1969

The Effect of Positive Reinforcement on the Attending Behavior of a Distractible Child

Michael Lewis Ikard
Central Washington University

57

THE EFFECT OF POSITIVE REINFORCEMENT ON THE ATTENDING BEHAVIOR OF A DISTRACTIBLE CHILD

A Thesis

Presented to

the Graduate Faculty

Central Washington State College

In Partial Fulfillment

of the Requirements for the Degree

Master of Education

---

by

Michael Lewis Ikard

May 1969

APPROVED FOR THE GRADUATE FACULTY

_____

Hyrum S. Henderson, COMMITTEE CHAIRMAN

_____

Larry M. Sparks

_____

Darwin J. Goodey

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENT

Grateful acknowledgement is extended to Dr. Hyrum S. Henderson for his advise and encouragement in directing the writing of this paper. Valuable suggestions were also made by Dr. Larry M. Sparks and Darwin J. Goodey.

INTRODUCTION

The simple matter of paying attention can be a key factor in the learning process; but getting a child to pay attention is not so simple." (Martin and Powers, 1967). Robinson and Robinson (1965) theorize that for retarded children, management of attention is possibly the most valuable contribution a teacher can make. Many times certain educational activities are not attempted with a retarded child simply because his short attention span is thought to interfere with necessary task attendance (Martin and Powers, 1967). It is readily observable why Von Wagenen and Travers (1965) have indicated the need for research involving situations related to reinforcement of learning in the classroom.

Are the systematic methods of reinforcement of learning applicable in lengthening the attending behavior of a distractible child? Although earlier studies have been successful in modifying attending behavior under certain conditions, the number of studies dealing with actual academic performance of retarded children has been quite limited. In this study an attempt was made to determine whether a token reinforcement system could be used successfully in modifying time spent attending to an academic task by a retarded child. It was felt that if

attending behavior could be increased, there would be definite possibilities for teaching additional academic skills to the distractible child.

The Problem

The mentally retarded child, like many other children, is often characterized by a short length of attending behavior. He is often distracted by various items around him. Because he does not concentrate on any one task for long, many learning tasks are difficult or impossible to master. Improving the child's attending behavior can be a major problem facing the classroom teacher. Various investigations have indicated that certain behaviors can be changed through the systematic application of behavior modification techniques. It was felt that further evidence was required to determine if these techniques could be applicable in improving the attending behavior and academic performance of a distractible child.

Purpose of the Study

It was the purpose of the study (1) to evaluate the use of a token reinforcement system in modifying the attending behavior of a distractible child; (2) to demonstrate a technique which a teacher may find useful in helping the distractible child learn to manage his own

attention; and (3) to show the relationship between attending behavior and academic performance.

Limitations of the Study

One of the major limitations of this study was the fact that the investigation was limited to one subject. Although the findings of this study cannot necessarily be applied to all distractible children, it was felt that they might help to shed further light on the problem of short attending behavior.

Another limitation was that the experiment was conducted in an empty classroom. Although the room was free from the distractions of other children, there were many toys and other distracting objects in the room. The classroom was selected in order that the experimenter could have more control over as many variables as possible. While the study was not designed to investigate transfer effects into the normal classroom, the classroom teacher was frequently consulted as to whether the subject showed any observable changes in academic performance and attending behavior either during or after the course of the experiment.

Definition of Terms

Attending Behavior

For the purpose of this study, attending behavior

was defined as that time spent printing acceptable forms of letters or numbers on a paper.

Non Attending Behavior

For the purpose of this study, non attending behavior was classified as time spent doing things other than writing acceptable forms of letters or numbers on a paper such as (1) scribbling, (2) looking around the room, (3) looking at the observer, (4) looking at the paper without printing, or (5) leaving the desk.

Distractibility

A child's inability to remain with an assigned task until its completion because of his limited ability to sustain attention in the presence of external stimuli.

Reinforcement

For the purpose of this study, reinforcement was considered to be the presentation of (1) M&M candies, or (2) colored chips for the improvement of attending behavior and academic performance. The chips were exchanged for "play time" with a doll which the subject enjoyed.

Mental Retardation

The definition of mental retardation introduced by the American Association on Mental Deficiency was accepted

for use with the present study. "Mental retardation refers to subaverage intellectual functioning which originates during the developmental period and is associated with impairment in adaptive behavior" (Heber 1961).

Related Research

Attending behavior has long been recognized as a necessary prerequisite to classroom learning. For many children, sustained attention is very difficult because of their susceptability to various distractions. A number of studies have been reported in which attending behavior was modified under certain conditions. Among the more successful of these studies have been those which applied various techniques of operant conditioning. Some of the more closely related studies will be reviewed in subsequent paragraphs.

Through the systematic application of adult social reinforcement, experimenters were able to successfully control the number of activity changes of a hyperactive 4 year old boy (Allen, Henke, Harris, Baer and Reynolds, 1967). The child tended to move constantly from one play activity to another. Social reinforcement was made contingent on remaining engaged in one activity for at least one minute. This process resulted in a significant reduction of activity changes.

A study by Kennedy and Thompson (1967) indicated that a 6 year old boy's attending behavior was increased considerably by the presentation of reinforcement for paying attention in counseling sessions and in arithmetic lessons. Candy was presented for each minute of attending accumulated during a counseling session. Prior to the use of candy as a reinforcer, he was extremely inattentive. Especially significant in this study was the fact that attending behavior in the counseling sessions transferred to the regular classroom where completion of arithmetic lessons increased significantly.

A recent study (McKenzie, Clark, Wolf, Kothera and Benson, 1968) used grades as token reinforcers in a study of distractible students in a learning disabilities class. The subject's weekly allowances were paid on the basis of grades (e.g. ten cents for A's and five cents for B's). Using grades as tokens was found to significantly increase attending to reading and arithmetic.

Conditioning techniques were applied to the attending behavior of a bright underachieving 9 year old boy in a study by Walker and Buckley (1968). Attending to a programmed learning text was reinforced with points which could be exchanged for a model of the subject's own choice. The percentage of attending behavior increased significantly during the individual conditioning process but the

conditioning did not transfer well into other academic activities.

The preceeding investigations were conducted on children who were classified as within the normal range of intelligence. Limited sustained attention is often even more of a problem for the mentally retarded child. Without this sustained attention, the retarded child finds learning very difficult. Although it has been shown that attending behavior has been modified in normal children, one questions whether there are techniques to increase attending behavior in retarded children. The following examples indicate that attending behavior can be increased under certain circumstances.

Doubros and Daniels (1966) conditioned the attending behavior of six overactive, mentally retarded boys ranging in age from 8 to 13 years. Tokens, which could be exchanged for candy, were dispensed for playing with certain toys for a designated time without displaying hyperactive responses. The number of hyperactive responses during the conditioning period were less than one-third the number of those observed prior to conditioning.

Martin and Powers (1967) demonstrated that the attending behavior of a retarded child could be conditioned even though he was being distracted by other human

stimuli. The subject was placed in a double plexiglass cubicle and was presented tokens for pressing a lever. Although the introduction of a confederate temporarily disrupted the pattern of response, the response soon recovered to its original rate because of the strength of the reinforcer (tokens were exchanged for peanuts, pretzels or juice).

In an attempt to determine whether token reinforcement was essential in maintaining high rates of study and relatively high levels of accuracy among retarded pupils, researchers conducted a study in which a token reinforcement system was removed for a period of twenty-one days (Birnbrauer, Wolf, Kidder, and Tague, 1965). The children had previously been awarded tokens for cooperative behavior and correct responses to instructional materials. The results of removing the token reinforcement system indicated that approximately one-third of the subjects showed no adverse effects from the removal of the system while the remaining two-thirds either increased in percentage of errors, completed less work, or became serious disciplinary problems. After the tokens were reinstated, the subjects again completed more work and their percentage of errors was less than at any other time.

Inappropriate behaviors (e.g. hitting, talking,

looking around the room, or walking around the room) were significantly decreased in a study by Patterson (1965). The study was especially significant in that it was done in the normal classroom. During the conditioning sessions, M&M candies were presented for each 10 second interval in which no inappropriate behavior occurred. A light went on each time the subject worked for the designated time and a counter kept track of the number of attending intervals completed throughout the conditioning session. Because the candies were divided among all students in the classroom, the social reinforcement received from his classmates undoubtedly affected the subject's behavior. In a similar study, experimenters were able to modify the attending behavior of a brain-injured hyperactive boy (Patterson, Jones, Whittier, and Wright, 1965). An auditory stimulus was presented through an earphone for each 10 second period of attending behavior. A control subject was included in the study in order to compare the occurrence of non-attending behavior between an experimental and a control subject. Non-attending behavior decreased significantly with the experimental subject while there was little change in the occurrence of non-attending behavior with the control subject.

In none of the preceeding studies was the relationship between attending behavior and academic performance

investigated. In most of the studies, reinforcement was only contingent on time spent attending to an assigned task. In the several studies that did concentrate on academic performance, data was not presented on the time spent attending to the task to elicit the improved performance. In the present study, complete data was kept both on time spent attending to the assigned task and on the rate of acceptable performance. From this data, the relationship found between attending and performance can be observed. An experiment which concentrates only on the elimination of some form of inappropriate behavior in the classroom may often do nothing to improve the subject's actual academic performance in the classroom. Many of the studies concentrating on a student's ability to pay attention to an assigned task often classified attending behavior as simply not displaying non-attending responses. By this definition, a student can be classified as attending to the task while actually his performance is at a very low rate. Because of these limitations found in previous studies, this study was conducted in such a manner that attending behavior could be paired with actual performance in order to establish a more thorough understanding of the relationship between the two.

METHOD

Subject

The subject, a moderately retarded fifteen-year-old girl, was one of seven children attending a class for the mentally retarded. She was not able to start formal schooling until the age of eleven and this may have contributed to some of her problems in school. Although she seemed to thoroughly enjoy school, she had a tendency to constantly move from one activity to another, spending little time with any one activity. The problem had been observed by previous teachers and by her present teacher. All felt that better attending behavior was necessary for good classroom adjustment. Initial observation indicated that the child was distracted by the slightest noise in almost all instances. When given the task of printing letters of her name, she would seldom print more than one or two letters without looking around at the other people in the room. If the duration of attending behavior were increased, the observer and her teacher felt that she would have a much easier time acquiring additional academic skills.

Observation Procedures

The subject was observed in the regular classroom to determine characteristics of non-attending behavior exhibited. When she was placed in the empty classroom, most

non-attending behaviors continued. Among her more common behaviors classified as non-attending were leaving the desk, looking out the window, looking around the room, turning around to look at the observer, and looking at the paper without printing.

As was stated in the definitions of terms, attending behavior was classified as time spent printing acceptable forms of letters. This particular activity was selected because it provided a routine, well-structured opportunity for observation and reinforcement. The subject seemed to particularly enjoy working on writing and was anxious to learn to write her name.

The subject was observed for fifteen to thirty minutes per day, four days per week over a period of three months. Most of the observations were made in the morning, normally immediately upon the subject's arrival at the school. Three other observers gathered data in nine instances in order to determine inter-observer reliability.

When the subject was placed in the experimental classroom, she was presented a paper on which her name had been partially printed (letters were outlined in a series of dots). This paper was later replaced with a paper which had been lined off to form a series of 3/4 inch squares. The subject was instructed to practice forming letters of her name. The observer timed the length of time she spent

attending in each instance and also determined her rate of performance by dividing the number of acceptable letters formed by the duration of the observation session.

Conditioning Procedures

The study was done in five phases:

Phase I

The first phase was used to collect baseline data. Existing duration of attending behavior and rate of task performance were collected for eight sessions.

Phase II

During this phase, the subject was told that she would receive a token (colored chip) for each instance she was able to work continuously on printing letters for a specific length of time (e.g. 30 seconds). She was then told that she would be able to exchange five tokens for "play time" with a doll which she enjoyed. Duration of attending behavior and rate of task performance were collected for six sessions.

Phase III

During this phase, the subject was told that she would receive a M&M candy for each instance she was able to work continuously on printing letters for a specific length of time. Duration of attending behavior and rate of task

performance were collected for six sessions.

Phase IV

During this phase, the subject was told that she would receive a token for each time she performed a specified number of acceptable letters. Again she was told that she could exchange five tokens for "play time" with the doll. Duration of attending behavior and rate of task performance were collected for six sessions. On the third session of this phase, the original type paper on which her name was formed, was replaced by the paper which had been lined off into squares. This was done to facilitate reinforcement of responses.

Phase V

During this phase, the subject was told that she would receive a M&M candy for each time she formed the specified number of acceptable letters. Again the duration of attending behavior and rate of task performance were collected for six sessions.

In all phases the reinforcers were presented immediately upon completion of the designated activity. This was done in order to maximize the strength of the reinforcers. Accompanying some of the reinforcers was a statement such as "For working that long, you get a chip.". This was done in order to be sure that the subject realized

exactly why the reinforcer was being presented. This may have been a form of social reinforcement for the subject and may have had a small effect on her performance.

Follow Up

Following the termination of the experiment, the observer gradually lessened the frequency of observation. Post checks were made during these observation sessions in order to determine the stability of the behavior modifications.

Hypotheses

Two null-hypotheses were formulated in relation to the study:

I. Reinforcement of time spent attending to an assigned task would make no significant difference in the length of time spent on the task.

II. Reinforcement of acceptable responses formed would make no significant difference in the number of responses formed within a designated time period.

RESULTS

After observing the subject for several sessions, base rate of attending behavior and academic performance was collected. The mean duration of attention during phase I (control phase) was 17.0 seconds. Upon presentation of tokens for time spent attending to the task of printing letters, the subject's mean duration of attention increased to 24.0 seconds. Although this was only a moderate gain in duration of attention over the base rate, the gain was found to be significant ($p<.05$).

When the reinforcer for attention was changed from tokens to M&M candies, the subject's mean duration of attention increased to 26.9 seconds. In comparing this duration with the base rate, it was found to be significant ($p<.01$). Although there again was a moderate gain between phase II (tokens) and phase III (candies), the difference was not found to be significant.

In changing from the reinforcement of duration of attention to the reinforcement of acceptable responses with tokens, mean duration again increased to 34.7 seconds. This gain was significant ($p<.05$) when compared with the base rate.

Duration of attention again increased slightly when reinforcement of responses was changed from tokens to

candy in phase V. Mean duration of attention increased to 39.4 seconds. In comparing this to the base rate, the difference was again significant ($p<.01$). No significant difference was found between the reinforcement of appropriate responses with tokens (phase IV) and with candy (phase V).

Figure 1 represents daily mean durations of attention as gathered from each observation session. In comparing the five phases, it is evident that there was somewhat of a general increase of duration of attention as the study progressed. In comparing the results between the two phases which reinforced attention and the two which reinforced actual performance, again a difference was found. The reinforcement of performance produced significantly higher durations of attention than did actual reinforcement of attention. Some of this difference was due to the change in paper. This will be discussed in later section. No significant difference in duration of attention was found between the use of candies or tokens as reinforcers.

At the same time as the observer was recording data on the duration of attention, he was also recording data on the rate of acceptable letters that the subject printed. Rates were established by dividing the total number of acceptable letters printed during a session by the length of the session. Table I presents mean durations of

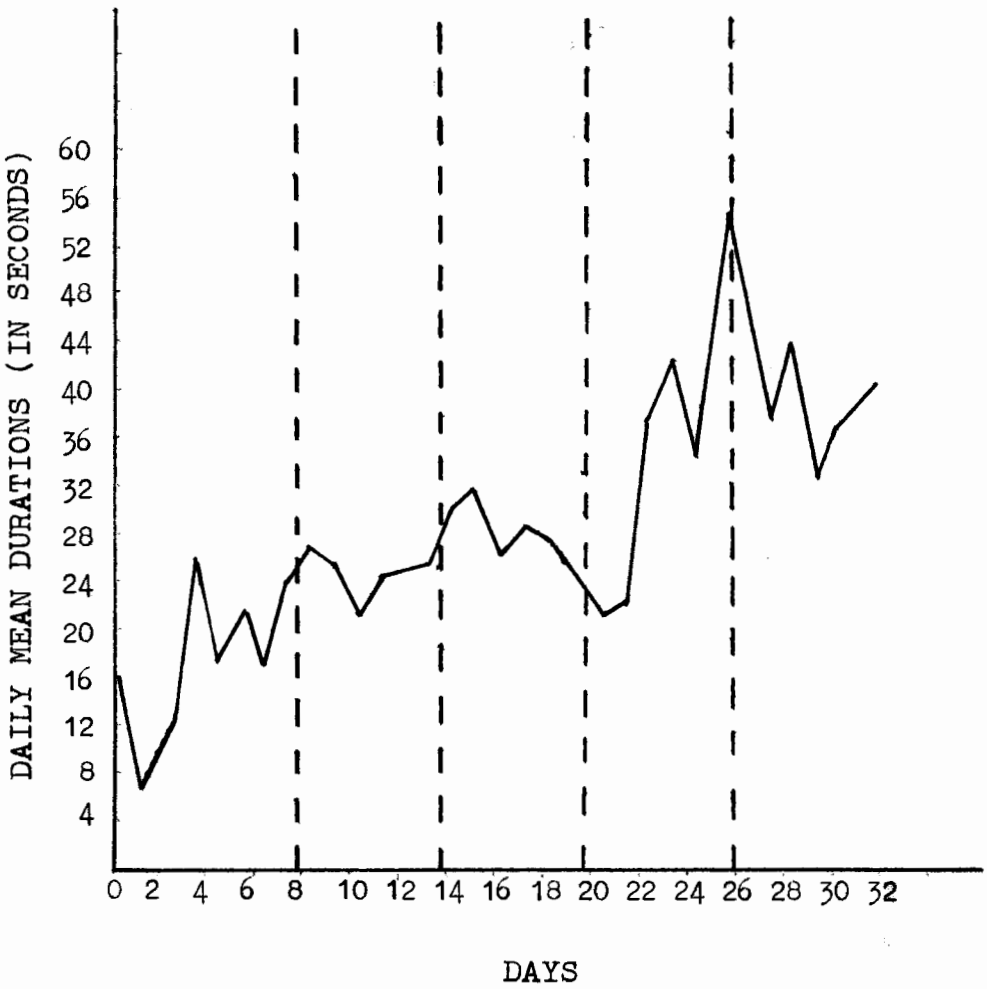

FIGURE 1

DAILY MEAN DURATIONS

OF ATTENDING

attending time and mean rates of acceptable response for each of the five phases. By comparing results in each of the phases, the relationship between attending behavior and academic performance can be observed.

During the baseline (control) phase, the subject printed at a rate of 2.8 acceptable letters per minute. Upon introduction of tokens for time spent attending to the task of printing letters, the subject's rate of response increased to 7.9 letters per minute. This gain was significant to the .01 level.

When the reinforcer for attention was changed from tokens to M&M's the subject's mean rate of response increased slightly to 8.7 letters per minute. Although this gain was also significant ($p<.01$), there was no significant difference between attention with candy or tokens.

In changing from the reinforcement of duration of attention to the reinforcement of acceptable responses with tokens, the responses showed a non-significant gain to 9.8 letter per minute. This gain remained significant ($p<.01$) when compared to the base rate.

In the final phase in which responses were reinforced with candy, rate of responses gained to 12.7 letter per minute. There was no significant difference in the rate of response between the use of candy or tokens as reinforcers.

TABLE I

COMPARISONS OF MEAN DURATIONS OF ATTENTION AND RATES OF RESPONSE

	Phase I	Phase II	Phase III	Phase IV	Phase V
Duration (in sec)	17.0	24.0	26.9	34.7	39.4
Responses/Minute	2.8	7.9	8.7	9.8	12.7

Figure 2 represents daily means for rate of response as gathered from each observation session. After a large initial gain, there is a gradual increase in the rate of response. After the initial gain between the base rate and the reinforcement phases, gains between individual reinforcement phases were not significant in most instances.

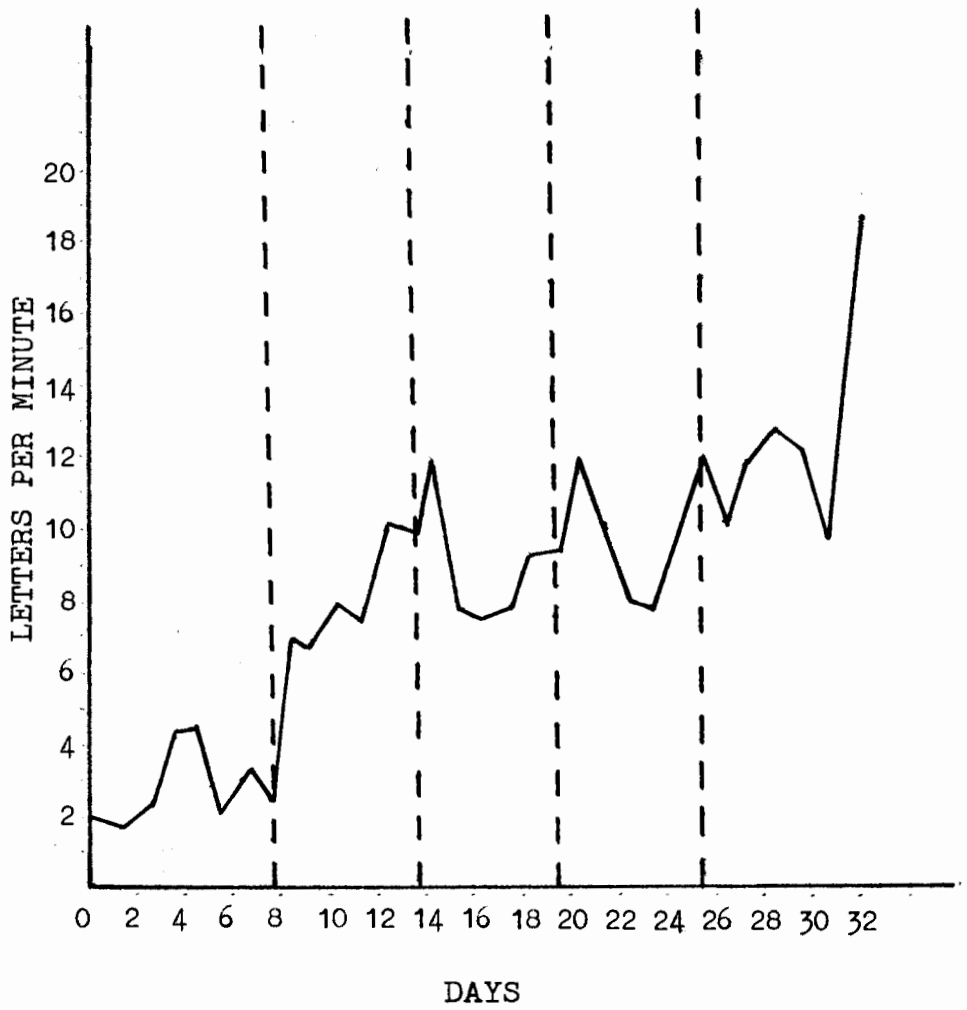

FIGURE 2

DAILY MEAN RATES

OF PRINTING LETTERS

DISCUSSION

In interpreting the previous results, the general picture is one of steady, but gradual, improvement as the study progressed. The duration of attending behavior was more than doubled during the study and the subject's rate of performance increased to more than four times that of the base rate. For this reason, the experimenter rejected both hypotheses which had been proposed.

Inter-observer reliability was determined by running tests for correlation between the data gathered by the experimenter and by a second observer. In determining inter-observer reliability of durations of attention, both the experimenter and the observer timed the subject and reliability was established at the .991 level. The experimenter and a second observer counted acceptable letters formed and reliability was established at the .965 level.

Prior to the collection of baseline data in phase I, the experimenter spent several weeks observing the subject both in the regular classroom and in the experimental classroom. During this period the subject was seldom able to attend to any task for more than from five to ten seconds. When the experimenter began to gather data regularly in the experimental classroom, the subject's

attention increased to the point indicated in phase I. Much of this improvement was probably due to the subject's acceptance of the routine. Although her attention was very limited during this period, she seemed to enjoy trying to print her name. During this phase she would often print only one letter and then look around to the observer in order to try to gain approval. The observer attempted to limit social reinforcement to a large extent although on occasion he would say something like "You must keep working to get a chip". Many of the letters printed during this phase were unacceptable and this also limited her rate of performance.

When the observer began reinforcing longer durations of attention, there was a moderate gain in duration of attention. The subject seemed to enjoy working for the tokens and the doll seemed to be a high-strength reinforcer early in the experiment. One of the problems in this area was determining how to help the subject understand how long she had to attend in order to receive the reinforcer. The observer did this by pointing to the stopwatch each time the subject completed a period of attention. This process would be changed if the study were to be repeated. Along with the moderate gain in duration of attention came a major gain in her rate of response. When rewarded for longer attention, the subject began

to form more letters without looking up. The quality of letters was slightly improved over that of the baseline. Some of this improvement may possibly be attributed to the amount of practice she was receiving from the experiment. When the experimenter began reinforcing attention with candies, the subject again improved slightly both in duration of attention and in rate of response. She seemed as satisfied to work for candy as she had for tokens and "play time" with the doll. Reinforcement with candy was easier for the experimenter to implement and proved to disrupt the subject less.

Upon changing to the reinforcement of specified numbers of letters, a new problem arose. Although the subject continued to attend for approximately the same duration of time, she began forming many more letters, of which many were judged unacceptable. She often would print as fast as possible with little or no attention to the quality of her letters. Because the study was only concerned with the printing of acceptable letters, only slight gains were made in her rate of response. On the third day of reinforcing responses, the experimenter changed to the paper which had been lined off into squares. This change was made to facilitate more accurate reinforcement of the designated number of responses. With the change in paper, the subject began to print even more

rapidly with no improvement in the quality of her letters. The change did modify the length of time spent printing letters. With the new type paper, her average attention duration increased by an average of 10 to 15 seconds and was longer than her best previous mean duration of attention in almost all instances. Although this change in paper probably influenced all subsequent data collected on duration of attention, this knowledge of type of paper was probably quite important.

With the problem of duration of attention somewhat solved, the experimenter concentrated on quality of letters. The experimenter was quite explicit on the quality of letters which would be accepted in determining reinforcement. Although her rate and quality of performance continued to improve slowly throughout the rest of the study, the experimenter was not able to completely eliminate the habit of forming unacceptable responses. Although the subject had some minor coordination problems, it was felt that she could have improved her rate of performance to a greater extent with more concentration on the formation of high quality letters.

Another problem found in phase IV was the reintroduction of the doll as a backup reinforcer. The subject's interest in the doll seemed somewhat satiated and she often spent more of her "play time" playing with the tokens

which had been presented than with the doll. If the study were to be repeated, a number of backup reinforcers would be provided in an attempt to limit the satiation of reinforcers. Upon returning to the use of candy in phase V, evidence of satiation was not present. There can be problems implementing either of these techniques into the regular classroom. One teacher would be kept very busy simply distributing candy or tokens for attention or performance. There are implications for implementing this type of program in any instance where a teacher or assistant is able to work with a student on an individual basis.

Even after considering the additional factors which may have influenced certain aspects of the study, the observer felt that there were implications to be derived from the study. No matter to what cause the improvement in attending behavior is attributed, the fact still remained that the behavior was modified. In addition, the study produced a major improvement in the subject's rate of response. These results further support the evidence that through the systematic application of behavior modification techniques, the attending behavior and academic performance can be improved; even with the distractible retarded child. Without sustained attention, many academic activities are not attempted with the

retarded child and the ability to perform these activities is often diminished.

Although inspection of the present data indicated that reinforcement of attention and responses increased as a function of the conditioning process, the exact nature of their relationship remains obscure. Further evidence is required to ascertain which type of activity should be reinforced to improve the actual performance of the distractible child. With further study, it is hoped that the problem of short attention, which so often is present in the retarded child, can become less of a problem.

SUMMARY

An operant conditioning procedure was utilized in an experimental setting for the purpose of increasing attention and improving academic performance. The subject was an overactive 16 year old mentally retarded girl who had difficulty remaining interested in one task for more than a few seconds. Baseline data on the duration of attention and the rate of performance were collected. Following this, four reinforcement phases were studied. Both duration of attention and rate of response were reinforced with both tokens and candies. The results indicated that both duration of attention and rate of response can be significantly increased through systematic application of behavior modification techniques.

CONCLUSIONS

Because the study was done with one child, one may not obtain any general conclusions which can be considered applicable to all retarded children. Although the results have indicated significant improvement in both time spent attending and in the rate of response, there was a great deal of room for further improvement. The observer felt that the subject was nowhere near her potential in either of the areas. Further studies are recommended with similar children in both areas to determine whether there are other types of reinforcers which could make additional improvements in their performance. The observer concluded that part of the reason for the subject's improved performance in this study was her realization of success. The observer felt that this had been one of the first times that the subject's academic efforts had proved to be worthwhile to her. If a teacher can structure activities so that a retarded child can be successful, problems with poor attention may be reduced in many instances. If the distractible child is able to learn to manage his own attention, one of the most important problems facing educators will be solved.

REFERENCES

REFERENCES

Allen, K. Eileen, Henke, Lydia B., Harris, Florence R., Baer, Donald M., and Reynolds, Nancy J., "Control of Hyperactivity by Social Reinforcement of Attending Behavior." Journal of Educational Psychology, 58:231-37, August, 1968.

Birnbrauer, J.S., Wolf, M.M., Kidder, J.D., and Tague, Cecilia E., "Classroom Behavior of Retarded Pupils With Token Reinforcement," Journal of Experimental Child Psychology, 2:219-35, 1965.

Doubros, Steve G., and Daniels, Gary J., "An Experimental Approach to the Reduction of Overactive Behavior," Behavior Research and Therapy, 4:251-58, 1966.

Durio, Helen F., "Reinforcement; Candy, Grades, or Money?" The Texas Outlook, 50:17, June, 1966.

Hagen, John W., "The Effect of Distraction on Selective Attention," Child Development, 38:633-44, September, 1964.

Heber, R.F., A Manual on Terminology and Classification in Mental Retardation. American Journal of Mental Deficiency, 1959, 64, Monograph Supplement.

Johnson, Bette M., "Reward Schedules and Instrumental Conditioning in Normal and Retarded Children," Child Development, 37:633-44, September, 1964.

Kagan, Jerome, "Understanding the Psychology of Mental Growth," Grade Teacher, 83:79+123-30, March, 1966.

Kennedy, Daniel A., and Thompson, Ina, "Use of a Reinforcement Technique with a First Grade Boy," Personnel and Guidance Journal, 46:366-70, December, 1967.

McKenzie, Hugh S., Clark, Marilyn, Wolf, Montrose, M., Kothera, Richard, and Benson, Cedric, "Behavior Modification of Children with Learning Disabilities Using Grades as Tokens and Allowances as Backup Reinforcers," Exceptional Children, 34:745-52, Summer, 1968.

Martin, Gary L., and Powers, Richard B., "Attention Span: An Operant Condition Analysis," Exceptional Children, 33:565-70, April, 1967.

Patterson, G.R., Jones, R., Whittier, J. and Wright, Mary A., "A Behavior Modification Technique For the Hyperactive Child," Behavior Research and Therapy, 2:217-26, 1965.

Patterson, G.R., "An Application of Conditioning Techniques to the Control of a Hyperactive Child," Case Studies In Behavior Modification. New York: Holt, Rinehart and Winston Inc., 1965, Pp370-75.

Reger, Roger, "Stimulating the Distractible Child," Elementary School Journal, 64:42-48, October, 1963.

Robinson, Halbert B. and Nancy M., The Mentally Retarded Child. New York: McGraw-Hill Book Company, 1965 Pp316-40.

Stimbert, Vaughn and Frazier, James R., "The Effect of Tangible Reinforcement on the Learning and Retention of Programmed Material in Academically Retarded Children," Journal of School Psychology, 6:246-49, Summer, 1968.

Tyler, Vernon O., and Brown, G. Duane, "Token Reinforcement of Academic Performance with Institutional Delinquent Boys," Journal of Educational Psychology, 59:164-68, June, 1968.

Van Wagenen, R. Keith, and Travers, Robert M.W., "Learning Under Conditions of Direct and Vicarious Reinforcement," Journal of Educational Psychology, 54:356-62, December, 1963.

Walker, Hill M., and Buckley, Nancy K., "The Use of Positive Reinforcement in Conditioning Attending Behavior," Journal of Applied Behavior Analysis, 1:245-50, 1968.