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WITH THE EDUCABLE MENTALLY RETARDED AND ITS
RELATIONSHIP TO THE CONSTRUCT OF LOCUS OF
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THE EFFECTIVENESS OF SILENCE AS A REINFORCER
WITH THE EDUCABLE MENTALLY RETARDED
AND ITS RELATIONSHIP TO
THE CONSTRUCT OF LOCUS OF CONTROL

DISSertation
Presented in Partial Fulfillment of the
Requirements for the Degree Doctor of
Philosophy in the Graduate School of
The Ohio State University

By
William George Callahan, B.S.Ed.

* * * * *

The Ohio State University
1971

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CHAPTER I: INTRODUCTION

Communication in our society is a multibillion dollar industry and takes many forms. We have publishing companies which produce many magazines, books, journals, and newspapers that use the visual modality to communicate. We also have the radio and telephone companies that use the auditory modality. Television and the movie industries utilize both the auditory and visual modalities to transmit meaning. As can be seen, the above industries are based on the presence of language in either the spoken or written form. In recent years, people have become interested in methods of communication in which there is no need to rely on the spoken or written word.

The newly expanding field of science called kinesics is one example of this growing interest in the area of non-verbal communication. Kinesics is the study of body language or how the holding or moving of different parts of the body conveys meaning. (Fast, 1970).

There is still another method of communication which has been researched on an intermittent basis for the past fifteen years. This has to do with the meanings attached
to silence or the absence of oral communication. Poets have been interested in silence for many years. The Shorter Bartlett's Familiar Quotations (Morley, 1964) lists forty-nine references to silence. One of the more widely known questions discussed by people just becoming interested in philosophy has to do with silence (i.e., If a tree fell in the middle of the forest and there was no one around, is there any sound?).

It is on the topic of silence that this dissertation is concerned, not in the abstract but in the applied situation.

Problem Statement:

Utilizing a social learning point of view, it has been postulated that the mentally retarded have had a greater history of failure experiences than the "normal" child (Cromwell, 1963; Heber, 1957; Zigler, 1962). Although data has been presented which questions this formulation (Gruen & O'Donnell, 1969), the majority of research agrees that "... by virtue of his [the mentally retarded child's] limited capacity, he would be likely to meet with more failure than the normal child in his day-by-day goal-directed behavior" (Cromwell, 1961, p.46).

It has been stated (McGee, 1970) that among special
class teachers there is a commonly held feeling that since the mentally retarded meet so many failure experiences in their lifetime, the school setting should be one in which there are a great many success experiences. "It is not uncommon for these teachers to engineer or even contrive success." (McGee, 1970, p. 757). Gruen & Zigler (1968) have alluded to this point in explaining the results of their study as have Gruen & O'Donnell (1969). Guskin (1963) does not restrict this feeling to teachers but extends it to those who interact with the retardate. A common method is to structure the environment so that the retarded will meet success with the teacher verbally reinforcing the effectiveness of the student by saying words to the effect of "That's correct," "You're right," etcetera. Problems arise when the student does not perform in a successful manner. The teacher is now faced with the problem of what to say. One of three choices is now available to the teacher: 1) to positively reinforce the student's attempts to perform successfully, 2) to negatively reinforce the student by telling him verbally that he failed, or 3) to remain silent.

The last choice, silence, has been studied as a reinforcer for the past fifteen years. It has been found that silence acquires reinforcement value opposite in direction from the reinforcer it has been paired with in
verbal discrimination learning experiments (Buchwald, 1962). The little work reported on visual discrimination learning seems to confirm the results of research done in verbal learning (Spence, 1963).

If these results are found to hold for mentally retarded subjects, then the effect of silence by a special class teacher who utilizes verbal praise frequently will be directly opposite to what the teacher intends. This is especially true for those teachers who use verbal reinforcement in their behavior modification techniques. One of the principle dictums of behavior modification is to reward the desired behavior and ignore the undesired behavior. For the teacher using verbal reinforcement, the ignoring would be that of silence.

A second area to which these results would apply can be found in the diagnostic process. Most standardized tests stipulate that the examiner should establish rapport with the examinee, offer encouragement, and avoid noting the correctness of the response (Dunn, 1965; French, 1964; Slosson, 1963; Terman & Merrill, 1960; Wechsler, 1958). If the words of encouragement are viewed as positive verbal reinforcers, then by remaining silent, the examiner may in fact be telling the examinee that he is wrong, thus violating the intent of the protocol with the possible result of lowering the examinee's actual performance level.
If one were to describe the person who would most likely interpret silence as reward or punishment, it would be that person who sees other people controlling the outcome of events as compared to the person who sees himself controlling the outcome of events. Bialer (1961) has developed a construct that pertains to these types of people which he has labeled "Locus of Control." The first person described would have an external locus of control (ELC) while the second person would have an internal locus of control (ILC).

The topic of this research is the effectiveness of silence as a reinforcer for educable mentally retarded children and its relationship to locus of control. The problem is "Does silence act as a reinforcer (positive and/or negative) for the educable mentally retarded and is it related to locus of control (internal and external)?"

Hypotheses:

The major hypotheses generated are as follows:

H 1) The subjects will reach Criterion 1 in fewer trials under the conditions of "You're right-Silence" (RN) than when under the conditions of "You're wrong-Silence" (NW).

H 2) The subjects will reach Criterion 2 in fewer trials under the "You're wrong-Silence" treatment
than when under the "You're right-Silence" treatment.

H 3) The subjects with an Internal Locus of Control (ILC) will reach Criterion 1 in fewer trials than those subjects with an External Locus of Control (ELC).

H 4) The subjects with an External Locus of Control (ELC) will reach Criterion 2 in fewer trials than those subjects with an Internal Locus of Control (ILC).

Definition of Terms:

Subject (S) - A child with an Intelligence Quotient (IQ) of 50-80, a mental age (MA) of 5-8, attending a special class for the Educable Mentally Retarded, and not diagnosed as brain damaged.

Special Classes - Those classes administratively designated for children with IQs within the range of 50-80.

Educable Mentally Retarded (EMR) - For the purposes of this study, the EMR are those children who have an IQ of 50-80 and are found in classrooms administratively designated as special classes for the educable mentally retarded.

Locus of Control (LC) - A personality construct dealing with the person's perception of the source of control of the reinforcement he receives as measured by the Bialer-Cromwell Locus of Control Scale.

External Locus of Control (ELC) - The perception of
positive and/or negative events as being unrelated to one's own behaviors in certain situations and therefore beyond personal control (Lefcourt, 1966). This is represented by a low score on the Bialer-Cromwell Locus of Control Scale.

Internal Locus of Control (ILC) - The perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control (Lefcourt, 1966). This is represented by a high score on the Bialer-Cromwell Locus of Control Scale.

Trial - The presentation of one 2" x 2" slide projected on the screen.

Dimension - A class of stimuli (e.g., color, shape, position).

Cue - A member of a class of stimuli (e.g., color—red, yellow, blue; shape—square, circle, triangle; position—first, second, third).

Reinforcer - A stimulus that affects the frequency of the behavior it follows.

Positive Reinforcer - A stimulus which increases the frequency of the behavior that it follows.

Positive Reinforcement - The presentation of a positive reinforcer.

Negative Reinforcer - A stimulus that decreases the frequency of the behavior it follows.
Negative Reinforcement - The presentation of a negative reinforcer.

Silence - The absence of any verbal reinforcement.

Criterion 1 - The selection of nine correct responses in a row, eight of which are either reinforced by silence or by "You're right" while the ninth is reinforced by "You're wrong" or silence.

Criterion 2 - The point at which the subject no longer selects the cue used in attaining Criterion 1.

Failure Criterion - The inability of the subject to attain Criterion 1 in 80 trials. If the 80th trial consists of the selection of the correct cue, the number of trials was continued until the attainment of criterion 1 or the subject stopped selecting on the basis of the correct cue.

Discriminative Stimulus - A cue stimulus that releases the operant response (English & English, 1958, p.526).

Relevant Dimension - That dimension which has been selected as being correct.

Irrelevant Dimensions - Those dimensions which have been selected as being incorrect.

Verbal Praise - "You're right" contingent on selecting the correct cue.

Verbal Punishment - "You're wrong" contingent on
selecting an incorrect cue.

Blank Trials - Those trials in which no verbal reinforcement is presented to the child.

Response Set - "A set to follow a certain pattern in responding" (English & English, 1958, p.496).
CHAPTER II: A REVIEW OF THE LITERATURE

The Construct of Locus of Control:

The following review of the literature on the construct of locus of control is of necessity a selective review. This is due to the fact that prior to 1970, there were at least 339 references dealing with the construct (MacDonald, 1971). The interest generated in locus of control can be seen in the fact that in the bibliography by Throop & MacDonald (1971) the fact is cited that of the 339 citations, 206 appeared after 1966. In a personal communication (MacDonald, 1971) that attempted to update the bibliography published, MacDonald included an additional 84 items.

This bibliography was not mentioned in any of the literature but MacDonald's name was received from Irving Bialer in a personal communication. Upon writing MacDonald in late December, 1970, soon after the bibliography was completed (it was accepted for publication on November 11, 1970), the examiner was informed that although 300 copies of the bibliography were made available, none was left. This is cited as further evidence of the
interest in this construct.

An overview of the development of the construct will be presented, then a discussion of the literature dealing with the Bialer-Cromwell Locus of Control Scale and its use with the mentally retarded, and finally a discussion of the tests available that measure the construct.

The role of reinforcement in our society is generally recognized by most people as being of prime importance in the developing of new behaviors and their maintenance as well as their performance. Although the man in the street may not be aware of the psychological terminology or the laws relating to reinforcement, he is keenly aware of them as they operate (e.g., a man works at his job, performs, and is paid for this work, thus reinforced).

J. B. Rotter has developed a theory of learning that he calls Social Learning Theory. It is discussed in length in his book, Social Learning and Clinical Psychology (Rotter, 1954) and to a lesser degree in a second book, Clinical Psychology (Rotter, 1964). It is within the framework of this theory that one can find the construct locus of control.

The Social Learning Theory postulates that there are objects in the person's environment toward which the individual is moving, and there are also objects in the environment from which the individual moves away. These
statements gave rise to the ideas of approach and avoidance behavior. Rotter (1964) believes that human behavior is determined by goals and that all behavior is directional. He distinguishes the psychologically based satisfactions from the biologically based satisfactions in that the former are the result of experience rather than instinct.

In discussing reinforcement, Rotter states that it "... acts to strengthen an expectancy that a particular behavior or event will be followed by that reinforcement in the future. Once an expectancy for such a behavior-reinforcement sequence is built up, the failure of the reinforcement to occur will reduce or extinguish the expectancy." (1966, p.2).

Rotter states that "... the potentiality of a given behavior or set of behaviors to occur in some specific situation is dependent on an individual's expectancy that the behavior will lead to a particular goal or satisfaction, the value that satisfaction has for him, and the relative strength of other behavior potentials in the same situation." (1964, p.59). This leads us to the formulation of the theory in mathematical format:

\[ BP = f(E \& RV) \]

which means that Behavior Potential (BP) is a function (f) of Expectancy (E) and Reinforcement Value (RV).

Both E and RV consist of two components. E consists
of generalized expectancies (GE) which are those expectancies of reinforcement that have been developed in other situations and generalized to the new situation, and situational expectancies (E') which are the reinforcement expectancies developed in the situation in question. An example of E is seen in the following statement made by some students, "I will do very well in graduate school (GE) except in statistics (E')." HV consists of the value of the present reinforcers and the expectancy that they will lead to other reinforcers that also have a place in the reinforcer hierarchy of the subject.

In a further discussion of reinforcement, Rotter discusses locus of control and its two components, "internal control" and "external control." To quote Rotter:

When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control. (1966, p.1).

These formulations have been systematically applied
with the mentally retarded, mainly in a series of studies by graduate students at George Peabody College during the late fifties and early sixties under the direction of R. Cromwell, a former student of Rotter's at The Ohio State University. Several studies were concerned with the manipulation of the reinforcement value portion of the formula. The results of these studies showed that the mentally retarded were affected in their performance by alterations in the reward value. (Gardner, 1957; Heber, 1959).

Other studies investigated the theoretical assumption that the mentally retarded differ from the "normal" child in that the former have a lower generalized expectancy for success and a higher tendency for avoidance behavior than the latter. One would thus get a cyclic effect in that a lowered GE would lead to a lowered BP, which in turn would increase the probability of failure, thereby lowering the GE (and E') even more. Heber (1957) showed that when mentally retarded and normal children are matched on the initial performance of a novel task, the mentally retarded's increment in performance will be greater than the increment for the normal children when both groups are exposed to a series of predominantly success trials. The basis for this finding within the Social Learning Theory framework is that since it is a
novel situation, the effect of $E'$ was not a confounding variable and only $GE$ was influencing the child's behavior. Therefore, the success experiences would be building up a positive $E'$ which would in turn lower the predictive influence of the $GE$.

Moss (1958) took Rotter's directionality concept and using it in combination with the concept of $GE$ formulated the construct of "success-striving versus failure-avoiding." The individual who was seen as "success-striving" was believed to have a high $GE$ for success and would respond to those cues which would lead to continued success. The "failure-avoiding" individual was believed to have a low $GE$ for success and would respond to those cues in the environment which would lead to the prevention of more failure. In a study involving four hypotheses based on the above construct, Moss was unable to validate his beliefs. Moss felt that there was a possibility that the subjects involved in his study were unable to conceptualize success and/or failure. Later studies (Bialer & Cromwell, 1960; Miller, 1961; Spradlin, 1960) obtained data which supported the belief in a developmental change in the reactions of educable retarded children to success and failure. Since the construct seemed to be conceptually valid, more studies were done in order to validate the construct. There was found to be partial
support of the construct.

To help explain the results of Moss' study, there was a redefining of success and failure. Up to this time, success and failure were looked at as the attainment or non-attainment of the goal. A new dimension to the above definitions was added. Success was still the attainment of a goal but now the individual was to see that it was due to his own effectiveness while failure was redefined as the non-attainment of the goal which the individual attributes to his personal lack of effectiveness.

This new definition required that previous studies in this area be looked at once again. One of the problems caused by this redefinition was that what was believed to be failure by the examiner may not have been viewed as failure by the examinee. A second problem was that now all avoidant behavior could not be seen as failure-avoidant nor could all goal attainments be interpreted as success-striving.

For his doctoral dissertation, Bialer took the new definition and the concept of its developmental nature and developed the formulation that the motivational system consists of two parts. The earlier appearing system is mainly biologically based (the pleasure-approach and pain-avoidance system) while the later system is elaborated from the earlier system but does not replace it.
It is in the later system in which we find the development of success-failure awareness. Also, we find that the individual develops a motivation to approach those situations which demonstrate the individual's effectiveness and to avoid those situations which would threaten his effectiveness. The development and "... magnitude of the later system develops as a function of the degree to which the child can associate and conceptualize event outcomes with his own behavior." (Cromwell, 1963, p.66). If the child is unable to do this or associates event outcomes with other people, this later system would not develop as great a magnitude.

Bialer then went on to test this formulation through three techniques. One was a verbally administered set of questions whereby the subject's responses could be checked for the degree to which he sees himself or others as controlling the outcome of events (Bialer-Cromwell Locus of Control Scale). The second technique was a repetition choice situation in which the subject could either return to a puzzle which he had completed or to the one he had failed. The third measure he used was a choice situation involving gratification pattern (immediate but small reward versus delayed but larger reward).

The hypotheses were that the above three measures would change with the increasing age (chronological age
and mental age) of the individual; that the mental age would be the more influential than chronological age; and, that the three measures would be significantly intercorrelated. All three of the hypotheses were accepted showing that the retarded do not differ qualitatively from normal children in the development of the ability to conceptualize success and failure. But the retarded were found to be chronologically older than normal children when looking at any given level.

Miller (1961) became interested in the construct of locus of control and expanded it into the area of learning by attempting to predict differences in learning rate from the subject's responses to the scale of locus of control developed by Bialer and Cromwell. Miller hypothesized that: 1) the ILC subject would be sensitive to cues within the task which would show his effectiveness while the ELC subject would be sensitive to cues which are external to the task reinforcers; 2) the ELC subject would develop a situational ILC by attending to those cues which were relevant to the task and lead to success when the task situation was positive; while if the situation was negative, the ELC subject would show a decrease in task attention ("task orientation" versus "task alienation"); 3) the different reactions to failure and success found in earlier studies (Gardner, 1957; Heber,
1959) could be explained by differences in locus of control rather than by differences in GE as they were originally explained; and 4) transfer of learning is influenced by situational ILC. Miller's results showed the first, second, and fourth hypotheses were correct. The third hypothesis could be accepted if one were to take the results of this study and apply them to the earlier studies, for locus of control could be seen as a major component of GE. Therefore, Miller's hypothesis would have a more narrow and more useful focus.

Butterfield & Butterfield (1961) in trying to look at similar ideas in a wider range of learning situations, hypothesized that whereas those individuals with an ILC would respond in terms of their own values, the ELC individuals would respond in a manner that would reflect the values of those around them. These writers found that for familialis in a school setting within an institution, the ELC had a higher academic achievement record than did the ILC. A reason put forward for this discrepancy in achievement between ELC and ILC is that the child with a high achievement need has so much invested that he is unable to admit an ILC (Chance, 1965). He needs something external on which he can place the blame if he experiences failure.
Tests of Locus of Control:

In addition to the Bialer-Cromwell Locus of Control Scale previously mentioned, there have been other tests developed and revised that are aimed at the measurement of the locus of control of a subject. Throop & MacDonald (1971) cite eleven such tests developed in the period from 1954-1969.

The first such scale was developed by Phares (1955). This scale consisted of 26 items—13 items reflecting external control and 13 items reflecting internal control. In his doctoral dissertation, James (1957) "revised Phares' test still using a Likert format and wrote 26 items plus filler items based on the items which appeared to be most successful in the Phares study." (Rotter, 1966, p.9).

This revision is known as the James-Phares Scale of Internal-External Control and is applicable for use with adult subjects. James revised the scale to consist of 60 items, including 30 buffers in 1963, but for some reason, a copy has not been presented in the literature although a copy would seem to be obtainable from the author (MacDonald, 1971).

Liverant, Rotter, and Seeman attempted to expand the 1957 scale to 60 items that included subscales. The final version consisted of 29 forced-choice items. This included six filler items used in an attempt
to cover up the true intent of the test. This scale is called the I-E Scale by Rotter (1966).

The earliest test constructed for children was the Children's Locus of Control Scale developed by Bialer & Cromwell. It was also derived from the James-Phares Scale. It consists of 23 questions which are administered orally to young children who answer "yes" or "no". A method of allowing older children to read the questions and circle the correct response has been reported (Lesiak, 1970).

The Intellectual Achievement Responsibility Scale (IAR) was developed by Crandall, Katkovsky, & Preston (1962) to measure whether the child had an internal or external control for the successes and failures experienced in situations involving intellectual achievement. This scale has 34 forced-choice items (17 positive and 17 negative items) with each item posing one internal and one external alternative. This scale has two major limitations: 1) it assesses beliefs exclusively in the intellectual academic achievement situations rather than broad motivational and behavioral areas, and 2) it therefore restricts the source of external control to persons who most often come in face-to-face contact with the child (i.e., parents, peers, teachers).

The third test of children's feelings of personal
control was developed by Battle & Rotter (1963). The Children's Picture Test of Internal-External Control is a projective measure and the child responds to a statement by one character in a cartoon in a way he believes the other character would respond. There are six cartoon situations presented to the child, each of which involves the attribute of responsibility.

MacDonald (1971) states that a new I.-E. scale for children has been developed by Nowicki and Strickland called the N. S. Personal Reaction Survey. It consists of 40 forced-choice items and has been used with over 2,000 children in grades 4 to 12. MacDonald is presently in the process of developing a testing and scoring manual for this test.

The scale which is most suited for this study is the Bialer-Cromwell Scale. It is the only test designed to be used with the mentally retarded and, as will be seen later, has been used quite extensively. For the age group that the examiner will be working with (MA five through eight), the Battle and Rotter Scale is the only other appropriate test. The Bialer-Cromwell Scale is easier to administer and interpret. Since it was developed for and used with the mentally retarded, it was the instrument of choice.

One of the major criticisms leveled at the forced-choice type of scale is its susceptibility to response set, whether
this set is the consistent use of either "yes" or "no" or the use of a response that is socially desirable. Lefcourt (1966) felt that the data he reviewed did not support this criticism. Gozali & Bialer (1968) noted that Lefcourt's analysis of his data did not include mentally retarded subjects. Therefore, they designed a study to research this criticism that did include the mentally retarded. The results that they obtained showed that the Children's Locus of Control Scale is free from both forms of response set ("yes," "no," or social desirability). This was done by developing a reverse form (RLC) of the original scale (OLC), and administering both forms along with a scale for acquiescence response set (Agreement Response Scale) and social desirability (Children's Social Desirability Questionnaire). Six groups were formed based on a test-retest design within a seven-day span (OLC-OLC, RLC-RLC, OLC-RLC, OLC-ARS, RLC-ARS, OLC-CSD). The data collected were statistically significant at .001 for the first 3 groups and were statistically non-significant for the last 3 groups. The data allowed for a product moment correlation which showed the test-retest reliability coefficient for the OLC to be .84 and for the RLC (which can be considered an alternate form) to be .87. The correlation of the OLC with the RLC resulted in a coefficient of .67.

Fesoe (1968) took the Gozali & Bialer study and
attempted a replication of it. Pesce's data did not support the Gozali & Bialer study. To explain his data, Pesce cites two differences in the studies. Gozali & Bialer administered the OLC and RLC in group settings while Pesce administered his in a one-to-one setting and the former authors allowed the subjects to have the written directions in front of them while Pesce did not. Pesce seems to ignore two other major differences in these studies. Pesce used subjects who were residents of the Johnstone Training Center, a residential facility, whereas Gozali & Bialer selected their subjects from a vocational training program in New York City. A second difference that Pesce ignores is the difference in both the CAs and IQs of the subjects. Gozali & Bialer used subjects ranging in age from 16.5 to 28 years with a mean CA of 20.5 and an IQ from 58 to 91 with a mean IQ of 70.5. Pesce's subjects had a mean CA of 16.4 years and a mean IQ of 63.7. (The tests used for each IQ were not listed in either study).

Research Using the Bialer-Cromwell Scale:

Connell (1965) reviewed the earlier work done on locus of control and came up with three conditions that he felt were necessary in order to obtain a differential performance from internal and external control subjects.
These were: 1) the examiner had to be present to some degree during the performance of the task; 2) success and failure on the task had to be defined by the examiner; and 3) the examiner did not administer any form of positive reinforcement during the execution of the task. McConnell investigated the first and third of these conditions for his doctoral dissertation.

The results did not support either of the conditions. The only positive finding consisted of an interaction between locus of control, type of reinforcers, and success or failure experiences. The internal control subjects under the reinforcement condition of the experimenter administering the reinforcer (for both positive and negative combined), were more successful under failure emphasis than under success emphasis. McConnell discussed the difficulty in interpreting the finding in a meaningful way due to the fact that it does not bear out his hypotheses and contradicts the current theories regarding locus of control. Since this study had contradictory results, either the premises are wrong and/or some unknown variable affected the results, and/or the data on locus of control has to be amended, and/or the interaction of all of the above could have occurred.

Litzinger (1968) studied the developmental changes in locus of control among children in Grades 2, 4, and 6
Her findings confirmed those of Bialer in that as the child grew older, there developed an increase in the degree of internal control. What Litzinger failed to consider was that this may still be more a function of MA than of CA. Bialer's "increase in age" was for both MA and CA, but his data analysis showed a higher correlation between MA and locus of control (LC) score than for CA and LC score—.56 versus .37 (p:.311).

Litzinger also found an increase in LC scores between Grades 2 and 4. A cause for this is not given but she later makes a statement to the effect that the Grade 2 subjects were "bewildered" by some of the questions. By Grade 4, the "bewilderment" may have disappeared.

Badabaugh (1970) researched the topic of Locus of Control and its relationship to the occupational adequacy of EMR students. Several of her findings were of interest. She found that there was no significant correlation between either MA and LC or between CA and LC. There was a relationship between the sex of the subject and the LC score with the males being significantly more internal than the females. A further finding was that those subjects with an ELC were more often employed than those with an ILC. This would tend to go along with the findings of others that the retardates lose their jobs because they do not
get along with their coworkers although Hadabaugh does not state this.

The finding of no significant relationship between CA and LC or between MA and LC contradicts the findings of Bialer (1960) and Litzinger (1968). This discrepancy is explained by adopting the point of view of McMillan (1969) that locus of control is not developmental as Bialer believes but is a learned personality variable.

Work has been undertaken using the Bialer Scale to ascertain the relationship between Locus of Control and what may be called "cognitive style" (Lesiak, 1970; Linder, 1968). The results of these two studies showed that the internal locus of control child tended to be more reflective whereas the external locus of control child tended to be more impulsive.

Silence as a Reinforcer:

The following review of the literature on silence as reinforcement is not an exhaustive review but consists of those authors and papers that the examiner has felt to be original and significant. Other researchers have studied silence when it is paired with a buzzer (e.g., Meyer, 1960, 1961; Offenbach, 1964, 1966; Seidman, 1967) but have used one of the above theoretical frameworks as their point of reference.
The use of silence as a reinforcer has become a topic for research in psychology only in the last fifteen years. Buss and his colleagues (Buss et al., 1956; Buss & Buss, 1956) were among the first to do research in this area. These researchers realized that in using verbal reinforcers they were, as Spence (1966a) states, using "... reinforcement combinations: each of the subject's responses is followed by either an overt signal from the experimenter or by nothing..." (p.163). Utilizing the Wisconsin Card-Sorting Task (cards are to be sorted by color, shape, or number of figures), Buss had his subjects—psychiatric patients and student nurses—learn the shape concept to criterion and then switch to color without being verbally told. The subjects had to learn to switch on the basis of the verbal reinforcement given. One group of subjects (RW) was told "Right" when they made the correct response and "Wrong" for the incorrect response; a second group (RN) was told "Right" for the correct response and the examiner remained silent when an incorrect response was made; while the third group (NW) was told "Wrong" for the incorrect response and the examiner remained silent when a correct response was made. Buss et al. (1956) found that
BW and NW led to quicker learning than did RN. Arguing from the point of view of reinforcement as seen in a continuum from negative to positive, the authors posited two possible explanations for the results: 1) either W was more strongly negative than R was positive with silence remaining neutral, or 2) R and W are equal and opposite with silence being slightly positive. Buss et al. (1956) felt that the former explanation was more plausible and a second study was undertaken to test the validity of this explanation.

This study (Buss & Buss, 1956) also utilized the Wisconsin Card Sorting Task. Using psychiatric patients as subjects, Buss and Buss found that HW and NW were similar and both led to significantly better performances than did RN. In the second experiment in this study, student nurses were used as subjects and placed under the RW and NW reinforcement strategies. No significant differences were found between these two strategies. In discussing the results of the experiments, the authors again utilized the construct of the reinforcement continuum. If this continuum was valid, then one should get significantly different results than those that were obtained (RW should be significantly superior to RN and NW which should have no significant differences). Buss and Buss felt that the data they had collected lent validity to
their contention that R is a weaker positive reinforcer
than W is as a negative reinforcer.

Buchwald (1959a) hypothesized that the above data
collected by Buss et al. (1956) and Buss & Buss (1956)
could also be accounted for if N is considered to be
neutral initially and acquired its reinforcement value
during the experiment. If this hypothesis were valid, then
under extinction, RN should extinguish more readily.
Buchwald divided his college subjects into three groups
(RW, RN, NW) and using a verbal learning task, he ran his
subjects until they reached criterion. In this acquisition
stage, the learning by the RW group was better than the
NW group which was better than the RN group. During the
extinction phase, the examiner remained silent (N) after
each response of the subject. In this phase, it was found
that the RN group extinguished more readily than either
the RW or NW groups. As Buchwald points out, the data
during the acquisition phase could be predicted by either
Buss or his own hypothesis. But if N has either no rein-
forcement effect or the same reinforcement effect regardless
of the conditions under which acquisition has occurred, there
would be no basis for predicting a difference during extinc-
tion. Thus, the differences obtained by Buchwald during
extinction support his hypothesis that N does acquire rein-
forcement value opposite in direction to that of the
verbalization with which it is combined.

To further validate his hypothesis, Buchwald (1959b) ran two more experiments which did support his contention that during exposure to a positive reinforcer (R), silence (N) became a negative reinforcer whereas during exposure to a negative reinforcer (W), silence (N) became a positive reinforcer. Buchwald was required to add a corollary to his hypothesis to explain the differences that he obtained between RN and NW groups in the acquisition stage. This corollary states the "N acquires greater reinforcement value under exposure to NW than under exposure to RN." (1959b, p.352).

Buchwald (1962) reports two experiments in which he puts forth still another view that is an expansion of his corollary in that it is explanatory. In this view, silence plays a minor role for Buchwald states, "In such a situation [concept formation task] a clear indication of incorrect responses may be more effective than a clear indication of correct responses . . . . Being informed of the incorrect responses allows a re-classification of stimuli while being informed only of the correct responses does not." (p.74). In effect, what Buchwald is saying is that Right and Wrong are not reinforcers as we commonly think of the terms, but that they are informational. Their differential effectiveness would then be due to the non-equivalence of information
extracted from them.

Along these lines, Spence, Lair, & Goodstein (1963) and Spence (1964) using probability analyses, showed that the Right-Nothing condition is inferior to the Wrong-Nothing condition not because of any differential strength in Right or Wrong, but because many of the subjects were unable to interpret the information conveyed by the examiner's silence. The cause of this inability will be discussed later but the point to be made is they are in agreement with Buchwald (1962).

Spence et al. (1963) showed that when the subjects are previously instructed about the information value of Nothing there are significant differences between the RN and NW groups and therefore the N in each combination had the same effect as an overt response from the examiner. The effect of informing the subjects of the meaning of the examiner's silence, results in making each of the three reinforcement conditions (RW, RN, NW) essentially RW conditions; therefore, no significant differences would be expected.

Levine, Leitenberg, & Richter (1964) and Spence (1964) looked at the above hypotheses and data and recognized that they only explained the effectiveness of silence after its experimental manipulation. These two researchers ran studies that examined the reinforcement value of silence that the
subject brings to the experiment. Whereas Buchwald (1959a) assumed silence was initially neutral based on data accumulated by Buss & Buss (1956), Levine et al. (1964) and Spence (1964) saw the flaw in Buchwald's reasoning. Buss and Buss showed that at the end of the experiment, silence was neutral, and Buchwald assumed that this state of affairs held initially. Levine et al. (1964) and Spence (1964) showed that initially if the examiner remains silent, the subject behaves as if he were told "Right." Their method of researching this was the observation of the subjects' hypothesis formulation. When the examiner said "Wrong," the subject altered his hypothesis, whereas "Right" and silence did not produce a change in the hypothesis. This change was seen in the fact that the subjects in the RN condition took longer to reach criterion than did those subjects under NW or RW (this finding is consistent with the findings of others). Therefore, under RN conditions a subject initially is operating under handicapping conditions for when he is actually making an incorrect response, the feedback he receives is interpreted as telling him he is right. Thus, the greater effectiveness of NW over RN is due to the interpretation of silence that the child brings with him. From this data, the hypothesis was generated that silence functions not as reinforcement but as information.

Levine et al. (1964) reported on four differently
constructed experiments which support the hypothesis that the initial value of silence is positive. These authors put forth the following ideas as the cause for this finding as "... the unit of behavior directly affected by the outcome procedure is the subject's hypothesis (a mediating process defined as a prediction about what constitutes solution behavior) rather than his specific response. [and] ... right functions not as a strengthener of the choice response but as a maintainer of the mediating process." (pp.101-102).

Spence (1964) indicated that although there were no significant differences between the mean scores of RW and WN subjects, the RN subjects did significantly poorer on a verbal discrimination task. The interesting point in this study was that there was no difference between the three groups in producing repetition of correct responses but the difference clearly showed up in its lesser effectiveness in decreasing the repetition of incorrect responses. This can only be explained if the subjects in the RN treatment interpreted silence as positive reinforcement, for RN subjects would then not know when they made an incorrect response.

Spence (1964) states that the results of her two studies "... suggest that the performance differences obtained in prior investigations employing uninformed
subjects was due to nothing acquiring reinforcement (information) value less rapidly and to a lesser degree when combined with Right than when combined with Wrong." (p.196).

As Spence (1966b) states "... the data suggested that the inferiority of the Rb combination can be completely explained in terms of blank in this combination having less reinforcement value than the overt reinforcer for which it stands, without any assumption having to be made about the reinforcement values of Right versus Wrong." (p.270).

The main point to be taken from these studies is the point of view adopted by Spence and her colleagues in regard to verbal feedback. It seems as though they are in agreement with Buchwald (1962) in that they are emphasizing the informational properties rather than the reinforcing properties of the feedback process.

Levine et al. (1964) also took this point of view and formulated what they call "The blank trials law" that is applicable during two trial learning situations. This law states "... that the behavior of subjects during trials when no outcomes are given is the same as the behavior of subjects when the experimenter says 'Right' following each response." (p.101). This formulation grew out of a model developed by Levine (1963) and later expanded (1966) that
"... views the adult human subject as selecting, at the outset of a discrimination problem, one hypothesis from a set of Hs, where the H is defined as a mediating process."

(p.254).

In a study using adult subjects, Spence (1966a) questioned the subjects after the experiment was over regarding the informational value they attributed to the examiner's silence. Her results showed that a number of the subjects in the BN situation misinterpreted its meaning which would lend support to the Levine et al. (1964) hypothesis. In a study using both normal and retarded children, Spence (1966b) also found that when subjects were not told about the value of silence, they interpreted it to mean right in a problem-solving situation.

Bourne, Guy, & Wadsworth (1967) in two experiments, lent further credence to the Levine et al. (1964) hypothesis by showing that the BN group is at a disadvantage until they get a stimulus indicating incorrect, i.e., until they regard N as indicating wrong.

Ault & Vogler (1969) questioned the results of the above studies for their lack of control of the non-verbal reinforcement factor. In a well designed study that attempted to assess the validity of the above formulations regarding silence, the authors also questioned whether R is interpreted as meaning correct or whether it is construed
as general encouragement. To assess this, the authors used the following four reinforcement contingencies: 1) Right-Nothing (RN), 2) Wrong-Nothing (WN), 3) Correct-Nothing (CN), and 4) Incorrect-Nothing (IN). The results showed the WN, CN, IN were significantly superior to RN and that there were no differences between WN, CN, and IN. This study must be looked at from the point of view of the differences between "Right" and "Correct." Right has been shown to be related to personal effectiveness whereas Correct is related to task performance (Zigler & Kanzer, 1962). Since the subjects were college level students, the differential effectiveness of Right and Correct as found in this study may be applicable to only college students. It has been found that the above results are reversed with lower socio-economic elementary school children with Right being more effective than Correct (Zigler & Kanzer, 1962).

This chronological approach to the development of the efficacy of silence as a reinforcer shows that there was a constant refining of a theory. Moving from the Buss et al. (1956) theory that R and W are equal and opposite in reinforcer value with silence being slightly positive, to the Buss & Buss (1956) theory that W was more strongly negative than R was positive with silence remaining neutral, and thus to the Buchwald (1959a,b) theory that silence was initially neutral and acquired its reinforcement value
(opposite from the reinforcer it is paired with) during the experiment. The corollary that Buchwald added to his theory resulted in a great deal of research. Buchwald (1959b) stated that "N acquires greater reinforcement value under exposure to NW than under exposure to RN." (p.352).

In order to explain this corollary, Buchwald (1962) posited that Right and Wrong are not reinforcing but are informational in nature and W allows for a reclassification of the stimuli involved whereas R does not. Spence et al. (1963) and Spence (1964) showed that RN subjects were unable to interpret the examiner's silence correctly and therefore were inferior to NW and RW subjects. Levine et al. (1964) and Spence (1964) in looking for a cause of this found that silence initially has positive value and therefore RN subjects do not realize when they make an incorrect response. Spence (1966a) rephrased this by stating that N in the RN treatment has less reinforcement value than the overt reinforcer for which it stands.

Bourne et al. (1967) called the R an ambiguous stimulus whereas W is not ambiguous. This is due to the fact that a response may be correct for the wrong reasons which will lead the subject astray whereas W clearly tells the subject he is wrong.

To summarize, it can be said that N acquires informa-
tional properties opposite in value or direction from its counterpart and that initially N is positive which partially accounts for the lesser effectiveness of right in the RN treatment in comparison to the NW or RW treatments. As Spence (Spence et al., 1963; Spence, 1966b) showed, this is true only when the subjects are not explicitly told what N means.

Crandall, Good, & Crandall (1964) in discussing why "Right" is not as effective a reinforcer as would be expected from its positive sign, made a statement that may explain the paradox. They state that since "Right" is so often used "... in normal social intercourse in our culture to indicate encouragement or support, it has lost some of its original reinforcement strength." (p.496).

Social Reinforcement:

Since silence is a social reinforcer and therefore an intangible one, research in these areas of reinforcement must be considered. Several variables seem to be related to the effectiveness of social reinforcers. Zigler & Kanzer (1962) cite the following variables: "the type of social reinforcement previously received ... a previously experienced condition of social isolation or social satiation ... long term social deprivation experienced ... anxiety level of the subject ... the particular sex of
the examiner in relation to the sex of the subject . . . and
the CA or MA of the subject . . . as well as the socio-
economic class of the subject." (p.158). Of these, the
effects of CA, MA, sex, and socioeconomic class will be
discussed.

Socioeconomic class has been one of the more contro-
versial variables. Terrell, Durkin, & Wiesley (1959) were
among the first to investigate this area and are usually
the ones cited when this topic is discussed. Their results
showed that on a discrimination learning task, lower class
subjects performed better under conditions utilizing tangi-
ble reinforcers while middle class subjects performed
better on intangible ones. Since this finding was of such
importance and had so many ramifications, other investiga-
tors felt it should be researched further.

Zigler & de Labry (1962) made use of a finding by
Zigler (1961) (that institutionalized familial retardates
are predominantly from the lower socioeconomic class), in
trying to lend strength to and extend the finding of
Terrell et al. (1959). In a concept switching task (card
sorting), Zigler and de Labry used tokens which were later
redeemable for a prize as the tangible reinforcer. The
social reinforcement consisted of the word "good." The
results of this study showed that institutionalized retard-
ed and lower class subjects of equal MA performed better
with tangible reinforcement while middle class subjects of equal MA did better with intangible reinforcement. Further validity was lent to the findings of Terrell et al. (1959) when the performance of the three groups under their optimal reinforcer was analyzed and it was found there was no difference.

Zigler & Kanzer (1962) researched the possibility of a difference in the effectiveness of reinforcers that are person-oriented as contrasted to those that are task or performance-oriented. An hypothesis was generated that verbal reinforcers that arbitrarily connote praise (good, fine) will be more effective with lower class children while those arbitrarily connoting correctness (right, correct) will be more effective with middle class children. The above hypothesis was found to be valid and in analyzing the results, the authors found a tendency (not statistically significant) for the verbal reinforcers to be less effective for lower class children than those from the middle class, thus lending some support to previous findings.

McGrade (1966) in a study that served as her doctoral dissertation (with Zigler as her adviser) extended the Zigler & Kanzer (1962) study by adding a control group, adding another pair of praise reinforcers (great, swell), using a naive examiner, and by adding directional modifiers to the reinforcers. "That's" was used in connection with
the performance reinforcers while "you're" was used with the praise reinforcers. The results did not support the minor Zigler and Kanzer finding of a significant interaction between social class and reinforcer effectiveness, but did support their categorization of reinforcers. Here also, it was found that praise was more effective with lower class subjects, whereas correctness was more effective with middle class subjects.

Rosenhan & Greenwald (1965) in a replication of the Zigler and Kanzer study found no differences between middle and lower class children in the effectiveness of person-oriented reinforcers and performance-oriented ones ("concrete" and "abstract" respectively). Rosenhan (1966) using the construct of alienation in relation to the public schools, proposed that lower class subjects would be more alienated from the middle class schools than middle class children. If this were true, then lower class children should be more responsive to praise and more disrupted by disapproval than their middle class peers. The reinforcer paradigm used was "RN" and "NW" which, as a result of the directions given the subjects, were person-oriented. Results showed that lower class subjects were more responsive to approval than to disapproval. This finding must be compared with the findings of the research done on silence as a reinforcer (which, judging from the bibliography,
Rosenhan was unaware of). The white middle class child was found to be more responsive to disapproval than to approval. This finding would thus call into question the generalizability of the research findings previously presented on silence, for there would seem to be a differential effectiveness based on socioeconomic levels.

In two studies that were identical in all respects except for the ages of the subjects, Cernius (1966) and Lighthall & Cernius (1967) showed that for lower class boys the tangible-intangible reinforcer results of Terrell et al. (1959) or Zigler & de Labry (1962) did not hold. In seeking possible causes for this discrepancy, the authors cited the findings of Zigler & Kanzer (1962) and McGrade (1966) on "praise" and "correct" reinforcement, and Stevenson's (1961) finding of a complex interaction of children's age and sex with the experimenter's sex. They also felt that their results might be valid if one looks at the results of Terrell et al., Zigler & de Labry, and Zigler & Kanzer as due to experimenter bias. A study that controlled for this factor (McGrade) by using a naive examiner obtained results agreeing with Cernius (1966) and Lighthall & Cernius (1967).

Safer & Kornreich (1968), in a one page report of two experiments, report conflicting results. One study supported the findings of Terrell et al. (1959) while the other
did not. The authors believe that their results were due to the insensitivity of the task and suggest more research be done in the area.

Locke (1969) compared the effectiveness of tokens based on a monetary system with the word "good" for mentally retarded subjects in the mild and moderate range. The tokens were found to be more reinforcing than "good." This would agree with Terrell et al. (1959) and Zigler & de Labry (1962).

From the above reported data, it can be seen that there is a controversy as to the effectiveness of social reinforcers with the lower socioeconomic classes.

Ross (1968), using preschool aged EMRs (mean CA 6-6), found that intentional learning was affected by the type of reward as a function of the task. In two related experimental game situations (the first where the child is corrected by the examiner to emphasize the rules of the game, and the second where the child received success in the game), a differential effectiveness was discovered. Tangible reinforcers were more effective in the second situation while in the first situation, success (as seen by the subject) in the game was more important than the reinforcer offered.

Srivistava (1969) in using a high mental age group (mean MA 8 and 9) and a low mental age group (mean MA 4
and 5) found that there was no significant difference in the rate of learning under any of the reinforcing conditions (primary—jellybeans; social—"That's very good;" and, control—no reinforcement). It was concluded from this data that the ineffectiveness of any type of reinforcer is not a function of mental age.

In analyzing the above studies for possible causes of the discrepancies in interpretation, one must consider the concept of a hierarchy of reinforcers. This concept refers to the fact that each person has something that is reinforcing to him/her. There are some things that a person will work harder for and other things that a person will not work as hard for. The former are to be found at the top of the hierarchy, while the latter fall lower on the hierarchy. This hierarchy of reinforcers must be considered in relation to the reinforcers being used. Social reinforcers will be more powerful if the tangible reinforcers being offered fall below them in the hierarchy. What is a positive reinforcer for one child may be a neutral reinforcer for another and a negative reinforcer for a third. In the above studies, the examiners select items that are felt to be reinforcing for the child. The child is then asked to pick the one he likes best and/or the one he likes least. These are then assumed to be at the top or bottom of the child's hierarchy. What is neglected is
the fact of having the child rank the examiner's presence or his praise. It would seem that the researchers feel that this is not required. Also, the supposed hierarchy is only a hierarchy of those items selected by the examiner and one cannot say where on the hierarchy each falls except in relation to the other items presented. It is further assumed that when the results are tabulated, they can then be generalized to the extent that "tangible reinforcers are more (less) effective for the lower (middle or upper) class than intangible reinforcers."

One must also consider the type of social reinforcer used. Whether it is person-oriented or task-oriented may have an impact on the outcome of the study.

Research on the effects of the experimenter's sex was done by Stevenson (1961). The findings of this study showed that social reinforcement by a female was more effective in modifying the performance of a subject with a CA of 3 to 4 than was a male. For CAs 4 to 7, it was found that a female examiner was more effective with boys than with girls. Male examiners were not any more effective with girls than with boys at any CA level. For ages 9 and 10, there were no statistically significant differences due to the cross-sex variability being so great.
The Effect of Labels:

The effect of labels on the speed with which learning occurs has been primarily researched by Ausabel (1960) who used the term "advance organizer" to refer to the labels. Ausabel found that learning was facilitated for college students if labels were introduced that subsumed the material to be learned.

Work done with the mentally retarded has shown that verbal labels may direct the subject's attention to or away from the critical dimension or cue (Milgram & Noce, 1968) and that distinctive labels facilitate the learning of the relevant cue or dimension (Katz & Rosenberg, 1969; Milgram & Noce, 1968; Smith, Means & Fishkin, 1968).

Research by Herzog (1968) and Jensen & Rowher (1963) has shown that the mentally retarded use fewer superordinate labels for grouping data than do normals of equal MA or CA. Jensen & Rowher taught the retarded some superordinate labels. When they returned one week later, they found that the subjects had forgotten the learning technique. This was substantiated by Katz & Rosenberg (1969).

Research contradicting these points of view is presented by Neisworth (1968) in his doctoral dissertation. In explaining the results of his study, Neisworth seems to hold that his hypothesis (retardates with advance organizers
will do better than the retarded without them) is true. As the cause for his hypothesis not being empirically validated, he cites his own failure to provide clarity in the designing and evaluation of the advance organizers that were used. Also, he neglected to note that previous research was based on the use of words as the advance organizers whereas his research consisted of a passage of 336 words. This change may have influenced his results.

To quote Spiker (1963), "... there is facilitation resulting from prior learning of distinctive names for stimuli that cannot be attributed to warm-up, learning-to-learn, or observing responses. Apparently, there is something about the learning of names, per se, that results in the subsequent facilitation." (p.59).
CHAPTER III: DESIGN

Sample Selection:

A list of subjects attending special classes for the educable mentally retarded was obtained from the teachers of these special classes. This list consisted of the names of the students in the class with their IQ as measured on the Stanford Binet, grouped by MA level.

From these lists, a random selection was made to obtain the sample. These subjects were administered the Slosson Intelligence Test. Those subjects who received an MA of 5-0 to 8-11 and had an IQ of 50-80 inclusive were included in the sample. Those subjects who scored above or below these scores were not included in the sample. Five subjects were rejected: one for an IQ of less than 50; one for an IQ above 80; one for an MA less than 5; two for an MA greater than 8.

During the course of the study, two other subjects were excluded from the study: one subject was absent for the treatments and one subject was unwilling to participate.

The final sample consisted of 48 subjects: 13 with
an MA of 5; 13 with an MA of 6; 12 with an MA of 7; and 10 with an MA of 8. A description of the sample can be found in Appendix A.

**Instruments:**

Eighteen blocks (six blocks of each of three shapes—square, circle, triangle) were cut by a local lumber yard from 1" x 2" Grade A white pine according to specifications set forth by the examiner. The squares measured 1 3/4" x 1 3/4"; the triangles were equilateral measuring 1 3/4" on the sides; while the circles had a 1 3/4" diameter.

Nine of the blocks (three of each shape) were painted one of three colors—red, yellow, and blue—while the remaining nine were to serve as extras in the event that any were lost. Each block received three coats of paint and two coats of spar varnish. The varnish was used to protect the paint as well as to make the blocks washable in the event they became dirty, thereby providing a clue to the selection of the appropriate block, especially when the subject was being tested for his concepts of position.

A box measuring 8" in length, 3 7/8" in width, and 2 1/4" in depth was also made by the lumber yard. The box had three sections each measuring 3" in length, 2 1/4" in width, and 2" in depth. The box was made of 1" x 2" Grade A white pine for the sides as well as the
pieces that served to make the three sections. The 1" x 2" had been cut so it was actually 1/2" x 2". The bottom was a piece of 1/16" thick masonite measuring 8 7/8" x 1 7/8". The box was given three coats of spar varnish on the inside as well as on the outside.

The nine blocks were then taken to a commercial photographer where the thirty-six possible combinations of shape, color, and position were shown. The photographer then made three 2" x 2" slides of each of the thirty-six combinations.

When the slides were finished, they were put into a carousel projection tray that held 100 slides. The sequence they were put in was randomly determined for the first 36; the second 36 followed the same sequence so that slides 1 and 37 were the same. Since the carousel held only 100 slides, the last 8 slides of the third group of 36 slides were removed. Thus, for slides numbered 1 to 28, there were 3 copies used while for those numbered 29 to 36, there were only 2 copies used.

The slide projector used was the Airequipt 135 model and the screen used was the Da-Lite Silver Pacer—a lenticular screen measuring 40" x 40".

The tests that were used were the Slosson Intelligence Test (Slosson, 1963) and the Bialer-Cromwell Locus of Control Scale (Bialer, 1958).
The Slosson Intelligence Test (which can be administered in twenty minutes) was devised by selecting items that are similar to those found on the Stanford Binet (Terman & Merrill, 1960) and Gesell Developmental Schedules (Gesell & Amatruda, 1947). The age range is wider than that found on the Binet by extending both the lower and upper ends. The standardization population as described by Slosson (p.iv) is quite adequate although the size was small (p.701). The test-retest reliability coefficient is reported as .97 (p.v). Concurrent validity is reported as being above .90 for ages 4-18 using the Stanford Binet (p.v).

The Bialer-Cromwell Locus of Control Scale is discussed in Chapter 2 and a copy can be found in Appendix B.

Procedures:
Each of the subjects was seen for three sessions, with each session approximately one week apart. The first session was used to administer the following materials. Each of the subjects was shown the following nine wooden objects: red square (RS), red circle (RC), red triangle (RT), blue square (BS), blue circle (BC), blue triangle (BT), yellow square (YS), yellow circle (YC), and yellow triangle (YT). The subjects were asked to describe each of these objects (the examiner said, "I am
going to show you some things and I want you to tell me what you see."). Attention here was focused on the subject's ability to distinguish figure from ground and to name the shapes and colors involved. The order of presenting the items was randomly determined but each subject was shown the objects in the same sequence. The sequence was: YT, BT, RC, YS, RT, YC, RS, BS, BC. The subject's response was recorded on a special form (see Appendix B) such that the examiner would only be required to mark down the cue given by the subject (e.g., if the red triangle was presented and the subject responded "Red," the examiner would then put only the R of the RT on the answer sheet). No prompting was given since the spontaneous use of labels was the topic of interest.

The examiner then placed three objects (a yellow circle, a blue square, and a red triangle) in front of the subject. The three objects were selected by placing the names of the colors on three sheets of paper and the names of the shapes on three other sheets of paper and placing these sheets of paper face down. One of the three colors was selected and one of the three shapes was selected. By combining these two sheets, the appropriate object was selected. This procedure was continued to select the other two objects. The three objects were placed in the following randomly selected sequence:
yellow circle, red triangle, and blue square. The subject was asked to point to the following randomly selected sequence: the second object, the first object, the middle object, the third object, and the last object. This procedure was undertaken to discover if the subject recognized and knew the meaning of the positional labels.

The subjects were then asked, "Would you please put these objects into this box?" The box given to the subject contained three compartments with each compartment able to contain only three of the objects. This allowed the examiner to ascertain the dimension the subject preferred to use in grouping objects (form, color, or neither).

Each subject was then administered the Bialer-Cromwell Locus of Control Scale and then the Slosson Intelligence Test (see Appendix B).

The above sequence of administering the instruments was the same for all subjects and was selected on the basis that there might be a lessening of anxiety in the child. It would also go along with Zigler's (1966) ideas on "positive reaction tendencies" and "negative reaction tendencies."

These terms refer to the fact that a child wants to interact with an adult and gain approval (positive reaction tendency) but is afraid to enter the situation because in the past the child has experienced a great deal of failure
Upon completion of these instruments (the blocks, the Locus of Control Scale, and the Slosson Intelligence Test), the examiner told the subject the session was over and that he would be back next week with a game to play using a slide projector with pictures of the objects that he played with today.

Using the data obtained from the Slosson, the subjects were grouped by MA level and divided into two groups. One group received the "You're right-Silence" treatment first and then the "You're wrong-Silence" treatment. The second group received the reverse sequence of treatments. This counter-balanced design was selected to control for any possible effects of the order of presentation.

One week later, the examiner returned to begin the testing situation. Slides were presented one at a time to the subject by projecting them on a screen. Each slide contained three of the nine objects in such a manner that each of the three colors and each of the three shapes was represented. The following directions were given to the subject: "We are going to play a game with the nine objects you saw last week. I am going to show you three of the objects on the screen and you are to point to one of them. Remember one of the objects is the right one to point to. It will become clear to you as we go along
which of the objects is correct. The object may be correct because of its color, shape, or position. Do you have any questions? Okay, now we will begin the game." All questions were answered by repeating or rephrasing the relevant part of the instructions.

In presenting the slides to the subject, the verbal reinforcement ("You're right-Silence" or "You're wrong-Silence") was continued until eight correct responses in a row were obtained. The examiner responded to the ninth correct response by remaining silent in the "You're right-Silence" treatment and by saying, "You're wrong" in the "You're wrong-Silence" treatment. This change in reinforcer was continued until the subject altered his selection at which time the experiment was completed for that day.

The number of trials to reach eight correct responses in a row was counted as was the number of trials required until the subject altered his selection to another cue or dimension from that selected in reaching eight correct responses in a row.

If the subject did not reach criterion 1 by the time the eightieth slide was presented, the experiment was terminated unless trial eighty was a correct response. In the latter case, the experiment continued until criterion 1 and 2 were reached or until an incorrect response was made.
The third week, the examiner returned and the subject underwent the same treatment as in week two with the verbal reinforcer used being the only change. The subjects who received the "You're right-Silence" treatment now underwent the "You're wrong-Silence" treatment and vice-versa. This technique was selected so that each subject would serve as his own control. The directions for this third week were, "Do you remember the game we played last week? Well, we are going to play one like it again this week. Remember, I am going to show you three objects on the screen and you are to point to one of them. One of the objects is the right one to point to. It will become clear to you as we go along which of the objects is correct. The object may be correct because of its color, shape, or position. Do you have any questions? Okay, now we will begin the game." All questions were again answered by repeating or rephrasing relevant parts of the instructions.

Treatment of Data:

After completion of the first week's treatment (presentation of the blocks to obtain the number of labels spontaneously used by the subjects, the administration of the Bialer-Cromwell Locus of Control Scale, and the Slosson Intelligence Test), the subjects were grouped by their mental age (obtained from the Slosson Intelligence Test).
Each subject was then randomly assigned (within their mental age group) to either the "You're right-Silence" (RN) then the "You're wrong-Silence" (NW) treatment sequence or to the opposite sequence ("You're wrong-Silence" then the "You're right-Silence" treatment).

The analysis of the data was not undertaken until all of the data were collected on all of the subjects.

The data analysis for this study will consist of the use of: 1) chi-square on the frequencies; 2) F ratio on the variances for Hypotheses 1 and 2; and 3) 2 x 2 analysis of variance for Hypotheses 3 and 4.

The computation of a chi-square on the number of subjects reaching criterion 1 and criterion 2 will be done for the sample as the subjects perform under both the RN and NW treatments. The chi-square permits the analysis of the frequency data and will tell whether the obtained frequency deviates from the expected frequency to a degree that is greater than chance. In the data for this study, the expected frequency is equal to N/2. In the case of criterion 1, the N is equal to the sample size, while for criterion 2, the N is equal to the number of subjects reaching criterion 1.

The F ratio on the variances between the treatments (RN and NW) was computed for both Hypothesis 1 (criterion 1) and Hypothesis 2 (criterion 2). The F ratio will show
whether the differences between the two means are statistically significant by using the analysis of variance technique.

The analysis of the data for Hypotheses 3 and 4 (the relationship of locus of control and criterion 1 and criterion 2) will be done by dividing the sample into quartiles based on the subjects' scores on the Locus of Control Scale. By omitting those subjects in the inter-quartile range, two groups will remain—those that fall below the twenty-fifth percentile and those that fall above the seventy-fifth percentile. If there is any difference it would show up with these two groups for they are composed of the subjects at the extremes.

These groups will then be analyzed by using the 2 x 2 analysis of variance technique. This will show whether the differences between the means are statistically significant and if there is an interaction effect.
Each hypothesis will be treated separately. The hypothesis will be stated followed by the results pertaining to it.

**Hypothesis 1:** The subjects will reach Criterion 1 in fewer trials under the conditions of "You're right—Silence" (RN) than when under the conditions of "You're wrong—Silence" (NW).

The data for this hypothesis can be found in Table 1. The F ratio on the variances for the two groups (2.24) was not significant below the .05 level. The chi-square was used on the number of subjects to reach criterion under both RN (.33) and NW (1.33) treatments. Neither of these were significant at less than the .05 level.

The above statistical analysis necessitates the rejection of Hypothesis 1.

This finding does not agree with behavior modification theory (from which the hypothesis was evolved) but it does agree with the research done on silence as a reinforcer. The latter research shows that while "You're wrong" tells
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Chi Square</th>
<th>Mean Trials</th>
<th>Variance</th>
<th>F Ratio</th>
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<tr>
<td>Criterion 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RN</td>
<td>26</td>
<td>54.0</td>
<td>.33</td>
<td>45.54</td>
<td>405.17</td>
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<td>20</td>
<td>41.6</td>
<td>1.33</td>
<td>36.00</td>
<td>488.00</td>
<td></td>
</tr>
<tr>
<td>Criterion 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RN</td>
<td>18</td>
<td>69.2</td>
<td>3.85&lt;sup&gt;a&lt;/sup&gt;</td>
<td>13.05</td>
<td>210.10</td>
<td>4.79&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>NW</td>
<td>20</td>
<td>100.0</td>
<td>20.00&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.80</td>
<td>1.06</td>
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</tr>
</tbody>
</table>

<sup>a</sup> .05 level
<sup>b</sup> .001 level
the child that his reason for selecting the cue is wrong, "You're right" can be reinforcing the selection of the wrong cue. Therefore, the subject will maintain his selection of the wrong cue under "You're right-Silence," but alter his response under the "You're wrong-Silence."

**Hypothesis 2**: Those subjects who reach Criterion 1 will reach Criterion 2 in fewer trials under the "You're wrong-Silence" treatment than when under the "You're right-Silence" treatment.

The data for this hypothesis is presented in Table 1. The F ratio of 4.79 (significant at the .05 level) showed a significant difference between the two groups. A chi-square was computed on the frequency of the subjects reaching criterion under each treatment. The chi-square for the RN treatment (3.85) was significant at the .05 level, while the chi-square for the NW treatment (20.00) was significant at the .001 level.

The above statistical analysis leads to an acceptance of Hypothesis 2.

This statistical analysis shows that "You're wrong" causes the subjects to switch cues sooner than silence does (significant F = .05), but silence does tell the subject he is wrong as evidenced by the number of subjects who did switch (significant chi-square = .05) under the RN
Hypothesis 3: The subjects with an Internal Locus of Control (ILC) will reach Criterion 1 in fewer trials than those subjects with an External Locus of Control (ELC).

The data for this hypothesis can be found in Tables 2 and 3.

**TABLE 2**

**ANALYSIS OF VARIANCE FOR LOCUS OF CONTROL GROUPS REACHING CRITERION 1**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN-NW</td>
<td>765.941</td>
<td>1</td>
<td>765.941</td>
<td>2.3360</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>204.074</td>
<td>1</td>
<td>204.074</td>
<td>0.6223</td>
</tr>
<tr>
<td>RN-NW x Locus of Control</td>
<td>196.462</td>
<td>1</td>
<td>196.462</td>
<td>0.5991</td>
</tr>
<tr>
<td>Within</td>
<td>5902.114</td>
<td>18</td>
<td>327.895</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>7068.591</td>
<td>21</td>
<td>---</td>
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</tbody>
</table>

\[F_{.05} (1,18) = 4.41\]

The analysis of the data for the hypothesis was done by dividing the group as nearly as possible into quartiles based on their score on the Locus of Control Scale and by
<table>
<thead>
<tr>
<th>Locus of Control</th>
<th>Subjects</th>
<th>Chi Square</th>
<th>Mean Trials</th>
<th>Variance</th>
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<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RN Treatment</strong></td>
<td></td>
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</tr>
<tr>
<td>External</td>
<td>7</td>
<td>64</td>
<td>.33</td>
<td>38.43</td>
</tr>
<tr>
<td>Internal</td>
<td>5</td>
<td>39</td>
<td>.90</td>
<td>50.00</td>
</tr>
<tr>
<td><strong>NW Treatment</strong></td>
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<td>External</td>
<td>5</td>
<td>46</td>
<td>.33</td>
<td>30.40</td>
</tr>
<tr>
<td>Internal</td>
<td>5</td>
<td>39</td>
<td>.90</td>
<td>32.80</td>
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</tbody>
</table>
using the outer-quartile groups. This resulted in a group of eleven subjects that scored low on the test (external control) and a group of thirteen subjects that scored high on the test (internal control).

A 2 x 2 analysis of variance was computed (see Table 3). This provided F ratios of 2.336 for RN-NW, 0.6223 for Locus of Control (ELC-ILC), and 0.5991 for their interaction. None of these F ratios were significant at less than the .05 level.

The data on the analysis of variance must be observed with caution for two of the subjects in the ELC group who reached criterion 1 under the RN treatment did not reach criterion 1 under the NW treatment. For the ILC group, two subjects reached criterion 1 under RN but not under NW, and two subjects reached criterion 1 under NW but not under RN. This prevented the data from being analyzed using 2 x 2 factorial design with repeated measures.

The chi-square for the ELC subjects under both treatments was .33 while for the ILC subjects it was .90. Neither of these were significant at the .05 level.

The above data shows that this hypothesis must be rejected as there was no statistically significant difference between the two groups under either treatment.

Therefore, there is no differential effectiveness for these verbal reinforcers for the internal and/or the
external locus of control groups.

**Hypothesis 4**: The subjects with an External Locus of Control (ELC) will reach Criterion 2 in fewer trials than those subjects with an Internal Locus of Control (ILC).

The data analysis for this hypothesis (presented in Tables 4 and 5) also made use of the upper and lower quartiles of the subjects based on their score on the Bialer-Cromwell Locus of Control Scale as well as the 2 x 2 analysis of variance.

**TABLE 4**

**ANALYSIS OF VARIANCE FOR LOCUS OF CONTROL GROUPS**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN-NW</td>
<td>1040.400</td>
<td>1</td>
<td>1040.400</td>
<td>2.765</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>460.056</td>
<td>1</td>
<td>460.056</td>
<td>1.226</td>
</tr>
<tr>
<td>RN-NW x Locus of Control</td>
<td>0.044</td>
<td>1</td>
<td>0.044</td>
<td>0.000</td>
</tr>
<tr>
<td>Within</td>
<td>5268.000</td>
<td>14</td>
<td>376.286</td>
<td>--</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>6768.500</td>
<td>17</td>
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<td>--</td>
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</table>

\[ F_{.05}(1,14) = 4.60 \]
<table>
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<tr>
<th>Locus of Control</th>
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<th>Chi Square</th>
<th>Mean Trials</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RN Treatment</td>
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<td>External</td>
<td>4</td>
<td>57</td>
<td>.14</td>
<td>28.0</td>
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<tr>
<td>Internal</td>
<td>4</td>
<td>80</td>
<td>1.80</td>
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<tr>
<td>NW Treatment</td>
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</tr>
<tr>
<td>External</td>
<td>5</td>
<td>100</td>
<td>5.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12.8</td>
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<td>5</td>
<td>100</td>
<td>5.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.6</td>
</tr>
</tbody>
</table>

<sup>a</sup> .05 level
The analysis of variance resulted in F ratios of 2.765 for RN-NW, 1.226 for Locus of Control (ILC-ELC), and 0.000 for their interaction. The analysis of variance data must be observed with caution for both the ELC and ILC groups had one subject reach Criterion 2 under the NW treatment but not under the RN treatment.

The chi-square was computed for both the internal and external groups under both the RN and NW treatments. Under the RN treatment, neither the ELC score (1.14) nor the ILC score (1.80) was significant below the .05 level. Under the NW treatment, the ELC and ILC scores were the same (5.00) as were the significance levels (.05).

The above data shows that there was no statistically significant difference between the Locus of Control groups for the number of trials to reach Criterion 2; therefore, Hypothesis 4 is rejected.
CHAPTER V: SUMMARY AND IMPLICATIONS

Summary:

This study was undertaken to research the effects of silence as a reinforcer with educable mentally retarded children. A further aspect of this study was to research the relationship of locus of control and the effectiveness of silence as a reinforcer.

The major hypotheses were that silence would act as a reinforcer with its value being acquired as a function of the verbal reinforcer it was paired with (i.e., positive when paired with "You're wrong" and negative when paired with "You're right").

It was further hypothesized that the relationship of silence and locus of control would not be so much in the ability to interpret silence as reward or punishment, but in the use to which this information was put. It was hypothesized that the external locus of control child would utilize the information regarding silence sooner than the internal locus of control child.

The sample consisted of 48 children who were selected from the special classes for the educable mentally retarded.
The criteria for selection were: 1) an IQ below 80, 2) not diagnosed as brain damaged, and 3) a mental age of 5-0 to 8-11.

The instruments used were a set of nine blocks (three of each shape—square, circle, triangle; painted one of three colors—red, yellow, and blue), the Bialer-Cromwell Locus of Control Scale and the Slosson Intelligence Test.

The above instruments were administered during the first week of contact with the subjects. The second and third weeks consisted of the treatment paradigm. The nine blocks were taken to a photographer who made 2" x 2" color slides with each slide consisting of three of the blocks arranged so that each shape was present as was each color (e.g., BS, YC, RT; RC, YS, BT). There were 36 possible combinations of color, shape, and position and of each of the 36 combinations, 3 slides were made. These were then put on a carousel slide projector and shown to the subjects under one of two types of treatments: 1) being told "You're right" when they made an appropriate response and getting no verbal response ("silence") when they made an error, or 2) being told "You're wrong" when they made an incorrect response and "silence" when they made the correct response.

Each child underwent both treatments but the order of treatment was reversed for one half of the group. One
group received "You're right-Silence" during the second week and "You're wrong-Silence" during the third week, while the other group received the reverse.

The results of this study partially supported the hypotheses regarding silence as a reinforcer but not its relationship to the construct of locus of control. There was a tendency toward statistical significance for these subjects as seen in the number of subjects involved and the mean number of trials.

Limitations:

The sample selected for inclusion in this study is not a random sample and therefore generalizations from this sample to the population are to be made with care.

The size of the sample was a limiting factor. The small number of subjects in some of the cells on which data analysis was undertaken could very easily be atypical. This would cause the statistical analysis to be invalid.

The effect of non-verbal reinforcement was not controlled in this study; therefore, it is possible that some facial expression of the examiner may have interfered with the results.

Intonation of the verbal reinforcers administered were not controlled and it is possible that the verbalization "You're right" and "You're wrong" were presented with
an intonation that affected the results obtained.

Although the subjects were not diagnosed as brain damaged, this does not rule out the possibility that some of the subjects were brain damaged. These subjects cannot be classified as cultural familial because they were not diagnosed as brain damaged. This would require that the subjects have mild mental retardation (IQ 55-70) with one parent and one sibling also mentally retarded. Several of these subjects would not fit the first criterion.

The examiner's directions assumed that the subjects would try to maximize the number of correct responses they attained. This assumption may not have been valid which would have affected the scores obtained for the subjects.

The effects of partial reinforcement were seen in this study when subjects entered the session with a "set" for one of the cues. This was especially noticeable under the RN treatment where R was confirming an incorrect hypothesis.

Implications:

The implications for this study can be found for teachers, psychologists, and guidance counselors. As far as teachers are concerned, the implications would be in the area of teaching techniques which in turn holds implications for teacher training.
Although not statistically significant, it was found that more subjects reached criterion 1 (learning the correct cue) under the RI treatment while the NW treatment was more efficient for the subjects reached criterion 1 in fewer trials.

This finding would imply that if a teacher was interested in getting a large number of students to learn something, the use of "You're right" when the students are right and silence when they are wrong would be more effective than remaining silent when they are right and saying "You're wrong" when they are wrong. If the teacher was interested in the students learning as quickly as possible, the choice of verbal reinforcement would be reversed ("You're wrong-Silence" rather than "You're right-Silence").

The best way to teach, based on the above, would be to use both types of verbal reinforcers and when the students are wrong, to tell them the right answer.

The finding (Hypothesis 2) that silence does tell the subject he is wrong when it is paired with the positive verbal reinforcer "You're right" would require that special educators assess their teaching techniques. If teachers find that they are using mainly verbal praise and silence, and if silence is used more frequently than praise, the teacher should alter his or her approach.
This would support the belief of Zahorik (1967) that teachers should know what they intend the feedback to mean and only use those forms that transmit the desired meaning.

The implication for teacher training institutions would be that they should disseminate this finding to the teacher trainees.

The implication for school psychologists is in the area of standardized testing which is being attacked on many fronts. Its failure to adequately evaluate subjects from minority groups has been the main area of attack. Recently Bersoff (1971) has been attacking testing from the point of view of what might be called psychological climate. Test administrators are attempting to get the subject to perform to the very best of his ability with the results of the test then reported to the classroom teacher. In comparing the results with the child's functioning in the classroom (where he operates under a different psychological climate) a discrepancy is noted. The results of this study show that research is needed to discover if words of encouragement and the absence of them act the same way that "You're right" and silence do. If so, the protocols for standardized tests may be reducing the subject's scores.

In the area of guidance and counseling, silence as a reinforcer would be particularly important in the
counseling interview, where the type of verbal reinforcer used could have an effect opposite in direction to that expected by the counselor. Since the roles of the counselor and the school psychologist are beginning to overlap, this implication would hold for the school psychologist as well as vice-versa.

Future Research:

Conceptually, the theoretical framework for this study is valid although it was not proven empirically. Therefore, a similar study should be undertaken.

In the new study, modifications would be made that would overcome the limitations in this study. The arbitrary selection of 80 trials would be increased to 100 and criterion 1 would be changed to 12 correct responses in a row. This should lead to an increase in the number of subjects reaching criterion 1. The size of the sample would be increased to 30 at each NA level from the present number of 12, and NAs 9 and 10 would be added. The research design would be an ABA3 design rather than the design used in this study. This would allow more precise results regarding the effect of silence.

In this new study using the ABA3 design, it will be interesting to look at the intra-dimensional and extra-dimensional shifts of the subjects. Based on the findings
of House & Zeman (1962), it would be expected that the subjects would tend to shift a cue that is within the dimension that was correct during the attainment of criterion 1. The subject could be asked to verbalize the cue that was the correct one after the session is completed.

It would also be interesting to look at the dimensions selected by the subjects as correct. Research in this area (Bearison & Sigel, 1968; Brian & Goodenough, 1929; Cunningham, 1969; Hoekstra & McDaniel, 1969; Honkavaara, 1958; Kagan & Lemkin, 1961; Suchman & Trabasso, 1966a, b; Wilcock & Venables, 1968) all report a shift in preference from form to color to form as a function of the age of the child. The ages given vary within the studies with Brian & Goodenough (1929) finding that children use form up to CA 3, color from 3-6, and shift back to form again, while Suchman & Trabasso (1969a) found that the age for the shift from color to form was at CA 4-2. (This discrepancy may be a function of MA rather than CA since Suchman & Trabasso's subjects were from a private nursery school at the University of California). The above cited research in this area leaves one with the impression that this shift is a maturational shift. It is also possible that the shift is one of instruction since the children enter school at this age. This conception is used as the
possible reason for the lack of color labels used by the subjects in this writer's study.

Another possible study would be to use alternate forms of a psychological test on the subjects using both the RN and NW treatment. A correlation between the two scores could then be undertaken and the reliability coefficient could be compared with the test-retest coefficient that is usually supplied by the test publisher.

During the treatment sessions it was observed that several subjects would make a correct response and their next response would not have any of the three cues that were involved in the previous correct response. It is possible that the subject felt that the correct response was based on a sequential pattern. If this were so, then the directions administered must be revised for this type of behavior interferes with the efficiency of learning on this task. It would be of value to find out if this is one aspect of the child's cognitive style or not.
### APPENDIX A—SAMPLE CHARACTERISTICS

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<td>C.A. ...........</td>
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<td>9-10</td>
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83
Children's Locus of Control Scale

Instructions

This is not a test. I am just trying to find out how kids your age think about certain things. I am going to ask you some questions to see how you feel about these things. There are no right or wrong answers to these questions. Some kids say "Yes" and some say "No." When I ask the question, if you think your answer should be yes, or mostly yes, say "Yes." If you think the answer should be no, or mostly no, say "No." Remember, different children give different answers, pending on how you think the question should be answered. If you want me to repeat a question, ask me. Do you understand? All right, listen carefully, and answer "Yes" or "No."

1f. When somebody gets mad at you, do you usually feel there is nothing you can do about it?

2f. Do you really believe a kid can be whatever he wants to be?

3f. When people are mean to you, could it be because you did something to make them be mean?

4f. Do you usually make up your mind about something without asking someone first?

5f. Can you do anything about what is going to happen tomorrow?

6f. When people are good to you, is it usually because you did something to make them be good?

7f. Can you ever make other people do things you want them to do?

8f. Do you ever think that kids your age can change things that are happening in the world?
9f. If another child was going to hit you, could you do anything about it?

10f. Can a child your age ever have his own way?

11p. Is it hard for you to know why some people do certain things?

12f. When someone is nice to you, is it because you did the right things?

13f. Can you ever try to be friends with another kid even if he doesn't want to?

14f. Does it ever help any to think about what you will be when you grow up?

15f. When someone gets mad at you, can you usually do something to make him your friend again?

16f. Can kids your age ever have anything to say about where they are going to live?

17f. When you get in an argument, is it sometimes your fault?

18p. When nice things happen to you, is it only good luck?

19p. Do you often feel you get punished when you don't deserve it?

20f. Will people usually do things for you if you ask them?

21f. Do you believe a kid can usually be whatever he wants to be when he grows up?

22p. When bad things happen to you, is it usually someone else's fault?

23f. Can you ever know for sure why some people do certain things?

Note: The letter "f" following item number indicates that an answer of "Yes" is scored as internal control. The letter "p" signifies that an answer of "No" is scored as internal control.
LOCUS OF CONTROL SCORE SHEET

Yes Battery - Yes

LC Record Sheet

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