

AN INDEX FOR MEASURING SOCIAL DEPRIVATION IN
INSTITUTIONALIZED MENTAL RETARDATE

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1952

Submitted to the faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the degree of
DOCTOR OF PHILOSOPHY
July, 1968

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INSTITUTIONALIZED MENTAL RETARDATES

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ACKNOWLEDGMENTS

I would like to express my appreciation to all the members of my committee, Dr. L. Brown, Dr. H. Brobst, Dr. E. Starkweather and Dr. C. Morgans. I would also like to thank Dr. Julia McHale for her very kind assistance to me throughout my career at Oklahoma State University.

My deepest thanks go to Dr. Larry Brown who assisted me so greatly in the writing of the dissertation.

Mrs. Kay Nettleton, who typed the dissertation, was a very important help to me.

Finally, I want to thank my wife, Jane, for her constant concern and support during the entire work and, especially, for her sacrifices in the care of our three children during my necessary absences in the completion of this study.

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CHAPTER I

INTRODUCTION

The Problem and Purpose of the Study

Appropriate treatment approaches to the habilitation of mentally retarded individuals have been curtailed, in the past, by the exposition that such individuals are rigid. By "rigid" Lewin (1936) and others indicated that the retarded individual does not possess "the capacity for a dynamic rearrangement of psychical systems" that the normal child of the same mental age has.

Assuming, therefore, that mentally retarded persons were relatively homogeneous with respect to personality structure, authorities in the field of mental retardation decided to set up large communities where retarded persons would be competing only with others of their peer group. The type of approach in the classroom and the appropriateness of psychotherapy for such individuals were dominated by this approach to the underlying personality structure.

A series of researches on the personality structure of the retardate was instituted by Zigler in 1958. He attempted to determine if differences in performance on a simple task would reflect some differences in the personality structure of mentally retarded children. Such differences might be attributable, at least in part, to the amount of social interaction the individual had received from adults in his environment. It had been noted that both institutionalized normal individuals and

institutionalized mentally retarded subjects exhibited a greater desire to interact with significant adults than do non-institutionalized individuals (Sarason, 1953). It thus appeared that social deprivation could be specified as a drive state in the same manner as degree of thirst, hours of hunger, etc. Such a drive could receive some satisfaction by the individual getting social reinforcement from significant adults.

Since drive theory would predict that performance in a simple learning situation would be facilitated by a high degree of drive, one test of Zigler's hypothesis would be to pick out retarded persons who could be said to have had relatively little social reinforcement during their lives (i.e., having a high degree of social deprivation).

Zigler (1958) started out by using students at the Austin State School--a publically supported institution for mentally retarded persons. He and another psychologist rated certain of the students on the amount of social deprivation they had experienced prior to placement in this facility. They used a holistic approach with the pre-institutional histories, which were rated as either very deprived or mildly deprived. Although only subjective judgments were used, the raters noted the factors that enabled them to rate the subject into one or the other group. These factors, however, were not quantified in assigning the ratings. Rather they were to become a universe of specific events which could be useful in the formation of a scale of social deprivation.

Finally, there were 60 mentally retarded children who were matched on MA, CA, and length of institutionalization, and divided into two groups--those who were highly socially deprived and those with a low amount of social deprivation. All of the subjects were then given a task in which they placed marbles in a board. It was possible to place

one hundred marbles. Without any overt reinforcement, Zigler was able to show that those subjects who were considered the more socially deprived placed more marbles than did those who were considered to be not so socially deprived (Zigler, 1958).

Berkowitz and Zigler (1965) have done a study in which second graders of normal ability were subjected to conditions which were considered to be of a positive nature and to conditions which were of a negative nature. If the subject received a warm, friendly interaction with an adult there was a heightened gradient of responsiveness to social situations for a week after the interaction; however, if the positive social interaction was followed by an interaction with another adult who was "cold" but not hostile, the effectiveness of the first interaction decreased considerably after the second interaction. However, both exposure conditions were of more significance than no contact at all with the experimenters.

In another study testing the value of the hypothesis that the drive for social reinforcement may well be a factor in the learning ability of the mentally retarded, Zigler and Butterfield (1965) have shown that the differences in the degree of social deprivation may be assessed as a function of the prevailing social climate at different institutions for the retarded. Thus, patients at Institution A, where every opportunity is taken to provide a homelike environment, do not play as long at the Marble-in-a-Hole game as do patients from Institution B, where the patients are segregated with respect to sex and where all the buildings are locked. Presumably, patients from this second institution have the greater amount of social deprivation.

Greater universality of the concept of social deprivation was

gained in a study which demonstrated that both normal and mentally retarded children who had been in an institution showed a greater drive for social reinforcement than comparable children who had not been placed in an institution (Stevenson and Fahel, 1961). This difference between institutionalized and noninstitutionalized mentally retarded children was shown by Green and Zigler (1962). In the latter study normal and noninstitutionalized mentally retarded children were found to be more alike in their response to social reinforcement than a group of institutionalized mental retardates.

These studies have indicated that the degree to which an individual has been receiving social reinforcement can be measured by the child's response to social reinforcement. However, the use of the term social reinforcement or social deprivation (which is to be considered the motivational state requiring social reinforcement for its satisfaction) has questionable value in generating future research. For one thing, further attempts to produce a scale for the measurement of social deprivation using such measures as the criminal history of the parents, proportion of preinstitutional life spent with the parents, etc., have not been more successful than a subjective judgment using a holistic approach (Zigler et al., 1966). Other researchers have failed to show that all institutionalized mentally retarded individuals increase their performance in response to mere interaction with the experimenter (Stevenson and Kass, 1961; Stevenson and Knights, 1961).

Sufficient evidence has been generated, however, to show that in some situations there is a difference in the performance of noninstitutionalized and institutionalized retardates which can be related to their previous social history. One question that should be raised is

whether any other source of drive--which would also produce different levels of performance in subjects differing in the degree of drive they possessed--would account for the findings that Zigler has attributed to social deprivation.

One such construct would be that of anxiety. In theoretical expositions on anxiety, Spence and Spence (1966) pointed out that anxiety, as measured by the Taylor Manifest Scale, refers to an emotionally based drive which differs significantly in persons scoring high and low on the Taylor scale. Such a drive (D) multiplies the learning component (H) in a new learning situation. If the response to be evoked is high in the possible hierarchy of responses available to the organism at the time of learning, the person with the high D will learn more rapidly than will one with a low score on the anxiety scale (Low D).

On the other hand, in complex learning tasks with competitive responses more dominant than the correct response, the high-D subject will have more difficulty learning the task than will a person with low D. Experimental verification of these predictions is ample and can be found in Spence and Spence (1966) and Spence (1958).

In the experimental work on social deprivation the responses the subjects were called upon to make were very simple--responses dominant in the response hierarchy. In fact, those data which have indicated that institutionalized mentally retarded children are more variable in their learning of a simple task than are normal children (Ellis, Pryer et al., 1960) might better be accounted for by using anxiety as the explanatory vehicle. However, such a test was not administered, so there is no way of assessing this possibility.

Studies have shown, however, that institutionalized mentally

retarded are significantly more anxious than are non-institutionalized retarded children or normal children of the same MA (Carrier, Orton, and Malpass, 1962; Cochran and Clelland, 1963; Silverstein et al., 1964). What is needed, then, is a study in which the discrimination is made as to whether anxiety or social deprivation (or both) is responsible for the behavior demonstrated by institutionalized mentally retarded children.

If it can be demonstrated that social deprivation exists apart from anxiety, then it should be possible to measure it--not in terms of the physiological model using deprivation to develop parameters--but in terms of mathematical relationships. Spence and Spence noted that only the latter approach is appropriate if the findings are to be referred to the Hull-Spence model. The most noteworthy approach is the assessment of a presumed psychological state has been the Taylor-Manifest Anxiety Scale.

After Taylor had constructed a questionnaire which she presumed to have construct validity, she tested its predictive validity against predictions derived from the Hull-Spence model. She and other investigators have shown that persons who score high on the Taylor scale will tend to learn a simple task faster than persons who score low on the same scale. High scorers will also condition more rapidly than do low scorers. Conversely, high scorers, as predicted, will learn a complex task more slowly than do those persons who score low on the anxiety scale. (Spence and Spence, 1966).

In a similar manner, it should be possible to assess any scale which presumably measures social deprivation. First, it should possess some construct validity, and secondly, it should be testible via

specific predictions generated by the underlying theoretical structure. Relative to a scale of social deprivation, those who score highest on the scale would presumably have the greatest amount of social deprivation; therefore, their drive for social reinforcement should be greater than those who score low on the scale. In simple learning or performance situations, then, they should perform in a superior manner to those who score low on a scale of social deprivation. Conversely, on complex tasks, the persons who score low on the scale of social deprivation should perform in a superior manner relative to that of persons who score high on the scale.

To develop such a scale, this researcher turned to two well standardized tests of intelligence which have been used on mentally retarded persons. These were the Peabody Picture Vocabulary Test and the Stanford Binet Intelligence Scale, Form L-M. Though both are primarily verbal scales of intelligence, the former has the subject point to concrete pictures to define a vocabulary stimulus item; whereas the latter, on its vocabulary items, makes the subject recall the definition. In administering these two tests to numerous mentally retarded individuals, this researcher was struck with the disparity in the performance on these two tests by some of the retarded individuals.

A search of the literature to determine if studies using a comparison of vocabulary tests had been reported found that no one had gone further than to compute inter-test reliability between the mental age scores on the two tests.

There has been considerable evidence in the literature that there has been a need for research which would give a quantitative measure of verbal behavior as well as a qualitative score. As early as 1912,

Terman pointed out the need for this on the vocabulary definitions to the Stanford-Binet (Terman, 1912). Feifel and Lorge (1950) found that that young children tend to give descriptions and use definitions (a ball is a thing you play with) to vocabulary stimulus items, while older children use more of the synonym-type definitions. Other investigators (Kruglov, 1953; McNemar, 1942) have found the same results in their investigations. This evidence indicates that the child's vocabulary not only grows but becomes more abstract as a consequence of his experiences in his social environment.

The current investigation makes the assumption that the amount of social reinforcement can be assessed by means of a comparison of two types of verbal tests--one of which is "recall" in nature, the other "recognition" (see below). In addition to the evidence given by the investigators alluded to previously, there has been further evidence of the applicability of this assumption in the works of Jenkins et al. (1967). In this study, children showed a differential ability to learn words presented serially and pictures of objects represented by words. The latter were the more easily learned.

There have been some attempts to qualitatively assess verbal responses as diagnostic of mental disorders. Thus, Moran et al. (1960) noted that the ability of schizophrenics to define words decreased after a six year period of hospitalization. He attributed this decline to aging rather than to any personality disorder. Hallenbeck et al. (1960) found that internal scatter within the vocabulary items on the WAIS differentiated among normal, psychiatric, brain-injured and traumatically-injured patients. His index of intellectual inefficiency was composed by determining how many of the more difficult words were passed

after an easier word was missed. Fink and Shontz (1958) showed that the meanings of words differ in the completeness with which they are grasped by normal persons. In their study, they found that certain words used in Wechsler's standardization group were consistently given half-credit scores, while others had a high incidence of two-point scores (full credit). Jenkins sums up the lack of information about differences in the learning ability of individuals when he stated,

We know a lot about what I would call 'process laws' but very little about 'subject laws'. . . It may well be that different verbal learning tasks (learning prose, serial learning, etc.) draw on different abilities or utilize some sets or sets of abilities with different weights. (1961, p. 148)

Evidence that the vocabulary scores on the Stanford-Binet may be higher than the total mental age score due to socio-economic or cultural differences (Levinson, 1958) suggests that a qualitative approach to intelligence test scores may turn up significant information about the individual taking the test.

Statement of Experimental Problems

Tying a history of previous behavior to current motivational status would be of significance in the diagnosis of a mentally retarded child's learning potential and it would assist in the institutional planning for such an individual. Most notably it could assist in the determination of which children could be grouped together, so that those with the greatest needs for social reinforcement (i.e., are the most socially deprived) could have a higher staff/patient ratio. This would enable staff members to provide reinforcement with the greatest degree of temporal contiguity. The problem that this researcher faced was to determine how these practical advantages might be effected.

Statement of Hypotheses

The focus of this investigation, then, was to determine if (a) social deprivation can be measured by means of a comparison of scores on two types of vocabulary tests, and (b) if the construct, Social Deprivation, can be demonstrated to be independent of the construct of Anxiety. To provide these determinations, the following hypotheses were made:

- (1) It is assumed that the same variables that affected the Index score will affect the retardate's performance on the experimental tasks. A high score on the Index would indicate a relatively greater ability to recognize verbal concepts which have been illustrated by means of pictures than the ability to recall the abstract definition of those words. Such a person would be presumed to have a relatively higher level of social deprivation (here social deprivation means that the person has not been reinforced as frequently as most of the persons growing up in our society. Social reinforcement accrues to those persons who can recognize and express their interest in elements of their environment).

The person with a high level of social deprivation presumably has a higher level of drive than does a person with a low level of social deprivation and should do relatively better on simple experimental tasks where the dominant habit strength is high in the hierarchy of habits. On complex tasks, where interfering behavioral patterns may be relatively higher than the one called

for in the task, the persons with the high drive should do more poorly at the beginning of the task but show relatively better gains in their performance as they have more trials at the task. Since persons scoring high on the Index are presumed to have a high level of drive, they should do better on simple tasks than do those persons who score low on the Index. On complex tasks, high scorers on the Index should do more poorly at the beginning of the trials than do those who score low on the Index, but the former group should show greater improvement over trials.

- (2) By a comparison of two types of standardized verbal intelligence scale, a device measuring the amount of social reinforcement the retardate has received can be formulated. Since one of these scales uses "recognition" vocabulary to arrive at mental age scores, and the other uses "recall" vocabulary to do the same job, possibly differences in mental ages on the two types of tests will obtain in some consistent fashion. A person with a much higher mental age on a "recognition" test than on a "recall" test will presumably reflect relatively high social deprivation (i.e., have had relatively little social reinforcement). A person whose mental-age scores on both types of test fall close to each other presumably has had a considerable amount of social reinforcement--and has had little social deprivation.
- (3) In a similar manner, the length of institutionalization

will influence the level of drive. Those who have been institutionalized the longest would presumably have the greatest amount of social deprivation (i.e., have received the least amount of social reinforcement). The predictions suggested above should also apply to this environmental factor.

CHAPTER II

REVIEW OF THE LITERATURE

Impetus to the study of the personality structure of the mentally retarded was given by the theoretical work and the researches of Lewin and Kounin. Although they characterized the retarded person as "rigid"--by which they meant that the boundaries within the "Life Space" were relatively less permeable than those of the normal person--they did derive predictions from it which could be tested experimentally. They showed that it took longer to satiate a mentally retarded subject on a simple task, and it was more difficult to make the retarded child turn his attention from one task to another (Lewin, 1936; Kounin, 1941,a; Kounin, 1941,b).

On the theoretical level, one prediction derived from the Lewin-Kounin position was that mentally retarded children should not be able to learn a discrimination reversal problem as well as could normal children of the same mental age. In a test of this hypothesis, Plenderleith (1956) found no significant differences between normal children and retarded children of the same mental age in the learning of a response which is now correct but which has been incorrect in a previous learning situation. Stevenson and Zigler (1957) supported these findings when they found no differences in the relative incidence of perseverative responses among three groups matched for mental age: normals, older retardates, and younger retarded children.

In order to explain the contradictory findings of Kounin and of Plenderleith, Zigler (1958) advanced a motivational hypothesis. He noted that in Kounin's tasks the response is made primarily on the basis of instructions; while in both the Plenderleith study and that by Stevenson and Zigler, there was some interaction with the experimenter. Therefore differences between normal subjects and retarded ones may have been due to differences in the subject's motivation to comply with the experimenter's wishes.

Zigler (1958, 1962) suggested that a construct, social deprivation, could explain the consequences of the experimental evidence if the motivational hypothesis were advanced. Although this construct had found use in earlier writings about normal children who had received inadequate mothering and were characterized by very immature behavior, severe learning deficits, and pronounced tendencies to withdraw from human contact (Bowlby, 1951; Goldfarb, 1943, 1945; Spitz, 1946), Zigler felt it could reflect the fact that institutionalized mentally retarded children tend to have been relatively deprived of adult contact and approval and hence have a higher motivation to procure such contact and approval than do normal children.

In his doctoral study, Zigler (1958) demonstrated that those institutionalized mentally retarded children considered the most deprived of social reinforcement would work longer for the continued presence of the examiner than would the less deprived. He continued to assess the value of the construct of social deprivation in subsequent studies.

Shallenberger and Zigler (1961) found that institutionalized mentally retarded children would perform longer than would normal children of the same mental age. The retardates also performed longer

for positive verbal reinforcement than did the normal subjects. Other retardates from an institutional population would show an increase in performance over each of five successive sessions when the experimenter stayed with them or made supportive statements; while the performance of normal subjects (of the same mental age as the retarded subjects so as to avoid confounding the results attributed to motivational differences with mental retardation) declined under either condition (Stevenson and Cruse, 1961). In a similar study, Zigler, Hodgen and Stevenson (1959) found that institutionalized mental retardates worked significantly longer under support and under non-support conditions than would normals of the same mental age. The retardates did better under support than non-support conditions.

In further studies, Zigler developed his understanding of the construct of social deprivation.

Green and Zigler (1962) used three groups of ten subjects each-- a normal group, an institutionalized mentally retarded group, and a non-institutionalized mentally retarded group. All of the subjects were of the same mental age, and the two retarded groups were of the same chronological age. Five subjects from each of the groups were then given the game, Peg-in-a-Hole, under the conditions of support-non-support; the other five subjects in each group played the game under the nonsupport-support conditions. Support conditions consisted of the examiner telling the subject what he must do and then smiling or nodding at him during the game. Under the nonsupport conditions, the examiner explained the directions and then took a seat some ten feet behind him.

In the analysis, the institutional group was found to have spent a significantly greater amount of time playing the game under either

condition than did either of the other groups--who did not show any significant difference in their performance on either game from each other. This finding was both in accordance with the predictions and with previous experimental findings. However, the finding that the institutionalized group played the game for a shorter amount of time under support-nonsupport conditions than under the nonsupport-support conditions was contrary to expectations.

Zigler sought to clarify the meaning of social deprivation which he had initially thought reflected an absence of social reinforcement. Now, he theorized, those subjects with a high level of social deprivation have relatively high negative reaction potentials to each new social situation. This is, in part, dissipated when the person receives positive reinforcement as a consequence of his activities; however, the negative potential is reinstated when he no longer receives this type of reinforcement.

Thus, in the support-nonsupport condition, the negative reaction potential was reinstated and the level of performance decreased. In the nonsupport-support condition, only the positive reaction potential would be activated, and the performance should increase as positive reinforcement was received.

In a similar manner, the findings of the Berkowitz and Zigler study (1965) that preliminary interaction with a person who smiles at the subject and expresses some interest in him tends to decrease the effectiveness of social reinforcement by a person who does not show the concern about the subject. These same investigators (Berkowitz and Zigler, 1965, a) found that experiences of either success or failure affected the performance of both normals and institutionalized mentally

retarded children, but there were no differences which could be attributed to the subjects by conditions interaction. In a further study of environmental effects, Butterfield and Zigler (1965, b) found evidence that the drive for social reinforcement is greater in mentally retarded subjects from an institution which is largely custodial in nature compared with those subjects from an institution which is more treatment oriented.

These studies have indicated that the behavior of the institutionalized mentally retarded child may reflect motivation derived from the previous social environment. Within or without the institution, persons may well reflect differences in the amount of social reinforcement (i.e., their degree of social deprivation differs) they have received.

However, there are at least two problems with the use of the construct of social deprivation. One is the determination of whether these studies have in fact been demonstrating this construct, or, as has been suggested by Walters and Karal (1960) and Walters and Ray (1960), can the results be explained as due to the construct of anxiety. The other is, if the construct of social deprivation is to be measured, in what manner may this be accomplished?

Three reviews of the literature by Taylor (1956), Spence (1958), and Spence and Spence (1966) have shown that twenty-one out of twenty-five studies on the effect of anxiety in simple learning situations have shown that persons who score high on the test of manifest anxiety will perform at a higher rate than will those who score low on the scale of anxiety. These same reviews have indicated that in complex learning situations, persons who score high on the test of manifest anxiety will do relatively more poorly than will those who score low on the manifest

anxiety scale--if they are at the same level of ability.

One study that has examined the possibility that anxiety and not social deprivation is responsible for the efficacy of social reinforcement was performed by Walters and Karal (1960). In their study, anxiety was not measured with any instrument but was induced by manipulation of environmental circumstances. First and second grade children were exposed to conditions which were supposed to evoke anxiety in one half of the subjects but no anxiety in the other half. Within each of these groups, one half was subjected to the isolation situation; the other half was considered to be satiated with regard to social reinforcement--they were taken to the experimental situation immediately after the noon-hour play period. In a simple conditioning situation, the two groups in whom anxiety was considered to have been induced showed a significantly higher rate of conditioning than either of the two non-anxious groups. Thus, they attributed their results as due to anxiety rather than to social deprivation.

A search of the literature fails to reveal any instances in which the relatively enduring state of social deprivation--as defined and measured by Zigler--is compared with the relatively enduring state of anxiety--as measured by the Children's Manifest Anxiety Scale (CMAS).

The CMAS is held to measure an emotionally based drive in the same manner as its parent, the Manifest Anxiety Scale. Studies have shown that children who score high on the CMAS will learn a task more rapidly than those who score low on the CMAS if the dominant response is compatible with the correct response, but less rapidly if the correct response is not compatible (Castenada, 1961). Other studies using the CMAS to dichotomize children on this drive variable have supported

predictions derived from the Hull-Spence model (Castenada et al., 1956; Palermo et al., 1956).

In studies using the CMAS with an institutionalized mentally retarded population, test-retest reliabilities have been found in the order of +.63 to +.83 (Pryer and Cassel, 1962; Malpass, Mark, and Palermo, 1960). Thus, if the institutional population has persons with mental ages of seven or above, it appears that the instrument can be of some value in this population. Other studies using the CMAS have shown that institutionalized retardates are significantly more anxious than are non-institutionalized retardates or normals of the same mental age (Carrier et al., 1962; Churchill and Dingman, 1965; Malpass et al., 1960). However, Lipman (1960) found differences only between the females of the two groups.

Summary

There is, then, a considerable body of evidence which suggests that some motivational factor is operating in a relatively consistent manner to influence the performance of institutionalized mentally retarded children in a new learning situation.

Two possible factors have been suggested as capable of accounting for the experimental evidence: (1) the construct of social deprivation as suggested by Zigler, and (2) the construct of manifest anxiety.

This investigation was designed to determine if social deprivation can be demonstrated independently of anxiety by using subjects matched on the CMAS but differing in the amount of social deprivation they show. Further, by the use of the Index it was hoped that social deprivation could be assessed in a more precise manner than the holistic approach.

CHAPTER III

METHOD

Subjects

All the subjects for this study were chosen from the population of educably mentally retarded subjects at the Austin State School in Austin, Texas. Six hundred such subjects live on a campus separate from the main body of the institution, and they attend a school provided for them on their campus. Experimental subjects were chosen in accordance with the following criteria.

1. They must have been in residence at the institution for at least six months.
2. They must have fallen within the chronological age range of nine years to seventeen years eleven months, and they must have had a mental age of at least four years.
3. They must have had no motor handicap, visual handicap, or auditory handicap; and there must have been no history of psychosis.
4. No patients with Down's syndrome (Mongolism) were included.

After all the criteria were met, there was a pool of eighty-four subjects. Twenty of these were under the chronological age of thirteen years. All of the experimental procedures were administered to this group except for the anxiety scale--which does not measure individuals

this young. This group will be referred to as the Young group. The remaining 64 subjects were divided into four groups of sixteen subjects each matched on the bases of chronological age, mental age, and anxiety scale score. These groups will be referred to, hereafter, as the Older groups. The four groups of Older subjects consisted of the following groupings:

1. A High Index, Reinforced group.
2. A High Index, Non-Reinforced group.
3. A Low Index, Reinforced group.
4. A Low Index, Non-Reinforced group.

In a similar manner, the Young groups were made up as follows:

1. A High Index, Reinforced group.
2. A High Index, Non-Reinforced group.
3. A Low Index, Reinforced group.
4. A Low Index, Non-Reinforced group.

Table I gives the means and ranges of the variables used in matching the four Older groups; Table II, the means and ranges used in the matching of the four Young groups. The analysis of variance on these characteristics on the Older groups is given in the Appendix (Table XVII); that for the Young groups in Table XVIII (in the Appendix). The adequacy of the matchings in both sets of subjects is shown by the fact that Index scores were significantly higher in both sets of subjects who were considered as being in the High Index group than were the Index scores of those groups who were in the low Index groups. However, there were no significant differences among the Older groups on the variables which had been used in the matchings, and, likewise, there were no significant differences among the subjects in the Young groups on the variables used

TABLE I
 MEANS AND RANGES OF CHRONOLOGICAL AGES, MENTAL AGES,
 ANXIETY SCORES, AND SCORES ON THE INDEX OF THE
 OLDER GROUPS

	Group I Reinforced High Index	Group II Reinforced Low Index	Group III Not Rein- Forced High Index	Group IV Not Rein- Forced Low Index
Number of Subject	16	16	16	16
Means				
Chronological Age	15.61	15.63	16.00	15.30
Mental Age	8.52	8.74	8.72	8.63
Anxiety Score	32.50	30.00	30.88	32.63
Index Score	1.10	0.87	1.12	0.86
Ranges				
Chronological Age	13.09- 17.17	13.33- 17.33	14.59- 17.33	13.08- 16.75
Mental Age	5.33- 12.17	6.25- 11.42	6.59- 12.00	6.50- 13.17
Anxiety Score	20-46	12-41	17-49	20-47
Index Score	0.96- 1.60	0.75- 0.95	0.96- 1.47	0.60- 0.95

TABLE II
 MEANS AND RANGES OF CHRONOLOGICAL AGES, MENTAL AGES,
 AND INDEX SCORES OF THE YOUNG GROUPS

	Group I High Index Reinforced	Group II High Index Not Reinforced	Group III Low Index Reinforced	Group IV Low Index Not Reinforced
Number of Subjects	10	10	10	10
Means				
Chronological Age	11.15	10.89	11.20	10.92
Mental Age	6.15	6.36	6.59	7.02
Index Score	1.22	1.05	0.86	0.84
Ranges				
Chronological Age	4.59- 7.00	5.50- 7.33	5.25- 7.59	6.42- 7.92
Mental Age	8.92 12.33	9.59 12.75	9.59 12.82	9.92 13.42
Index Age	1.09- 1.40	0.99- 1.15	0.75- 0.94	0.73- 0.96

in matching these groups.

To determine which groups would be reinforced, all of the names of the eighty-four subjects were placed in a box. Then, one name was withdrawn and designated as a person to whom reinforcement would be given. If this name were that of one of the Older subjects, then all of the other fifteen persons in that group were also designated to receive reinforcement. This meant that the other Older group who had the same range of scores on the Index would not receive any overt reinforcement. The name drawn was then returned to the box and additional drawings were made until the name of one of the groups not designated was pulled out. This group was then designated to receive reinforcement and its opposite group was designated as a group to whom overt reinforcement would not be given.

The procedure was repeated until all of the groups--Older and Young--had been designated as to whether or not they would receive reinforcement. In actuality, the first name drawn was one of the Older subjects who were in the Low Index category. He and all of the others in the same group were then eligible to receive overt reinforcement; the other group of Older subjects who were in the Low Index category were then assigned to the Non-Reinforcement condition. Further drawings established which of the Older subjects in the High Index groupings was to receive overt reinforcement, and which group would not. In a similar manner, the Young groups were assigned to High Index, Reinforcement; High Index, Non-Reinforcement; Low Index, Reinforcement; and Low Index, Non-Reinforcement groups.

Materials

The Index, referred to in previous parts of this paper, was designed to measure the amount of social deprivation that institutionalized mentally retarded children had received during their developmental life. It was computed by using the ratio of the mental age on the Peabody Picture Vocabulary Test to the mental age derived from the Vocabulary Items of the Stanford-Binet Intelligence Scale, Form L-M.

These items were administered to each subject in accordance with the printed instructions in manuals for the respective tests. Using scoring standards according to each manual, mental age equivalents were then assigned. In the case of the Binet, the method of Cureton (1954) was used. The Peabody Picture Vocabulary Test, Form A, was administered to each subject in the accepted method of having the subject point to the correct alternative.

The Children's Manifest Anxiety Scale is a form of the Taylor Manifest Anxiety Scale. Its development and the steps taken in applying validity studies are described in Castenada et al. (1956). This article also gives the items in the test. The test is simply scored--the number of "Yes" responses is the score of each subject. In the current study it was thought to be inappropriate to give the test to anyone with a chronological age of less than thirteen years. (With this population, few if any of the subjects with a chronological age of less than thirteen years would have a mental age of nine years--the lower limit of the test.)

Apparatus

One of the tasks chosen by this experimenter was placing ordinary

table matches into holes that had been drilled into a plain wooden board. It appeared to the experimenter that placing these matches would take a longer period of time than did the task Zigler used in his studies (i.e., placing marbles in a marbleboard). It might better reflect the continued effort that had been posited as a requisite to the determination of the effectiveness of social reinforcement.

The Pegboard used in this experiment was made from a good quality board of yellow pine. The board measured 12 inches long by 6 inches wide and was three-quarters of an inch thick. An electric drill with a 1/8-inch bit was used to drill two hundred holes in the board. Three-eighths of an inch deep, the holes were one-half inch from each other and from the ends or the sides of the board. There was also a two-inch space in the center of the board separating the two sets of one hundred holes. Then, one-half of the board was colored black; the other half was left in its natural state.

A box of large wooden matches was purchased from a grocery store and the flammable heads were cut off. Both ends of the match were sanded lightly so they could be placed easily in the holes. Each match was two inches long when finished and one-half of the match was painted black.

For the Easy experimental task, squares one-quarter of an inch thick and measuring one inch on a side were cut from a longer piece of balsa wood. Of five hundred squares cut, half were painted black and the other half white. For the difficult (Hard) experimental task, five hundred wooden chips were cut to a uniform thickness of three-eighths of an inch. Half of these were cut from a piece of balsa that measured three-eighths of an inch on one side and one-half of an inch on the

other. The other two hundred and fifty chips were cut from a piece of balsa that measured one-half inch on a side. For the Hard task, then, the subjects had to discriminate between chips of wood that were identical in color, composition, and thickness; but which differed only in that one-half of the chips were one-eighth of an inch smaller in one dimension than were the other one-half of the chips.

For either task the chips had to be sorted into two paper plates nine inches in diameter and one and one-half inches in depth. With sixteen plates, there were eight sets.

Experimental Design

A factorial design was deemed most appropriate to determine the effects of the factors used and their interactions. The factors assessed included the following: (a) the effect of the reinforcement condition; (b) the influence of the type of task; (c) the influence of the amount of previous social reinforcement--as measured by the Index; and (d) the effect of repetition of the experimental tasks (i.e., Trials).

Procedure

All of the subject's names selected for the study were typed on individual pieces of paper and placed in a box. A name would then be drawn and the Peabody test or the vocabulary items from the Binet would be given next. In half the subjects, the Peabody was given first; in the other half, the Binet items. This should have eliminated any effects due to the order of presentation.

The vocabulary tests were given in the psychological testing room. Subjects were sent directly to the test room by the classroom teacher.

Following the examination, the subjects were returned to their class. After all the subjects in the sample had been seen, the anxiety scale (CMAS) was administered in group sessions in the classroom to all appropriate subjects.

Using the data obtained from the Peabody, the Binet, and the CMAS four Older groups of sixteen subjects, each were composed--as noted earlier. A previous section has indicated how the Young groups were composed and how groups were selected to be in the Reinforcement of the Non-Reinforcement conditions.

All the subject's names were replaced in the box and names were then drawn to determine which subject would be given the experimental tasks. When a subject's name was drawn, the classroom teacher was advised and she sent the subject to the same room in which the verbal tests had been given. The examiner greeted each subject with the following: "You remember me. I have some games that I'm going to play with all the students. Please sit here at this table." The chair was a standard straight-backed one used by teachers at their desks. It faced a table that was of an appropriate height. The subjects appeared to be under normal sitting conditions. The examiner seated himself in a chair similar to the subject's and at right angles to it. Both the examiner and the subject had their feet under the table. The examiner was approximately three feet from the subject. At this point, the examiner brought out the match board which was described in the section on materials. One hundred matches were introduced on the table with the following instructions:

'The matches have one end that is colored black, and the other end has not been colored at all. Now I want you to take these matches and place the black end of the match in this end of the board

(indicating the black end of the board). There are enough holes so that you can place all the matches if you want to. I'll let you decide when you are through. You can place all of them if you wish, or you can stop when you wish to. You let me know when you are through.'

After the subject had placed all of the matches, the examiner recorded the time it had taken on a sheet of ruled paper. If the subject did not finish the task, the examiner asked, 'You're through?'' At the same time, the watch was stopped--this was out of sight--and the time recorded. All of the matches were then pulled out of the board by the examiner (E) and placed in front of the subject. The board was turned around so that the end which had not been used was directly in front of the subject. The end first used was changed for each new subject, so that the black end was presented first to eight subjects; the natural, to eight. The matches were picked up and, depending upon which end of the board was now facing him (using the above illustration, the natural color would be towards him) he was told,

'Now we have another game to play. You see those plates? Well, you're going to place the black chips in one of the plates and the white chips in the other. I have a card here which has a black chip on one side and white chip on the other. If the white chip on the card is on this side of you and the black chip is on the other side, then you would place the white chips into the plate that is on the same side of you as the side the white chip is on.'

This was then illustrated. The subject was then told,

'Ready, begin.'

At the end of thirty seconds he was told to stop, and the plates and chips were cleared away.

Next, a grocery bag with the chips of similar dimensions was introduced and the subject was advised,

'See how much alike these chips of wood are, but they are not exactly alike,. . .etc. (The rest of the instructions were as before with only the name of the chips changed.)

The remainder of the procedure was identical to that used with the other chips. Cards were rotated under the table so the subject could not see himself; and the time was begun when the subject reached for the first chip.

With all subjects the plates were picked up at the end of each thirty-second trial and were stacked. The tasks were alternated: Easy, Hard, Easy, Hard, Easy, Hard, Easy and Hard. No other instructions or verbal interaction was given the subjects who were in the non-reinforcement condition. The subjects who were to be reinforced were told one of the following at the end of each trial, "Well done!", "Very good", "You play this game very well!" and "I liked the way you did that." Each of these was given in the same order to the subjects.

When all eight trials were completed, the subject was told, "Now you must go back to your classroom and tell your teacher that you are through."

Scoring Procedure

After the subject had left the room, the chips correctly placed were counted for each trial and recorded separately; there were eight entries for the eight trials. All chips were placed back in the bag in preparation for the next subject.

CHAPTER IV

RESULTS

Although the purpose of this experiment was to examine differences among subjects with assumed variation in pre-institutional social deprivation, drive (D) theory may best be tested if the subjects are exposed to tasks that differ in difficulty level. Tasks that are relatively difficult are assumed to involve responses which are relatively low in the possible family of responses that are called forth by a stimulus situation. On the other hand, tasks that are judged to be relatively easy are assumed to call forth responses that are relatively dominant in the family of responses that are elicited in a particular stimulus situation.

A person who presumably has a high drive state--as would persons with a high degree of social deprivation or anxiety--would perform relatively better on a task in which the correct response is relatively dominant than would a person who has a low drive level (i.e., a person with a low degree of social deprivation or a low state of anxiety). On the other hand, when the task is relatively difficult and likely to evoke incorrect responses, the high drive state would multiply all of the possible response tendencies and make it more probable that the person possessing such a high level of drive would give a poorer performance on such a task than would a person with a low level of drive.

Statistical Methodology

Analyses of variance were performed on the data. In the case of

the Pegboard, a ^{3x2x2} 2x2x2 factorial was used in which Reinforcement versus Non-Reinforcement was one factor; Trials was another factor; and the third factor was either Index Score (high vs. low), Level of Deprivation (severe vs. mild; judged subjectively), or Anxiety (high vs. low)..

When tasks of unequal levels of difficulty were assessed, a repeated measures design was used with Reinforcement as one factor, Index Score (or Level of Deprivation--judged subjectively; or Anxiety) as another, Task Difficulty as nested factor and Trials was the final factor, also nested. This design may be found in Winer (1962; p. 350).

The summary tables (and discussion) of the analyses of variance done on data for persons chosen for extreme scores on the Index, persons chosen for extreme scores on the Anxiety scale, and persons selected subjectively as reflecting extremes of Social Deprivation prior to institutionalization may be found in Appendix A. Such results are not directly germane to the major purposes and hypotheses of this investigation but they may be of some aid in evaluating the more pertinent findings.

Task Difficulty

The first consideration should be to determine whether in fact the tasks did differ in their level of difficulty. Tables VI, VII, and VIII (also XII, XIII, and XIV in Appendix A) all indicate that task difficulty was a significant source of variance and that the differences were in the predicted direction (i.e., fewer chips were placed when the task was Hard).

Subjects

The influence of the type of subject was dealt with extensively by the different analyses of variance. Among the factors considered were Index Score, Anxiety Score, Social Deprivation (judged by reading an institutional case history), and Length of Institutionalization. (It will be recalled that persons who have been in an institution for a longer period of time were hypothesized to have a higher level of drive than those who have been in an institution for a shorter period of time). Further analyses were done using only those who made extreme scores on the Index, and those who were too young to be given the CMAS, i.e., the Young group. The groups that will be considered, then, in this section will be the Older groups, the Young groups, and the groups separated upon the basis of the length of time they had spent in the institution. (Data for groups separated for extreme scores on the Index, extreme scores on the Anxiety scale, and those judged subjectively as reflecting the extremes of social deprivation are to be found in Appendix A).

Performance on the Pegboard

On the Pegboard the dependent variable was the time taken by each subject on each of two trials to place the matches. If the subject did not complete the task, the time was pro-rated and projected to give the amount of time it might have taken him to complete the task.

Index Scores: The Older Groups

Table III shows that the only source of variation that was significant for these groups was that due to an increase in speed of performance over trials. Further the interaction between the Index and Reinforcement, while not significant ($p < .15$), suggests that the High Index-Reinforced group took longer on both trials than the High Index-

TABLE III
 SUMMARY OF ANALYSIS OF VARIANCE OF THE TIME SPENT
 ON THE PEGBOARD BY THE FOUR OLDER GROUPS

Source of Variance	df	SS	MS	F
Total (adj.)	127	1.828		
Between Persons	63	1.584		
Reinforcement	1	0.002	0.002	0.089
Index Score	1	0.169	0.169	0.677
Reinforcement X Index	1	0.064	0.064	2.573
Error (a)	60	1.501	0.025	
Within Persons	64	0.244		
Trials	1	0.059	0.059	19.686 ^{**}
Trials X Reinforcement	1	0.005	0.005	1.669
Trials X Index	1	0.001	0.001	0.249
Trials X Index X Reinforcement	1	0.001	0.001	0.035
Error (b)	60	0.179	0.003	

^{**}Significant at the One Per Cent Level.

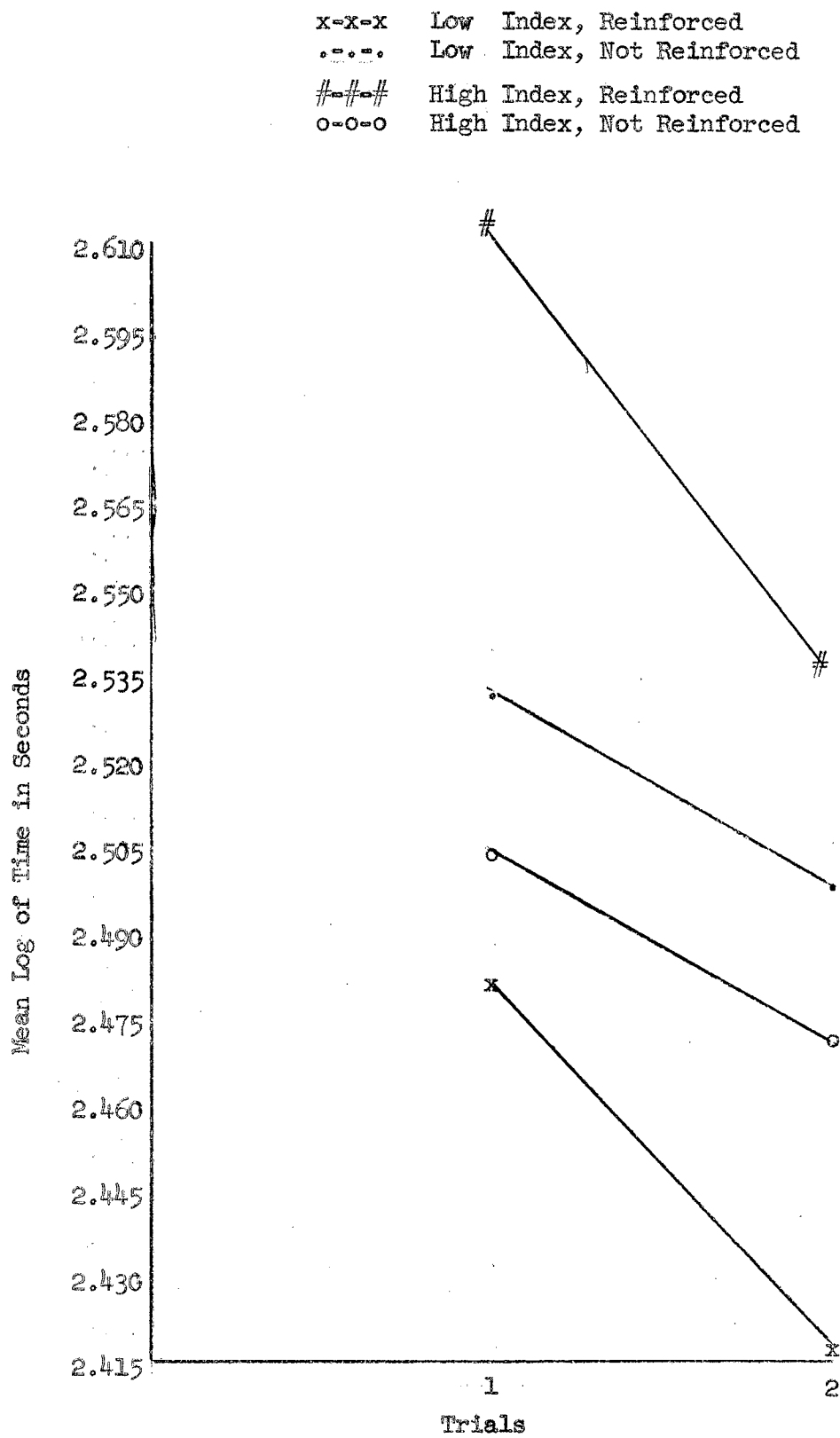


Figure 1 Performance on the Pegboard- Older Groups

Non-Reinforced group, but that the Low Index-Reinforced groups took shorter times on both trials than the Low Index-Non-Reinforced group (see Figure 1).

Index Scores: The Young Groups

Table IV shows that Young subjects improved the speed of their performance significantly over Trials and that Trials interacted significantly with Reinforcement, with the Index score, and with the Reinforcement X Index interaction. Reinforcement, Index Score, and their interaction were non-significant. Figure 2 shows that the Low Index-Non-Reinforced group took the longest amount of time on the first trial but showed the greatest increment in responding between Trials 1 and 2, and the High Index-Non-Reinforced group took the same amount of time on the first trial as the two reinforced groups but took the longest time on the last trial. Although the High Index-Reinforced group took the same amount of time on the first trial as two of the groups, this group took less time than any other group on the final attempt.

Index Scores: Length of Time Institutionalized

In the analysis of variance of performance on the Pegboard by subjects reflecting different lengths of time spent in the Institution (Table V), Trials once again emerged as a significant source of variance. These subjects (selected from the original group of eighty-four subjects) were assigned to three groups of ten subjects each so selected as to represent three different lengths of time in the institution. One group had been in residence from six months to one year; a second group, from one year to 2.4 years; the third group, from 2.75 years to six years. All groups were matched on chronological age, mental age and Index score, and each group had the same number of subjects who had been reinforced

TABLE IV
ANALYSIS OF VARIANCE OF PERFORMANCES ON THE PEGBOARD
BY THE YOUNG GROUP

Source of Variance	df	SS	MS	F
Total (adj.)	39	7.933		
Between Persons	19	6.657		
Reinforcement	1	0.024	0.024	0.057
Index Score	1	0.006	0.006	0.000
Reinforcement X Index	1	0.001	0.001	0.000
Error (a)	16	6.626	0.414	
Within Persons	20	1.308		
Trials	1	0.758	0.758	57.402**
Trials X Reinforcement	1	0.164	0.164	12.386**
Trials X Index	1	0.041	0.041	3.083*
Trials X Index X Reinforcement	1	0.134	0.134	10.167**
Error (b)	16	0.211	0.013	

*Significant at the Five Per Cent Level.

**Significant at the One Per Cent Level.

x-x-x Low Index, Reinforced
 .-.-.- Low Index, Not-Reinforced
 #-#-# High Index, Reinforced
 o-o-o High Index, Not Reinforced

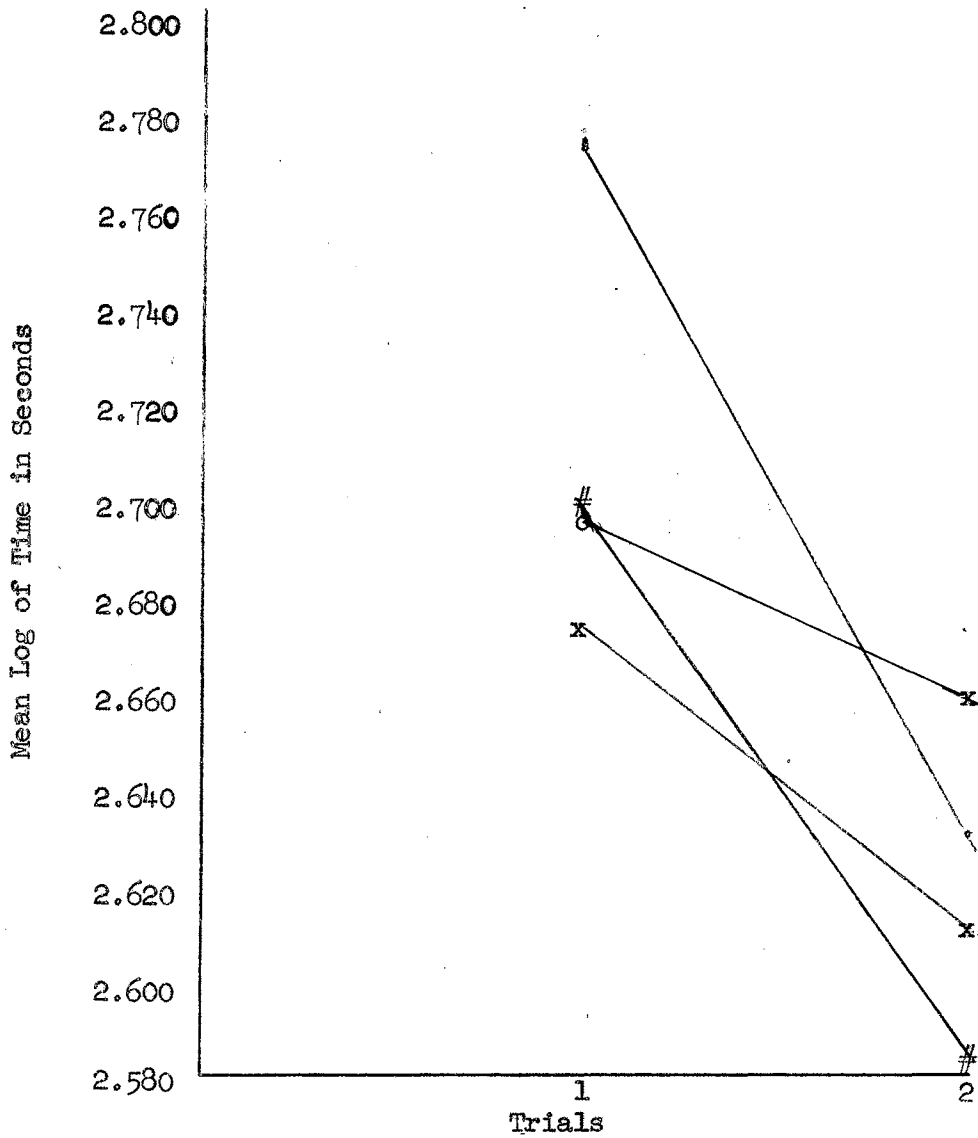


Figure 2 Performance on the Pegboard- Young Groups

TABLE V

ANALYSIS OF VARIANCE OF PERFORMANCE ON THE PEGBOARD BY GROUPS
SPENDING DIFFERENT LENGTHS OF TIME IN THE INSTITUTION

Source of Variance	df	SS	MS	F
Total (adj.)	59	1.201		
Between Persons	29			
Groups	2	0.085	0.042	1.26
Error (a)	27	0.906	0.034	
Within Persons	30			
Trials	1	0.084	0.084	22.27**
Trials X Groups	2	0.024	0.012	3.24*
Error (b)	27	0.102	0.004	

*Significant at the Ten Per Cent Level.

**Significant at the One Per Cent Level.

x-x-x Institutionalized from 2.75 to 6 Years
o-o-o Institutionalized from One to 2.4 Years
#-#-# Institutionalized from 6 months to One Year

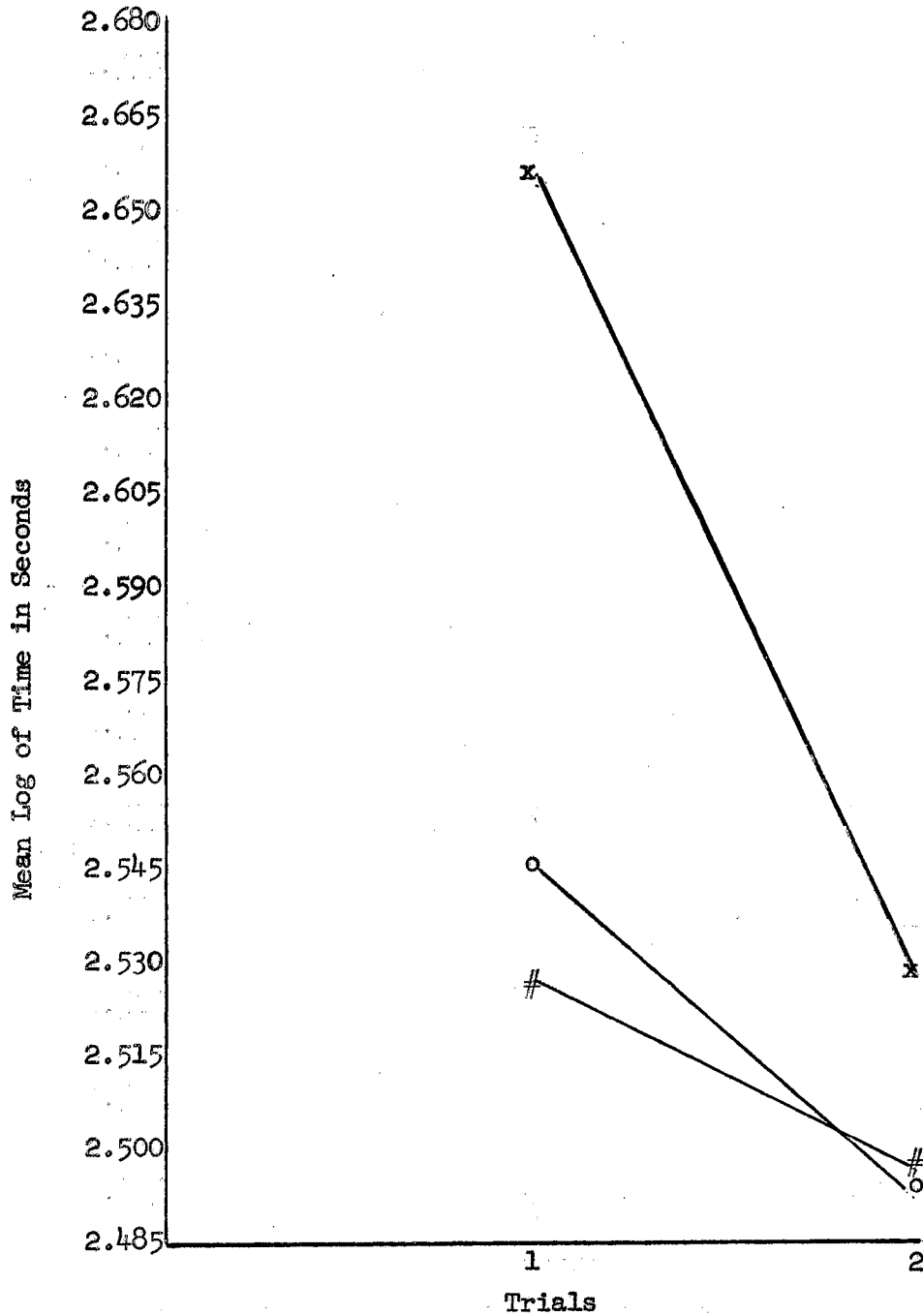


Figure 3 Performance on the Pegboard- Groups Chosen for Different Lengths of Institutionalization

during the experiment. Means and ranges of the factors upon which the groups were matched, and the analysis of variance for differences among the groups are included in Table XXIV in the Appendices.

Although no other source of variation is significant, the Trials X Groups interaction approaches significance ($p < .10$). Figure 3 shows that the group which had spent the longest amount of time in the institution took longer to complete the Pegboard on both the initial and final Trials, and there is a suggestion that this same group showed the greatest increase in speed from Trial 1 to Trial 2.

Performance on the Chip-Sorting Tasks

Index Scores: The Older Groups Table VI, the summary of the analysis of variance of the performance of the four Older groups on the Hard task and on the Easy task, indicates that these groups did place more chips when the task was Easy than when the task was Hard ($p < .01$). Other findings that exceeded the .01 level included the following: Trials (all groups placed more chips on the last trial than on the first), the interaction of Index with Task Difficulty, the interaction of Reinforcement with Trials, and the interaction of Trials with Task Difficulty.

Figure 4 shows that the Low Index-Reinforced group placed more chips on every trial than did any of the other groups. The High Index-Reinforced group placed fewer chips on every trial than did any of the other groups. Figure 5 shows that the Low Index-Reinforced group placed the greatest number of chips on the first three trials, but that this group was joined by the High Index-Non-Reinforced group on the last trial.

The significant Reinforcement X Trials interaction may be

TABLE VI
 SUMMARY OF THE ANALYSIS OF VARIANCE OF PERFORMANCE IN
 PLACING CHIPS BY SUBJECTS IN THE OLDER GROUPS

Source of Variance	df	SS	MS	F
Total (Adj.)	511	73,175.967		
Between Persons	63	32,022.092		
Reinforcement	1	927.189	927.189	1.818
Index Score	1	478.564	478.564	0.938
Reinforcement X Index Score	1	19.143	19.143	0.004
Persons w. Groups	60	30,597.196	509.963	
Within Persons	448	41,153.875		
Task Difficulty	1	28,233.144	28,233.144	640.550**
Task Difficulty X Reinforcement	1	81.879	81.879	1.858
Index Score X Task Difficulty	1	2,163.066	2,163.066	49.075**
Reinforcement X Index Score X Task	1	78.908	78.908	1.790
Task Difficulty X Persons w. Groups	60	2,981.3024	44.076	
Trials	3	1,893.461	631.154	83.167**
Reinforcement X Trials	3	306.649	102.216	13.468**
Index Score X Trials	3	54.386	18.129	2.389
Reinforcement X Index X Trials	3	37.834	12.611	1.662
Trials X Subjects w. Groups	180	1,365.945	7.589	
Tasks X Trials	3	345.555	115.185	5.918**
Reinforcement X Tasks X Trials	3	46.762	15.587	0.801
Index X Tasks X Trials	3	42.043	14.014	0.720
Reinforcement X Index X Tasks X Trials	3	19.600	6.533	0.336
Tasks X Trials X Persons w. Groups	180	3,503.341	19.463	

*Significant at the Five Per Cent Level.

**Significant at the One Per Cent Level.

x-x-x Low Index, Reinforced
.-.-.- Low Index, Not Reinforced
#-#-# High Index, Reinforced
o-o-o High Index, Not Reinforced

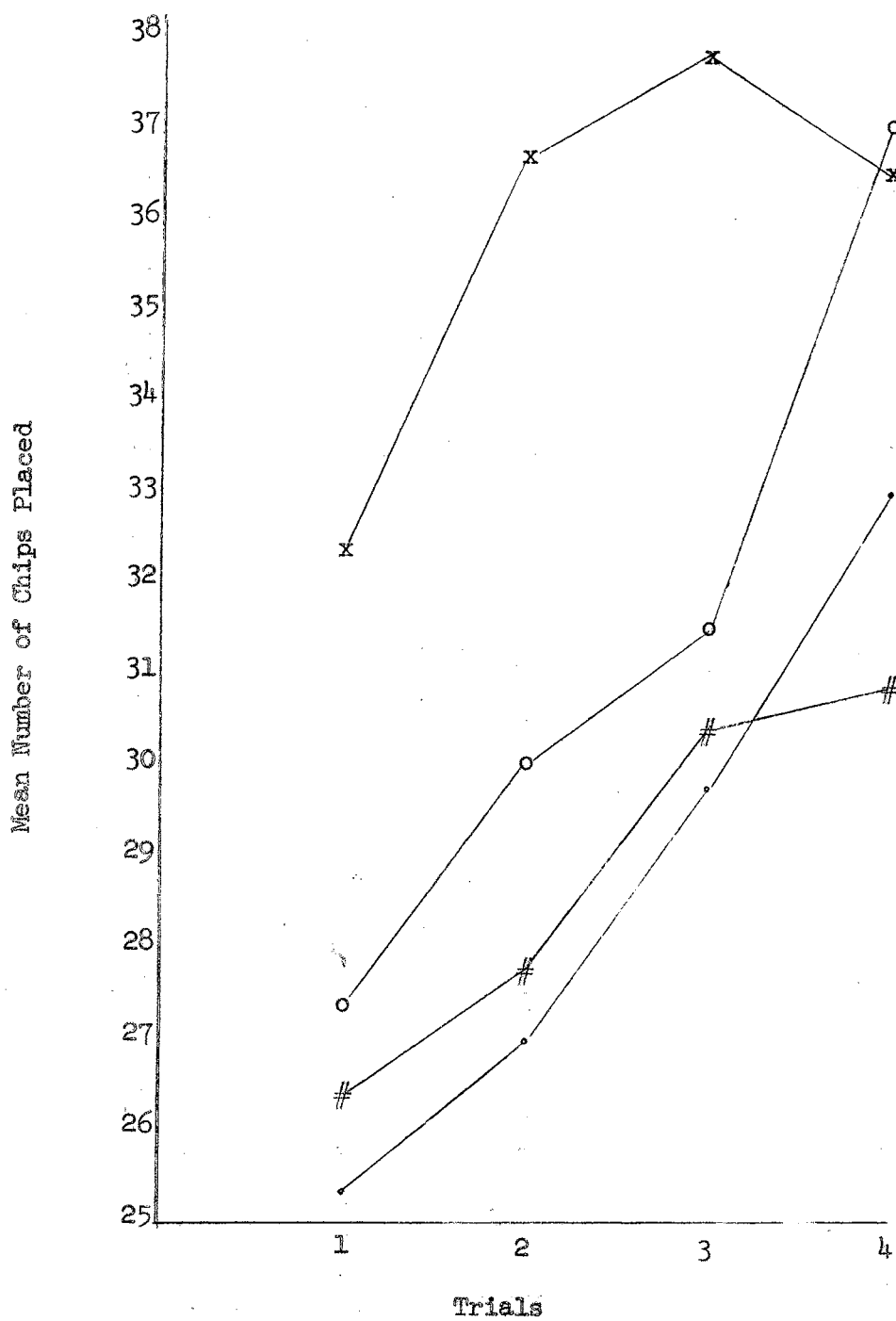


Figure 4 Performance on the Easy Task- Older Groups

x-x-x Low Index, Reinforced
 .-.-. Low Index, Not Reinforced
 #-#-# High Index, Reinforced
 o-o-o High Index, Not Reinforced

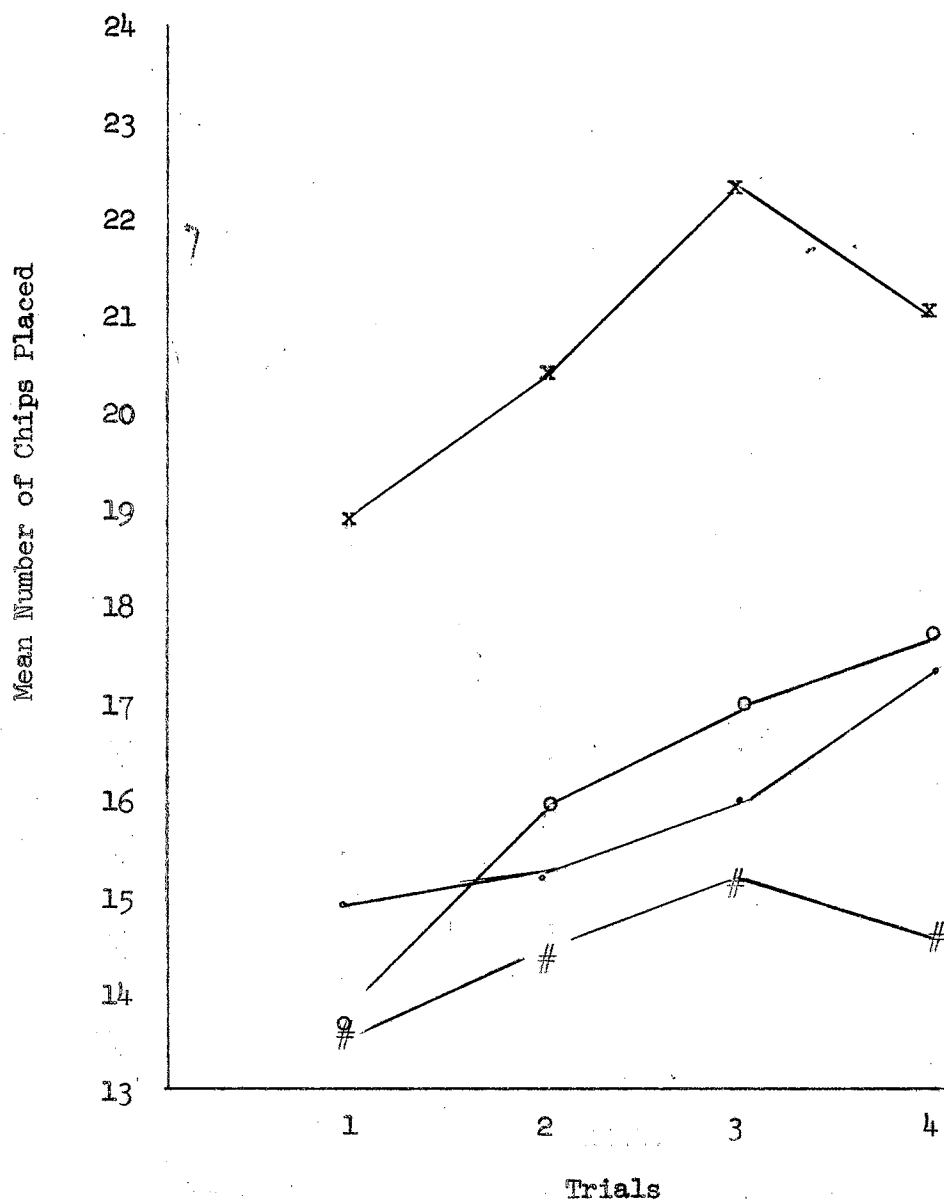


Figure 5 Performance on the Hard Task- Older Groups

attributed to the increase in performance over trials by the Non-Reinforcement groups, while the performance of the Reinforced groups declined on the last trial. On the first three trials, the latter group had shown an increase in performance on every trial.

Of the findings reported in Table VI, certainly one of the most important was the significant Index X Task Difficulty interaction. The Low Index groups performed at a higher level on both the Hard and the Easy tasks than did the High Index groups; however, the latter groups did relatively better on the Easy task. This finding does give some support for the use of the Index as a discriminative instrument.

The other significant interaction, Trials X Task Difficulty, appears to be due to the greater increase in performance over trials by all groups on the Easy task than on the Hard task.

Index Score: The Young Groups. Table VII, in which the summary of the analysis of variance of the performance of the Young groups on placing chips is presented, shows that the following sources of variance were significant at the .01 level: Task Difficulty (more chips were placed when the task was Easy than when it was Hard), Trials (more chips were placed on the final trials than on the initial trials), Index X Trials, Task X Trials, Reinforcement X Index X Trials, and Reinforcement X Tasks X Trials. (The interactions will be discussed later in this section).

Figure 7 shows that the Low Index-Non-Reinforced group placed more chips on the Hard task than did any of the other groups and continued its relative superiority until the final trial. At that point, the High Index-Reinforced group placed the greatest number of chips of any of the Young groups.

TABLE VII

SUMMARY OF THE ANALYSIS OF VARIANCE OF PERFORMANCE IN
PLACING CHIPS BY SUBJECTS IN THE YOUNG GROUP

Source of Variance	df	SS	MS	F
Total (Adj.)	159	20,043.775		
Between Persons	19	10,090.275		
Reinforcement	1	48.05	48.05	0.094
Index Score	1	273.80	273.80	0.535
Reinforcement X Index	1	1,920.80	1,920.80	3.751
Persons w. Groups	16	8,191.38	511.96	
Within Persons	140	9,609.50		
Task Difficulty	1	6,808.05	6,806.05	130.060**
Reinforcement X Tasks	1	121.85	121.85	2.327
Index Score X Tasks	1	168.10	168.10	3.211
Reinforcement X Index X Task	1	120.05	120.05	2.293
Task X Persons w. Groups	16	837.50	52.35	
Trials	3	406.53	135.51	16.18**
Trials X Reinforcement	3	27.19	9.06	1.08
Trials X Index Score	3	135.25	45.08	5.38**
Trials X Reinforcement X Index Score	3	255.17	85.06	10.16**
Trials X Persons w. Groups	48	401.90	8.37	
Task X Trials	3	79.25	26.42	7.08**
Reinforcement X Tasks X Trials	3	68.10	22.70	6.09**
Index Score X Tasks X Trials	3	1.50	0.50	0.13
Reinforcement X Index X Tasks X Trials	3	0.00	0.00	0.000
Tasks X Trials X Persons w. Groups	48	179.06	3.73	

*Significant at the Five Per Cent Level.

**Significant at the One Per Cent Level.

x-x-x Low Index, Reinforced
.-.-. Low Index, Not Reinforced
#-#-# High Index, Reinforced
o-o-o High Index, Not Reinforced

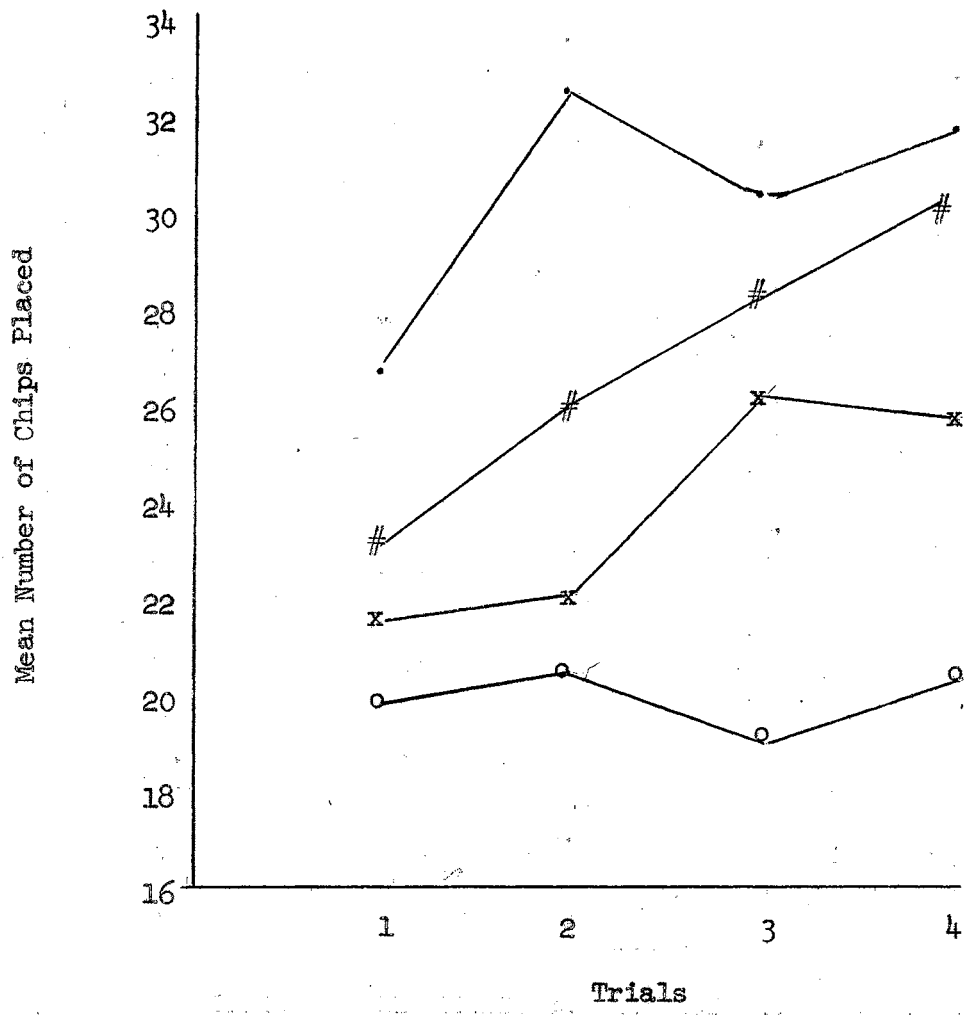


Figure 6 Performance on the Easy Task- Young Group

x-x-x Low Index, Reinforced
 Low Index, Not Reinforced
 #-#-# High Index, Reinforced
 o-o-o High Index, Not Reinforced

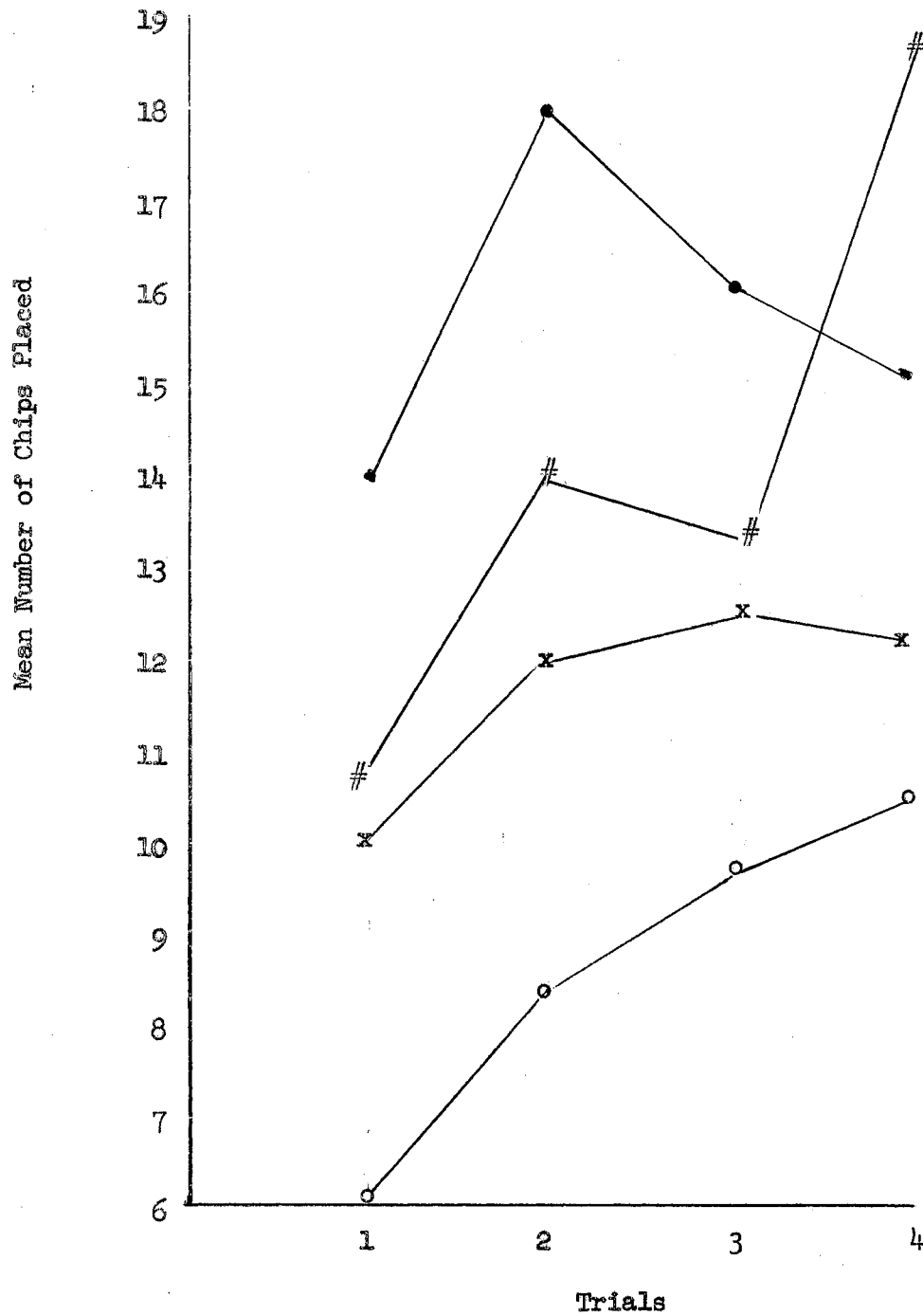


Figure 7 Performance on the Hard Task- Young Group

On the Easy task (Figure 6) findings quite similar to the above were found, i.e., the greatest number of chips on all trials were placed by the Low Index-Non-Reinforced group; the fewest number by the High Index-Non-Reinforcement group.

Of the significant interactions, that between Reinforcement X Tasks X Trials is accounted for by the improved performance over trials on the Easy task by the Reinforced groups. The performance of this group increased on every trial, whereas the performance of the Non-Reinforced groups did not. The performance of the Reinforced groups tended to increase across trials on the Hard tasks, too, but the performance when compared with that of the Non-Reinforced groups did not show differences which were so clear-cut as in the case of the Easy task.

The significant interaction of Trials X Reinforcement X Index appears partially to be due to the improvement over trials of the High Index-Reinforced group. The curves of performance for the other groups tend to be more irregular and show far less evidence of improvement.

Index Scores: Length of Time Institutionalized. Among these three groups (the selection procedures were indicated in an earlier section) statistically significant differences emerge at the .01 level on the following sources of variance (cf. Table VIII): Task Difficulty, Trials, and Groups X Trials. The interaction of Tasks with Trials reached the .05 level of significance. Reference to Figures 8 and 9 indicate that all groups increased the number of chips they placed over trials on both tasks, and that they all placed more chips on the Easy task than on the Hard task. Further examination of the data indicates that the significant Tasks X Trials interaction is due to the greater gain over trials on the Easy task than on the Hard task. Further, the significant Groups X Trials interaction appears to be in part due to the greater continued

TABLE VIII
ANALYSIS OF VARIANCE OF PERFORMANCE ON TASKS BY GROUPS
REPRESENTING DIFFERENT LENGTHS OF
TIME INSTITUTIONALIZED

Source of Variance	df	SS	MS	F
Total (Adj.)	239	36,982.663		
Between Persons	29	17,451.787		
Groups	2	2,521.0750	1,260.538	2.279
Subj. w. Groups	27	14,930.712	552.989	
Within Persons	210	19,530.876		
Task Difficulty	1	11,495.504	11,495.504	82.707**
Groups X Tasks	2	258.859	129.430	0.931
Tasks X Persons w. Groups	27	3,752.762	138.991	
Trials	3	552.013	184.004	16.034**
Groups X Trials	6	248.687	41.448	3.612**
Trials X Persons w. Groups	81	929.537	11.476	
Tasks X Trials	3	213.933	71.311	2.852*
Groups X Tasks X Trials	6	54.108	9.018	0.361
Tasks X Trials X Persons w. Groups	81	2,025.473	25.007	

*Significant at the Five Per Cent Level.

**Significant at the One Per Cent Level.

x-x-x Institutionalized 2.75 to 6 Years
o-o-o Institutionalized One to 2.4 Years
#-#-# Institutionalized Less Than One Year

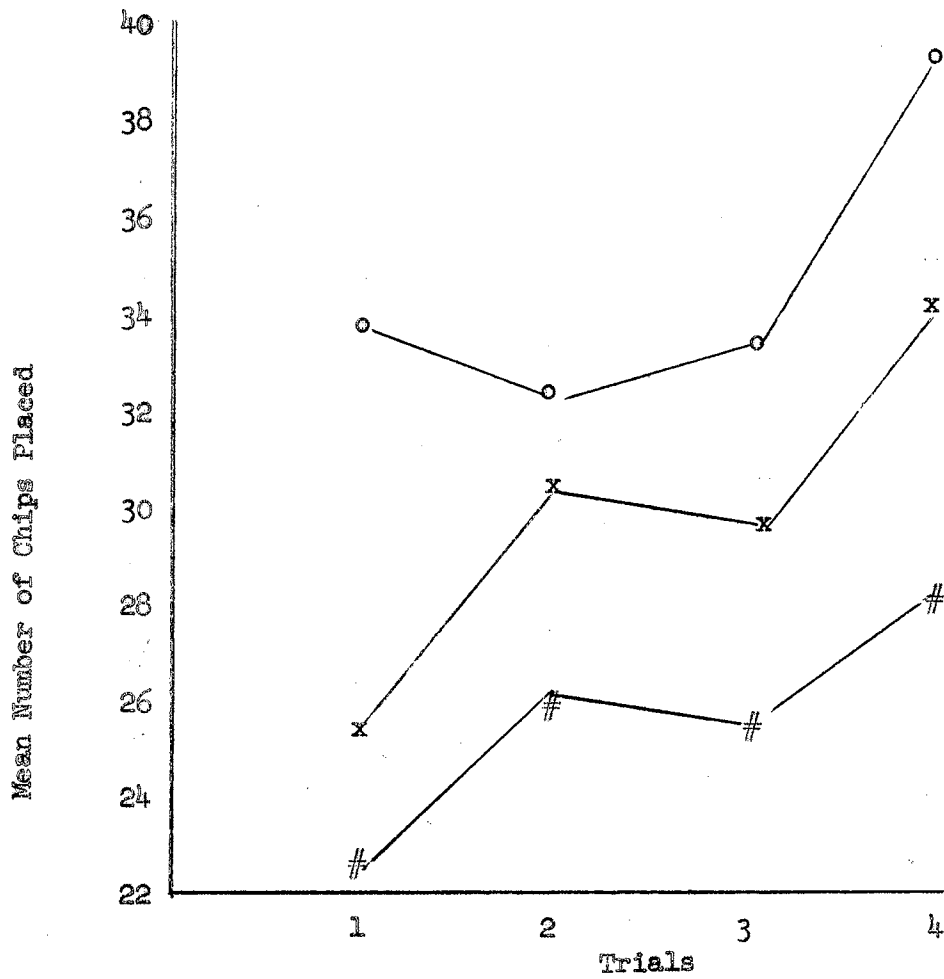


Figure 8 Performance on the Easy Task - Different lengths of Institutionalization

x-x-x Institutionalized 2.75 to 6 Years

o-o-o Institutionalized One to 2.4 Years

#-#-# Institutionalized Less Than One Year

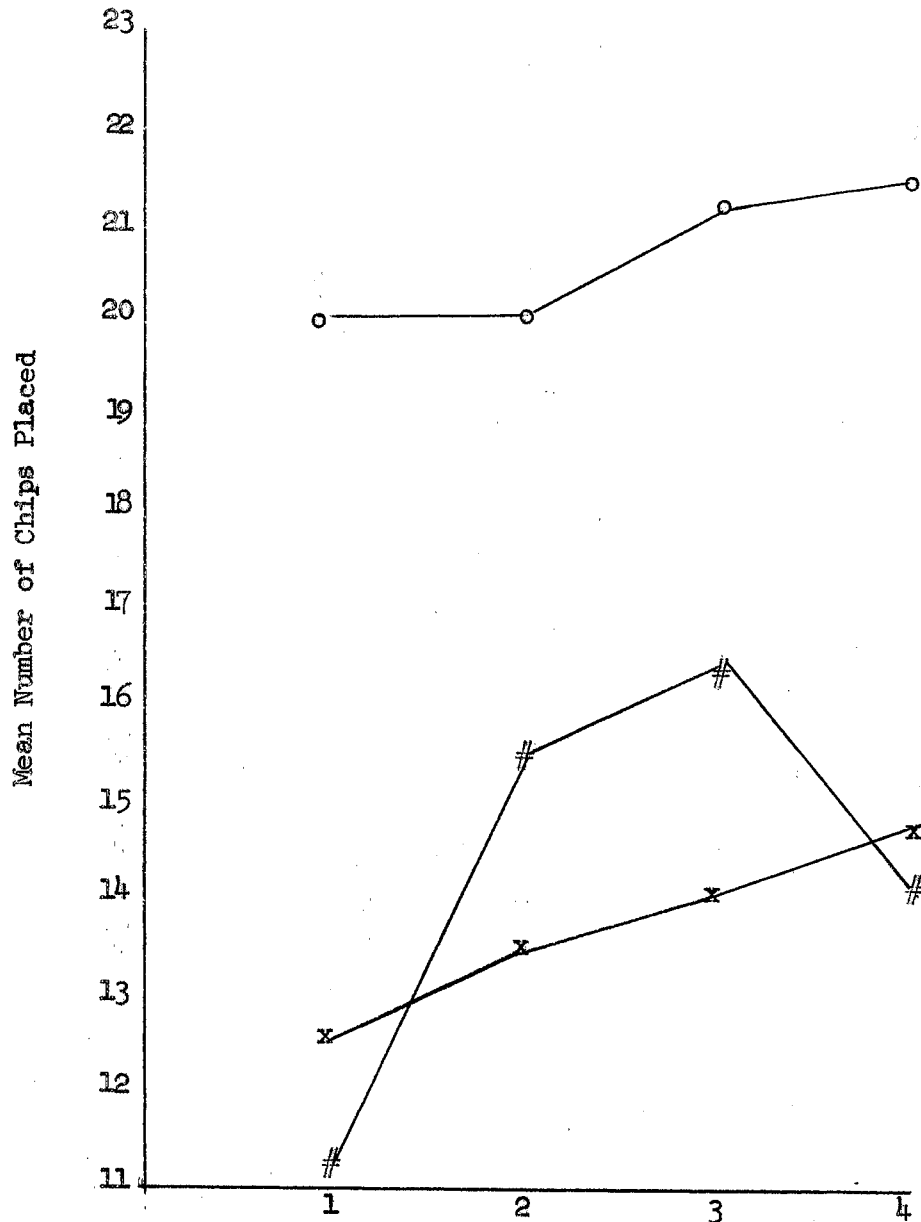


Figure 9 Performance on the Hard Task- Different Lengths of Institutionalization

increase over Trials by the group that had been institutionalized the longest (a finding which is in accord with the predictions advanced earlier in this investigation). While the group that had been in the institution for the intermediate period placed more chips on the first trial, the other two groups showed greater subsequent improvement over trials.

In the following Table, the significant findings that emerged from the data are summarized.

TABLE IX

SUMMARY OF FINDINGS THAT REACHED STATISTICAL SIGNIFICANCE

Main Factors and Interactions: Descriptive Indications Of Experimental Findings	Experimental Groups		
	Older	Young	Length of Time Institution- alized
Pegboard:			
Trials-- more rapid performance on later trials	X	X	X
Trials X Reinforcement-- non- reinforcement enhanced performance over trials more than did reinforce- ment		X	
Trials X Index-- the Low Index group showed a greater decrease in time trials than did the High Index group		X	
Trials X Index X Reinforcement-- the effect of reinforcement over trials was greater for the Low Index group than for the High Index group		X	
"Hard" vs. "Easy" Tasks:			
Task Difficulty-- more chips were placed when the task was "Easy"	X	X	X
Task Difficulty X Index-- High Index persons placed relatively more chips when the task was "Easy" than when the task was "Hard" as compared to the Low Index groups	X		

TABLE IX (Continued)

Main Factors and Interactions: Descriptive Indications Of Experimental Findings	Experimental Groups		
	Older	Young	Length of Time Institution- alized
"Hard" vs. "Easy" Tasks: (Continued)			
Trials-- more chips were placed on the later trials than on the earlier	X	X	X
Trials X Reinforcement-- persons who were reinforced placed more chips on trials 1-3 than did persons receiving no reinforcement	X		
Trials X Tasks-- improvement over trials was greater when the task was "Easy" than when "Hard"	X	X	X
Trials X Reinforcement X Index-- the High Index, reinforced group improved more over trials than did the other groups		X	
Trials X Reinforcement X Tasks-- with the young group, it was the reinforced group who showed more improve- ment over trials on the "Easy" task than did the non-reinforced group		X	
Trials X Groups-- those institution- alized the longest showed the greatest continued improvement over trials			X

CHAPTER V

DISCUSSION OF RESULTS

Table IX was compiled in an attempt to summarize significant findings which emerged from the analyses of the data. A few findings were significant with everyone of the three groups, i.e., the effect of Trials, the effect of Task Difficulty, and the interaction of Trials with Tasks. These data indicate that the experimental procedures were appropriate to test the hypotheses set forth in an earlier section: The tasks did differ in level of difficulty and there were changes in performance over trials.

Examining the predictions, those retardates designated as the most deprived of social reinforcement, those who scored high on the experimental Index, or who spent the longest period of time in the institution, should have shown the following (relative to those designated as less socially deprived): greater improvement over trials when reinforcement was provided, lower initial and final time scores on the Pegboard; a greater number of chips placed on both the final and initial trials when the task was Easy; and a smaller number of chips placed on the initial trial when the task was Hard, but with a greater improvement over reinforced trials, so that on the final trial the most socially deprived should have done as well, or almost as well, as those who were less socially deprived.

Reference to Table IX shows that there were three instances in

which these predictions appeared to have received significant statistical support. These were the following: (a) High Index persons who were in the Older groups did place relatively more chips when the task was Easy than when it was Hard; (b) in the Young groups, the High Index, Reinforced group improved more over trials on the tasks than did the other High Index group and both of the Low Index groups; (c) the groups institutionalized the longest show the greatest amount of continued improvement over trials; (d) in the Older groups, persons who were reinforced placed more chips on Trials than did persons receiving no reinforcement; and (e) in the Young groups, the groups receiving reinforcement showed more improvement over trials on the Easy task than did the Non-Reinforced group.

One significant finding which did not support the predictions was the following: For the Young, Low Index groups the effect of reinforcement was greater than for the High Index groups on the Pegboard task.

In the light of these statistical analyses, the hypotheses set forth in the introductory chapter can now be evaluated:

1. Although the main effect of the experimental Index did not reach statistical significance in any of the analyses, it did enter into significant interaction with Task Difficulty in the Older groups. The fact that the High Index groups did relatively better on the Easy tasks than did the Low Index groups (and that there was no differences between the groups over trials on the Hard tasks) does offer some support for the Index as a discriminative instrument. With the Young groups, the Index entered into a significant second-order interaction

with Trials and Reinforcement. The High Index group was the one which showed the most marked improvement over trials when reinforcement was administered. Both of these findings would have been predicted by the theoretical basis underlying the design of the study.

Further evidence which may indicate that the Index is of discriminative value is the greater gain in performance on the Pegboard over trials of the Young, Low Index groups. Although this finding is in the opposite direction from that which the rationale for this study would have predicted, another possible explanation for the findings will be advanced later in this section.

2. It was predicted that High Index groups would perform at a higher level on tasks in which the correct response was presumably dominant among the possible responses to the situation (i.e., the Easy task). It was also predicted that the High Index groups would do more poorly where the correct response to a problem situation was probably not so obviously the dominant response (i.e., the Hard task), but that these groups would improve more over trials as a result of social reinforcement than would the Low Index groups. Evidence consistent with the latter prediction was obtained for both the Older and Young groups. Further support for this hypothesis is indicated by the relatively higher level of performance of the High Index groups when the task

was Easy than when the task was Hard as compared to the Low Index groups.

3. In accord with hypotheses relating social deprivation to length of institutionalization, it was predicted that those institutionalized the longest would have the highest level of drive and their performance would therefore be like those in the High Index group. Of predictions generated for the performance of this group (i.e., faster times on the Pegboard than for those groups that had not been institutionalized so long, more chips placed on all trials of the Easy task, and fewer chips placed on the initial trials on the Hard task but with greater improvement over trials following reinforcement) only the last received any statistically significant support.

Explanations

Though his initial studies on social deprivation used simple holistic criteria to obtain groups differing in the amount of this construct, Zigler and Berkowitz (1965) found that further experimental work required an elaboration of their theoretical framework. They assumed that a retardate approaches a new social interaction with both a positive reaction potential and a negative reaction potential. They need and want social reinforcement; however, their lengthy history of rejection makes them expect further disappointment.

Extending such a formulation to this study, a question may be raised as to the effect of the previous experimenter-subject interaction. When the intelligence scales and the anxiety scale were given by the

experimenter, no overt reinforcement was given. This might have tended to raise the negative reaction potential in all subjects, and since drive is held to be increased by any increase in reaction potential, positive or negative, it might be expected that the effect of these experimenter-subject interactions would have been of greater benefit to those with a low drive level.

With the Low Index groups, their reaction to a raised negative reaction potential might be to get the task over as rapidly as possible; however, the High Index groups have a greater conflict due to their relatively greater need for social reinforcement.

This would offer one explanation for the higher level of performance on the initial trials on the Pegboard and the Easy and Hard tasks by those in the Low Index groups among the Older subjects. It would not explain the superiority of the High Index, Young subjects on the initial trials of the Pegboard and the Hard tasks.

It is possible that this result was due a possible confounding factor--in the Young group, anxiety scores were not considered in the matchings. It is not possible to predict what effect this might have.

One other possibility relevant to the Pegboard performance is that persons with a high drive for social reinforcement might have wished to preserve their relationship with the experimenter and therefore proceeded more slowly (rather than more quickly, as has been assumed throughout the study).

One factor which was beyond the control of the experimenter was the approach of summer vacation. Although none of the experimental subjects left the institution during the experiment, it is quite probable that such plans were being discussed among the subjects. The

effect of this might well have increased the drive state of all subjects. It quite possibly increased the "feelings of rejection" that those subjects who were not going home experienced. In fact, the more socially deprived children may well have been more apt to feel rejection at this time than the less socially deprived. Evaluation of the effects of these circumstances would be difficult and hazardous at best.

CHAPTER VI

SUMMARY

Recent experimental findings reported in the literature have challenged the previously prevailing concept that institutionalized mentally retarded children are characterized by a homogeneous personality structure (which has dictated certain education and therapeutic practices with these children).

Differences have been obtained on experimental tasks when institutionalized retardates have been separated into groups considered to have been relatively deprived of adult approval and groups which had relatively greater adult approval (Severely Socially Deprived and Mildly Socially Deprived, respectively). However, the devices used to segregate these groups have been relatively gross. Subsequent attempts to refine these measures have been only partially successful.

Although the fact of retardation limits the usefulness of verbal tests, certain of these tools have been shown to be applicable and useful. Some evidence suggests that the Peabody Picture Vocabulary Test and the vocabulary subtest of the Stanford-Binet Intelligence Scale appear to measure different aspects of mental ability. In an attempt to add to the usefulness of these scales, the mental age scores on each test were compared to form a scale of Social Deprivation--an "Index." It was argued that persons scoring high on this Index (persons with relatively higher mental age scores on the Peabody Test than on the

the Stanford-Binet) might well have a high drive for social reinforcement.

Predictions derived from such reasoning were based on drive theory. It was predicted that on an easy task (where the correct response is presumably dominant) a person with a high degree of drive should perform at a higher level than a person with a low degree of drive. On the other hand, when the task is hard, and the correct response not so dominant in the hierarchy of possible responses, persons who make a low score on the experimental Index might be expected to perform at a relatively higher level than those with a High Index score. With socially reinforced trials on the hard task, however, the expectation might be that this latter group would increase their performance more rapidly than those in the Low Index group.

Eighty-four subjects were chosen from a population of 2,400 hospitalized mental retardates for the administration of the experimental operations. Sixty-four of these were designated as the Older group, and twenty persons too young to be given the anxiety scale (which was used in matching the groups of Older persons) were referred to as the Young group. Within each grouping two groups were reinforced with verbal statements and two groups were not. In both the Older group and the Young group, one of the groups that was reinforced consisted of persons selected for high scores on the Index; another group, for low scores on the Index. Of the Non-Reinforced groups two, (an Older group and a Young group), were selected for high scores on the Index; another group for low scores on the Index. The subjects were then subjected to several experimental tasks, and the data were subjected to analyses of variance designed to measure any differences in performance attributable to the

main effects of reinforcement, Index score, task difficulty and trials, or their interactions.

Of the statistically significant findings, some were consistent with the hypotheses (for example the interaction, Task Difficulty with Index), others were not (i.e., Trials with Index with Reinforcement on the Pegboard).

The explanations that were advanced for the discrepancies between predictions and the experimental data focused on the effects that uncontrolled environmental variables could have elicited. Specifically, the positive reaction potential towards social reinforcement may have been overcome by the negative reaction potential which had been triggered by previous encounters with the experimenter in which no overt reinforcement was given.

In conclusion, there was some evidence supporting the Index as a discriminative instrument. One further possibility relevant to the Pegboard performance is that persons with a high drive for Social reinforcement might have wished to preserve their relationship with the experimenter and therefore proceeded more slowly (rather than more quickly, as has been assumed throughout the study).

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APPENDIX A

In this section of the paper, a discussion of the results of three groupings of the subjects (which were in addition to the groupings previously discussed).

Groups Taken From Extreme Scores on the Index

Since the analysis of the data of the Older groups had indicated that the Index Score was not contributing any significant source of variance, a further analysis was made using two groups of ten subjects each who had scored at the extremes of the range of Index scores. Within each group, five of the ten had received Reinforcement; the others had not. Table X shows that the only significant source of variance was that attributed to improvement over Trials. There were no significant interactions with Trials.

Anxiety Scores

Table XI shows that among groups chosen to represent extreme scores on the CMAS (as with the Index, two groups of ten subjects each were selected: half of each group had received reinforcement, the other half had not) only two sources of variance reached significance. These were the interaction of Reinforcement and Anxiety (.05 level) and Trials (.01 level). The CMAS scores of those included in the High Anxiety group varied from 32 to 47 with a mean of 38.50; for the Low Anxiety group, the range of scores was 17-30, the mean, 22.70. Figure 10 shows that the Low Anxiety group that was not reinforced took less time to complete the task on both Trials with the Pegboard, and that the Low

TABLE X
ANALYSIS OF VARIANCE OF PERFORMANCES ON THE PEGBOARD
BY SUBJECTS CHOSEN TO REPRESENT EXTREME SCORES
ON THE INDEX

Source of Variance	df	SS	MS	F
Total (adj.)	39	0.351		
Between Persons	19			
Reinforcement	1	0.004	0.004	0.21
Index	1	0.0015	0.002	0.08
Reinforcement X Index	1	0.002	0.002	0.10
Error (a)	16	0.290	0.018	
Within Persons	20			
Trials	1	0.027	0.027	18.44 ^{***}
Trials X Reinforcement	1	0.002	0.002	1.18
Trials X Index	1	0.001	0.001	0.63
Trials X Index X Reinforcement	1	0.001	0.001	0.43
Error (b)	16	0.024	0.002	

^{***}Significant at the One Per Cent Level.

TABLE XI

ANALYSIS OF VARIANCE OF THE PERFORMANCES ON THE PEGBOARD BY
GROUPS SHOWING EXTREME SCORES ON THE ANXIETY SCALE

Source of Variance	df	SS	MS	F
Total (adj.)	79	1.087		
Between Persons	39			
Reinforcement	1	0.025	0.025	1.18
Anxiety	1	0.007	0.007	0.34
Reinforcement X Anxiety	1	0.150	0.150	7.038*
Error (a)	36	0.766	0.021	
Within Persons	40			
Trials	1	0.043	0.043	16.58***
Trials X Reinforcement	1	0.001	0.001	0.43
Trials X Anxiety	1	0.001	0.001	0.46
Trials X Anxiety X Reinforcement	1	0.000	0.000	0.07
Error (b)	36	0.093	0.003	

*Significant at the Five Per Cent Level.

***Significant at the One Per Cent Level.

x-x-x Low Anxiety, Reinforced
 .-.-. Low Anxiety, Not Reinforced
 #-#-# High Anxiety, Reinforced
 o-o-o High Anxiety, Not Reinforced

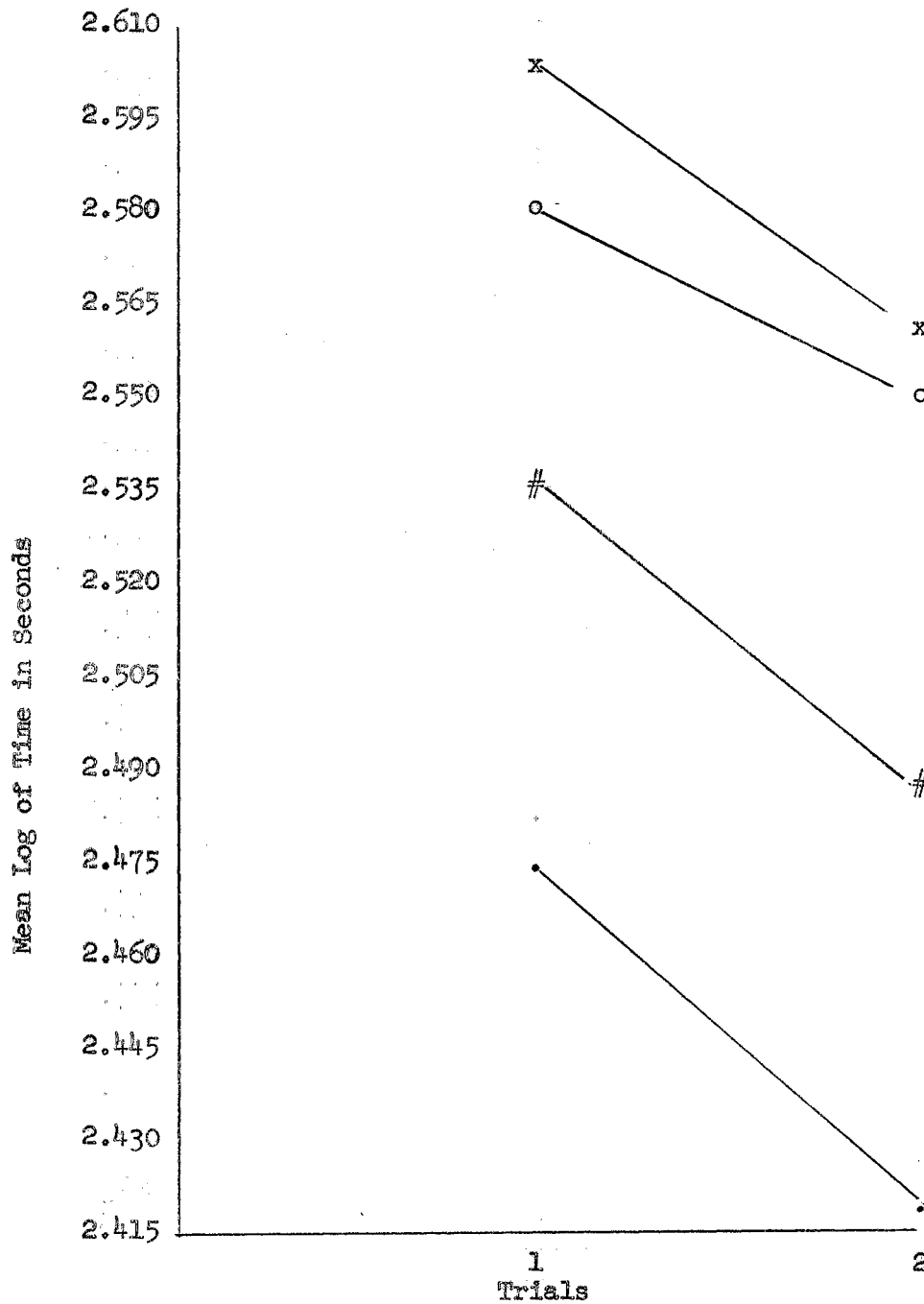


Figure 10 Performance on the Pegboard- Subjects Chosen for Their Anxiety Test Scores

Anxiety group that was not reinforced took less time to complete the task on both Trials with the Pegboard, and that the Low Anxiety, Reinforced group spent more time on both Trials. The failure of the interaction of Trials with Reinforcement and with Anxiety to reach statistical significance that motivational variables other than those posited throughout this paper may be operating.

Subjectively Determined Degree of Social Deprivation

In seeking factors which might reflect differences in performance on the experimental tasks, the experimenter rated the pre-institutional histories of the eighty-four subjects previously used in the experiment for the degree of social reinforcement they had received during their preinstitutional period. A holistic approach was used on a four point scale ranging from No Deprivation to Severely Deprived. Factors that were noted included the number of families the person had lived with, number of visits to the person after placement in the institution, relationship with the family, and the number of times the person was taken home after placement in the institution. No quantitative weighting was given to these factors.

Matching for chronological age, mental age, and whether or not they had received verbal reinforcement during the experiment, four groups of eight subjects each were composed. Two groups had received verbal reinforcement and two groups had not. One group in each of the reinforcement conditions had a history of severe social deprivation before they were placed in the institution; the other groups had had little social deprivation. Germane means and ranges are given in Table XXIII (in the Appendix), the analysis of variance for these characteristics is given in Table XXIV (in the Appendix).

Table XII shows that the only significant source of variance in performance on the Pegboard by the subjects selected for differences in pre-institution social deprivation was the interaction of Reinforcement X Deprivation ($p < .05$). Figure 11 shows that the group that had experienced Mild Social Deprivation and received verbal reinforcement did the Pegboard in the fastest time on both Trials. The other group that had been classified as having Mild Deprivation--but were not reinforced--took the greatest amount of time to complete the second Trial.

Performance on Hard and Easy Tasks

Extreme Index Scores

The procedure in selecting these groups has been described in an earlier section. Means and ranges for these groups on chronological age and mental age are given in Table XVIII in the Appendix.

Table XIII shows that the main effects reaching significance in the analysis of this group were those attributable to Task Difficulty and to Trials (both at the .01 level). Other findings significant at the .01 level were the first order interactions of Tasks X Trials, and the second order interactions of Reinforcement X Task X Trials. The second order interaction of Index X Tasks X Trials reached the .05 level of statistical significance.

Figure 12 indicates that the Low Index, Not Reinforced group placed the highest number of chips on the first trial when the task was Easy (however, all four groups were quite close together on this trial). On the final trial, the High Index, Not Reinforced group placed the most chips (however the Low Index, Not Reinforced group did almost as well.) The fewest number of chips placed on both the first and last trials was

TABLE XII

ANALYSIS OF VARIANCE OF THE PERFORMANCES ON THE PEGBOARD
 BY SUBJECTS REPRESENTING THE MOST SOCIALLY DEPRIVED
 AND THOSE HAVING HAD THE LEAST AMOUNT OF
 SOCIAL DEPRIVATION ACCORDING TO A
 SUBJECTIVE RATING

Source of Variance	df	SS	MS	F
Total (adj.)	63	1.052		
Between Persons	31			
Reinforcement	1	0.004	0.004	0.282
Social Deprivation	1	0.015	0.015	1.177
Reinforcement X Social Deprivation	1	0.056	0.056	4.500*
Error (a)	28	0.346	0.012	
Within Persons	35			
Trials	1	0.031	0.031	1.657
Trials X Reinforcement	1	0.004	0.004	0.023
Trials X Social Deprivation	1	0.005	0.005	0.024
Trials X Reinforcement X Social Deprivation	1	0.010	0.010	0.556
Error (b)	31	0.581	0.019	

*Significant at the Five Per Cent Level.

x-x-x Mild Deprivation, Reinforced
.-.-.- Mild Deprivation, Not Reinforced
#-#-# Severe Deprivation, Reinforced
o-o-o Severe Deprivation, Not Reinforced

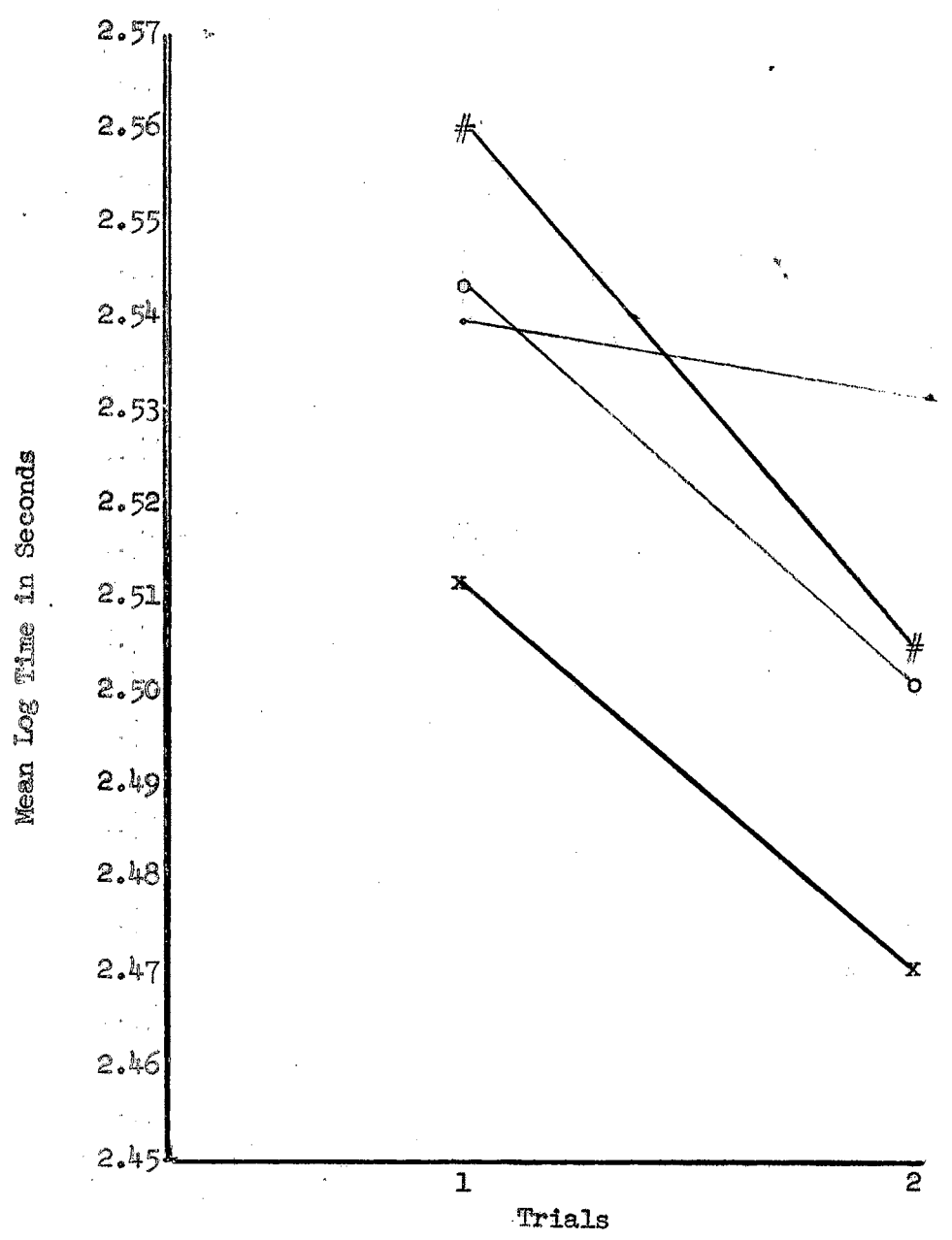


Figure 11 Performance on the Pegboard- Groups Chosen Subjectively for Extremes of Deprivation

TABLE XIII

ANALYSIS OF VARIANCE OF PERFORMANCE IN PLACING CHIPS
BY PERSONS CHOSEN FOR EXTREME SCORES ON THE
EXPERIMENTAL INDEX

Source of Variance	df	SS	MS	F
Total (Adj.)	319	19,694.775		
Between Persons	19	4,935.025		
Reinforcement	1	2.500	2.599	0.008
Index Score	1	133.225	133.225	0.446
Reinforcement X Index	1	22.50	22.500	0.075
Persons w. Groups	16	4,776.80	298.55	
Within Persons	140	14,759.75		
Tasks	1	8,584.900	8,584.900	51.691**
Reinforcement X Tasks	1	119.650	119.650	0.720
Index X Tasks	1	84.725	84.725	0.510
Reinforcement X Index X Tasks	1	0.625	0.625	0.004
Tasks X Persons w. Groups	16	2,657.300	166.081	
Trials	3	536.725	178.908	10.165**
Reinforcement X Trials	3	59.570	19.857	1.128
Index X Trials	3	33.225	11.075	0.629
Reinforcement X Index X Trials	3	142.930	37.643	2.139
Trials X Persons w. Groups	48	844.800	17.600	
Tasks X Trials	3	526.900	175.635	11.339**
Reinforcement X Task X Trials	3	309.180	103.060	6.653**
Index X Tasks X Trials	3	182.775	60.925	3.933*
Reinforcement X Index X Task X Trials	3	57.30	19.10	1.233
Tasks X Trials X Persons w. Groups	48	743.50	15.490	

**Significant at the One Per Cent Level.

x-x-x Low Index, Reinforced
 .-.-. Low Index, Not Reinforced
 #-#-# High Index, Reinforced
 o-o-o High Index, Not Reinforced

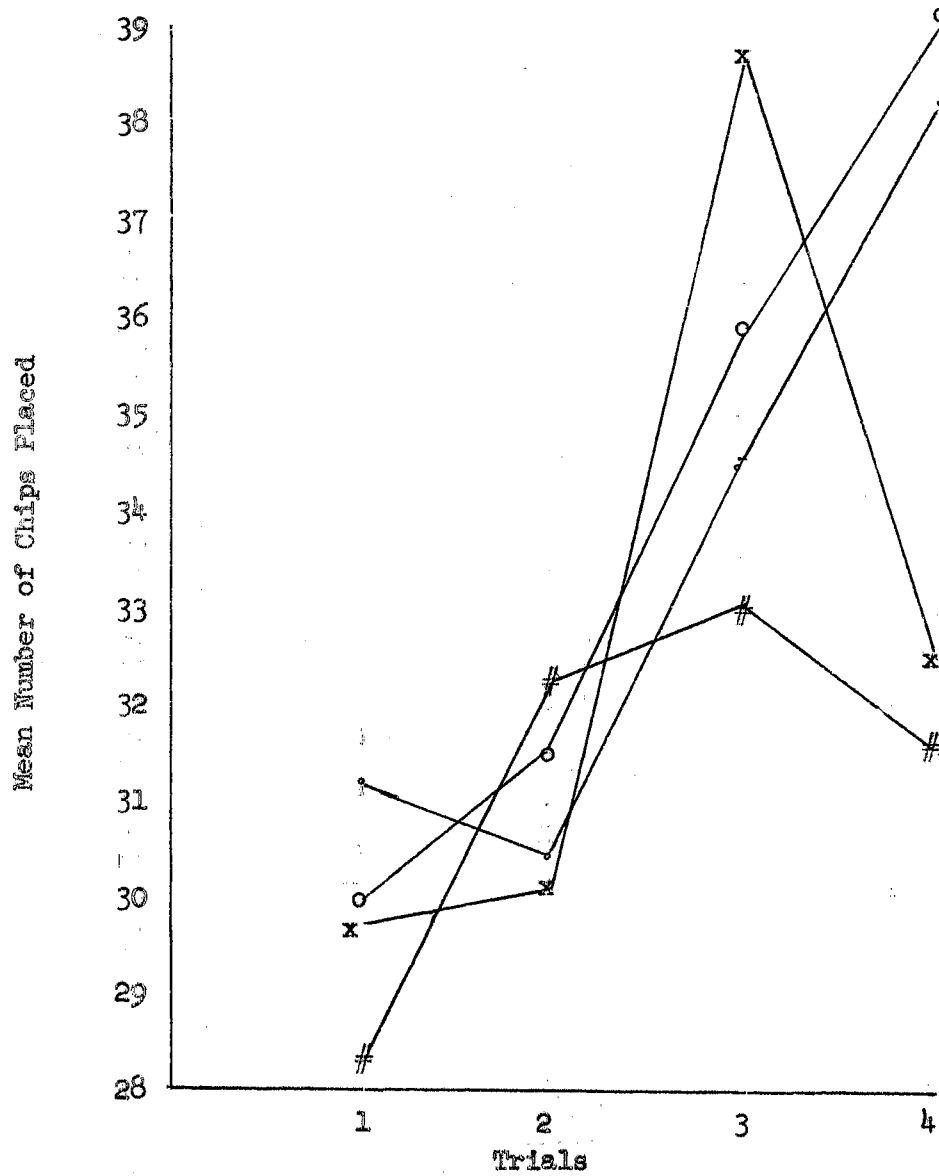


Figure 12 Performance on the Easy Task- Subjects With Extreme Scores on the Index

accomplished by the High Index, Reinforced group. These findings are not in the direction predicted if the Index does indicate how much drive retardates have for social reinforcement.

On the Hard task, the greatest number of chips placed on all trials was done by the Low Index, Reinforced group (see Figure 13). The other Low Index group placed the next highest number of chips on all trials, and the performances of both High Index groups were indistinguishable.

These data again suggest that motivational variables not assessed in this study are possibly responsible for the results.

Anxiety Scores

In those subjects selected for extreme scores on the anxiety scale, variance on the Hard and Easy tasks appear to be due the following: Task Difficulty, Trials, the first order interaction of Reinforcement X Trials, the first order interaction of Tasks by Trials, the second order interactions of Reinforcement X Anxiety X Trials and that of Reinforcement X Tasks X Trials (all at the .01 level--as is the interaction of Reinforcement X Anxiety X Tasks X Trials). Table XIV also shows that the .05 level was attained by the interaction of Reinforcement X Anxiety, and the interaction of Anxiety X tasks.

On both Figures 14 and 15, the highest number of chips placed on the initial and the concluding trials on the two types of tasks was done by the Low Anxiety, Not Reinforced groups; and the fewest number of chips placed on both final trials was done by the Low Anxiety, Reinforced group.

Subjectively Determined Degree of Social Deprivation

Table XV, which gives the analysis of variance for these groups (the selection procedures were described in an earlier section),

x-x-x Low Index, Reinforced
 .-.-. Low Index, Not Reinforced
 #-#-# High Index, Reinforced
 o-o-o High Index, Not Reinforced

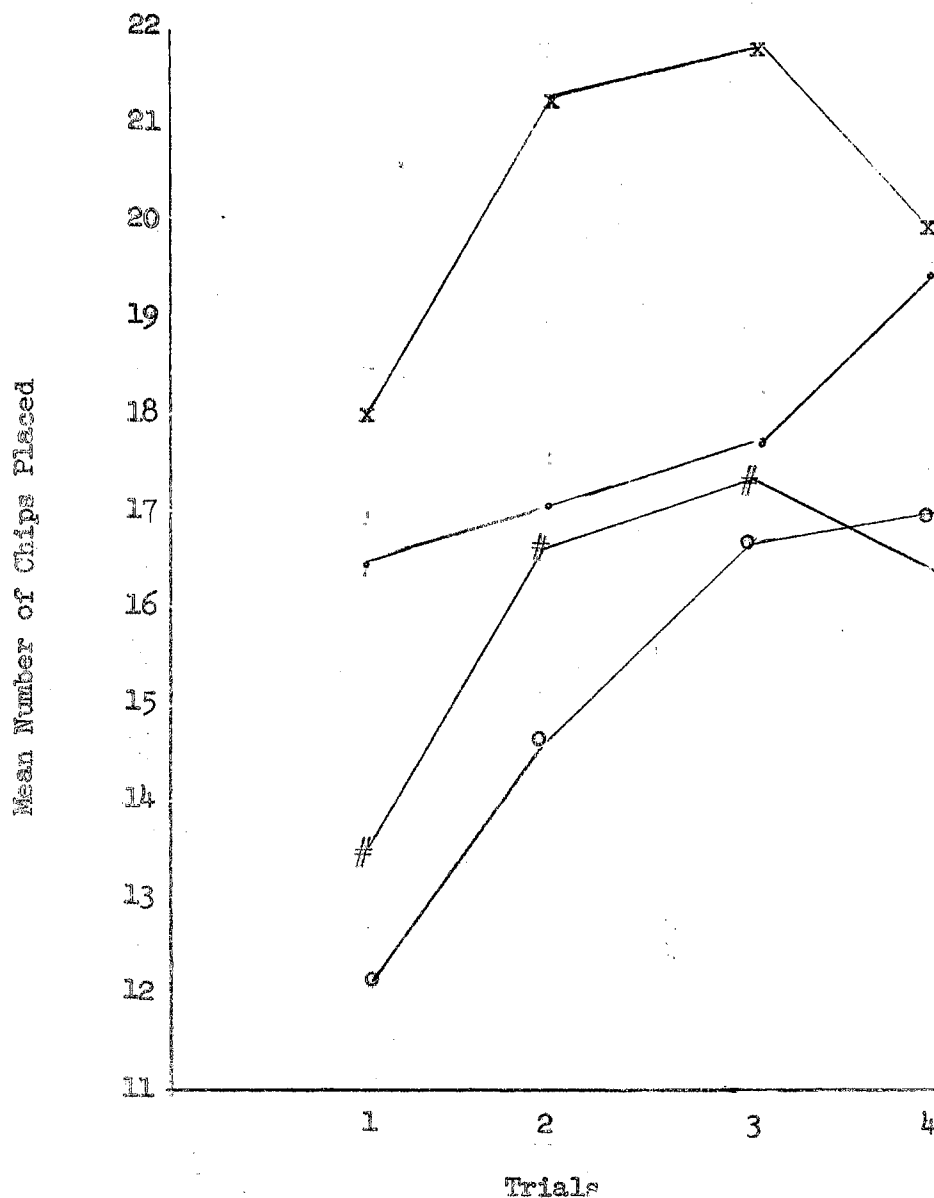


Figure 13 Performance on the Hard Task- Subjects With Extreme Scores on the Index

TABLE XIV
ANALYSIS OF VARIANCE OF PERFORMANCE IN PLACING
CHIPS BY PERSONS CHOSEN FROM EXTREME
SCORES ON THE ANXIETY SCALE

Source of Variance	df	SS	MS	F
Total (Adj.)	319	43,245.672		
Between Persons	39	14,445.297		
Reinforcement	1	434.778	434.778	1.308
Anxiety	1	389.403	389.403	1.171
Reinforcement X Anxiety	1	1,651.653	1,651.653	4.968*
Persons w. Groups	36	11,969.463	332.485	
Within Persons	280	28,800.375		
Task Difficulty	1	18,574.706	18,574.706	125.311**
Reinforcement X Tasks	1	328.656	328.656	2.217
Anxiety X Tasks	1	707.731	707.731	4.775*
Reinforcement X Anxiety X Task Difficulty	1	439.453	439.453	2.965
Task Difficulty X Persons w. Groups	36	5,336.250	148.229	
Trials	3	1,197.034	399.011	36.251**
Reinforcement X Trials	3	281.884	93.961	8.536**
Anxiety X Trials	3	46.609	15.536	1.411
Reinforcement X Anxiety X Trials	3	138.959	46.320	4.208**
Trials X Persons w. Groups	108	1,188.737	11.007	
Tasks X Trials	3	105.559	35.186	15.979**
Reinforcement X Tasks X Trials	3	92.334	30.778	13.977**
Anxiety X Tasks X Trials	3	13.409	4.470	2.030
Reinforcement X Anxiety X Tasks X Trials	3	111.185	37.062	16.831**
Tasks X Trials X Persons w. Groups	108	237.869	2.202	

*Significant at the Five Per Cent Level.

**Significant at the One Per Cent Level.

x-x-x Low Anxiety, Reinforced
 .-.-. Low Anxiety, Not Reinforced
 #-#-# High Anxiety, Reinforced
 o-o-o High Anxiety, Not Reinforced

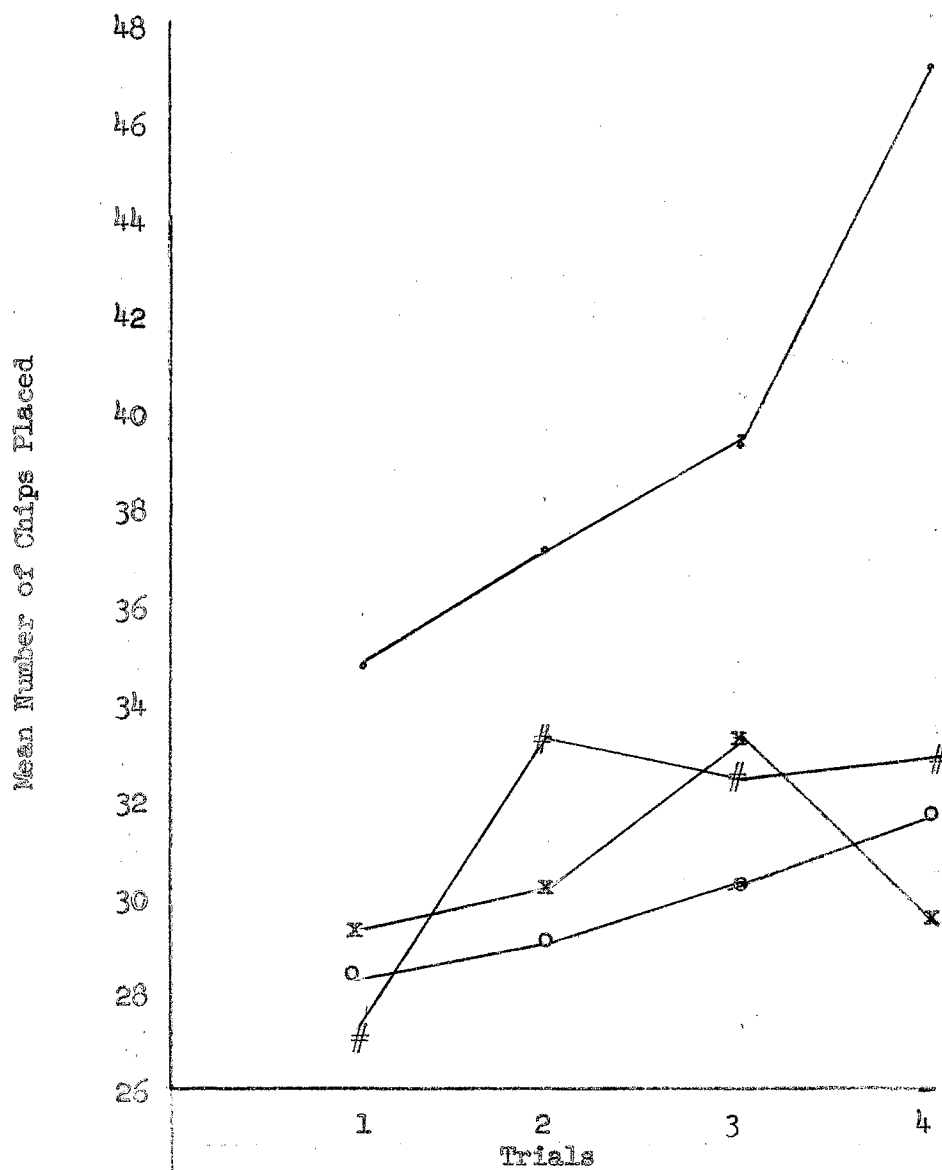


Figure 14 Performance on Easy Task -Subjects With Extreme Scores on the CMAS

x-x-x Low Anxiety, Reinforced
 .-.-. Low Anxiety, Not Reinforced
 #-#-# High Anxiety, Reinforced
 o-o-o High Anxiety, Not Reinforced

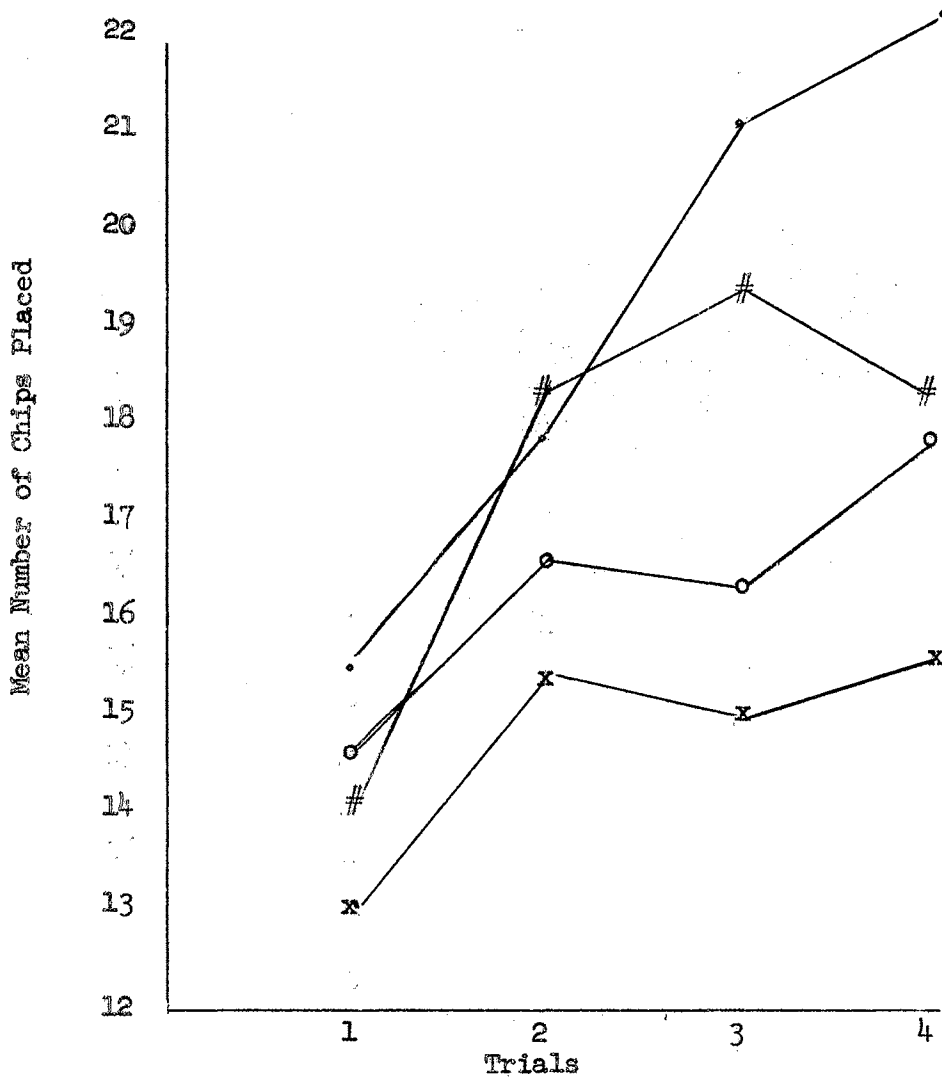


Figure 15 Performance on the Hard Task- Subjects With Extreme Scores on the CMAS

TABLE XV
ANALYSIS OF VARIANCE OF PERFORMANCE IN PLACING CHIPS
BY SUBJECTS REPRESENTING THE EXTREMES OF
SOCIAL DEPRIVATION

Source of Variance	df	SS	MS	F
Total (Adj.)	255	40,226.3399		
Between Persons	31	19,694.465		
Reinforcement	1	30.941	30.941	.005
Deprivation Rating	1	957.129	957.129	1.433
Reinforcement X Deprivation Rating	1	3.285	3.285	.005
Persons w. Groups	28	18,703.11	667.968	
Within Persons	224	20,531.875		
Task Difficulty	1	8,175.477	8,175.477	127.124**
Reinforcement X Tasks	1	1,322.383	1,322.383	20.652**
Deprivation X Tasks	1	459.696	459.696	7.149**
Reinforcement X Deprivation X Tasks	1	372.973	372.973	5.800*
Tasks X Persons w. Groups	28	1,800.704	64.311	
Trials	3	912.297	304.099	10.983**
Reinforcement X Trials	3	469.715	156.572	5.655**
Deprivation Score X Trials	3	464.804	154.935	5.596**
Reinforcement X Deprivation Trials	3	468.183	156.061	5.637**
Trials X Subj. w. Groups	84	2,325.683	27.687	
Tasks X Trials X Deprivation Reinforcement X Tasks X Trials	3	500.478	166.826	6.421**
Deprivation X Tasks X Trials	3	388.923	129.641	4.990**
Reinforcement X Deprivation Tasks X Trials	3	347.512	115.837	4.459**
Tasks X Trials	3	340.532	113.511	4.369**
Tasks X Trials X Persons w. Groups	84	2,182.515	25.980	

*Significant at the Five Per Cent Level.

**Significant at the One Per Cent Level.

indicates that except for Reinforcement, Deprivation Rating, and the interaction of Reinforcement X Deprivation Rating, all of the other effects and interactions were statistically significant. Of these, all reached the .01 level, except for the second order interaction of Reinforcement X Deprivation X Task which attained the .05 level of significance.

Figures 16 and 17 indicate that on both the Hard task and the Easy task, one of the Severe Deprivation groups placed the highest number of chips (the Reinforced group of the Easy task; the Non-Reinforced, on the Hard task.) Although the former of these findings is in accord with predictions; the latter is not. Another finding that is inconsistent with the predictions is that on both tasks, one of the Mild Deprivation groups placed fewer chips on the first trial than did one of the Severe Deprivation groups, but on the final trial, the former group placed more than the latter.

x-x-x Mild Deprivation, Reinforced
 .-.-. Mild Deprivation, Not Reinforced
 #-#-# Severe Deprivation, Reinforced
 o-o-o Severe Deprivation, Not Reinforced

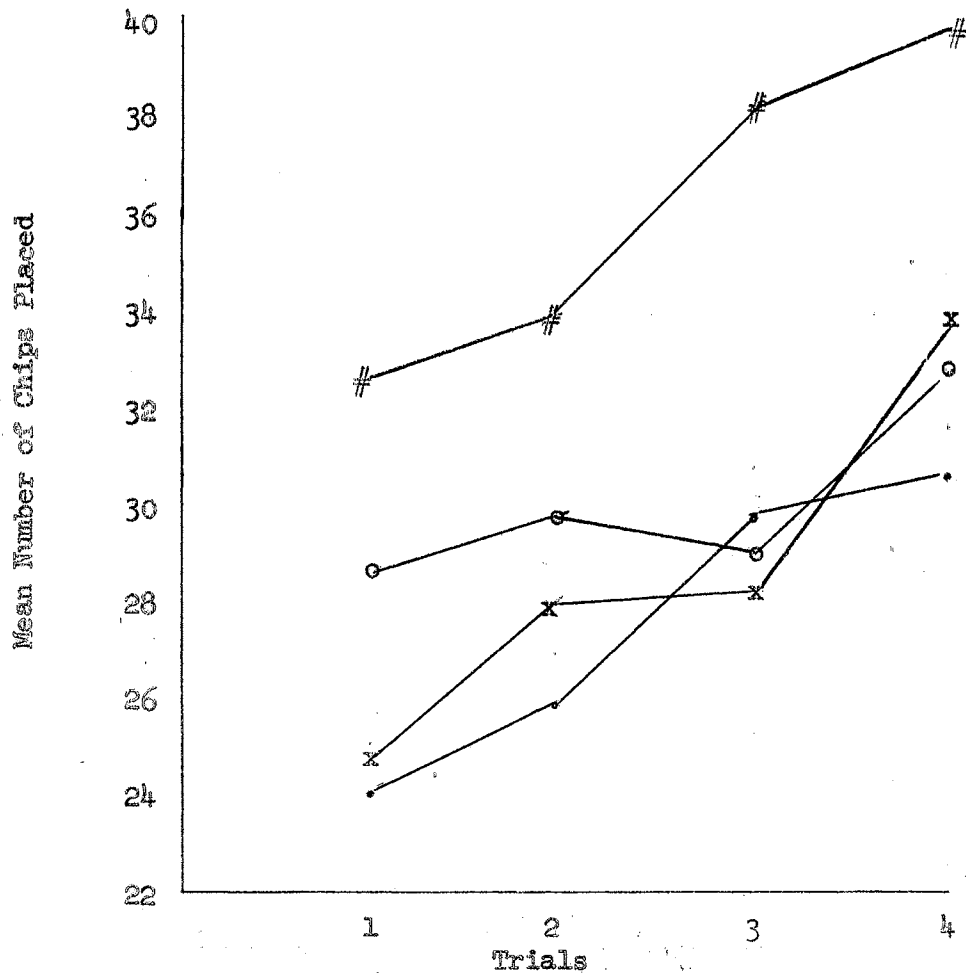


Figure 16 Performance on the Easy Task- Subjects Chosen for Extremes of Social Deprivation

x-x-x Mild Deprivation, Reinforced
 .-.-. Mild Deprivation, Not Reinforced
 #-#-# Severe Deprivation, Reinforced
 o-o-o Severe Deprivation, Not Reinforced

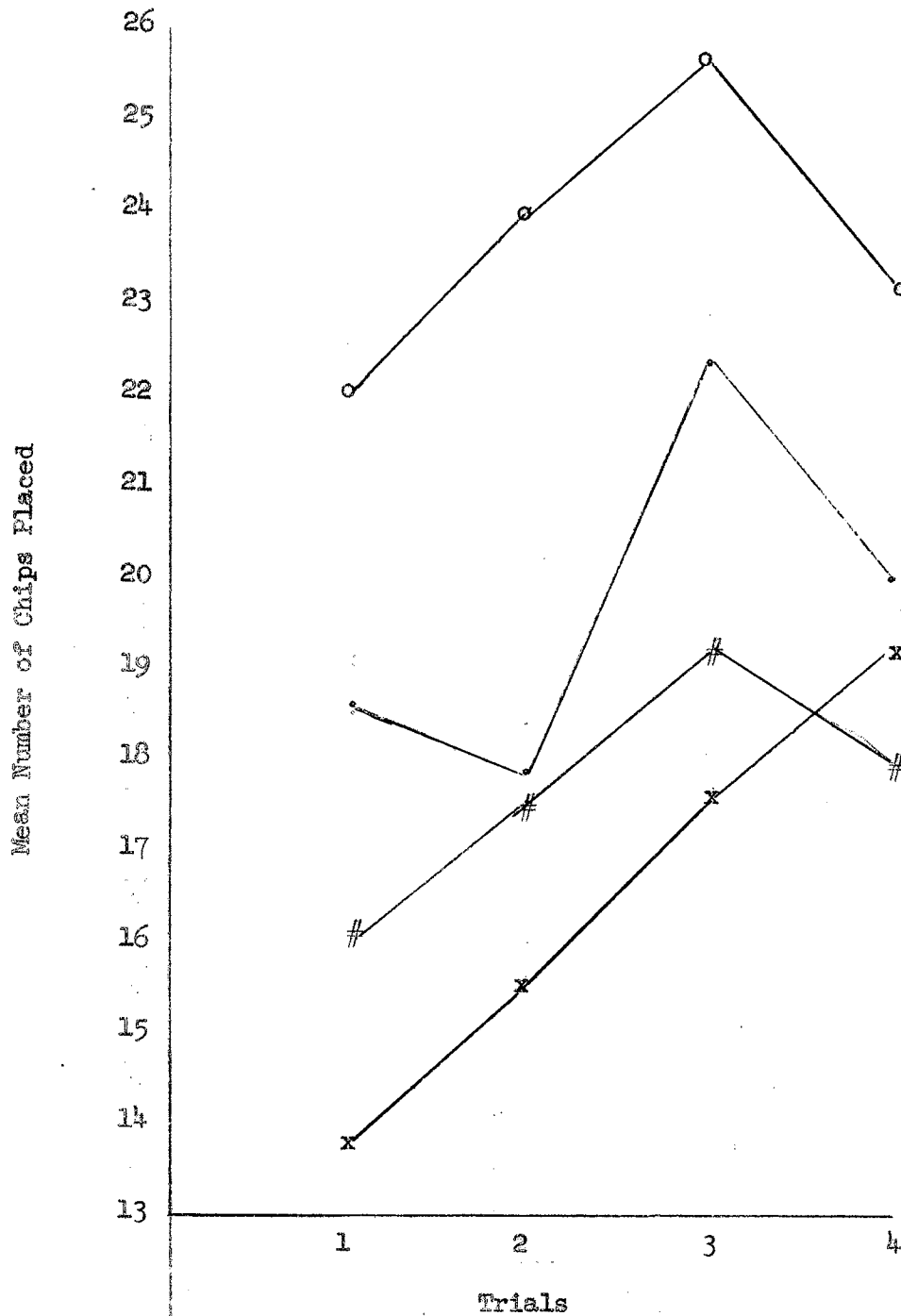


Figure 17 Performance on the Hard Task- Subjects From Extremes of Social Deprivation

APPENDIX B

INSTRUCTIONS USED IN ADMINISTERING THE CHILDREN'S MANIFEST ANXIETY SCALE

"I am going to ask you some questions, one at a time. When I have asked you the question, you are to put a circle around the 'Yes' by that question, or you are to put a circle around the 'No' by that question. I'll tell you the number of each question when I read it to you. Some of the questions are very personal, but no one will see them besides me. It is very important that you try to answer each question like you feel. Just put down what you feel about the question right after I finish reading it. Now, I'm going to give you two examples.

I am a boy.

What did you put down on your sheet? If you are a boy, you would put a circle around 'Yes'; if you are a girl, you would put a circle around 'No'. Now for the second example.

I am a girl.

If you are a boy, you would put a circle around 'No' this time; if you are a girl, you would put a circle around the 'Yes'. Now please do the best you can. Answer all the questions. Raise your hand for help."

TABLE XVI
SUMMARY: TABLE OF CORRELATIONS

A. Correlations Between the Children's Manifest Anxiety Scale, and

1. Chronological Age.	+.061
2. Index.	+.037
3. Age When Placed in the Institution . . .	+.160
4. Time in the Institution.	-.178
5. Full Scale Mental Age.	-.252

B. Correlations Between the Index, and

1. Chronological Age.	+.098
2. Age When Placed in the Institution . . .	+.069
3. Time in the Institution.	+.025
4. Full Scale Mental Age.	+.038

C. Correlations Between the Full Scale Mental Age, and

1. Stanford-Binet Vocabulary M.A.	+.677
2. Peabody Picture Vocabulary Test M.A. . .	+.740

TABLE XVII

ANALYSIS OF VARIANCE OF ANY DIFFERENCES AMONG
THE OLDER GROUPS FOR CHRONOLOGICAL AGE,
MENTAL AGE, AND ANXIETY

Source of Variance	df	SS	MS	F
Chronological Age				
Total (Adj.)	63	87.881		
Groups	3	3.793	1,264	0.902
Error	60	84.088	1,402	
Mental Age				
Total (Adj.)	63	152.962		
Groups	3	2.478	0.826	0.329
Error	60	150.482	2.508	
Anxiety Score				
Total (Adj.)	63	4962.00		
Groups	3	78.50	26.167	0.328
Error	60	4783.50	79.725	

TABLE XVIII

ANALYSIS OF VARIANCE OF ANY DIFFERENCES IN
CHRONOLOGICAL AGE AND MENTAL AGE IN
THE YOUNG GROUP

Source of Variance	df	SS	MS	F
Chronological Age				
Total	19	31.781		
Groups	3	0.373	0.124	0.063
Error	16	31.308	1.957	
Mental Age				
Total	19	14.691		
Groups	3	2.041	0.680	0.861
Error	16	12.650	0.791	

TABLE XIX

MEANS AND RANGES OF CHRONOLOGICAL AGES AND MENTAL AGES OF
SUBJECTS CHOSEN FOR EXTREME SCORES ON THE INDEX

	GROUP 1 HIGH INDEX REINFORCED	GROUP 2 HIGH INDEX NOT REINFORCED	GROUP 3 LOW INDEX REINFORCED	GROUP 4 LOW INDEX NOT REINFORCED
Number of Subjects	5	5	5	5
Means				
Chronological Age	15.74	15.60	15.34	15.42
Mental Age	9.09	9.24	9.10	8.25
Ranges				
Chronological Age	13.09- 17.17	13.33- 17.17	14.59- 16.59	13.08- 16.67
Mental Age	7.42- 12.17	7.42- 11.17	7.75- 10.42	6.50- 9.92

TABLE XX

ANALYSIS OF VARIANCE OF CHRONOLOGICAL AGES, MENTAL AGES
AND INDEX SCORES OF SUBJECTS CHOSEN FOR
EXTREME SCORES ON THE INDEX

Source of Variance	df	SS	MS	F
Chronological Age				
Total (Adj.)	19	32.937		
Groups	3	0.339	0.113	0.057
Error	16	31.598	1.975	
Mental Age				
Total (Adj.)	19	73.103		
Groups	3	2.303	.768	0.178
Error	16	70.800	4.425	
Index Score				
Total (Adj.)	19	0.9736		
Groups	3	0.6832	0.228	12.545**
Error	16	0.2900	0.018	

**Significant at the One Per Cent Level.

TABLE XXI

MEANS AND RANGES FOR CHRONOLOGICAL AGES, MENTAL AGES, AND ANXIETY SCALE SCORES OF SUBJECTS CHOSEN FROM EXTREMES ON THE ANXIETY SCALE

	GROUP 1 LOW ANXIETY REINFORCED	GROUP 2 HIGH ANXIETY REINFORCED	GROUP 3 LOW ANXIETY NOT REINFORCED	GROUP 4 HIGH ANXIETY NOT REINFORCED
Number of Subjects	10	10	10	10
Means				
Chronological Age	15.39	15.59	15.87	15.68
Mental Age	8.99	8.56	9.00	9.07
Anxiety Score	22.00	40.70	20.70	38.70
Ranges				
Chronological Age	13.09- 17.17	14.59- 16.75	14.16- 17.17	13.33- 17.17
Mental Age	6.92- 12.17	5.33- 11.25	7.50- 10.42	7.17- 9.92
Anxiety Score	17-27	34-46	12-30	32-47

TABLE XXII

ANALYSIS OF VARIANCE OF DIFFERENCES IN CHRONOLOGICAL AGES, MENTAL AGES, AND ANXIETY SCALE SCORES BY THOSE CHOSEN FROM EXTREME SCORES ON THE ANXIETY SCALE

Source of Variance	df	SS	MS	F
Chronological Age				
Total (Adj.)	39	50.492		
Groups	7	5.877	1.825	0.593
Error	32	44.614	1.394	
Mental Age				
Total (Adj.)	39	73.102		
Groups	7	2.302	0.329	0.149
Error	32	70.800	2.213	
Anxiety Scores				
Total (Adj.)	39	4,853.498		
Groups	7	4,487.498	641.711	56.106**
Error	32	365.000	11.438	

**Significant at the One Per Cent Level.

TABLE XXIII

MEANS AND RANGES FOR THE CHRONOLOGICAL AGES AND THE MENTAL AGES OF PERSONS SUBJECTIVELY CHOSEN AS REPRESENTING THE EXTREMES OF SOCIAL DEPRIVATION

	GROUP 1 HIGH SOCIAL DEPRIVATION REINFORCED	GROUP 2 HIGH SOCIAL DEPRIVATION NOT REINFORCED	GROUP 3 LOW SOCIAL DEPRIVATION REINFORCED	GROUP 4 LOW SOCIAL DEPRIVATION NOT REINFORCED
Number of Subjects	8	8	8	8
Means				
Chronological Age	14.56	14.49	15.16	15.45
Mental Age	8.57	8.62	7.90	7.74
Ranges				
Chronological Age	11.92- 16.75	10.59- 16.75	12.33- 17.17	13.82- 17.35
Mental Age	4.59- 11.42	6.00- 10.42	6.25- 11.17	7.00- 9.75

TABLE XXIV

ANALYSIS OF VARIANCE OF ANY DIFFERENCES IN CHRONOLOGICAL AGES OR MENTAL AGES BY PERSONS SUBJECTIVELY CHOSEN AS REPRESENTING THE EXTREMES OF SOCIAL DEPRIVATION

Source of Variance	df	SS	MS	F
Chronological Age				
Total (Adj.)	31	110.307		
Groups	3	5.845	1.982	0.531
Error	28	104.462	3.731	
Mental Age				
Total	31	80.225		
Groups	3	4.934	1.645	0.446
Error	28	75.291	3.689	

TABLE XXV

MEANS AND RANGES FOR THE CHRONOLOGICAL AGE, MENTAL AGE,
INDEX SCORE AND TIME IN THE INSTITUTION FOR
PERSONS CHOSEN FOR DIFFERENT LENGTHS
OF TIME IN THE INSTITUTION

	Group 1	Group 2	Group 3
Number of Subjects	10	10	10
Means			
Chronological Age	14.186	14.693	14.376
Mental Age	7.651	8.372	7.744
Index Score	1.004	1.759	4.591
Years in Institution	0.674	1.759	4.591
Ranges			
Chronological Age	9.92 16.53	9.59- 16.75	9.92- 16.67
Mental Age	5.33- 10.00	5.82- 11.42	6.59- 9.59
Index Score	0.60-1.60	0.83-1.17	0.75-1.30
Years in Institution	0.50-0.92	1.00-2.67	2.75-6.42

TABLE XXVI

ANALYSIS OF VARIANCE OF DIFFERENCES IN CHRONOLOGICAL
AGES, MENTAL AGES, INDEX SCORES, AND YEARS IN THE
INSTITUTION FOR PERSONS CHOSEN TO REPRESENT
DIFFERENT DEGREES OF INSTITUTIONALIZATION

Source of Variance	df	SS	MS	F
Chronological Age				
Total (adj.)	29	1.064		
Groups	2	0.001	0.0004	0.010
Error	27	1.053	0.0390	
Mental Age				
Total (adj.)	29	85.848		
Groups	2	18.882	9.441	3.807*
Error	27	66.966	2.480	
Index Score				
Total (adj.)	29	138.041		
Groups	2	1.373	0.686	0.010
Error	27	136.669	5.062	
Years Institutionalized				
Total (adj.)	29	102.240		
Groups	2	86.645	43.323	75.005***
Error	27	15.595	0.578	

* Significant at the Five Per Cent Level.
*** Significant at the One Per Cent Level.

VITA

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Candidate for the Degree of

Doctor of Philosophy

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