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Middlebush

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THE GENERALIZATION EFFECTS OF INITIALLY  
IMPROVED READING SKILLS UPON SOCIAL  
AND OTHER ACADEMIC BEHAVIOR

by

C. Wesley Middlebush

A Thesis  
Submitted to the  
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C. Wesley Middlebush

MASTER'S THESIS

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## INTRODUCTION

Over the last decade, experimental psychologists have shown an increased interest in education. This interest has ranged from specific problems in the classroom to general learning and management problems. Psychologists majorly identified with the experimental analysis of behavior have been particularly active in the education area (Skinner, 1968; Ullman and Krasner, 1965; Ulrich, Stachnik, and Mabry, 1966; Bijou and Baer, 1967). More specifically, much of this research has indicated that many problem behaviors arise in part because (1) behavior that is necessary for adjustment in our society is absent from the individual's repertoire, (2) behaviors considered undesirable by the society are present in the individual's repertoire, or (3) the individual's motivation for learning was inappropriate in some respect, less ambiguously referred to as "setting events" (Bijou and Baer, 1966).

The notion that many behavior problems consist of deficits in behavior is important in the study of child development. Behaviorally speaking, a child is considered to be a problem when he does not acquire behaviors as other children do. It is conceivable that a deficit in behavior could arise because the child simply cannot acquire the behavior involved, even though

the conditions of learning have been entirely adequate for others. A child may be exposed to learning conditions that are appropriate for most children but, due to the particular child's past history of learning, are not appropriate for him. It is especially in these cases that people are most likely to conclude erroneously that since other children learn in the same circumstances, the child's deficit must be because of some personal defect. For example, in cases where the training is long term, adequate reinforcement must be available to maintain the crucial work behaviors necessary for learning. It has been demonstrated (Staats, Staats, Schutz, and Wolf, 1962; Birnbrauer, Wolf, Kidder, Tague, 1965; Madson, Becker, Thomas, 1968) that the reinforcers present in the traditional schoolroom are inadequate for many children. Their attending behaviors are not maintained, and they do not learn. Thus, a deficit in an individual's repertoire may arise although he has been presented with the "same" training circumstances from which other children profit. Learning does not take place because the child's previous experiences have not provided the necessary incentives to maintain good "learning" behaviors. It would seem that in such a circumstance the assumption that the child has a personal defect would be misleading.

It might also be expected that a behavioral deficit could arise in cases where the conditions of learning have been defective for all children. Learning conditions can be defective in different ways. For example, the child may never have received training in the behavior he must later exhibit. Likewise, the training may be poor, even though the "trainers," parents or teachers, and so on, have the best intentions.

After a few years of school attendance where the conditions of learning are not appropriate for the child, he will not have acquired the behavioral repertoires acquired by more fortunate members of the class whose previous experiences have been subject to an adequate incentive system. Then, lack of skilled behavior is likely to be treated with dire consequences. That is, the child with a reading deficit, or other evidence of underachievement is likely to be ridiculed and teased when he is still young, and ignored, avoided and made to feel inferior when he is older. Although the individual's doing this may not intend to be threatening, such actions constitute the presentation of aversive stimuli. Furthermore, this presentation of aversive stimuli by other "successful" children, and perhaps by a teacher, might be expected to result in further learning, but actually will result in learning of an



undesirable nature. These successful children, teachers, academic materials, and the total school situation can in this way become conditioned negative reinforcers, in other words, the child acquires negative attitudes toward school.

At this point, the child is likely to begin to "escape" the school situation in various ways (daydreaming, poor attendance, and so on) and to present many problems in turn to the school and its inhabitants (vandalism, fighting, baiting teachers and students, etc.). Thus, a deficit in behavior, resulting from an ineffective incentive system, can lead to the further development of inappropriate reinforcers and inappropriate behaviors.

Although some experimental psychologists have proposed the use of systematically applied reinforcement systems, and while the application of reinforcement methods are certainly encouraging, a legitimate question is often raised by psychologists and teachers concerned with the utilization of these procedures. One question might be, "What are the generalization effects of behavior to other social and academic settings as a result of academic success in one classroom?" According to a review of literature, there are very few studies which objectively measure these generalization effects by way of standardized measures (Ward and Baker, 1968).

Therefore, the purpose of this study was to (1) further demonstrate the effectiveness of operant techniques by utilizing an incentive system to improve reading skills; and (2) assess the generalization effects in other social and academic settings as a result of improved reading in another classroom.

#### METHOD

##### Subject

The subject was a 13 year old black student enrolled at the junior high level of a city public school. According to an assessment of the boy's intelligence prior to the study, an I.Q. of 92 was obtained on the WISC. The boy was also identified by standardized tests and academic performance as having a severe reading problem, in which he read at the 2.9 grade level. He had been known to exhibit many behaviors incompatible with learning such as "daydreaming", talking, and refusal to continue working. Student motivation, as evidenced by the amount of work accomplished, along with comprehension, was low. The boy also exhibited pre-delinquent behaviors, such as fighting, truancy, and various unusual personality characteristics. The subject was selected from one of four seventh-grade boys in a remedial reading class.

## Material

The experiment was conducted in the remedial classroom of a public junior high school. The room was equipped with the necessary facilities for teaching reading skills with a capacity for six students, and a teacher, plus teacher aid. The programmed Webster Basic Skill Cards were used as the reading material. The material was based on results of the Metropolitan Achievement Test, and past reading performance; and was geared to the student's reading level.

## Procedure

Sessions were conducted Monday thru Thursday morning between 9:05 and 9:35.

The student was administered the Metropolitan Achievement Test (Elementary Reading Form B) immediately preceding the initiation of the Baseline phase.

The experimenter measured "on task" behavior which was operationally defined as any of the following: (1) reading--if student is looking at the programmed material card; (2) writing answers to the questions on the back of the programmed cards; (3) asking questions related to the reading material. When the student was engaged in behaviors considered to be "incompatible", no time was recorded on the stopwatch.

Before beginning the Baseline phase, both teacher and experimenter had experience using the stopwatches to observe behavior in the classroom. In the present study the experimenter recorded the amount of "on task" behavior of the student.

Reliability checks were conducted throughout the study by having the teacher also observe the student at the same time. The percentage of agreement was formulated by dividing the larger of the two "times" recorded into the smaller, and the quotient multiplied by 100. Reliability checks for the entire study average 94% agreement.

#### Phase I:

Baseline data were collected to determine the amount of time the student exhibited "on task" behavior. During this phase the number of questions answered correctly on the back of the programmed cards, the word "accuracy", was recorded. The number of cards completed was also recorded and was used as a criterion measure for reinforcement.

Therefore, reinforcement was contingent upon (1) "on task" behavior; (2) the number of questions answered correctly, "accuracy", and (3) the number of cards completed.

Phase II:

At this point, the student was told, "If you study well during this exercise, you will be given a certain number of points with which you may purchase time to do something you would like." The experimenter determined during Baseline what was reinforcing for the student, and always made alternatives available in case the original reinforcer was no longer effective for the student. The reinforcers consisted of such things as playing ping-pong, reading a favorite book, playing games, and other reasonable activities. The reinforcing period, in any case, was not longer than ten minutes in duration.

The incentive system was so established that the student was reinforced for desirable responses, i.e. completing Reading Skill cards with high rate of "on task" behavior, and a high rate of "accuracy" in answering questions. Points were administered as follows: either 1, 2, or 4 points for the amount of time engaged in "on task" behavior; 1 point for each question answered correctly; and an increasing number of points corresponding to the number of cards completed. Also, points were given as a bonus if the student answered all questions correctly on any particular card, and were cumulative. The amount of time earned with a

particular reinforcer was contingent upon the number of points accumulated during the 15 minute reading session. Criteria for reinforcement were determined as a function of the level at which the student was responding during the Baseline phase.

Therefore, Phase II allowed the experimenter to introduce the incentive system contingent upon the specified criteria, and to record the student's responses as a result of instituting this system.

As a measure of the generalization effects in behavior to other learning situations, the experimenter designed an objective checklist to be filled out by four of the student's teachers. Data were recorded daily by these people as to how the student was behaving in their classes. The checklist used was constructed so that a minimal amount of time was required to complete the form. Effort was made to minimize subjective and evaluative responses by these people. These data were recorded during Phase I and II of the study, and also during the two remaining weeks of the school year after the study was terminated, a Post-Experimental phase.

A copy of the student checklist which the four teachers used to measure the generalization effects studied is presented in Table I.

## RESULTS

Figure 1 shows the percentage of time engaged in "on task" behavior throughout the study. Phase I continued for 15 days, while Phase II lasted 14 days.

Figure 2 shows the percentage or "accuracy" of questions answered as a result of reading the programmed material.

Figure 3 illustrates the number of programmed reading cards completed during the 15 minute reading session. This includes not only reading the material on side 1 of the card, but also answering all six questions on the reverse side.

The generalization measures are presented in Figures 4-9 and show the effects on behavior as a result of the experimental manipulations made in the reading class. Phase III represents a Post-Experimental period in which the contingencies no longer existed, observation in the reading class terminated also, however, data continued to be taken by the other classroom teachers until the end of the school year.

## DISCUSSION

It was found that the average amount of time spent working during the Baseline phase was 96.5% with a range from 100% to 83%. At the onset of Phase II, when the

reinforcement contingency was established, a somewhat higher percentage of "on task" behavior was observed. The mean percent now being 99.6%, and showing more consistency than in baseline with a range from only 100% to 99%. This accounted for the small increase observed in the amount of time spent working during the reinforcement contingency over non-contingent study.

Similarly, the mean percent accuracy during baseline was 78.1 with a range from 100% to 0% on the last day. A rather dramatic increase in accuracy was observed as a result of instituting the reinforcement system. The mean percent of accuracy during this phase was 90.6 with a range from 100% to 69%. Although this level of accuracy was relatively adequate, it was sporadic during the Baseline phase and there was a noticeable improvement with higher consistency during the reinforcement phase. During the reinforcement or experimental period the percent of accuracy was maintained above the mean percent during baseline, except on three occasions.

The average number of cards completed during baseline was two with a range from two cards to zero cards on the last day. During Phase II, the average number of cards completed remained the same, however, the number during this phase did not fluctuate, but



remained highly stable.

Most of the data in Figure 4 were from assignments made in math class and usually consisted of completing 10-30 problems which the student copied from the blackboard. Although there was at least one assignment made per day, the subject always turned in his assignments late and then were never completed in totality. Of the assignments that were partially completed, grades of either D or F were always received. It can be seen that more assignments were partially completed than not completed during the last five days of the study. Although there are no data to explain why more assignments were turned in during this period, the math teacher suggested that this was not an uncommon thing during the last two weeks of the school year. He felt that during this time students often perform better to compensate for their past, and poorer academic performances, hoping this will impress the teacher and raise their final grade.

The disruptive behavior, previously referred to in Figure 7, was recorded in only one of two classes in which this behavior actually occurred, as one of the teachers was not consistent in recording data throughout the study. The data shown in Figure 7 show that all class or individual student disruptions occurred in large

classes where there were thirty or more students. There tended to be more disruptions to the entire class than to any one student. Secondly, nearly all of the disruptive behavior occurred in the student's music class. The decrease in disruptive behavior shown in Figure 7 at the onset of the Post-Experimental phase may be explained by the student becoming part of a small rhythm group with another teacher. Both teachers recording data noticed a considerable improvement in his behavior at this time. He began to obey instructions, contributed to the group, and created few if any problems.

Most of the data reported in Figure 8 were collected in the student's music class. No explanation can be given for the dramatic increase in "out of seat behavior" on the two consecutive days toward the end of the experimental session. Neither can the dramatic decrease thereafter be explained, except for the fact that the student was referred to a counselor just prior to the increase for using profanity in another class.

Figure 5 shows that an increase in tardiness and absenteeism occurred during Phase II. However, none of this behavior occurred in the reading class. According to the reading teacher, tardiness and absenteeism decreased considerably in the reading class during the course of the study.

Figures 6 and 9, showing "times without necessary materials" and "student services volunteered", suggest no important behavior changes during the study.

Data from the present study give us basis for the following conclusion. Systematic reinforcement procedures can be effectively used in increasing study behavior and reading skills when previous attempts at assistance have been relatively ineffective. Secondly, little if any change in social and other academic behavior occurred in other classes as a result of initially improved reading proficiency. In other words, no generalization was observed. The reinforcement system worked very well, maintaining attention and working behavior in good strength throughout the duration of the study. There was little doubt that the study could have been continued for a much longer period of time, probably as long as it would have taken to train the boy to read normally.

A comment should be made about the probability of a Hawthorne effect concerning the student's morale and productivity in the present study (Roethlisberger and Dickson, 1939). As mentioned earlier, the reading teacher observed a noticeable improvement in the boy's classroom behavior, including a decrease in tardiness and absenteeism, as a result of the experimenter's presence.

It is unfortunate that data were not taken prior to the onset of the Baseline phase of the present study. Since no data are available, the question as to whether social reinforcement was responsible for the improvement in the student's behavior during baseline is open to speculation. This lack of data also makes it difficult to evaluate the influence of social reinforcement in the Experimental phase of the study.

In general, it can be shown that individuals will vary in the extent to which social reinforcers will be effective in influencing their behaviors. Various studies have shown that social reinforcement alone is a very powerful incentive (Harris, Wolf, and Baer, 1964; Hart, Allen, Buell, Harris, and Wolf, 1964; Thomas, Becker, and Armstrong, 1968; and Zimmerman, 1962) and adequate to obtain behavioral changes.

This study does illustrate the effectiveness of an incentive system in bringing about achievement gains in a short period of time (Figure 10). Furthermore, the reinforcement system need not be expensive to be effective (Birnbrauer, Wolf, and Kidder, 1965). In fact, the present study was conducted without a budget.

In future research utilizing reinforcement techniques with students, it would be interesting to further study generalization effects, specifically the conditions

necessary to observe the desired behavior changes in social and other academic settings. Perhaps the social reinforcement, as was seen when the boy's disruptive behavior disappeared after joining the rhythm group, is the most crucial variable which must take place, not in just one class, but in all classes.

Table 1  
Student Evaluation Form

Teacher  
Hour

It is important for \_\_\_\_\_ that each teacher complete this form as accurately and completely as possible. Items have been stated in such a way as to minimize time and effort on your part. Each item requires only that you indicate the number of times some well defined events occur or do not occur. To facilitate objectivity, the recording should be done as soon after the event as possible. Your cooperation in this regard is greatly appreciated.

(DATE)

	M	T	W	Th	F
1. Number of written assignments made.					
2. Number of written assignments completed (must be completed in totality to count).					
3. Grades received on these assignments.					
4. Number of assignments turned-in late.					
5. Number times tardy.					
6. Number times absent.					
7. Number of times student does <u>not</u> have necessary materials for class work (paper, pencil, etc.)					
8. Number of times student disrupts class (talking, laughing, humming, etc.)					
9. Number of times student disrupts other student (hitting, poking, jabbing, tripping, kicking, or fighting, etc.)					
10. Number of times student is out of seat without permission.					
11. Number of times student volunteers his services in any way.					

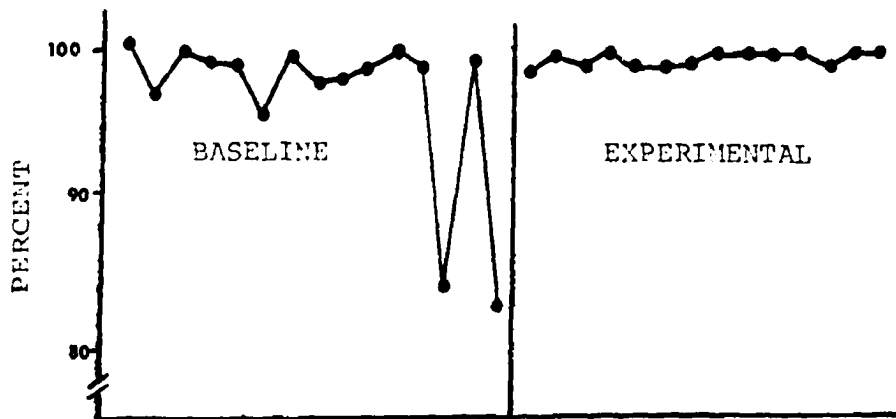


Figure 1 Percent "on task" behavior

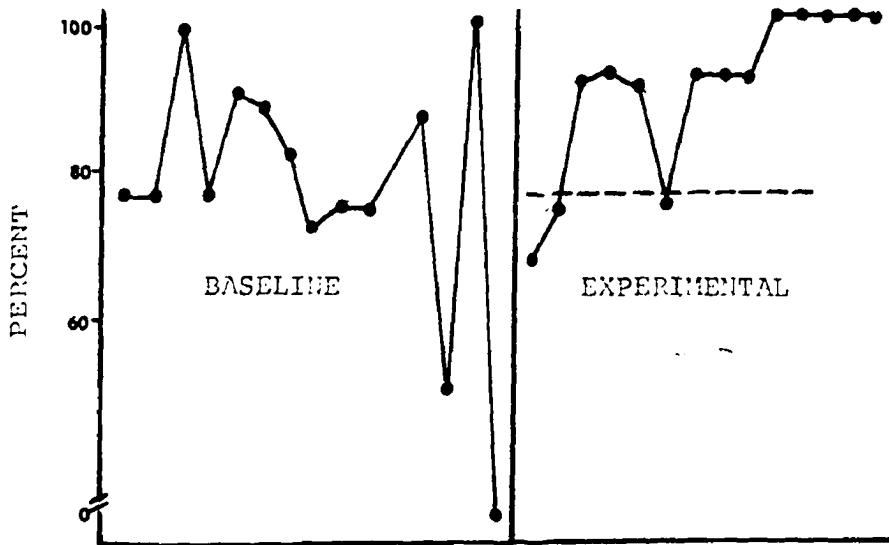


Figure 2 Percent "accuracy" of questions answered

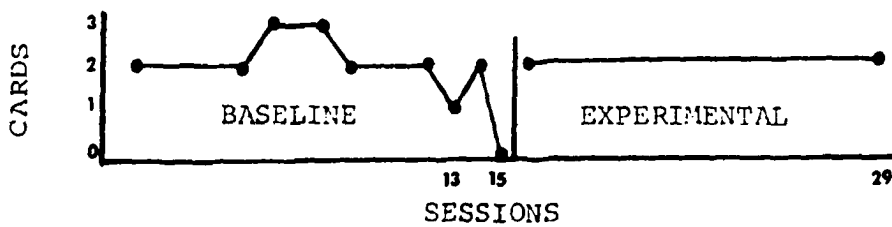


Figure 3 Number of reading cards completed during reading session

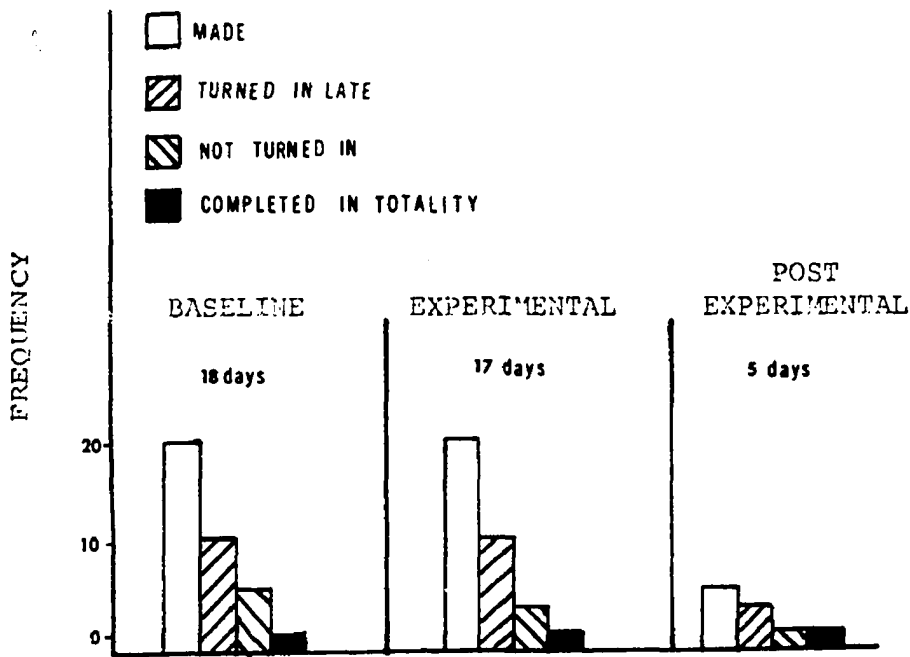


Figure 4 Assignments made and Student responses

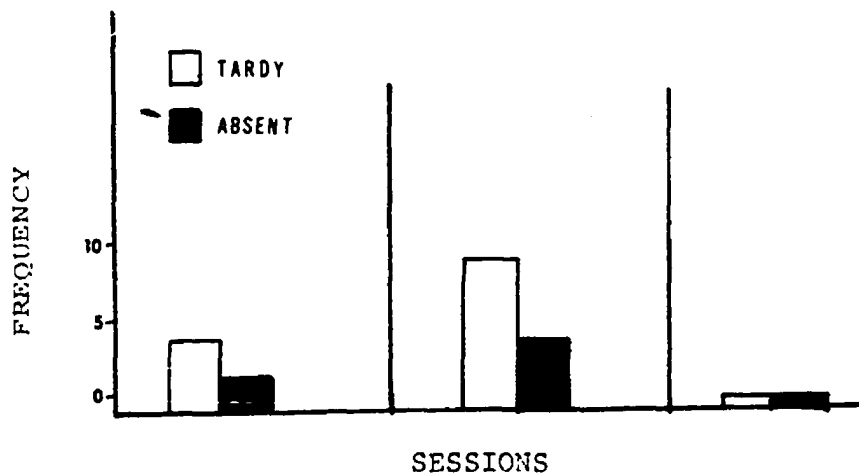


Figure 5 Times tardy and absent



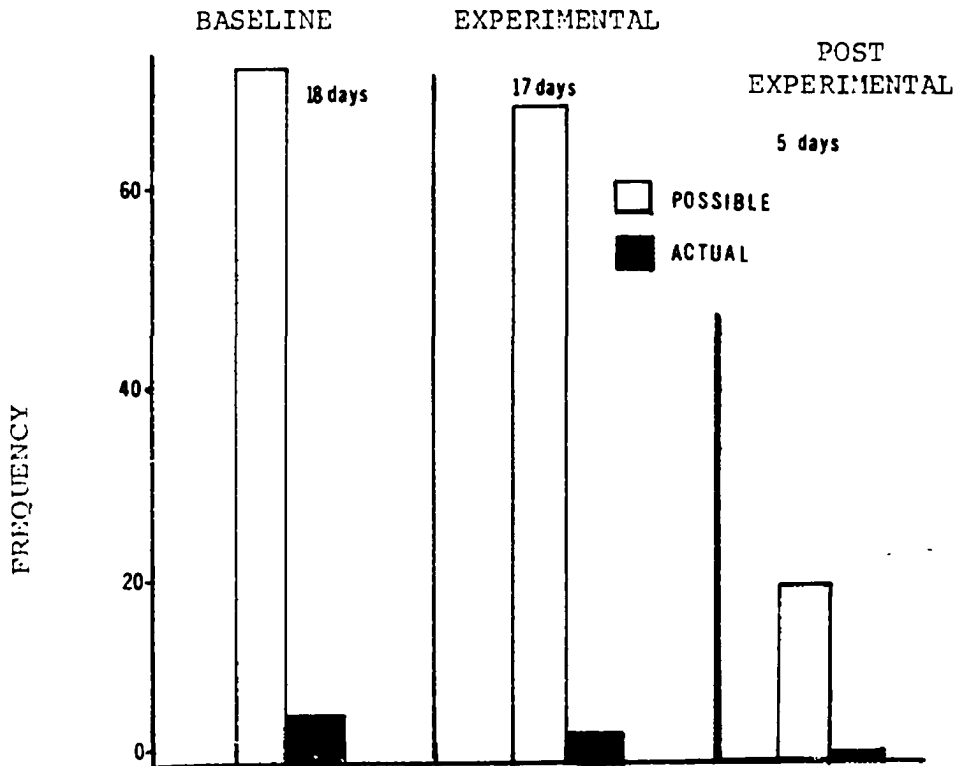


Figure 6 Times without necessary materials

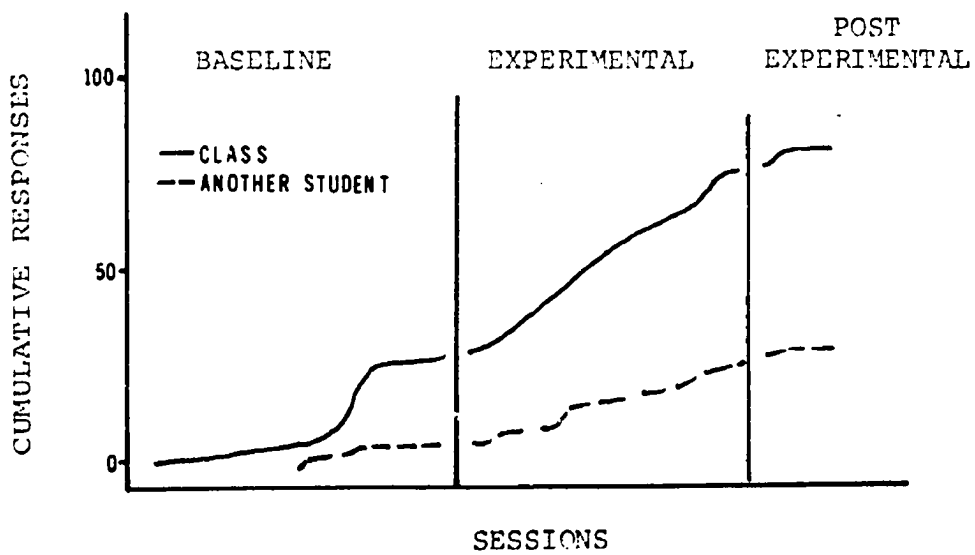


Figure 7 Disruptions to class or student

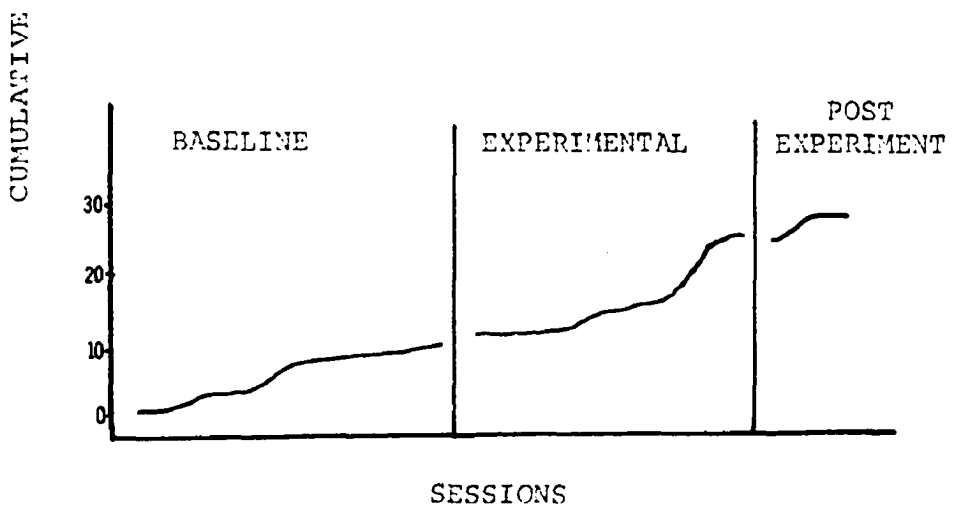
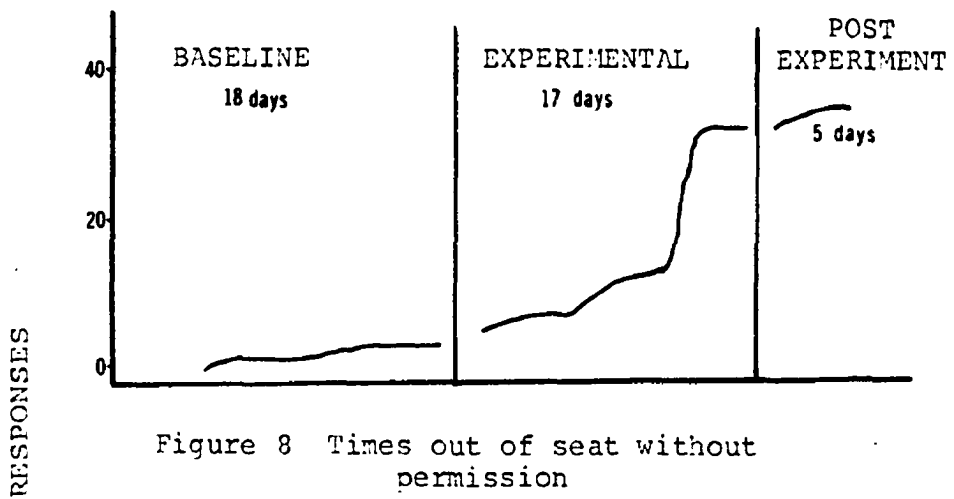


Figure 9 Student services volunteered

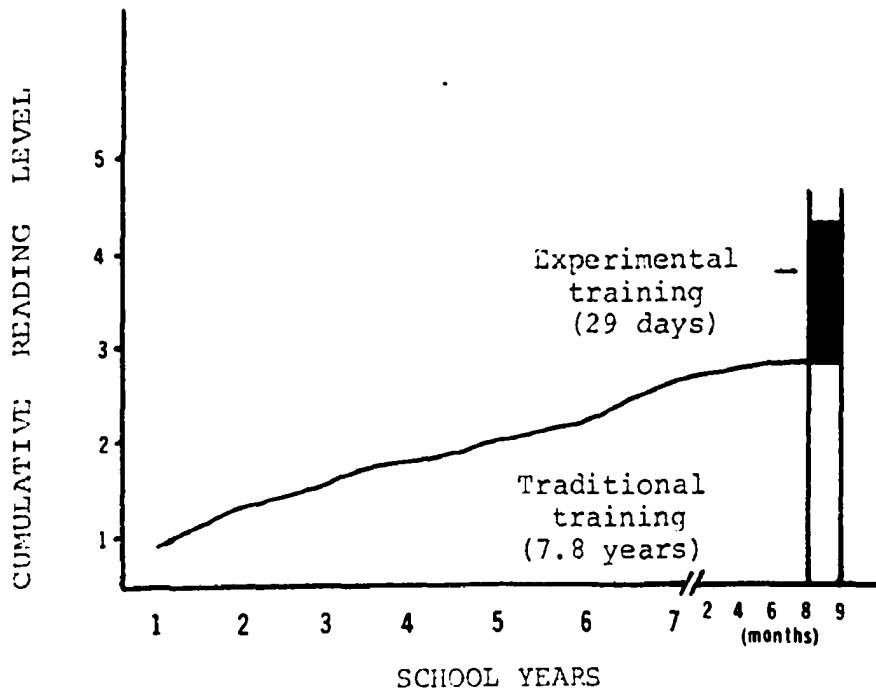


Figure 10 Reading development

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