.378	54	.001
Difference between retarded children who received direct positive reinforcement and the neutral condition on trial 3	3.179	54	.01
Difference between retarded children who received indirect negative reinforcement and the neutral condition on trial 3	2.198	54	.05
Difference between normal children who received direct positive reinforcement and the neutral condition on trial 3	2.854	54	.01
Difference between normal children who received indirect negative reinforcement and the neutral condition on trial 3	3.455	54	.01
Difference between normal and retarded children on trial 3	.066	54	n.s.
Difference between direct positive and indirect negative reinforcement on trial 3	.192	54	n.s.
A Posteriori (Newman Keuls)			
Difference between the normal children on trial 3 and the normal children on trial 4		54	.05

APPENDIX C

RAW DATA

REINFORCEMENT CONDITION	SUBJECT	BASERATE (AVERAGE OF TRIALS 1 & 2)	EXPERIMENTAL TRIAL (TRIAL 3)	POST-TREATMENT TRIAL (TRIAL 4)
NORMAL CHILDREN, NO REINFORCEMENT (NEUTRAL CONTROL CONDITION)	1.	64	69	67
	2.	58.5	64	57
	3.	55	54	51
	4.	63	63	62
	5.	44	41	40
	6.	49	49	46
	7.	48	50	39
	8.	57.5	59	52
	9.	70	68	74
	10.	67.5	70	65
RETARDED CHILDREN, NO REINFORCEMENT (NEUTRAL CONTROL CONDITION)	1.	48	51	46
	2.	69	75	66
	3.	29	31	38
	4.	54.5	55	62
	5.	47.5	47	48
	6.	44.5	47	48
	7.	62	64	60
	8.	59.5	59	58
	9.	55.5	65	53
	10.	86	80	86

REINFORCEMENT CONDITION	SUBJECT	BASERATE (AVERAGE OF TRIALS 1 & 2)	EXPERIMENTAL TRIAL (TRIAL 3)	POST-TREATMENT TRIAL (TRIAL 4)
NORMAL CHILDREN, INDIRECT NEGATIVE REINFORCEMENT	1.	68	75	71
	2.	58	58	60
	3.	66.5	77	69
	4.	61	75	73
	5.	62.5	66	67
	6.	45	64	61
	7.	69	69	67
	8.	61.5	69	59
	9.	66.5	66	67
	10.	60	68	68
RETARDED CHILDREN, INDIRECT NEGATIVE REINFORCEMENT	1.	53.5	54	59
	2.	52	56	52
	3.	44.5	68	53
	4.	56	49	59
	5.	30	41	45
	6.	53	60	52
	7.	76	83	66
	8.	61.5	66	67
	9.	70.5	69	75
	10.	49	61	63

REINFORCEMENT CONDITION	SUBJECT	BASERATE (AVERAGE OF TRIALS 1 & 2)	EXPERIMENTAL TRIAL (TRIAL 3)	POST-TREATMENT TRIAL (TRIAL 4)
NORMAL CHILDREN, DIRECT POSITIVE REINFORCEMENT	1.	80.5	83	88
	2.	80.5	84	83
	3.	54.5	58	52
	4.	54	57	45
	5.	59.5	60	56
	6.	57.5	59	60
	7.	73.5	86	85
	8.	65	78	76
	9.	62	67	63
	10.	74	80	80
RETARDED CHILDREN, DIRECT POSITIVE REINFORCEMENT	1.	31	41	36
	2.	43.5	64	64
	3.	48.5	52	53
	4.	66.5	83	85
	5.	52.5	63	62
	6.	52.5	50	62
	7.	71	72	75
	8.	49	72	69
	9.	44	50	52
	10.	69.5	63	63

VITA

Fred Lippert

Candidate for the Degree of

Master of Science

Thesis: COMPARISON OF NORMAL AND FAMILIALLY-RETARDED CHILDREN'S RESPONSES TO INDIRECT SOCIAL REINFORCEMENT

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