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Effects of Reinforcement on the IQ Scores of Preschool Children as a Function of Initial IQ

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EFFECTS OF REINFORCEMENT ON THE IQ SCORES OF PRESCHOOL CHILDREN AS A FUNCTION OF INITIAL IQ

by

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ABSTRACT

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by

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The effects of tokens as reinforcers on IQ test performance was investigated in 45 preschool Head Start children. There were 63 children assessed using the Slosson Intelligence Test for Children (SIT), and based upon these scores, were divided into three IQ groups: low, average and high. There were 15 children randomly selected from each group and within each of these groups, subjects were randomly assigned to one of three conditions: Control (C), Pretest experimental (E_1), and no pretest experimental (E_2). The C and E_1 groups were administered the Peabody Picture Vocabulary Test (PPVT), Form A, according to standardized procedures. Three weeks later all groups were assessed using the PPVT, Form B, with a token being contingent on correct responses. Three weeks later all children were assessed with a standardized administration of the PPVT, Form A. Results showed that tokens given contingent upon each correct response increased the IQ scores for the initially low

IQ subjects, but had no significant effect on the scores of the average and high IQ subjects. The increase in the IQ scores of the low IQ subjects was stable over time. The effectiveness of the reinforcer was empirically demonstrated.

(97 pages)

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Psychometrists who try to obtain a true score of a testee's ability must make a concerted effort to keep the subject working at his highest level. According to Terman and Merrill (1937), if the examiner "has failed to enlist the subject's best efforts, the only thing certain is that the resulting score will be too low in some unknown degree" (p. 52). An individual's highest performance is not easily measured, and examiners too readily accept that the testee is motivated to score as high as possible. Thorndike (1924) stated, "In general, all our measurement assume that the individual in question tries as hard as he can to make as high a score as possible. . . In general practice, however, we rarely know the relation of any person's effort to his possible maximum effort" (p. 228).

Terman (1916) addressed the problem of motivating subjects during intelligence tests by recommending the use of praise. According to Terman (1916), "Nothing contributes more to a satisfactory rapport than praise of the child's efforts . . . exclamations like 'fine!' 'splendid!' etc., should be used lavishly. Almost any innocent deception is permissible which keeps the child interested, confident, and at his best level of effort" (p. 215).

It becomes apparent, then, that in testing it is necessary to keep the subject working at his highest level, especially in light

of how the results of standardized tests are used in making important decisions about school age children.

Fine (1975) and Kolstoe (1967) pointed out that the decisions made resulting from scores on standardized tests include (a) predicting academic success; (b) determining what special scholastic tracks students should be placed on; (c) determining what books and other educational materials are appropriate for students; (d) determining how rapidly programming for pupils should progress; and (e) determining whether a child should be transferred to special educational classes.

Since the results of standardized tests are used in making important decisions regarding children, researchers have been investigating various factors which affect children's scores on standardized tests. Information gained by such research might allow those who use standardized test scores to come to more realistic conclusions about what they represent, and provide a more valid basis for making decisions about individual children.

Research has already shown that a number of variables play a part in determining an individual's scores on standardized tests. Sattler and Thaye (1967) reviewed this research and the variables discussed were the order in which the test items are administered (Hutt, 1947), the subject's and examiner's personalities (Masling, 1959; Young, 1959), the subject's anxiety level (Sarason & Minard, 1962), the threat of failure (Webb, 1955), the subject's level of frustration (Solkoff, 1964), and the relationship between the subject and the examiner (Sacks, 1952).

Performance on standardized tests has also been shown to be affected by reinforcement procesures (e.g., Edlund, 1972; Ayllon & Kelly, 1972; Clingman & Fowler, 1976; Baer, 1978). Ayllon and Kelly (1972) identified the importance of reinforcement as a motivator in their study of the effects of two different motivational conditions (standardized test conditions vs. reinforcement conditions) upon test performance with two student populations; trainable retardates and normal fourth graders. Both groups showed significant increases during reinforcement conditions. An additional study was conducted to determine the effect of reinforcement history on test performance. A group of children with six weeks exposure to reinforcement for daily academic performance scored higher under two conditions of test administration (standard and reinforcement) than a control group. When the experimental group and its matched control were given a single exposure to token reinforcement for correct performance on the Metropolitan Readiness Test, both groups showed a significant increase in test performance. These studies suggest a procedure that may yield a more representative assessment of academic achievement than does testing under standard conditions.

In light of Ayllon and Kelly's (1972) work, it would seem imperative to distinguish between low IQ scores due to reinforcement history (motivational deficit) and low IQ scores due to lack of ability. This must be determined early in life so that a child can be properly placed academically, and better academic planning can be incorporated in the child's course of study. If increases in IQ scores

are found due to lack of motivation, then an adequate history of reinforcement may be developed so that the motivational deficit may be reduced or eliminated; thus making a more correct academic placement possible. The questions posed in this research may be a first step in attaining such a goal.

Conner and Weiss (1974) pointed out that "it is unwarranted to assume that an increase in correct responses is necessarily paralleled by an increase in cognitive ability. Therefore, if the effects of reinforcement in a test taking situation are limited to a motivational function, and if all populations from which samples are drawn show the same increase in motivation, then application of reinforcement procedures will simply shift the distribution of scores upward and each subject's relative position will remain the same. This distributional shifting is meaningful to the extent to which a portion of the error variance is eliminated or accounted for, thus making the test score more reliable, and thus more reflective of the hypothetical "true" score, with a resultant lower standard error of measurement" (p. 351). This result will facilitate administrative decisions and increase the predictive accuracy, as Edlund (1972) has noted, in such decision making.

With populations identical with regard to movitational deficit in testing situations, it would be meaningless to suggest that contingent reinforcement could close the gap between IQ or achievement test scores of social classes or races. If, however, as Conner

and Weiss have stated, "the populations from which samples are drawn and given standardized tests demonstrate differential motivational deficits in test-taking situations, then manipulation of contingencies of reinforcement could differentially reduce the error variance on these tests for one or more populations. This application would differentially increase the reliability of the test, as well as increase our confidence in the true score location" (p. 351). Also, if differential motivational deficits are found, it would suggest that environmental factors, more specifically the reinforcement conditions holding between tester and testee, need to be seriously considered in test interpretation.

Research which has dealt directly with the problem of which groups of children (high, average, or below average initial IQ scores) show change scores due to reinforcement contingent on correct responses has demonstrated that:

1. Children with originally low IQ scores who are immediately reinforced for correct responses on a second testing, consistently improve their scores on the IQ test.
2. Children with originally high IQ scores who are immediately reinforced for correct responses on a second testing, consistently show no change in their scores on the IQ test.
3. Children with originally average IQ scores who are immediately reinforced for correct responses on a second testing, produce conflicting results. These results include:

Clingman and Fowler (1976) who found that administering the Peabody Picture Vocabulary Test (PPVT) under standardized conditions at one point in time, and then administering the alternate form PPVT at a later point in time using reinforcement contingent on correct responses led to no significant change in the IQ scores of the average IQ children.

Rasmussen (1974) who found that administering the Wechsler Intelligence Test for Children (WISC) under standardized conditions, and then at a later time administering the WISC under immediate reinforcement conditions led to significant increases in the IQ scores of the average IQ children.

Baer (1978) who found that administering the WISC to one group of average IQ children and the PPVT to another group of average IQ children under standardized conditions, followed by a reinforced administration of the tests, led to a significant increase in the WISC IQ scores, but no significant change in the PPVT IQ scores.

It appears that the IQ test used is an important variable in research assessing the effects of reinforcement on test performance. The research by Baer (1978) suggests that the different results obtained by Clingman and Fowler (1976) and Rasmussen (1974) are due to the different IQ tests used in their research. One explanation as to why the PPVT and WISC are differentially affected by reinforcement procedures with average IQ children is that the PPVT is a relatively simple test, whereas the WISC is a more complex test

requiring the child to perform a variety of tasks. Thus we may have to look at the complexity of the tasks involved in IQ tests when evaluating the results of research which deals with the effects of reinforcement on IQ test performance.

The problems that still exist in documenting the effects of reinforcement on test performance are:

1. Conflicting results with average IQ subjects;
2. Researchers have not used preschool subjects where immediate reinforcement procedures may be more powerful;
3. Researchers have failed to document stability over time with reinforcement procedures; and
4. Researchers have failed to empirically demonstrate the effectiveness of their reinforcers.

This research will address these issues by answering the following questions:

1. Will preschoolers with below average IQ scores who are administered an IQ test under standardized conditions at one point in time, show a significant increase in their IQ scores when administered the test under immediate reinforcement conditions for correct responses at a later time?
2. Will preschoolers with average IQ scores, who are administered an IQ test under standardized conditions at one point in time, show significant increases in their IQ scores when

administered the test under immediate reinforcement conditions for correct responses at a later time?

3. Will preschoolers with above average IQ scores who are administered an IQ test under standardized conditions at one point in time, show significant increases in their IQ scores when administered the test under immediate reinforcement conditions for correct responses at a later time?

In addition, three other questions will be answered to clarify three key issues.

Of all the research that has been done to date dealing with reinforcing correct responses on the second administration of an IQ test, none have done any follow-up testing to determine whether any changes found on the second administration are stable over time. If there is an increase in the IQ scores during the reinforced administration, will the increase be stable over time and show up on a third non-reinforced administration of the test? Therefore, the fourth question posed by the research is:

4. Will the changes, if any, shown in the reinforced administration of the IQ test, be stable over time?

or

Is it possible that the reinforced administration of the IQ test builds in a reinforcement history in preschool children, and the effects show up during a second standardized administration of the IQ test following the reinforced administration?

This is an important question to deal with, since it will give some additional information as to whether we are dealing with a motivational deficit when scores are low on a non-reinforced administration of a standardized test.

Another method of dealing with the stability over time issue is to include a group of children tested first with a reinforcement procedure in effect, and then tested at a later point in time, using a standardized administration of the IQ test. Therefore, the fifth question posed by this research is:

5. Will a change in test scores be significant if the first administration is reinforced and the second administration standardized?

Including a group of subjects that is given a reinforced administration of an IQ test first, followed by a standardized administration of the IQ test, has not been utilized in the research in this area to date. Including this group of subjects will also control for the order of administration of the test.

No researchers in the area of reinforcement of IQ test performance have empirically tested the effectiveness of their reinforcers with subjects who showed no improvement on their IQ test scores. The question posed by this research is:

6. If there is a lack of significant increases in IQ test performance, is it due to the fact that the reinforcers are ineffective with certain groups (high and average IQ subjects of children?

If it is continually shown that reinforcement does have an appreciable effect upon the efficacy of performance on intelligence tests, it would indicate that factors such as motivation must be controlled if the test scores are to be considered indicative of the intelligence of the children tested.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The following review will describe and evaluate those studies relevant to assessing the effects of reinforcement procedures on the intelligence test taking behavior of children.

Table 1 (in pocket) summarizes the research relevant to the present review (modified from Baer, 1978). Listed for each study are a number of variables including age or grade, IQ level, race, type of reinforcement, immediate or delayed reinforcement, test administered, and effect of reinforcement procedures. Immediate reinforcement refers to those procedures which deliver a presumed reinforcing stimulus immediately following a correct response to a test item. Delayed reinforcement refers to those procedures which deliver a presumed reinforcing stimulus after a number of correct responses to test items, or after the whole test.

Comparisons of the studies listed in Table 1 are difficult, since numerous variables differ between studies. This problem will be discussed in the review, since as each study is reviewed it will be compared and contrasted to previous studies in an attempt to determine the effects of variables such as initial IQ, age, type of reinforcement, etc.

A summary will follow the review in an attempt to draw some general, although tentative, conclusions about this area of research.

Review

The question of whether performance on standardized intelligence tests would be affected by reinforcement procedures was first studied by Hurlock (1924). Two important questions dealt with in this study were (a) What are the effects of praise vs. reproof on the performance of children on standardized tests? and (b) Of the three levels of intelligence (superior, average, and inferior) are children belonging to one level more influenced by praise and reproof than children of the other two levels? The 408 subjects used in the investigation were from the third, fifth and eighth grades of two public schools in the New York area. The author stated that in every possible case care was taken to have as nearly a random sampling as possible, but does not discuss the limitations of her randomization process.

The National Group Intelligence Tests, Scale B, Forms 1 and 2, were used for the eighth and fifth grade children, while the third grade children were given Forms A and B of the Otis Intelligence Scale, Primary Examination.

Children from all three groups (control, praise, and reproof) were given a standardized administration of the tests. A week later, during which time the tests were corrected and three equivalent groups formed on the basis of the IQs's obtained from the first

tests, they were called back to take another form of the test. Before being given the second form of the test, the praised group was told how well they did, how neat their papers were, and how they even did better than most boys and girls in grade ____ (mentioning a grade several years higher than the one present) do in the test. They were told not only to try and break their own record, but also to make their group stand first in the school and set a standard for the others that did not do so well. The test was then given according to the standardized test procedure.

The reproved group were told how badly they did on the first test; that their papers were slovenly, careless and mistakes were made that not even a baby would make. They were also told the following: "You certainly did badly enough in this test to feel thoroughly ashamed of yourselves, not only for your own sakes, but for your class records. It seems too bad that this group has to bring down the class standard and hold back others who really tried hard to do good work. I feel that it is only fair to give you another chance. . . I don't know whether you can do any better than you did last time--in fact, I rather doubt if you can."(p. 24). They were then given a standardized administration of the test.

The control group was simply given a standardized administration of the second form of the test.

In equating the three experimental groups, several considerations were taken into account. The groups not only were equal in the

average and variability scores of the first intelligence test, but also when pairing the subjects, an attempt was made to pair those who were of approximately the same chronological age. Likewise, distributions had to be so arranged as to have an equal number of white and Negro boys or girls in each of the three groups. Data was analyzed separately, taking into account the following variables: (a) total results, (b) grade, (c) sex, (d) initial levels of intelligence, and (e) race. The author felt that the results of the experiment seemed to jusify the following conclusions: (a) that praise and reproof are incentives which may be used effectively as a motivation for school work, and that on the whole they are of equal value; (b) older children respond more to both praise and reproof than do younger ones; (c) boys do better following both praise and reproof than do girls of similar ages; and (d) some incentive is more essential for "superior" (IQ $\geq$ 110) children than for "inferior" (IQ $<$ 90) children, if their work is to be kept up to the maximum of their ability. The "superior" children were greatly influenced by both incentives, while the "inferior" were decidedly less so; and (e) Negro children react more favorably to praise and white children to reproof.

Regarding initial IQ level, it is interesting to note that the author feels that the "below" normal in intelligence are for the most part above average in motivation, while the "above" normal in intelligence are for the most part below average in motivation. The "inferior"

children are working up to capacity, while the "superior are working at a much lower level than their innate ability would permit" Hurlock, 1925, p. 77).

Another interpretation might be that the incentives of praise and reproof are in fact motivators for "superior" children, but are not as motivating for "inferior" children. If a reinforcer were found that would motivate the "inferior" children to do as well (gain as many points) on the second testing as the "superior" children, then Hurlock's interpretation would not be supported. Hurlock's investigation was conducted with a view towards determining, through experimental analysis, just how effective praise and reproof were as incentives for children, which was accomplished. However, more extensive work needed to be done in order to deal with the motivation issue with respect to "inferior" and "superior" children.

Maller and Zubin (1932) conducted a study to determine the effect of motivation upon intelligence test scores. They administered the National Intelligence Test (NIT), Scale B, Form 1, to 42 children. Two equivalent groups of children were formed, matched as to IQ and age, and 13 days later the same form of the NIT was administered to both groups. One group of children were given their standing on the first test and told that a prize would be awarded to each person who gets ahead of the one next above him. The other group was readministered the test under standard conditions. Analysis of results

revealed no difference between the mean scores of the two groups on the second testing. The authors concluded that "the strong incentive of rivalry did not produce a greater gain than the mere repetition of the test under the control condition" (p. 137).

The assumption may have been incorrect that rivalry was a strong incentive to motivate children to do better on the NIT. Perhaps another incentive may have been more effective in raising their scores. It is also possible that this group of children were already working at their optimal level, and no incentive could have made them try harder.

Maller and Zubin (1932) did some additional analyses to determine the effect, if any, of the incentive rivalry on motivation. They analyzed the number of items attempted and also the number of errors. They found that the incentive brought about an increase in the number of items attempted, but also a corresponding increase in the number of errors, thus resulting in no increase in score. Again, the children may have been motivated to do their best in terms of information and, therefore, the only increase was an increase in speed with a resulting increase in errors.

In 1936, Arthur Benton conducted a study to determine the effects of praise, strong encouragement, knowledge of results, and the promise of a prize on the scores of the Otis Self-Administering Test. The rationale for this research was to attempt to more fully understand the contradictory character of the results of the experiments by Hurlock (1924)

and Maller and Zubin (1932). Hurlock (1924) reported that either praise or reproof as motivational factors were more effective in raising the scores of elementary school children than was mere repetition of the test. Maller and Zubin (1932) found that no greater gain in score was achieved by children who had been motivated by the promise of a prize, if they bettered their relative standings on the second test, than by children who were merely given the test again.

The Otis Self-Administering Test, Intermediate Examination, Form A, was given to a group of children in the seventh and eighth grades. Two groups of 25 children each were formed, and each child in one group was matched with a child in the other group with respect to age, score on test, sex and grade. After 28 days the test was administered to the two groups. For the control group, the test was again administered, just as in the initial test. The children in the experimental group were told what their relative standings on the test were, and they were promised a prize if they bettered their relative standings on the second test. There was no significant difference in the gains of the two groups.

Of the three studies discussed which used a delay of reinforcement procedure, two (Maller & Zubin, 1932, Benton, 1936) have shown no significant change in scores, while one (Hurlock, 1924) has shown

an increase in scores due to reinforcement procedures. The differences between the Hurlock (1924) and the Benton(1932) studies, which may account for the differences in results, are as follows: (a) Benton used only one form of the test, while Hurlock used Forms A and B; (b) different age children were given different tests in the two studies. Benton administered the OTIS Self-Administering Test, Intermediate Examination, Form A, to the seventh and eighth grade children, while Hurlock administered the OTIS Intelligence Scale, Primary Examination, to the third grade children and the NIT to the fifth and eight grade children; (c) Benton may not have had an effective reinforcer, which would account for the lack of an effect; and (d) Benton's subjects may have been initially low IQ children and, therefore, the results would be similar to Hurlock's results. Hurlock (1924) parcelled out the IQ data and found that the initially low IQ subjects did not benefit as much from the praise or reproof as did the average and high IQ subjects. If Benton's subjects had initially low IQ's, then that could be part of the reason no change in score was found.

Similar differences in the Maller and Zubin (1932) and Hurlock (1924) studies may have accounted for the difference in results. These two studies are very difficult to compare, since there are a wide variety of unknowns in the Maller and Zubin study. They did not list age, sex, or initial IQ's of their subjects, which makes comparisons difficult. They may not have had an effective reinforcer,

or regression may have accounted for their lack of increase in score. It is hard to determine what may have accounted for the lack of change, given the information presented.

In 1944, Klugman conducted a study which sought to determine whether a subject would obtain a higher score on an intelligence test if the incentive of a monetary reward was employed in place of praise, and whether the reliability of the test could be improved by this incentive. There were 72 white and Negro school children between 7 and 11 years of age, in grades 2 through 7, who were tested with one form of the Revised Stanford-Binet Intelligence Test, and one week later they were tested with the other form. Money was used as an incentive in half the instances, and praise for the other half. No significant differences were found either in scores or reliability coefficients. The effect of the incentive could not be determined, since no standardized administration data was available or provided by the study.

Tiber and Kennedy (1964) used 480 second and third grade subjects selected equally from three social groups--middle-class white, lower-class white, and lower-class black. They were randomly assigned to four incentive groups: verbal praise, verbal reproof, candy reward, and control. The 1960 Stanford Binet Form L-M was used, with the incentives administered at the end of each subtest. The statistical analysis revealed no significant differences between the means of the four groups, and no significant interaction between type of

incentive and social group. The authors concluded that explanations of IQ differences between cultural groups must be based on causes other than lack of intrinsic motivation provided by the intelligence test itself (different class groups did produce significantly different mean IQ scores: middle-class white, 107.59; lower-class white, 93.96; lower-class black, 77.39).

It is not surprising that there were no reinforcement effects found in the Tiber and Kennedy study, since the incentives were not administered in a contingent manner, and it was not entirely clear what was being reinforced.

Sweet and Ringness (1971) were the first investigators to study the effects of immediate reinforcement on variations in intelligence test performance. They administered the WISC verbal scale to a group of 156 elementary school males between the ages of 6 and 13 years of age who had IQ's between 80 and 120. These subjects had been referred to school psychologists and came from an initial referral population of 704 qualified children. Due to failure to grant permission by either the principal or parents, the sample was reduced to 175 subjects and random deletion provided the final referral sample of 72 middle-class white (MCWs), 48 lower-class whites (LCWs), and 36 lower-class Negroes (LCNs). Full scale WISC IQ scores were available from when these children were tested a year before the research was conducted. Within each group (MCW, LCW, LCN), subjects were randomly assigned to one of three treatment groups

before administration of the WISC verbal scale. One group was assessed using a standardized administration procedure, while the other groups were assessed using a feedback condition (verbal) or a monetary reinforcement condition. For the feedback group the children were told "all correct" or "mostly correct", depending on their responses to the test items; while in the monetary reinforcement group the children were given a token worth one cent after each "all correct" response, and a token worth a half a cent after each "mostly correct" response. Analysis of the results showed that scores of the children from the MCW and LCN tested under reinforcement conditions did not differ significantly from those children in the same groups tested under standard conditions. Children in the LCW group tested under reinforcement conditions scored significantly higher than those children in the same group tested under standard conditions. There are a number of problems wtih this research, which may prevent generalizing the results. First, the subject population was not randomly drawn, and this sample is probably not representative of children with average IQ's. Second, a requirement for a child to participate was that he have an IQ between 80 and 120. These IQ's were obtained from the children's school records a year earlier, and conditions of administration were not specified. Third, the children were administered the verbal section of the WISC, and results based on verbal IQ scores may not be comparable to those based on full scale IQ scores.

Ayllon and Kelly (1972) studied the effects of two different motivational conditions upon the standardized test performance of two student populations. In their first experiment, 12 trainable retardates (average IQ = 46.8) were given the Metropolitan Readiness Test (MAT) under two test conditions. Condition 1 consisted of standardized assessment procedures, whereas Condition 2, administered on the same day, was identical with the exception of one factor. After each subtest items were checked, and the children received one token (exchangeable for backup reinforcers) for each correct response. The average increase was 6.25 points, which was significant at the 0.05 level. Significant increases in test scores were produced with one exposure to reinforcement. It would have been appropriate to include a control group to see how much of the increase in test scores, if any, could be attributed to a regression effect.

In their second experiment, 34 fourth graders (average IQ = 92.8) served as subjects. They had taken the Metropolitan Achievement Test (MAT), Elementary Battery, under standard conditions. It was unclear as to the time gap between the first and second administration of the test. An alternate form was given to this class, with the addition to token reinforcement for correct responses at the end of each subtest. The tokens could later be exchanged for a variety of backup reinforcers. A t-test showed the mean increase in performance to be statistically significant at the 0.02 level.

Ayllon and Kelly (1972) conducted a third experiment to evaluate the importance of previous experience with reinforcement techniques. Two groups of 12 children each were matched on the basis of age, IQ, and mid-year test score on the MRT. The experimental group were assigned to one classroom and were exposed to a six week program of reinforcement for academic performance (tokens which were exchangeable for backup reinforcers). The control group remained in their original classrooms and continued under the same program with no changes in procedures. After six weeks the MRT was administered to the two groups in two different sessions. The first portion of the test (odd numbered items) was administered under standard conditions. The second portion of the test (even numbered items) was administered the same day, with the token reinforcement procedures outlined in Experiment I and II. Children with a six week history of token reinforcement scored significantly higher on the standardized portion of the test than did the group in the regular academic program. The experimental group averaged 3.67 points higher, while the control group averaged 2.75 points lower than their previous scores. On the reinforced section of the test the control group increased their score by 6.25 points over their previous score, while the experimental group showed an average increase of 7.71 points. The introduction of reinforcement demonstrated that even with a strong history of reinforcement, contingent reinforcement further increased test performance. Ayllon and Kelly stated that "either the performance of

the child in a standardized test situation must be maximally enhanced, or the resulting test score must not be assumed to be a representative sample of the child's academic performance."

Edlund (1972) administered the revised Stanford Binet, Form L, to 79 children from low-middle-class and lower-class homes. The children were 5 to 7 years of age, and based on their IQ scores, age, sex, and liking candy, 11 pairs of children were matched. The matched pairs included 10 pairs of boys and one pair of girls, both groups having a mean IQ of 82. At random, one subject from each pair was assigned to the experimental group and the other to the control group. Seven weeks later the control group was given Form M of the revised Stanford Binet under standard conditions. The experimental group was given one M&M candy contingent on correct responses to the items on Form M of the revised Stanford Binet. The median gain for the experimental group was 12 points, while for the control group the median gain was one point (means of 12.1 and .91 respectively). The t-test of the difference between the means proved to be significant at the 0.01 level. The author felt that either the performance of the child in a standardized test situation must be optimal, or the resulting score must not be assumed to be representative of what the child can do when motivated to perform well. Edlund states, "It would seem important that precise reinforcement procedures be used in the testing procedure, if one is to produce an accurate summary of the individual's learning progress or his IQ, which may be used as a basis for administrative decisions." (p. 319).

Rasmussen (1974) administered the Wechsler Intelligence Scale for Children (WISC) to a sample of 18 normal subjects (15 males and three females) and 18 borderline subjects (12 males and six females) from the Iowa public school system. The mean chronological age for the normal (95-105 IQ) and borderline (70-79 IQ) subjects were 9.77 and 10.79 respectively. The sample of 36 subjects was randomly drawn from a population who had been referred for psychological testing. During a later assessment, the children were readministered the WISC under a reinforcement condition where they received verbal reinforcement immediately contingent upon each correct response on the test. This resulted in significantly greater IQ scores across the normal and borderline levels of intelligence on the WISC Performance Scale and Full Scale. The author states that, "the use of violated procedures employing verbal reinforcement has been shown to be suggestive of successfully improving evaluation under optimal conditions. It should be a primary goal of intelligence testing to discriminate between those children who lack ability and those who lack intrinsic motivation." (p. 4886-A).

Unfortunately, all subjects were drawn from a population of children who had been referred for psychological testing, which makes it difficult to generalize these results. A sample selected in this way is probably not representative of children with average IQ's in general.

Smeets and Striefel (1975) conducted a study to explore the effects of different reinforcement conditions on the number of correct responses on the Raven Progressive Matrices. Previous research had used either a delay of reinforcement condition or an immediate reinforcement condition, but no study had compared the effect of contingent reinforcement, non-contingent reinforcement, and immediacy of reinforcement on the number of correct test responses. This study sought to analyze which type of reinforcement contingency constituted the optimal motivational condition as evidenced by the test performance of multihandicapped deaf children.

The initial group of subjects consisted of 52 deaf and hard-of hearing children ranging from 11 to 18 years of age. The pretest was administered to all subjects, and at the end of the test all subjects were allowed to take ten pennies, ten small candies, or five big candies before leaving the room. Subjects with scores of 5 or less and 45 or more were then excluded from further participation in the study. The remaining 44 subjects were then divided into four groups of 11 subjects each, matched on means and standard deviations of the subjects' ages and pretest scores. The four groups were then randomly assigned to any of four reinforcement conditions: end of session reinforcement (identical to pretest), noncontingent reinforcement (every response was reinforced or a reinforcer was given at the end of the 20-second interval in the event there was no response),

delayed reinforcement (at the end of every six trials, E would add up the number of correct responses and deliver the reinforcement), and immediate reinforcement (for correct responses). They were retested 17 days later.

The mean gain scores were as follows: end of session (0.5), noncontingent (1.7), delayed (2.1), and immediate (8.8). Only the immediate reinforcement group showed a significant difference between pre- and posttest scores.

When subjects with originally high scores or low scores are retested using a reinforcement procedure, any increase in scores by originally low scoring subjects or lack of change in scores by originally high scoring subjects may be attributed to regression toward the mean during the second administration of the test (with high scoring subjects, regression toward the mean may counteract the effect of reinforcement and, therefore, no change is observed, while with low scoring subjects, the gain in score under reinforcement conditions may be totally attributable to regression toward the mean). If one considers the differential results obtained by the four groups in the Smeets and Striefel (1975) study, a regression toward the mean hypothesis for changes observed seems highly unlikely. The fact that only the immediate reinforcement condition produced a significant increase in scores argues strongly that the increase was due to the procedure and not due to regression. This also suggests that significant

increases in scores seen in other studies employing immediate reinforcement are due to the procedures and not to regression toward the mean.

Clingman and Fowler (1975) investigated the effects of candy reinforcement on IQ test scores in first and second graders of above average intelligence. All 36 subjects, ages 6-3 to 8-8, were administered the revised Stanford Binet, Form L, according to standard instructions. The subjects were then randomly assigned to either a contingent reinforcement group (CR), a no reinforcement group (NR), or a noncontingent reinforcement group (NCR). Six weeks later the Stanford Binet, Form M, was administered. The NR group was tested under standardized conditions and served as a control group. Children in the CR group were given an M&M following each correct answer on Form M, and each member of the NCR group was randomly paired with a subject in the CR group according to the number of candies earned by the CR subject during the administration of Form M. If a subject in the CR group earned 20 M&M's, then the NCR subject (yoked control subject) who had been paired with the CR subject also received 20 M&M's, but noncontingently after the test question had been asked, and before the child responded, so that inadvertent reinforcement of correct responses could not occur. The differences between the first and second test scores were 4.17 for the CR group, 4.67 for the NCR group, and 1.00 for the NR group. None of these differences were statistically significant. A completely randomized analysis of variance was used in analyzing the data.

There are three possible reasons for the lack of increase in IQ test scores demonstrated in the Clingman and Fowler (1975) study, including a possibility of optimal responding by the subject on the initial administration, regression toward the mean, and not empirically demonstrating the effectiveness of their reinforcer. First, the level of responding in the initial testing for the subjects may have been at an optimal level. It may be that the reinforcement history for the children was such that being right was reinforcing and, therefore, the introduction of an extra incentive had no effect. Second, candy may not have been an effective reinforcer for these children. Third, regression toward the mean working against the reinforcement effect, although this seems highly unlikely since the control group scores did not decrease with the second administration of the PPVT.

Clingman and Fowler (1976) compared the effects of contingent candy reward (CR), noncontingent candy reward (NCR), and no candy (NR) on the IQ scores of children whose initial scores placed them in three different IQ levels. There were 72 children, ages 6-4 to 9-1, who served as subjects. Before the experiment began the children and their parents were asked whether they liked candy, and only when the child and parents agreed that the child liked candy were they included as subjects. Form A of the PPVT was administered according to the test manual. Subjects were then divided into three groups based on initial IQ scores (highest, third, next third, and lowest

third) and subjects from each group were randomly assigned to one of the three reinforcement conditions.

Four weeks later Form B was administered to the children. For the CR group, one M&M was given for each correct response, which the child had to eat right away. For the NCR group, each child was randomly paired with a child from the CR group and given the same amount of candies in a bowl, which the children had to eat (if they were going to eat them at all) during the testing situation (since no candies could be brought back to the classroom). For the NR group, the PPVT was administered according to the instructions in the test manual.

Only the low IQ group showed a significant increase in their IQ scores during the second administration of the PPVT, and only in the CR condition. The high IQ group showed an average decrease of between five and six points across all three conditions, while the average IQ group showed an increase of four IQ points in the NCR condition and a decrease of between one and two IQ points in the CR and NR condition. The possible reasons for the lack of increase in IQ scores for the originally high and medium IQ groups are as follows: first, Clingman and Fowler did not empirically demonstrate the effectiveness of their reinforcer before making it contingent on correct responses. Therefore, candy may not have been a reinforcer for the high and medium groups. Second, regression toward the mean may have been working against the effect of the reinforcer in the originally high IQ group, and as we have seen from the data, there was

a possible regression effect. An analysis of covariance might have been a more appropriate technique to use in this study, as opposed to the analysis of variance used. This technique would have increased the precision of the analysis of the treatment effects.

Rasmussen (1974) used the WISC with average IQ children and found significant increases in IQ scores due to reinforcement procedures, and yet, as we have seen, Clingman and Fowler (1976) found no change in IQ scores due to reinforcement procedures using the PPVT with average IQ children. Several differences in the two studies may account for the different results. First, different reinforcers were used to reinforce correct responses to test items. In the Rasmussen (1974) study, the children were verbally praised for correct responses, while in the Clingman and Fowler (1976) study, the children received candy for correct responses. This alone may account for the different results in that Clingman and Fowler did not empirically demonstrate the effectiveness of their reinforcer. Second, the ages of the children were different. Rasmussen's (1974) population were third, fourth and fifth graders. Clingman and Fowler's (1976) population were first, second and third graders. Third, the children in each study were administered different tests, and as we have seen, the IQ test used is an important variable in research assessing the effects of reinforcement on test performance.

Clingman and Fowler (1977) examined the proposition that children of high ability benefit more from the intrinsic reinforcement available

in taking a test than do low ability children, the latter responding more to extrinsic tangible reward. They randomly assigned 33 high performers and 33 low performers to receive intrinsic feedback alone, noncontingent candy reward, or contingent candy reinforcement while taking a derived picture vocabulary test, which had approximately equal difficulty of items in each half. An evaluation of the intratest performance of each group, with a mixed design analysis of variance, showed that only the low performers receiving contingent extrinsic reinforcement improved significantly within the test session. High performing children appeared to do as well or better under intrinsic feedback alone as under conditions of external tangible reward.

Baer (1978) conducted research to determine if the test scores of children would be differentially affected by reinforcement procedures. Two groups of 12 children (average IQ) were administered either the WISC or PPVT under standardized conditions, and again under reinforcement conditions after a nine day interval. Results showed a significant increase in the WISC scores, and a nonsignificant decrease in the PPVT scores.

Baer (1978) used tokens as reinforcers which were later exchanged for small toys. There were enough small toys available in the pool of reinforcers for every child to find several items that they wanted, and most of the children were very excited at the prospect of earning enough tokens to buy several items. There is a possibility that the children in the PPVT group were trying quite hard in the standardized

administration and, therefore, a reinforced administration could not improve their scores. In the WISC group, the test could have been long enough to have bored the children and, therefore, the reinforcers may have increased their attention span and interest in the test.

Summary

There are seven studies which have tested the effects of reinforcement procedures on the intelligence test scores of children with low IQ scores, and six of these have used a procedure which incorporates the immediate reinforcement of correct responses. The six studies using immediate reinforcement procedures have demonstrated an increase in scores due to these procedures. Therefore, one general finding in the area of reinforcement of intelligence test performance is that children who initially have low IQ scores and are immediately reinforced for correct responses on IQ tests at a later testing, show significant gains in their IQ scores. Since the various studies have used different reinforcers (candy, praise, tokens), tests (PPVT, WISC, Binet, MRT), and subjects (first and second grade children, 11 year olds, 5-7 year olds) and all show significant gains in IQ scores, it seems that the increases are due to the immediate reinforcement procedures. Regression toward the mean during the second administration of the test could be another explanation for the increases in IQ scores. However, as we have seen, the differential results

obtained when control groups or noncontingent reinforcement groups are used makes it unlikely that regression could have accounted for the increase in IQ scores.

Four studies have tested the effects of reinforcement procedures on the intelligence test performance of children with high IQ scores, and none have found significant effects. Therefore, a second general finding in this area of research is that children who have initially high IQ scores, and are tested at a later point in time using immediate reinforcement for correct responses, are not affected by these procedures. The data does not show significant increases in their IQ scores. However, additional replications will be necessary before we can generalize from these findings.

Studies assessing the effects of reinforcement on the intelligence test scores of children with initially average IQ scores have produced conflicting results. A number of studies have shown an increase in IQ scores due to reinforcement procedures, while others have shown no change in scores. Ten studies have examined the effects of reinforcement on the intelligence test scores of average IQ children. Five of these have used immediate reinforcement procedures. Two studies show no change, two studies show an increase, and one study showed an increase on the WISC but not on the PPVT. Of the five studies using a delay of reinforcement procedure, two have shown increases in IQ scores, and three have shown no increases.

No study on the effects of reinforcement on IQ scores has empirically demonstrated the effectiveness of the reinforcer used, and only one pilot study has used preschoolers as subjects.

CHAPTER III

PROCEDURES

Subjects

There were 45 caucasian preschool children attending Head Start who served as subjects. The children from low-middle class and lower-class homes were from 3 years 7 months to 5 years 2 months (average age 4 years 6 months). They attended Head Start classes for three hours a day, five days a week. The program was structured to help develop skills in fine and gross motor development, social skills, and language development. The parents signed a consent form which allowed their child to participate in the research (see Appendix).

Procedure

There were 63 children who were first administered the Slossen Intelligence Test (SIT, Slosson, 1961) and the test scores were divided into three groups. One group contained IQ scores of 75-89, the second group contained IQ scores of 90-109, and the third group contained IQ scores of 110-130. There were 15 subjects randomly selected from each group, and within each of these groups subjects were randomly assigned to one of three conditions: a control group, a pretest experimental group, and a no pretest experimental group. There were, therefore, three control groups, three pretest experimental groups, and three no pretest experimental groups (see Figure 1).

						C_1	C_2 Standardized-ized / Reinforced	C_3
					n	Standardized		Standardized
Slosson	High IQ	A_1 (n=15)	B_1	Control	5	$A_1B_1C_1$	$A_1B_1C_2$	$A_1B_1C_3$
			B_2	Exp 1	5	$A_1B_2C_1$	$A_1B_2C_2$	$A_1B_2C_3$
			B_3	Exp 2	5		$A_1B_3C_2$	$A_1B_3C_3$
	Av. IQ	A_2 (n=15)	B_1	Control	5	$A_2B_1C_1$	$A_2B_1C_2$	$A_2B_1C_3$
			B_2	Exp 1	5	$A_2B_2C_1$	$A_2B_2C_2$	$A_2B_2C_3$
			B_3	Exp 2	5		$A_2B_3C_2$	$A_2B_3C_3$
	Low IQ	A_3 (n=15)	B_1	Control	5	$A_3B_1C_1$	$A_3B_1C_2$	$A_3B_1C_3$
			B_2	Exp 1	5	$A_3B_2C_1$	$A_3B_2C_2$	$A_3B_2C_3$
			B_3	Exp 2	5		$A_3B_3C_2$	$A_3B_3C_3$

A = IQ levels (initial)

B = groups (2 experimental and one control)

C = type of administration of test

Figure 1. Schematic Representation

The control groups (n = 15) and the pretest experimental groups (n = 15) were given a standardized administration of the PPVT. Three weeks later the pretest experimental groups (n = 15) and the no pretest experimental groups (n = 15) were tested with a reinforcement procedure in effect, while the control group was given a standardized administration. The difference between the first and the second administration of the PPVT for the different experimental groups was the following: first, the PPVT, Form B, was used instead of Form A; second, the same graduate students tested different children; third, before the second administration began, testers explained to the children that they would receive a token (exchangeable for prizes) for every correct response; fourth, the children bought items after earning tokens for the three examples on the test (so they realized the buying power of a token); and fifth, after the second administration, these children were taken to a room where they were able to purchase back-up reinforcers (books, boats, airplanes, dolls, puzzles, marbles, army men, prehistoric animals, etc.) with their tokens. The control groups were given a standardized administration also with Form B, and with the same graduate students testing different children.

In order to determine whether the reinforcers available for the children were, in fact, reinforcers, the parents were asked what small items their children liked, and the children were also asked. The children were shown all the items before the second administration, and were able to buy something with the tokens they earned in the examples on the test.

In a pilot study (Weiss, 1978), it was found that the procedure of asking both parents and children was very useful in finding effective reinforcers for this group of children. After the pilot study was completed, the various trinkets were used (with the children who showed no increase in IQ scores) to determine whether they would perform better on a task that they functioned quite low on when the reinforcer was promised if they tried harder on these tasks (ball bouncing, skipping, walking on balance beam). They, in fact, did increase their functioning level on these tasks.

In order to empirically demonstrate the effectiveness of the tokens as reinforcers, six children were randomly chosen from the experimental groups (one child from each of the experimental groups) a day after the reinforced administration of the PPVT. Since "please" and "thank you" were used so rarely by these children, it was decided to try and increase the frequency of occurrence of these words by presenting the children with a token when "please" and/or "thank you" were used.

Three weeks later, the control groups (n = 15), the pretest experimental groups (n = 15), and the pretest experimental groups (n = 15) were given a standardized administration of the PPVT. The pretest experimental groups were included to see if the changes between the first and second testing, if any, were stable over time. The no pretest experimental groups were included to see if there were

any change between an initial reinforced administration of the test and a subsequent standardized administration of the test, and also to deal with the stability over time issue.

Descriptions of the Tests

The PPVT is an individually administered test of receptive vocabulary appropriate for children from 2 to 18 years of age. The child is presented with a series of plates, each consisting of four pictures. The examiner presents these plates one at a time and says a word which describes one of the pictures on the plate. The child is then to point to the appropriate picture. The raw scores derived from the test are converted to mental ages, IQ scores, and percentile scores.

Reliability of the PPVT, as reported in the manual (Dunn, 1965), shows alternative form reliability coefficients of 0.81, 0.77, 0.72, and 0.73 for children ages 3.6, 4.0, 4.6, 5.0, respectively. The coefficients were computed from data obtained on children from the standardization sample.

Reliability of the PPVT, as reported in the National Day Care Study (Ruopp et al., 1979), reports the reliability of the PPVT to be .9 for the 3 and 4 year old children used in the standardization sample.

Validity of the PPVT as a measure of intelligence was determined by its correlation with the WISC and 1937 Stanford Binet Tests of

Intelligence. In the PPVT manual, Dunn (1965) points out that studies comparing the PPVT with the Stanford Binet have reported correlation coefficients of from 0.60 to 0.87, with a median of 0.71. Studies comparing the PPVT with the WISC have reported correlation coefficients of from 0.30 to 0.84, with a median of 0.61.

The SIT is an individually administered intelligence test which has proven to be useful as an individual screening instrument for both children and adults. The SIT has adapted a great many items from the Stanford Binet, Form L-M.

A high reliability coefficient of 0.97 (test-retest interval within a period of two months) was obtained for the SIT (Slosson, 1961).

The concurrent validity of the Slosson is indicated by the high correlations with Stanford Binet, Form L-M. Correlations of 0.90, 0.93 and 0.98 have been found with subjects of 4, 5, and 6 years of age (Slosson, 1961).

Trivedi (1977) correlated the PPVT and the SIT using a resident population of a state institution for the mentally retarded. The correlations were from 0.49 to 0.79 with a mean of 0.635. Correlations of the SIT and WISC were also computed, and correlations from 0.85 to 0.89 were found with a mean of 0.87.

Raskin et al. (1974) conducted a study to determine the relationships between the PPVT and the SIT in preschool and third grade children. Correlations of 0.536 (nursery school children) and 0.672

(third grade children) were found. The SIT yielded higher scores than the PPVT for both nursery school and third grade children.

Reliability

At two times during the various administration of the PPVT, independent observers (blind to the rationale of the experiment) observed the testing and independently scored the test. Percent agreement between the tester and observer constituted the reliability score (number correct answers scores by independent observers/ number correst answers scored by tester).

Data Analysis

A split-plot design (used with factorial experiments with main effects confounded) was used to analyze the data (Cochran & Cox, 1971). There were two separate split-plot ANOVAs computed, and they were set up in the following way:

(1) a 3 x 2 x 3 split-plot ANOVA with the factors being 3 levels of IQ (A_1, A_2, A_3) x 2 groups (B_1, B_2) x 3 administrations of the test (C_1, C_2, C_3), and

(2) a 3 x 3 x 2 split-plot ANOVA with the factors being 3 levels of IQ (A_1, A_2, A_3) x 3 groups (B_1, B_2, B_3) x 2 administrations of the test (C_1, C_2).

In the split-plot ANOVA, the level of significance was set at .05, and F-ratios were computed for each of the following effects:

(1) A IQ

(2) B Group

(3) C Treatment

(4) AB IQ x Group

(5) AC IQ x Treatment

(6) BC Group x Treatment

(7) ABC IQ x Group x Treatment

Least Significant Difference (LSD) scores were computed according to the following formulas, where

n = number of subjects per call (5)

a = levels of IQ

b = number of groups used in analysis (control, Exp. 1, Exp. 2)

c = number of administrations of the IQ test.

I Q Main Effect

$$t\ df\ E(a)\sqrt{\frac{2\ M\ S\ E(a)}{n\ b\ c}}$$

Group Main Effect

$$t\ df\ E(a)\sqrt{\frac{2\ M\ S\ E(a)}{n\ a\ c}}$$

IQ x Group Interaction

$$t\ df\ E(a)\sqrt{\frac{2\ M\ S\ E(a)}{n\ c}}$$

Administration Main Effect

$$t\ df\ E(b)\sqrt{\frac{2\ M\ S\ E(b)}{n\ a\ b}}$$

Administration x IQ

$$t' \; df \; E(b) \sqrt{\frac{2\,[(a-1)\; M\,S\; E(c) + M\,S\; E(b)]}{n\; a\; b}}$$

Administration x Group

$$t' \; df \; E(b) \sqrt{\frac{2\,[(b-1)\; M\,S\; E(c) + M\,S\; E(b)]}{n\; a\; b}}$$

Administration x Group x IQ

$$t' \; df \; E(b) \sqrt{\frac{2\,[(ab-1)\; M\,S\; E(c) + M\,S\; E(b)]}{n\; a\; b}}$$

The LSD's were computed in order to determine which set of means accounted for significance being found in the split-plot ANOVA. The LSD was also used to check means where overall there was no significance.

CHAPTER IV

RESULTS

Reliability

At two times during the various administrations of the PPVT, independent observers watched the testing and independently scored the test. Percent agreement between the tester and observer constituted the reliability scores (number of correct answers scored by independent observers/number of correct answers scored by the tester). The reliability score between the examiner and observer was 100%.

Test Data

Table 2 outlines the mean and range of the IQ scores across groups. Six questions guided the research and these questions are listed below, together with the results of the statistical analyses computed to answer that question.

Question 1: Will preschoolers with below average IQ scores, who are administered an IQ test under standardized conditions at one point in time, show a significant increase in their IQ scores when administered the test under immediate reinforcement conditions for correct responses at a later time?

Table 2

Mean and Range of IQ Scores

			Standardized C_1	Standardized Reinforced C_2	Standardized C_3
High IQ A_1	B_1	5	115.4 (110-123)	114.2 (109-125)	113.6 (108-120)
	B_2	5	114.6 (111-116)	113.6 (99-133)	115.0 (109-123)
	B_3	5		118.6 (112-122)	113.6 (107-122
Average IQ A_2	B_1	5	97.8 (90-103	94.6 (85-99)	101.2 (94-108)
	B_2	5	102.6 (96-106	107.4 (101-115)	104.2 (102-110)
	B_3	5		108.8 (103-119)	103.2 (100-106)
Low IQ A_3	B_1	5	79.4 (71-89)	76.6 (75-84)	81.6 (76-87)
	B_2	5	77.2 (59-87)	97.4 (90-104)	97.4 (89-107)
	B_3	5		93.4 (85-102)	92.2 (88-100)

Table 3

F-Ratios and LSD Computations for
3 x 2 x 3 Split-Plot ANOVA

Source	F	Level of Significance	LSD
IQ x Treatment	3.567	p .05	5.295
Group x Treatment	6.642	p .01	4.135
IQ x Group x Treatment	3.787	p .05	7.801

F-ratios were computed from the 3 x 2 x 3 split-plot ANOVA, and the following significant effects were found: IQ x Treatment ($F = 3.567$, $p = .05$), Group x Treatment ($F = 6.042$, $p = .01$), and IQ x Group x Treatment ($F = 3.787$, $p = .05$). The LSD test was then used to determine which means accounted for the significant effects. In each and every case the significant difference was found in the low IQ group, standardized vs. reinforced administration of the PPVT.

Preschoolers with below average IQ scores who are administered the PPVT under standardized conditions at one point in time show a significant increase in their IQ scores when administered the PPVT, under immediate reinforcement conditions, for correct responses at a later time.

Question 2: Will preschoolers with average IQ scores, who are administered an IQ test under standardized conditions at one

point in time, show a significant increase in their IQ scores when administered the test under immediate reinforcement conditions for correct responses at a later time?

Analysis of the data shown in Table 3 reveals that there were no significant differences in the means for the average IQ subjects when comparing the standardized and reinforced administrations of the PPVT.

Preschoolers with average IQ scores who are administered the PPVT under standardized conditions at one point in time do not show significant increases in their IQ scores when administered the PPVT under immediate reinforcement conditions for correct responses at a later time.

Question 3: Will preschoolers with above average IQ scores, who are administered an IQ test under standardized conditions at one point in time, show a significant increase in their IQ scores when administered the test under immediate reinforcement conditions for correct responses at a later time?

Analysis of the data shown in Table 3 reveals that there were no significant differences in the means for the above average IQ subjects when comparing the standardized and reinforced administrations of the PPVT.

Preschoolers with above average IQ scores, who are administered

the PPVT under standardized conditions at one point in time, do not show significant increases in their IQ scores when administered the PPVT under immediate reinforcement conditions for correct responses at a later time.

Question 4: Will the changes, if any, shown on the reinforced administration of the IQ test be stable over time?

or

Is it possible that the reinforced administration of the IQ test builds in a reinforcement history in preschool children, and the effects show up during a second standardized administration of the IQ test following the reinforced administration?

The only significant difference in the IQ scores was in the low IQ group, between the standardized and reinforced administrations of the PPVT. The average mean scores from Group A_3B_2 went from 77.2 to 97.4 to 97.4. As we can see in Table 4, the significant increase in IQ scores was stable over time.

Table 4

Mean Scores from Standardized to Reinforced to Standardized Administration of the PPVT for the Low IQ Subjects

		C_1	C_2	C_3
A_3	B_2	77.2	97.4	97.4
	B_3		93.4	92.2

Significant increases in IQ scores were stable over time for the low IQ group.

Using the same significant F-ratios and LSD computations as in Question 1, it was found that for the high and average IQ subjects, there was no significant difference between the two standardized administrations of the IQ test. There was a significant effect found for the low IQ children. Therefore, the reinforced administration of the PPVT does not build in a reinforcement history in preschool children with high and average IQ scores, and there is a nonsignificant effect between the first and second standardized administration of the PPVT for these children. It is possible that the reason that the IQ scores for the low IQ children were stable over time was due to a reinforcement history being created by the reinforced administration of the PPVT.

Question 5: Will a change in test scores be significant, if the first administration is reinforced and the second administration standardized?

Using the LSD computation for the F-ratios that were significant, it was found that there was no difference between groups that were given a reinforced administration of the PPVT followed by a standardized administration.

There was no significant change in the IQ scores when the first administration was reinforced and the second administration was standardized.

Table 5

F-Ratios and LSD Computations for
3 x 3 x 2 Split-Plot ANOVA

Source	F-ratio	Level of Significance	LSD
Group	10.996	p = .01	4.232
IQ x Group	3.195	p = .05	7.329
Treatment	< 1	NS	3.547
IQ x Treatment	< 1	NS	4.914
Group x Treatment	6.447	p = .01	4.914
IQ x Group x Treatment	1.464	NS	7.671

Question 6: If there is a lack of significant increase in the IQ test performance, is it due to the fact that the reinforcers are ineffective with certain groups (high and average IQ subjects) of children?

A half-hour session was used with the six children randomly chosen from the experimental groups, where they had to share items and ask other children if they could use the toy, puppet, etc. that another child was using. They were reminded once each to use "please" and/or "thank you" when interacting with the other children. The procedure was explained to them and they knew the value of the tokens from their exposure to them on the previous day.

Once "please" and "thank you" were reinforced, the frequency of occurrence jumped to 43 for the 15-minute experimental period (no one child accounted for most of the increase, but the frequency of occurrence increased fairly equally across subjects). The reinforcer was equally effective for the high, average, and low IQ subjects.

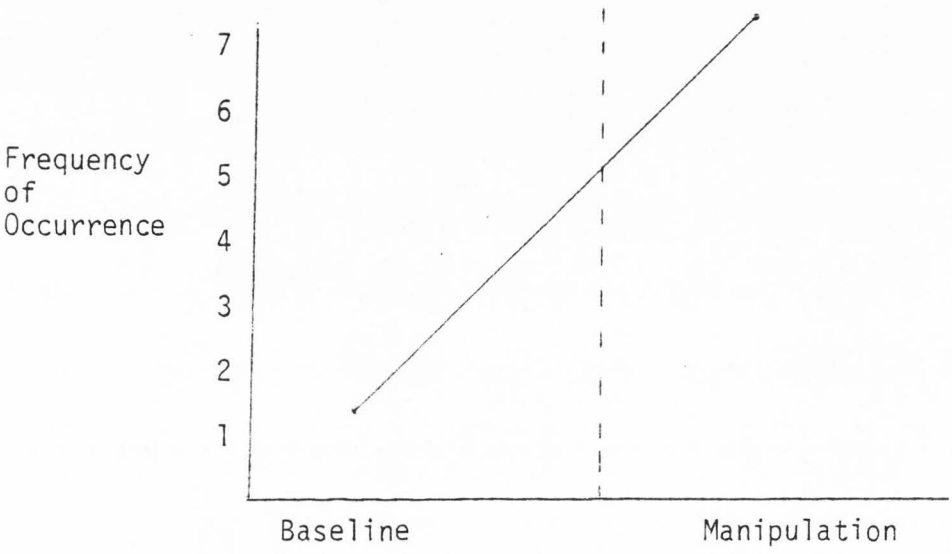


Figure 2. Mean increase across six subjects.

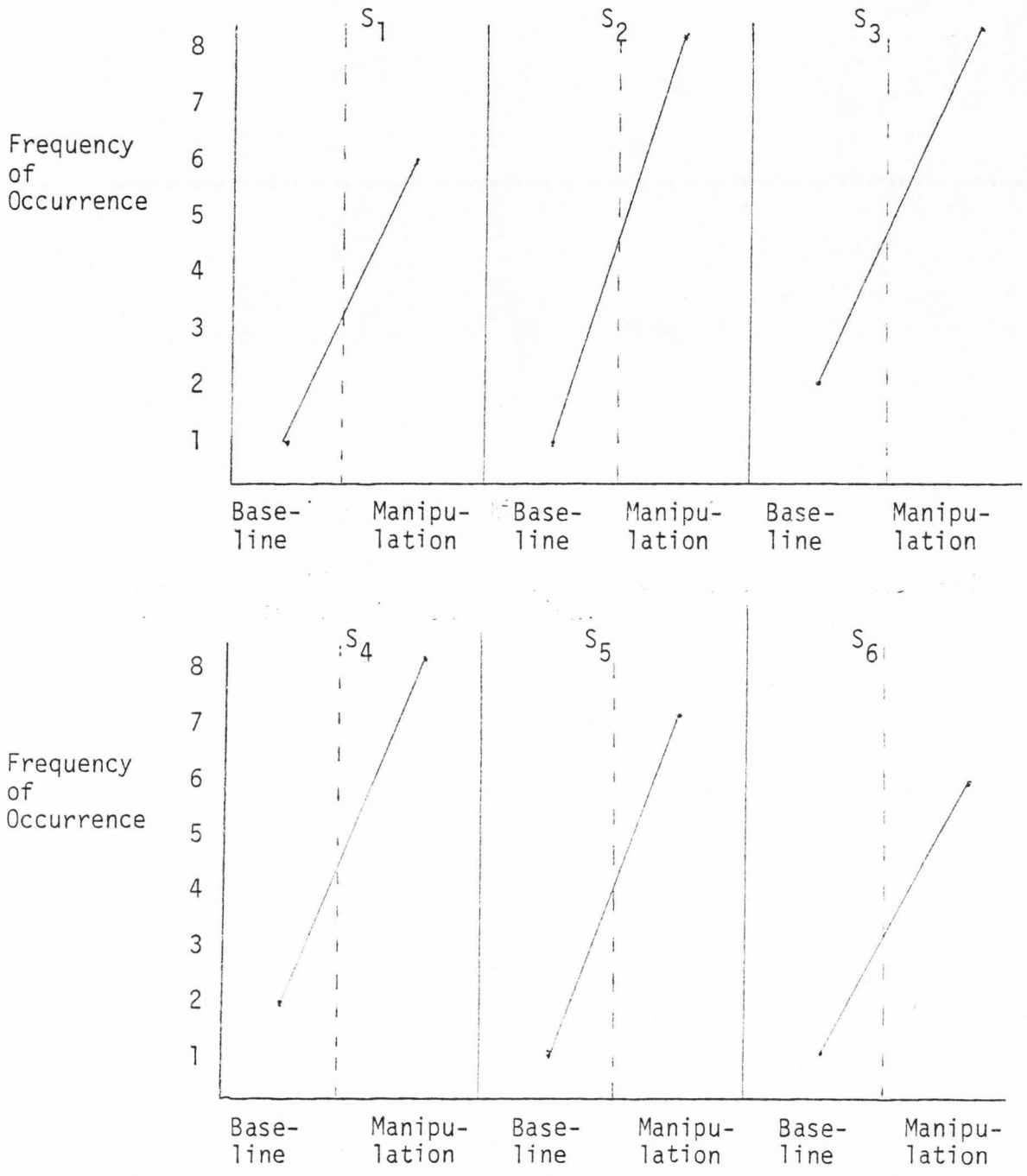


Figure 3. Individual increases in the occurrence of "please" and "thank you" from baseline to manipulation.

CHAPTER V

DISCUSSION

The present results show that immediate reinforcement procedures are effective in significantly increasing the IQ test scores of low IQ subjects, but these procedures have no significant effect on the IQ test scores of average and high IQ subjects. The lack of significant increase in the IQ scores of these subjects was not due to the ineffectiveness of the reinforcer, since the effectiveness of the reinforcer was empirically demonstrated. For the high IQ subjects, the lack of significant increase was not due to regression toward the mean, since there was no significant difference in scores for the control group. The significant increase shown in the low IQ subjects was not due to regression toward the mean, since a significant increase was not seen in the control group.

The results of this study are consistent with the research conducted by Weiss (1978), Clingman and Fowler (1975, 1976, 1977), and Edlund (1972). However, the results found in this study do differ from the results found by Baer (1978), Rasmussen (1974), Ayllon and Kelly (1972), and Hurlock (1924). There are several differences in the studies which might account for the differences in the results. First of all, the subjects differed in their ages. The present study used preschool children as subjects, while the

other studies used children ranging from the first to eight grade. Second, different IQ tests were administered in the other studies. While the PPVT was used in this research, other researchers have used tests such as the WISC, Otis, NIT, MRT, and MAT. Third, different reinforcers were used in the other studies ranging from praise and reproof to candies. And fourth, there is a difference in reinforcement procedures across studies. Hurlock (1924) and Ayllon and Kelly (1972) used a delay of reinforcement procedure, while Baer (1978) and Rasmussen (1974) used an immediate reinforcement procedure.

The question of whether increases in IQ test scores would be stable over time from a reinforced administration to a standardized administration was an important question to ask, since the answer would yield useful information in terms of whether the reinforced administration was building in a history of reinforcement in these children. The fact that the large increases in IQ test scores for the low IQ children were stable over time may indicate that a single reinforced administration of the IQ test was sufficient in increasing the child's motivation to perform well on the next standardized administration of the test. Test scores often reflect poor academic skills, but they also may reflect a lack of motivation to do well. It may be necessary to reinforce low IQ subjects more in classroom situations in order to motivate them to do well, both in their classroom activities and testing sessions. However, as Edlund (1972) has pointed out, even children who have a six week history of token

reinforcers for classroom activities improved their IQ scores during a reinforced administration of the IQ test. They also scored signi-fincatly higher on the portion of the test administered under standard conditions, than the group in the regular academic program.

The goal of individualized and group testing procedures should be to assess the individual's performance under optimal conditions, and yet there is a disagreement among test authors as to what constitutes optimal conditions.

Some researchers in the area of reinforcement of correst responses on IQ tests feel that perhaps reinforcement should be included in order to create more optimal conditions for assessment. Edlund (1972) states that "for those who frequently use test results. . . either the performance of the child in the standardized test situation must be maximally enhanced, or the resulting test score must not be assumed to be a representative sample of the child's academic performance" (p. 483). Ayllon and Kelly (1972) have also recommended the use of reinforcement with IQ tests in order to insure optimal testing conditions. However, other researchers (Smeets & Striefel, 1975) question the use of results of IQ test scores under reinforcement conditions, since it may not reflect the typical classroom performance of the children assessed.

It is important to note the effect of reinforcing correct responses on IQ tests in terms of deviating from the standardization procedure and invalidating the norms used to score the test. All

IQ tests are standardized in terms of testing procedures in order to develop norms for that particular test with a certain population of subjects. We cannot really say that IQ's are increased by these procedures, since we can no longer use the norms derived from the standardized testing procedures. What we can say is that the testee's potential score is greater than the score that a standardized procedure would provide. The subject's motivation level is increased, and this gives us a clue as to what to expect from the subject and what procedures are needed for an optimal rate of learning. This information is very useful in setting up the best working conditions for these children, and a more correct academic placement may be possible. A reinforcement procedure separates the low achievers from the children with low motivation.

Since it is so important to know whether a low IQ score results from lack of ability or lack of interest, perhaps the wisest course of action is to test children with a standardized administration, and then use a reinforced administration of the IQ test at a later point in time in order to determine the reason for the low IQ scores, given a reinforced administration does increase IQ test performance.

Additional research needs to be conducted comparing different tests and different subject populations, as well as research designed to determine what other variables affect children's IQ test performance. In addition, the empirical demonstration of the reinforcer effectiveness needs to be demonstrated in each study before the term

"reinforcer" can be used. Since the results of IQ test scores are used so frequently in making important administrative decisions regarding children, it is extremely important to identify the variables which do affect IQ test performance.

REFERENCES CITED

Ayllon, T. & Kelly, L. Effects of reinforcement on standardized test performance. Journal of Applied Behavior Analysis, 1972, 5, 447-484.

Baer, R. D. Effects of reinforcement on intelligence test behavior as a function of test administered and sex of subject. Unpublished doctoral dissertation, Utah State University, 1978.

Clingman, J. & Fowler, R. L. The effects of contingent and noncontingent rewards on the IQ scores of children of above average intelligence. Journal of Applied Behavior Analysis, 1975, 8, 90.

Clingman, J. & Fowler, R. L. The effects of primary reward on the IQ performance of grade school children as a function of initial IQ level. Journal of Applied Behavior Analysis, 1976, 1, 19-23.

Clingman, J. & Fowler, R. L. The influence of intrinsic and extrinsic reward on the intra-test performance of high and low-scoring children. The Psychological Record, 1977, 3, 603-610.

Cochran, W. G. & Cox, G. M. Experimental Design. New York: John Wiley & Sons, Inc., 1957.

Conner, I. J. & Weiss, F. L. A brief discussion on the efficacy of raising standardized test scores by contingent reinforcement. Journal of Applied Behavior Analysis, 1974, 7, 351-352.

Dunn, F. M. Peabody Picture Vocabulary Test. Circle Pines, Minn.: American Guidance Service, Inc., 1965.

Edlund, C. V. The effects on the behavior of children, as reflected in the IQ scores, when reinforced after each correct response. Journal of Applied Behavior Analysis, 1972, 5, 317-319.

Fine, B. The Stranglehold of the IQ. New York: Doubleday & Co., Inc., 1975.

Kolstoe, R. H. Uses of test results. Childhood Education, 1967, 44, 165-167.

Hutt, M. L. A clinical study of "consecutive" and "adaptive" testing with the revised Stanford-Binet. Journal of Consulting Psychology, 1947, 11, 93-103.

Hurlock, E. B. An evaluation of certain incentives used in school work. Journal of Educational Psychology, 1924, 16, 145-159.

Maller, J. B., Zubin, J. The effects of motivation upon intelligence test scores. Journal of General Psychology, 1932, 41, 136-151.

Masling, J. The effects of warm and cold interaction on the administration and scoring of an intelligence test. Journal of Consulting Psychology, 1959, 23, 336-341.

Raskin, L., Offenbach, S., & Black, K. Relationships between the Peabody Picture Vocabulary Test and Slosson Intelligence Test in preschool and third grade children. Psychology in the Schools, 1974, 11, 66-68.

Rasmussen, N. H. The effects of violating WISC standard administrative procedures on the performance of third, fourth, and fifth grade children of normal and borderline intelligence. Dissertation Abstracts International, 1974, 34, 4886.

Ruopp, R., Travers, J., Glantz, F., & Corlen, C. Children at the center: Summary findings and their implications. Final Report of the National Day Care Study. Contract #HEW 105-74-1100. Vol., I, 1979.

Sacks, E. Intelligence scores as a function of experimentally established social relationships between child and examiner. Journal of Abnormal and Social Psychology, 1952, 47, 354-358.

Sattler, J. M. & Thaye, F. Procedural, situational, and interpersonal variables in individual intelligence testing. Psychological Bulletin, 1967, 68, 347-60.

Sarason, I. G. & Minard, J. Test anxiety, experimental instructions, and the Wechsler Adult Intelligence Scale. Journal of Educational Psychology, 1962, 53, 299-302.

Slosson, R. L. Slosson Intelligence Test for Children and Adults. East Aurora, New York: Slosson Educational Publications, Inc., 1961.

Smeets, P. M. & Striefel, S. The effects of different reinforcement conditions on the test performance of multihandicapped deaf children. Journal of Applied Behavior Analysis, 1975, 8, 81-89.

Solkoff, N. Frustration and WISC coding performance among brain injured children. Perceptual and Motor Skills, 1964, 18, 54.

Sweet, R. C. & Ringness, T. A. Variations in intelligence test performance of referred boys of differing racial and socio-economic backgrounds as a function of feedback of monetary reinforcement. Journal of School Psychology, 1971, 9, 399-409.

Termin, L. M. The Measurement of Intelligence. New York: Houghton Mifflin, 1916, 362.

Termin, L. M. & Merrill, M. A. Measuring Intelligence. New York: Houghton Mifflin, 1937, 461.

Thorndike, E. L. Measurement of intelligence. Psychological Review, 1924, 31, 219-252.

Tiber, N. & Kennedy, W. A. The effects of incentives on the intelligence test performance of different social groups. Journal of Consulting Psychology, 1964, 28, 187.

Trivedi, A. A comparison of three intelligence tests for the assessment of mental retardation. Journal of Mental Deficiency Research, 1977, 21, 289-297.

Webb, W. W. Conceptual ability of schizophrenics as a function of threat of failure. Journal of Abnormal and Social Psychology, 1955, 50, 221-224.

Weiss, R. H. The effects of reinforcement on the IQ scores of preschool children as a function of initial IQ. Unpublished pilot study, Utah State University, 1978.

Winer, B. J. Statistical Principles in Experimental Design. New York: McGraw Hill, Inc., 1971.

Young, R. K. Digit span as a function of the personality of the experimenter. American Psychologist, 1959, 14, 375.

APPENDIXES

Table 6

LSD's for 3 x 2 x 3 Split-Plot ANOVA

	LSD
IQ Main Effect	4.974
Group Main Effect	4.061
IQ x Group Interaction	7.035
Treatment Main Effect	2.482
Treatment x IQ Interaction	5.295
Group x Treatment Interaction	4.135
Group x Treatment x IQ Interaction	7.801

Table 7

LSD's for 3 x 3 x 2 Split-Plot ANOVA

	LSD
IQ Main Effect	4.232
Group Main Effect	4.232
IQ x Group Interaction	7.329
Treatment Main Effect	3.547
Treatment x IQ Interaction	4.914
Group x Treatment Interaction	4.135
Group x Treatment x IQ Interaction	7.671.

Table 8

3 x 3 x 2 Split-Plot ANOVA

Significant Means Computed by LSD Test					
A	B	C	No. of Objects	Means	Significance
1			30	114.8	x IQ
2			30	103.3	
3			30	89.8	x
	1		30	97.0	x Group
	2		30	105.8	
	3		30	105.0	
1	1		10	113.9	
1	2		10	114.3	x IQ
1	3		10	116.1	Group
2	1		10	97.9	
2	2		10	105.8	
2	3		10	106.0	
3	1		10	79.1	x
3	2		10	97.4	
3	3		10	92.8	
		1	45	102.7	
		2	45	102.4	Admin.
1		1	15	115.5	
1		2	15	114.1	IQ
2		1	15	103.6	x Admin
2		2	15	102.9	
3		1	15	89.1	
3		2	15	90.4	
	1	1	15	95.1	
	1	2	15	98.8	Group
	2	1	15	106.1	x Admin.
	2	2	15	105.5	
	3	1	15	106.9	
	3	2	15	103.0	
1	1	1	5	114.2	
1	1	2	5	113.6	
1	2	1	5	113.6	
1	2	2	5	115.0	
1	3	1	5	118.6	IQ
1	3	2	5	113.6	x
2	1	1	5	94.6	x Group
2	1	2	5	101.2	Admin.
2	2	1	5	107.4	
2	2	2	5	104.2	

Table 8 (Continued)

A	B	C	No. of Objects	Means	Significance
2	3	1	5	108.8	
2	3	2	5	103.2	
3	1	1	5	76.6	
3	1	2	5	81.6	
3	2	1	5	97.4	
3	2	2	5	97.4	
3	3	1	5	93.4	
3	3	2	5	92.2	

Note: x = Significant

Table 9

3 x 2 x 3 Split-Plot ANOVA

Significant Means Computed by LSD Test						
A	B	C	Number of Observations	Means	Significance	Variables
1			30	114.8	x	IQ
2			30	103.8		
3			30	89.8	x	
	1		30	97.0	x	Group
	2		30	105.8		
	3		30	105.0		
1	1		10	113.9		
1	2		10	114.3		
1	3		10	116.1		
2	1		10	97.9	x	IQ x Group
2	2		10	105.8		
2	3		10	106.0		
3	1		10	79.1	x	
3	2		10	97.4		
3	3		10	92.8		
		1	45	102.7		
		2	45	102.4		Admin.
1		1	15	115.5		
1		2	15	114.1		IQ x Admin.
2		1	15	103.6		
2		2	15	102.9		
3		1	15	89.1		
3		2	15	90.4		
	1	1	15	95.1		
	1	2	15	98.8		Group x Admin.
	2	1	15	106.1		
	2	2	15	105.5		
	3	1	15	106.9		
	3	2	15	103.0		
1	1	1	5	114.2		
1	1	2	5	113.6		
1	2	1	5	113.6		
1	2	2	5	115.0		IQ x Group
1	3	1	5	118.6		x Admin.
1	3	2	5	113.6		

Table 9 (Continued)

A	B	C	Number of Observations	Means	Significance	Variables
2	1	1	5	94.6		
2	1	2	5	101.2		
2	2	1	5	107.4		
2	2	2	5	104.2		
2	3	1	5	108.8		
2	3	2	5	103.2		
3	1	1	5	76.6		
3	1	2	5	81.6		
3	2	1	5	97.4		
3	2	2	5	97.4		
3	3	1	5	93.4		
3	3	2	5	92.2		

Note: x = Significant

A = IQ
B = Group
C = Administration

Table 10

3 x 3 x 2 Split-plot ANOVA

Source	DF	SS	MS	VAR	F	Level of Significance
IQ	2	9393.689	4696.844	1	72.050	p .01
Group	2	1433.689	716.844	1	10.996	p .01
IQ x Group	4	833.1111	208.2778	1	3.195	p .05
Error A	36	2346.800	65.18889	1		
Treatment	1	1.877778	1.877778	1		NS
Error B	4	146.9556	36.73889	1		
IQ x Treatment	2	28.88889	14.44444	1		NS
Group x Treatment	2	217.6889	108.8444	1	6.447	p .01
IQ x Group x Treatment	4	98.84444	24.71111	1	1.464	NS
Error C	32	540.2444	16.88264	1		
Total	89	15041.79	169.0089	1		

Table 11

3 x 2 x 3 Split-plot ANOVA

Source	DF	SS	MS	VAR	F	Level of Significance
IQ	2	133077.62	6538.811	1	75.053	p .01
Group	1	840.2778	840.2778	1	9.645	p .01
IQ x Group	2	499.4889	249.7444	1	2.867	NS
Error A	24	2090.933	87.12222	1		
Treatment	2	289.6889	144.8444	1	8.338	p .05
Error B	8	138.9778	17.37222	1		
IQ x Treatment	4	440.3778	110.0944	1	3.567	p .05
Group x Treatment	2	409.9556	204.9778	1	6.642	p .01
IQ x Group x Treatment	4	465.1778	116.2944	1	3.787	p .05
Error C	40	1234.489	30.86222	1		
Total	89	19486.99	218.9549	1		

Table 12

Individual and Mean IQ and Gain Scores for High IQ Subjects

Slosson	Subject #		C_1	C_2	Gain	C_3	Gain
110	1	B_1	123.0	119.0	- 4	120	+ 1
120	2		111.0	109.0	- 2	108	- 1
130	3		118.0	125.0	+ 7	116	- 9
115	4		115.0	109.0	- 6	113	+ 4
115	5		110.0	109.0	- 1	111	+ 2
	$\bar{x}$		115.4	114.2	- 0.8	113.6	- 0.6
130	6	B_2	111.0	114.0	+ 3	110.0	- 4
110	7		116.0	133.0	+17	120.0	-13
115	8		116.0	133.0	-17	109.0	+13
130	9		114.0	100.0	-14	113.0	+13
113	10		116.0	122.0	+ 6	123.0	+ 1
	$\bar{x}$		114.6	113.6	- 1	115.0	+ 1.4
126	11	B_3		120.0		116.0	- 4
126	12			122.0		110.0	-12
133	13			112.0		113.0	+ 1
111	14			120.0		122.0	+ 2
118	15			119.0		107.0	-12
	$\bar{x}$			118.6		113.6	- 5

	Type of Administration of the Test		
	C_1	C_2	C_3
B_1 = Control	Standardized	Standardized	Standardized
B_2 = Exp. 1	Standardized	Reinforced	Standardized
B_3 = Exp. 2		Reinforced	Standardized

Table 13

Individual and Mean IQ and Gain Scores for Average IQ Subjects

Slosson	Subject #		C_1	C_2	Gain	C_3	Gain
93	16	B_1	103.0	99.0	- 4	107.0	+ 8
95	17		90.0	96.0	+ 6	100.0	+ 4
109	18		93.0	85.0	- 8	97	+12
107	19		102.0	95.0	- 7	94	- 1
109	20		101.0	98.0	- 3	108	+10
	$\bar{x}$		97.8	94.6	- 3.2	101.2	+ 6.6
102	21	B_2	103.0	101.0	- 2	100.0	- 1
108	22		104.0	102.0	- 2	100.0	- 2
106	23		106.0	108.0	+ 2	102.0	- 6
109	24		96.0	115.0	+19	110.0	- 5
101	25		104.0	111.0	+ 7	109.0	- 2
	$\bar{x}$		102.6	107.4	+ 4.8	104.2	- 3.2
101	26			104.0		104.0	0
101	27			112.0		101.0	-11
108	28			103.0		105.0	+ 2
106	29			106.0		106.0	0
100	30			119.0		100.0	-19
	$\bar{x}$			108.8		103.2	- 5.6

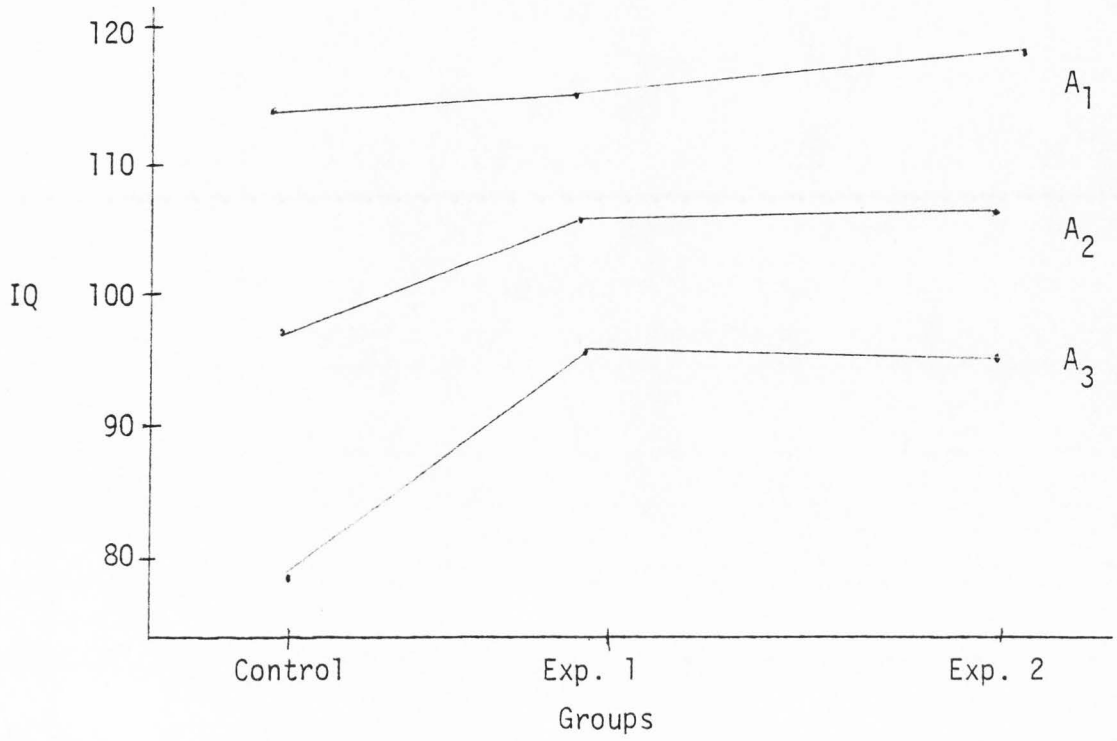
	Type of Administration of the Test		
	C_1	C_2	C_3
B_1 = Control	Standardized	Standardized	Standardized
B_2 = Exp. 1	Standardized	Reinforced	Standardized
B_3 = Exp. 2		Reinforced	Standardized

Table 14

Individual and Mean IQ and Gain Scores for Low IQ Subjects

Slosson	Subject #		C_1	C_2	Gain	C_3	Gain
79	31	B_1	81.0	84.0	+ 3	87.0	+ 3
88	32		71.0	75.0	+ 4	76.0	+ 1
89	33		73.0	69.0	- 4	80.0	+11
87	34		83.0	75.0	- 8	78.0	+ 3
89	35		89.0	80.0	- 9	87.0	+ 7
	$\bar{x}$		79.4	76.6	- 2.8	81.6	+ 5
85	36		87.0	100.0	+13	99.0	- 1
75	37		87.0	93.0	+ 6	89.0	- 4
89	38		75.0	100.0	+25	107.0	+ 7
88	39		78.0	104.0	+26	100.0	- 4
89	40		59.0	90.0	+31	92.0	+ 2
	$\bar{x}$		77.2	97.4	+20.2	97.4	0
75	41			85.0		89.0	+ 3
78	42			91.0		88.0	- 3
82	43			95.0		94.0	- 1
79	44			94.0		90.0	- 4
85	45			102.0		100.0	- 2
	$\bar{x}$			93.4		92.2	- 1.2

	Type of Administration of the Test		
	C_1	C_2	C_3
B_1 = Control	Standardized	Standardized	Standardized
B_2 = Exp. 1	Standardized	Reinforced	Standardized
B_3 = Exp. 2		Reinforced	Standardized



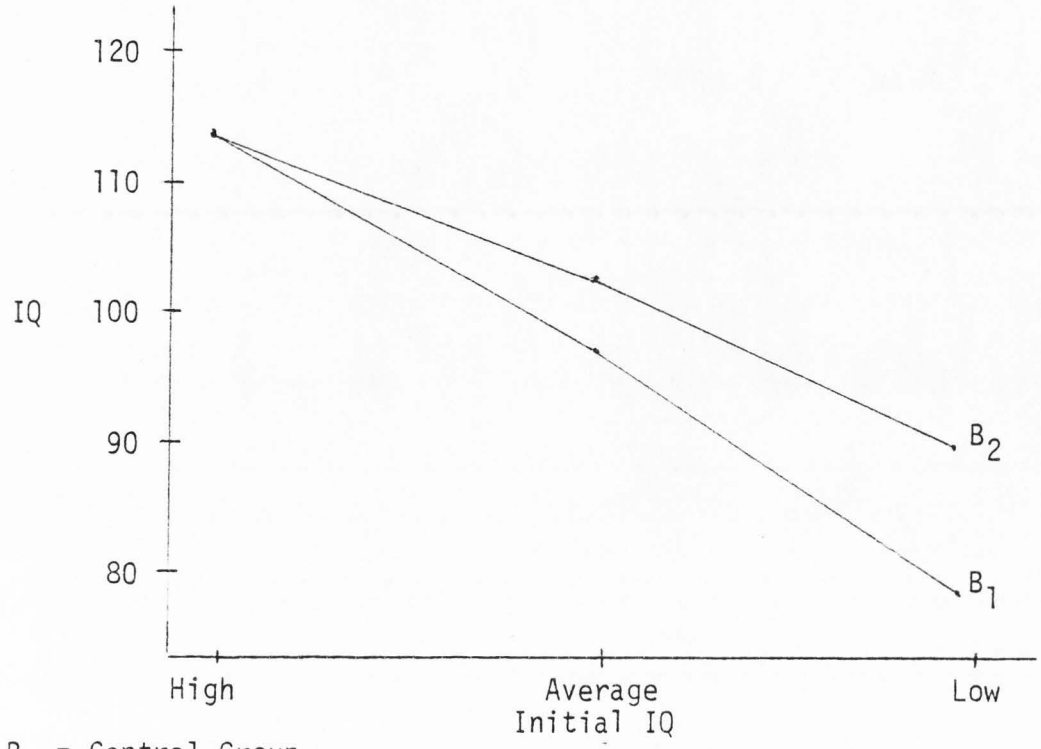
A_1 = Initially high IQ

A_2 = Initially average IQ

A_3 = Initially low IQ

3 x 3 x 2 = 3 levels of IQ x 3 groups x 2 administrations of the PPVT

Figure 4. 3 x 3 x 2 Split-Plot ANOVA Group x IQ Interaction.

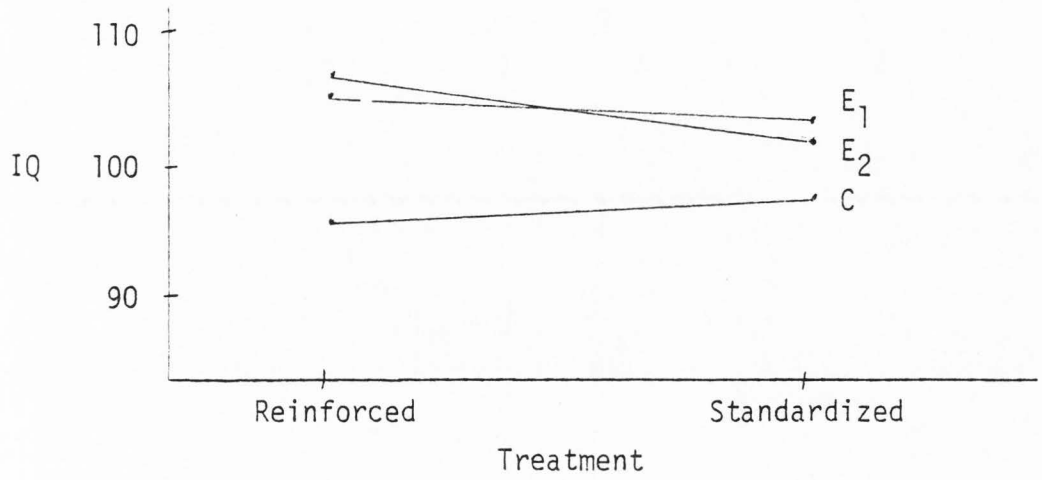


B_1 = Control Group

B_2 = Experimental Group

3 x 2 x 3 = 3 levels of IQ x 2 groups x 3 administrations of the PPVT

Figure 5. 3 x 2 x 3 Split-Plot ANOVA Group x IQ Interaction.



C = Control Group

E_1= Experimental Group 1

E_2= Experimental Group 2

3 x 3 x 2 = 3 levels of IQ x 3 groups x 2 administrations of the PPVT

Figure 6. 3 x 3 x 2 Split-Plot ANOVA Group x IQ Interaction.

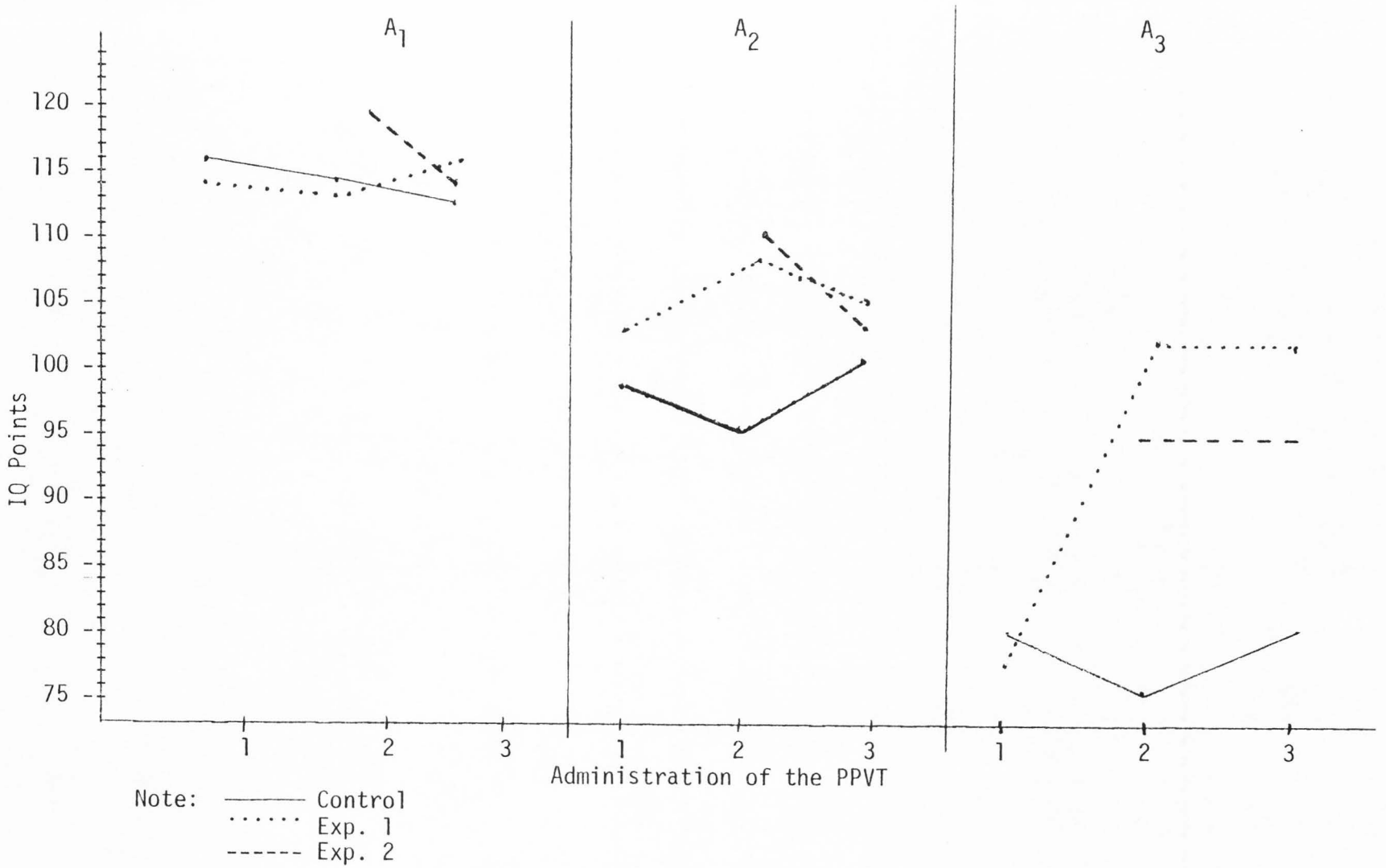


Figure 7. Change in mean scores from first to second to third administration of the PPVT.

Instructions Given by the Examiners Before the Reinforced Administration of the PPVT

Today I am going to give you the same test that you took the last time we played games. This time, every time you give me the right answer I will give you one of these chips. When we are finished with this game, we can take your chips to the prize room and buy anything there that you want. The more chips you get when we play the game, the more little prizes you can buy. Try really, really hard and you can get lots of little toys.

Are you ready? Let's start.

For the no pretest experimental groups, the instructions will read:

Today I am going to play a game with you, and I am going to ask you some questions about pictures I show you. Every time you give me the right answer . . .

PARENTAL CONSENT FORM

Authorization is given to Head Start/Home Start to screen my child, _____, for academic assessment. In addition, data from testing will be used to individualize the educational program for my child, as well as determine the effects of different evaluation procedures on assessment results. (The different procedures will involve reinforcing vs. not reinforcing a child's correct responses on an intelligence test.) Permission is given to Richard Weiss to scientifically report group information. I realize that individual results will remain confidential.

I understand the above explanation of the assessment and use of the information, and agree to allow my child to participate fully as long as all individual results remain confidential and are not given to anyone without permission. I understand that I can withdraw my child from the evaluation study at any time. I also understand that the results of the assessment will be available to me two weeks after the completion of the assessment, and that my child's teacher, as well as Richard, will be happy to discuss the results with me at that time.

_____ _____

Parent/Guardian Teacher

_____

Richard Weiss, Handicap Coordinator

VITA

PERSONAL DATA

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Birth Date:	July 12, 1947
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Interests:	Psychology Research Teaching and Education Sports: softball, tennis, skiing, scuba diving, fishing, swimming Reading, Bridge Photography

EDUCATION:

PhD. Completed June, 1980.
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Major: Child Psychology
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M.A. 1973 Experimental Psychology. Emphasis on Behavior Modification.
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Major: Experimental Psychology
Minor: Behavior Modification

B.S. 1970 McGill University, Montreal, Quebec, Canada

Major: Psychology
Minor: Statistics

PROFESSIONAL EXPERIENCE:

1979-1980 Staff Psychologist
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1977-1978 Curriculum Developer
Severe/Profound Project
Exceptional Child Center
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1976-1977 Coordinator of Monitoring Systems Project
Exceptional Child Center
Utah State University
Logan, Utah 84322

1976-1977 Research Assistant, MAPPS Project
(Multi-Agency Project for Pre-schoolers)
Exceptional Child Center
Utah State University
Logan, Utah 84322

1976 Psychological Consultant
Head Start/Home Start
Millville, Utah 84326

1974 Psychometrist
Psychology Department
Utah State University,
Logan, Utah 84322

1971 Laboratory Technician
Kalamazoo State Hospital
Western Michigan University
Kalamazoo, Michigan 49001

1970 Private Consultant
Worked teaching self-help skills to autistic children
Montreal, Quebec, Canada

1970 Token Economy
Worked on this ward at the Verdun Institution
Montreal, Quebec, Canada

1968 Teacher's Aide - children ages 4-12
Verdun Institution
Montreal, Quebec, Canada

RELATED EXPERIENCE

1976 Volunteer in a classroom for mentally retarded children
Supervised recreational bowling for severely retarded children, ages 10-15.
Exceptional Child Center
Utah State University
Logan, Utah 84322

1972-1973 Supervised transportation and recreational activities at weekend camp for retarded children
Exceptional Child Center
Utah State University
Logan, Utah 84322

1973-1974 Teacher's Aide
Special Education Classroom
Exceptional Child Center
Utah State University
Logan, Utah 84322

1973-1974 Taught self-help skills to a 16-year-old CP child
Exceptional Child Center
Utah State University
Logan, Utah 84322

1973-1974 Special Olympics in Logan and Salt Lake City
Supervised in training retarded children from Benson Sheltered Workshop and the Exceptional Child Center
Exceptional Child Center
Utah State University
Logan, Utah 84322

1973 Psychometrist utilizing the PIAT, VMI, PTPA, DRS.
Exceptional Child Center
Utah State University
Logan, Utah 84322

1972 Research in Psychology Animal Laboratory
Psychology Department
Utah State University
Logan, Utah 84322

1971 Behavior Modifier, state institution with patients ages 19-60.
Kalamazoo State Hospital
Western Michigan University
Kalamazoo, Michigan 49001

GENERAL SUMMARY

BS Psychology, MA Experimental Psychology, PhD Developmental Child Psychology, completion by July 1980, eight years experience using BEHAVIOR MODIFICATION techniques in the modification of children and adult behavior. Experienced in PSYCHOLOGICAL ASSESSMENT, EVALUATION, AND REMEDIATION. Coordinate services to handicapped children, counseling skills, PROGRAM DEVELOPMENT, Teaching Experience, RESEARCH. Supervision of staff in behavioral intervention strategies, CURRICULUM DEVELOPMENT for the exceptional Child.

PROFESSIONAL EXPERIENCE

January 1978 to Present: Alberta Children's Hospital
Calgary, Alberta, Canada

Staff Psychologist. Preschool Multihandicapped Program. Responsible for providing services to 40 preschool multihandicapped children ages 2-6 years of age (including CP children, visually impaired children, developmentally delayed children, MR children, as well as children with various genetic disorders) and the families of these children. Interdisciplinary team approach with Speech Therapists, Special Educators, Occupational Therapists, Physiotherapists, Child Care Workers, Social Workers, and Teachers. Major activities center on PSYCHOLOGICAL ASSESSMENT, EVALUATION, and REMEDIATION: PROGRAM DEVELOPMENT, BEHAVIORAL INTERVENTION, and DIAGNOSIS of preschool children; COUNSELING of parents of handicapped children, and PARENT EDUCATION TRAINING. Activities include Special Education, staffings, teaching Behavior Modification skills to staff and parents, counseling, and referral services.

March 1976 to December 1980: Northern Utah Head Start
Millville, Utah

Handicapped Coordiator, Staff Psychologist. Head Start (6-77 - Present) Responsible for providing services to a rural, two-county program serving over 100 children (including Downs children, visually impaired children, developmentally delayed children, achondroplastic dwarf, speech impaired children) and families. Directed interdisciplinary team coordinating activities of Speech Therapists (Department of Speech and Hearing, USU), Special Educator, Mental Health Coordinator, and Teachers. Major activities center on PSYCHOLOGICAL ASSESSMENT, EVALUATION, and REMEDIATION: PROGRAM DEVELOPMENT, BEHAVIORAL INTERVENTION, and DIAGNOSIS of preschool children. Activities include Special Education, staffings, Teaching Behavior Modification skills, and the etiology of handicapping conditions to staff, Parent

Education Training, and referral services. Developed Handicapped Grant for FY 77-78 and 78-79, as well as Early Start grant. Developed and Administered the budget as well as consultation in hiring and firing appropriate staff members. SUPERVISION of three clinical/counseling practicum students, two Family-Educator trainees, and Day Care Supervisors over day care activities. STAFF TRAINING, Arranging parent and staff workshops.

Special Educator, Staff Psychologist, Head Start (3/76 - 5/77) Administration of and responsible for delivery of handicapped services to preschool homebound children, parent training, BEHAVIORAL INTERVENTION (utilizing reinforcement and behavioral contracting for behavior problems, enuresis, etc.) in the classroom and home, training Family Home Educators in behavioral technology to more effectively work with the handicapped child and family, PSYCHOLOGICAL ASSESSMENT, EVALUATION, and REMEDIATION, referral services.

January 1976 to January 1978: Utah State University
Logan, Utah

Coordinator of Monitoring Systems Project, USU, Exceptional Child Center (1/76 - 1/78) Responsible for PROGRAM DEVELOPMENT in the areas of language, motor, social, self-help, homeliving, and pre-academic tasks for 60 children, (CP, EMR, TMR, DD, severely and profoundly retarded) at the Exceptional Child Center (ECC); an institution which serves as a training center for special education students (UAF) and at the same time serves children who could not be served elsewhere in the Utah, Idaho, Nevada areas. REVISE CURRICULUM to better serve these children, REVIEW NEW CURRICULUM on the market. TASK ANALYSIS of the curriculum to serve severely and profoundly retarded individuals. Coordination of MULTIDISCIPLINARY TEAM APPROACH with a speech therapist, physical therapist, occupational therapist, dance therapist, teachers, and special educators.

June 1975 to December 1975: Utah State University
Logan, Utah

Research Assistant, USU, Exceptional Child Center (6/75 - 12/75 Responsible for DATA ANALYSIS for the MAPPS Project (Multi-Agency Project for Pre-Schoolers, serving homebound children in the areas of expressive and receptive language, motor development, social-emotional development, and self-help skills) Training parents how to effectively work with the children. Coordinated activities with the MAPPS director and ASSESSED PROJECT EFFECTIVENESS by analyzing the available data, making home visits, and ASSESSMENT via behavioral observation in the home.

February 1974 to June 1974: Utah State University
Logan, Utah

Psychological Assessment and Evaluation, USU, Department of Psychology, (2/74 - 6/74) Supervised and led a team of Psychological Examiners and Evaluators in Utah and Idaho. Pre- and posttesting done with K through grade 4 children to determine the effectiveness of modules (money skills, measurement skills, volume skills) developed at Utah State University.

September 1973 to June 1974: Utah State University
Logan, Utah

Practicum Experience, USU, Exceptional Child Center (9/73 - 6/74) Taught self-help skills to CP children. These skill- included eating and other activities involved with hand movement. Worked as preschool Special Education trainee in the areas of math and spelling with EMR, TMR, and severely and profoundly retarded individuals. Evaluated children utilizing the Peabody Picture Vocabulary Test (PPVT), the Peabody Individual Achievement Test (PIAT), the Visual Motor Integration Test (VMI), the Illinois Test for Psycholinguistic Abilities (ITPA), the Diagnostic Reading Scales (DRS), and the WISC, etc.

January 1971 to December 1971: Western Michigan University
Kalamazoo, Michigan

Laboratory Technician, WMU, Department of Psychology (1/71 - 12/71) Electromechanical Instrumentation for human and animal research, teaching LABORATORY INSTRUMENTATION. Also served as TEACHER of academic and self-help skills to institutionalized patients in Kalamazoo State Hospital.

January 1970 to May 1970: Verdun Institution
Montreal, Quebec, Canada

Behavior Modifier, Verdun Institution (1/70 - 5/70) COORDINATED and SUPERVISED activities of undergraduates from McGill University. Administration of Behavior Modification Programs on a Token Economy unit. Behavior Modification PROGRAMS SUPERVISED: supervised and revised Behavior Modification procedures and programs.

Private Consultant, Verdun Institution, (3/70 - 5/70) Taught self-help skills to autistic children (8-22 years old). Coordinated Behavioral Intervention Programs in the homes and private schools using a Research and Development model.

TESTING EXPERIENCE

WAIS, WISC, WISC-R, PPVT, Stanford-Binet, ITPA, PIAT, DRS, DIAL, VMI, Key Math, Boehm Concepts Test, ACLC, Portage Checklist, McCarthy Scales of Children's Abilities, Pre-School Motor Survey.

WORKSHOPS AND PROFESSIONAL MEETINGS ATTENDED

May 1972 RMPA, Albuquerque, New Mexico

July 1972 Utah Academy of Science, Provo, Utah

Oct. 1972 Participant in International Symposium on Behavior Modification. Presented at University of Minnesota, Minneapolis Minnesota

July 1972 Scientific Methods Workshop; Murray Sidman
Utah State University
Logan, Utah

June 1974 APA
Montreal, Quebec, Canada

Jan. 1977 Infant Intervention Workshop
San Juan Handicapped Infant Program
Presented by Mary Tutor

July 1977 Workshop by Barbara Bateman
The Exceptional Child

March 1978 Language Development Symposium
Provo, Utah

April 1978 Hamanistic Psychology Symposium
Las Vegas, Nevada

May 1978 Marc Gold Conference; Try Another Way
Denver, Colorado

July 1978 APA
Toronto, Ontario, Canada

Sept 1979 AAMDDM
San Francisco, Canada

June 1980 CPA
Calgary, Alberta, Canada

AWARDS

1971 Foreign Student Scholarship
Western Michigan University
Kalamazoo, Michigan 49001

1977 Research Assistantship
Utah State University
Logan, Utah 84322

1978 Graduate Assistantship
Utah State University
Logan, Utah 84322

PAPER PRESENTATIONS AND GRANTS

"Schedule-induced Polydipsia: The effects of the interfood interval and access to water as a reinforcer." Unpublished Master's Thesis, Western Michigan University, 1971. Dr. E. Wade Hitzing, Chairman.

"Schedule-induced Polydipsia: The effects of inter-food interval on access to warer on ascending FR ratios." Unpublished study, Western Michigan University, 1971.

"A behavioral demonstration of drug tachyphylaxis (acute tolerance)" Richard H. Weiss, D.M. McCarthy and D.L. Burns. Paper presented at the Utah Academy of Science, 1972.

"Schedule-induced Polydipsia as a function of inter-pellet interval." Dr. E. Wade Hitzing and Richard H. Weiss. Paper presented at the Rocky Mountain Psychological Association, 1972.

"Schedule-induced Polydipsic consumption of ethanol and water." Richard H. Weiss and Dennis L. Burns. NIMH grant presented to the Psychology Department, Utah State University, Logan, Utah, 1972.

"The effects of reinforcement on the IQ scores of preschool children as a function of initial IQ." Richard H. Weiss and Glendon Casto. Unpublished study, Utah State University, Logan, Utah, 1978.

"Head Start Handicapped Project." Richard H. Weiss.

"Responsible Parenthood - Early Start." Richard H. Weiss. Grant presented to Northern Utah Operation Head Start staff, 1977.

"Head Start Handicapped grant." Richard H. Weiss. HEW continuation grant for the 1978-79 fiscal year.

"Development of Individualized Classroom Curricula for the Severely and Moderately Handicapped." Sebastian Striefel, Michael J. Fimian, and Richard H. Weiss. Grant submitted to the Vice President for Research, Research University Council, Utah State University, 1977.

TEACHING PREPARATION

Behavior Modification
Research Methods and Design
Introductory Psychology
Developmental Psychology
Electromechanical Programming

REFERENCES

Glendon Casto, Ph.D.
Associate Director
Exceptional Child Center, UMC 68
Utah State University
Logan, Utah 84322

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Special Education Department
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Director, Northern Utah Head Start
67 South Main
Millville, Utah 84326

Larry Jarvis, M.A.
Mental Health Coordinator
Northern Utah Operation Head Start
67 South Main
Millville, Utah 84326

PROFESSIONAL AFFILIATION

CEC - Council for Exceptional Children

AAMD - American Association of Mental Deficiency

RMPA - Rocky Mountain Psychological Association

NAUI - National Association of Underwater Instructors

APA - American Psychological Association

March 1976 - December 1978
Head Start/Home Start Training Center: Regions 8 & 10

Handicapped Coordinator - Staff Psychologist: Responsible for the diagnosis of handicapped children; development of IEP's; special education delivery of services; staff training; parent training; behavioral programming at home and in the classroom; counseling parents of handicapped children; behavioral programs for the parents.

Assessment Procedures: Psychological test administration: McCarthy Scales of Children's Abilities, PPVT, Pre-School Motor Survey, Boehm, VMI, ACLC, Portage Checklist

Administrative Responsibilities: Staff meetings, coordinators meetings, teacher advisory sessions, teacher and teacher-aide training, staff development and training, consultation with program director over personnel management and relations decisions (problem solving, conflict resolution, facilitation of communication), and assist in budget decisions. Coordinator staffings and team administrative decisions. Coordinate diagnosis, health, IEP decisions, and behavioral programming.

Classes Presented to Head Start Staff and Parents:

1) Systematic Training for Effective Parenting. Dinkmeyer
2) Effective Approaches: A manual for teachers of handicapped preschoolers.

By Subject and Treatment Variables

Study	Age or Grade	Race	Sex of Subject	Initial IQ or Raw Score	Reinforcer	Type of Reinforcement	Test	Effect of Reinforcement
	Subject Variables					*Treatment Variables*		*Effect of Reinforcement*
Hurlock, 1924	3rd grade	Black/White	Males/Females	All groups contained	Praise	Delayed	Otis	Increase
	3rd grade	Black/White	Males/Females	subjects with IQ	Reproof	Delayed	Otis	Increase
	3rd grade	Black/White	Males/Females	scores < 90, between	None		Otis	
	5th & 8th grades	Black/White	Males/Females	90-110, and > 110.	Praise	Delayed	NIT	Increase
	5th & 8th grades	Black/White	Males/Females		Reproof	Delayed	NIT	Increase
	5th & 8th grades	Black/White	Males/Females		None		NIT	
Maller & Zubin, 1932	Not specified	Not specified	Not specified	129.0 (raw score)	Rivalry + Prizes	Delayed	NIT	None
	Not specified	Not specified	Not specified	128.7 (raw score)	None		NIT	
Benton, 1936	7th & 8th grades	Not specified	Males/Females	49.8 (raw score)	Rivalry, Prizes + Praise	Delayed	Otis	None
	7th & 8th grades	Not specified	Males/Females	50.0 (raw score)	None		Otis	
Klugman, 19-4	2nd & 7th grades	Black/White	Males/Females	No standard administration	Money	Not specified	1937 Binet	Not determined (see text)
	2nd & 7th grades	Black/White	Males/Females	No standard administration	Praise	Not specified	1937 Binet	Not determined (see text)
Tiber & Kennedy, 1964	2nd & 3rd grades	White	Not specified	Only one administration	Praise	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	Reproof	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	Candy	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	None		Binet L-M	
	2nd & 3rd grades	White	Not specified	Only one administration	Praise	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	Reproof	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	Candy	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	None		Binet L-M	
	2nd & 3rd grades	White	Not specified	Only one administration	Praise	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	Reproof	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	Candy	Delayed	Binet L-M	None
	2nd & 3rd grades	White	Not specified	Only one administration	None		Binet L-M	
Sweet & Ringness, 1971	1st & 6th grades	White	Males	80-120 (IQ)	Praise	Immediate	WISC Verbal Scale	None
	1st & 6th grades	White	Males	80-120 (IQ)	Money	Immediate	WISC Verbal Scale	None
	1st & 6th grades	White	Males	80-120 (IQ)	Name		WISC Verbal Scale	
	1st & 6th grades	White	Males	80-120 (IQ)	Praise	Immediate	WISC Verbal Scale	Increase
	1st & 6th grades	White	Males	80-120 (IQ)	Money	Immediate	WISC Verbal Scale	Increase
	1st & 6th grades	White	Males	80-120 (IQ)	Name		WISC Verbal Scale	
	1st & 6th grades	Black	Males	80-120 (IQ)	Praise	Immediate	WISC Verbal Scale	None
	1st & 6th grades	Black	Males	80-120 (IQ)	Money	Immediate	WISC Verbal Scale	None
	1st & 6th grades	Black	Males	80-120 (IQ)	Name		WISC Verbal Scale	
Ayllon & Kelly, 1972	Not specified	Not specified	Not specified	46.8 (IQ)	Tokens	Delayed	MRT	Increase
	4th grade	Not specified	Not specified	92.8 (IQ)	Tokens	Delayed	MRT	Increase
Edlund, 1972	5-7 years	Not specified	Males/Females	82 (IQ)	Candy	Immediate	Binet L-M	Increase
	5-7 years	Not specified	Males/Females	82 (IQ)	None		Binet L-M	
Rasmussen, 1973	9.8 years	Not specified	Males/Females	95-105 (IQ)	Praise	Immediate	WISC	Increase
	10.8 years	Not specified	Males/Females	70-79 (IQ)	Praise	Immediate	WISC	Increase
Smeets & Striefel 1975	13.8 years	Not specified	Not specified	23.7 (raw score)	Tokens	Immediate	Ravens	Increase
	14.4 years	Not specified	Not specified	23.7 (raw score)	Tokens	Delayed	Ravens	None
	14.5 years	Not specified	Not specified	23.6 (raw score)	Tokens	Noncontingent	Ravens	None
	14.5 years	Not specified	Not specified	23.6 (raw score)	None			
Clingman & Fowler, 1975	1st & 2nd grades	White	Not specified	111 (IQ)	Candy	Immediate	Binet L-M	None
	1st & 2nd grades	White	Not specified	113 (IQ)	Candy	Noncontingent	Binet L-M	None
	1st & 2nd grades	White	Not specified	115 (IQ)	None		Binet L-M	
Clingman & Fowler, 1976	1st & 2nd grades	White	Not specified	117.2 (IQ)	Candy	Immediate	PPVT A + B	None
	1st & 2nd grades	White	Not specified	118.5 (IQ)	Candy	Noncontingent	PPVT A + B	None
	1st & 2nd grades	White	Not specified	119.9 (IQ)	None		PPVT A + B	
	1st & 2nd grades	White	Not specified	102.6 (IQ)	Candy	Immediate	PPVT A + B	None
	1st & 2nd grades	White	Not specified	97.5 (IQ)	Candy	Noncontingent	PPVT A + B	None
	1st & 2nd grades	White	Not specified	101.5 (IQ)	None		PPVT A + B	
	1st & 2nd grades	White	Not specified	81.8 (IQ)	Candy	Immediate	PPVT A + B	Increase
	1st & 2nd grades	White	Not specified	77.8 (IQ)	Candy	Noncontingent	PPVT A + B	None
	1st & 2nd grades	White	Not specified	78.1 (IQ)	None		PPVT A + B	
Clingman & Fowler, 1977	1st & 2nd grades	White	Not specified	High ability	Candy	Immediate	PPVT Split Half	None
	1st & 2nd grades	White	Not specified	High ability	Candy	Noncontingent	PPVT Split Half	None
	1st & 2nd grades	White	Not specified	High ability	None		PPVT Split Half	
	1st & 2nd grades	White	Not specified	Low ability	Candy	Immediate	PPVT Split Half	Increase
	1st & 2nd grades	White	Not specified	Low ability	Candy	Noncontingent	PPVT Split Half	None
	1st & 2nd grades	White	Not specified	Low ability	None		PPVT Split Half	
Baer, 1978	1st & 2nd grades	White	Males/Females	106.2 (IQ)	Tokens	Immediate	WISC	Increase
	1st & 2nd grades	White	Males/Females	111.9 (IQ)	Tokens	Immediate	PPVT	None
Weiss, 1978	Preschool child	White	Males/Females	110-130 (IQ)	Tokens	Immediate	PPVT A + B	None
	Preschool child	White	Males/Females	90-109 (IQ)	Tokens	Immediate	PPVT A + B	None
	Preschool child	White	Males/Females	79-89 (IQ)	Tokens	Immediate	PPVT A + B	Increase
Weiss, 1980	Preschool child	White	Males/Females	110-130 (IQ)	Tokens	Immediate	PPVT A + B	None
	Preschool child	White	Males/Females	110-130 (IQ)			PPVT A + B	
	Preschool child	White	Males/Females	90-109 (IQ)	Tokens	Immediate	PPVT A + B	None
	Preschool child	White	Males/Females	90-109 (IQ)			PPVT A + B	
	Preschool child	White	Males/Females	79-89 (IQ)	Tokens	Immediate	PPVT A + B	Increase
	Preschool child	White	Males/Females	79-89 (IQ)			PPVT A + B	

Workshops Provided

1) Enuresis: Incidence and Methods of Control
2) Effective Parenting
3) Child Behavior Management
4) Emotional Health
5) Answering Your Child's Questions Honestly
6) Mental Health: Primary Prevention, Emotional Health, Suggestions for Parents of Handicapped Children
7) Personnel and Employee Relations - Two-day retreat--agenda setting, relationship building, owning responsibility, communication, listening skills, problem solving, team cooperation

PROGRAM AND CURRICULUM DEVELOPMENT

Individualizing Teaching to the Child
Training teachers and implementing the following curriculum aids:
Developing Understanding of Self and Others (DUSO)
Peabody Language Development Kit
My Friends and Me

WORKSHOPS ATTENDED

Child Abuse: Incidence, Treatment and the Family
Honesty and Consistency with Children
Handicapping Conditions: Etiology, Treatment and Prevention

TREATMENT MODALITIES AND INTERVENTION METHODS EMPLOYED

Behavior Modification
Small Groups Teaching Concepts, Social-Emotional Relationships, Motor Skills, Small Group Process
Classroom Management, reinforcement procedures
Behavioral Intervention in Teaching and Training

TREATMENT POPULATION DESCRIPTION (Parents, siblings and staff members)

All family members eligible, low socio-economic group, handicapped children, emotionally disturbed children, children presenting academic, learning, and behavioral deficits, excessively aggressive or withdrawn children, hyperactive children, achondroplastic dwarf.

STAFFINGS

Consultation weekly with teachers or individual children; identification of children having problems in the classroom setting; reinforcement of teacher's Behavior-Modification procedures; encouraging techniques and parental consultation.