

1970

## Effects of Controlled Reading Reinforcement on Junior High Students

Earl Albertson  
*Central Washington University*

Follow this and additional works at: <https://digitalcommons.cwu.edu/etd>



Part of the [Educational Assessment, Evaluation, and Research Commons](#), and the [Educational Methods Commons](#)

---

### Recommended Citation

Albertson, Earl, "Effects of Controlled Reading Reinforcement on Junior High Students" (1970). *All Master's Theses*. 1277.  
<https://digitalcommons.cwu.edu/etd/1277>

This Thesis is brought to you for free and open access by the Master's Theses at ScholarWorks@CWU. It has been accepted for inclusion in All Master's Theses by an authorized administrator of ScholarWorks@CWU. For more information, please contact [scholarworks@cwu.edu](mailto:scholarworks@cwu.edu).

EFFECTS OF CONTROLLED READING REINFORCEMENT  
ON JUNIOR HIGH STUDENTS

---

A Thesis  
Presented to  
the Graduate Faculty  
Central Washington State College

---

In Partial Fulfillment  
of the Requirements for the Degree  
Master of Education

---

by  
Earl Albertson  
April 1970

LD

5771.31

A36

SPECIAL  
COLLECTION

0248838

**Library**  
**Central Washington**  
**State College**  
**Ellensburg, Washington**

APPROVED FOR THE GRADUATE FACULTY

---

Hyrum S. Henderson, COMMITTEE CHAIRMAN

---

Lloyd M. Gabriel

---

Sam Rust Jr.

## ACKNOWLEDGMENTS

I would like to express my appreciation and gratitude to Dr. Hyrum Henderson, Chairman of my committee, Dr. Sam Rust and Dr. Lloyd Gabriel, members of my committee, whose advice and assistance made this study possible.

Special thanks to Mr. Dick Thomas and participating students at Lewis and Clark Junior High in Yakima, Washington, and also the administration for their permission to undertake the project.

Many thanks to my wife Janet, and my two sons, Greg and Kurt, for their patience in making this possible.

## TABLE OF CONTENTS

	PAGE
LIST OF TABLES .....	v
CHAPTER	
I. PROBLEM .....	1
Purpose .....	1
Review of the Literature .....	2
Definition of Terms .....	13
Hypotheses .....	13
II. METHOD .....	16
Subjects .....	16
Material and Apparatus .....	16
Procedure .....	18
III. RESULTS .....	22
IV. DISCUSSION .....	33
Observations .....	34
Implications for Education .....	34
V. SUMMARY .....	36
REFERENCES .....	38
APPENDICES .....	43
A. Instructions for the C.W.S.C. Reading Project ..	44
B. Oral Reading Rate Charts .....	46

## LIST OF TABLES

TABLE	PAGE
1. Free Time Chart .....	20
2. Comparison of Total Student Reading Rates, as Measured by Equivalent Forms M(1) and M(2) of the Gates Reading Test, at the Beginning and End of the Study .....	25
3. Comparison of Total Student Vocabulary Development, as Measured by Equivalent Forms M(1) and M(2) of the Gates Reading Test, at the Beginning and End of the Study .....	26
4. Comparison of Total Student Comprehension, as Measured by Equivalent Forms M(1) and M(2) of the Gates Reading Test, at the Beginning and End of the Study .....	27
5. Comparison of Boys' and Girls' Reading Rate, as Measured by Equivalent Forms M(1) and M(2) of the Gates Reading Test, at the Beginning and End of the Study .....	28
6. Comparison of Boys' and Girls' Vocabulary Development, as Measured by Equivalent Forms M(1) and M(2) of the Gates Reading Test, at the Beginning and End of the Study .....	29

## TABLE

## PAGE

7. Comparison of Boys' and Girls' Comprehension, as Measured by Equivalent Forms M(1) and M(2) of the Gates Reading Test, at the Beginning and End of the Study .....	30
8. Comparison of Daily Individual Oral Reading Rates, in Words Per Minute, During Baseline and Reinforcement Periods .....	31



## CHAPTER I

### PROBLEM

Hypotheses tested in this study were formulated from research in operant conditioning. A central feature of operant reinforcement theory is that behavior is greatly influenced by changes that behavior produced in the environment. The principle of positive reinforcement states that if we wish to increase some desired behavior, then favorable consequences should be arranged for that behavior (Ayllon and Azrin, 1968).

With the above principles in mind, an attempt was made to determine the effects of controlled reinforcement on the reading of junior high students.

#### Purpose

Contemporary recommendations for maintaining the motivation of students to read usually are limited to using materials and procedures which combine interest value and high probabilities of success; i.e., Montessori methods (Standing, 1962); preparing materials which are intrinsically reinforcing; i.e., designed with individual interests and needs in mind (Kirk and Johnson, 1951); and programed instruction (Porter, 1957; Skinner, 1958).

All of these methods deal with presentation of material; however, the environmental conditions that may affect the way in which students perceive material also seem important.

The initial purpose of this investigation was to design a motivating environment based upon operant reinforcement theory. The second purpose of this study was to show how a high degree of structure and systematic application of operant reinforcement theory works in a junior high school reading class.

Classroom reinforcement programs seem to be effective in modifying behavior; however, the teacher-pupil ratio has usually been small and has usually been limited to special education students. In a study by Birnbrauer, Wolf, Kidder, and Tague (1965), a classroom of seventeen special education students had four teachers in the classroom at all times. Quay, Werry, McQueen, Marjrie, and Sprague (1966) had one teacher in a behavior modification classroom of five children. It is therefore the third purpose of this investigation to ascertain what effects the variable of operant reinforcement will have on the reading achievement of regular junior high school reading classes with twenty or more students.

### Review of the Literature

This section was written to review the literature on operant reinforcement and reading rate.

Operant reinforcement. The central feature of operant reinforcement theory is that behavior is greatly influenced by changes that the behavior produced in the environment (Ayllon and Azrin, 1968). Such environmental changes that result from a response may be designated as the consequence of the response. When a favorable consequence results from a behavior, it is called positive reinforcement. The probable effect of this favorable consequence is that the rate of behavior increases. The principle of positive reinforcement tells us that if we wish to increase some desired behavior, then favorable consequences should be arranged for that behavior. Conversely, the principle states that if one does not arrange favorable consequences for a behavior, then that behavior will be relatively infrequent.

The laws of reinforcement and extinction have been verified by almost every major learning theorist. Guthrie (1935) and Spence (1956) are two theorists who have stressed the contiguity aspect; Hull (1943) and Miller (1951), the drive reduction aspect; Mowrer (1950), contiguity and drive; Skinner (1938), the functional aspect of the behavior; and Thorndike (1935), the confirmatory aspect of stimulus-response relationships. The generality of the laws of reinforcement and extinction has been shown with many different types of animals, with different types

of animal behavior; e.g., the verbal learning of Thorndike (1931) and Greenspoon (1955), as well as the nonverbal learning of simple motor responses by investigators such as Lindsley (1956), Bijou and Orlando (1961), and Long, Hammack, May, and Campbell (1958).

Most reinforcement theory studies have taken place with animals in laboratory situations or in a room where the subject has been isolated from others. This has caused some educators to be reluctant to use behavior modification in the classroom. The only conclusive way of determining whether reinforcement theory can be used as the basis of designing a complex motivating environment is to try it.

American schools need an instructional method designed to handle the increasing number of uninterested, bored, and failure prone students. Such a method should be easily understood and usable by classroom teachers. Recently a model called behavior modification has displayed just such usefulness. According to Dyer (1968) training of teachers utilizing behavior modification could be minimal.

The concept of operant procedures was originally formulated by Skinner (1938); this concept provides teachers with a scientific, reliable method for analyzing behavior. This method concentrates on each child's responses. Instead of asking "why" an emotionally

disturbed child behaves as he does or attempting to relate his problems to "how" the central nervous system is functioning, a teacher using operant procedures would ask "what" behavior does the child exhibit which interferes with learning. According to Hewett (1968), behavior modification strategy is primarily concerned with asking "what" rather than "why" or "how." A basic goal of the behavior modifier is identification of maladaptive behavior which interferes with learning and assisting the child in developing more adaptive behavior.

It has often been implied that a fifty year gap exists between knowledge gained in basic research laboratories and application of that knowledge to problems which exist in classrooms. Much reliable knowledge concerning behavioral principles now exists. It is only through classroom application that information concerning behavioral principles discovered in laboratories can be validated.

Those who have extended such operant behavioral principles to classroom learning have suggested that response repertoires may be amenable to a methodology based on a functional analysis of behavior (Staats, Minke, Finley, Wolf, and Brooks, 1964). Whether or not this approach can be applied to situations beyond the short term or tutorial periods, however, has been the basis for continuing doubt.

Such doubt has partially been cleared through research by Nolen, Kunzelman, and Haring (1967):

The heterogeneous enrollments and complex curriculum requirements in most regularly scheduled classrooms have seemed to limit the functionality of operant behavioral analysis to appropriate social behaviors or to short sequences of the program. Preliminary findings from the classrooms of the University of Washington Experimental Education Unit, however, have suggested otherwise.

In the preceding study eight junior high age students were admitted to the Experimental Education Unit on the basis of having serious learning and behavior disorders. Individual programs were arranged for each child in the classroom. Activities known to be highly interesting to the students were established as reinforcement contingencies, used to reinforce academic activities. Functionally significant gains were recorded over a teaching period of approximately one hundred days. Generalization to situations other than the controlled environment of the classroom were also noted.

In a similar study by Busse (1969), the effects of contingency management on reading achievement of junior high special education students were examined. The study compared the effects of reinforcing an increase in reading rate during a fourteen week period, with a prior non-reinforcement four week period. Statistically significant gains were found in reading achievement. No statistically significant difference was found in comprehension questions

answered incorrectly or in achievement of the subjects' sex groups, during reinforcement and non-reinforcement periods. The use of contingency management, in this study, disclosed it to be a highly significant and valuable strategy for reading achievement of junior high school special education students.

In a recent investigation (Haring and Hauck, 1969) learning conditions were individually programmed in a group setting to provide sequential arrangement of reading material and systematic presentation of reinforcing events to optimize each child's performance. Arrangements of reinforcing events were designed first to accelerate performance rate, then to maintain the high rate. When learning conditions were individually appropriate, each child averaged between one hundred and two hundred more correct responses every day and spent very few minutes avoiding reading. The students not only made more correct responses daily and worked longer, but also progressed in instructional levels from one and one-half to four years over five months of instruction.

According to Ferster (1961), if the learning environment is programmed appropriately, there is a high probability that the child will make more reading responses and at an accelerated rate because he is rapidly acquiring a history of reinforcement which motivates him to read. Positive reinforcement not only accelerates responding but

also has the additional effect of establishing stimuli, present during reinforcement, as conditioned reinforcers, which come to maintain responding.

Johnson (1966) has utilized operant conditioning and compared the performances of retarded and normal children, matched for MA. Although absolute response speeds of retardates were significantly slower than those of normals, there appeared to be no difference in rate of acquisition.

Quay and others (1966) have made use of behavior modification techniques within a classroom program with conduct disorder children who displayed unsocialized and aggressive behavior in school. Quay rewarded his students by periodically flashing a light on their desks, if they were paying attention to the teacher, during a group listening period. The light flash later was rewarded with a piece of candy, and attending behavior of the students increased dramatically.

Patterson and Ebner (1965) have used a similar signaling device with hyperactive children during individual training sessions. The authors found that when children were rewarded for appropriate behavior, their functioning in the regular classroom and on the playground improved.

Whelan (1966) reported on usage of the Premack (1959) principle in educating emotionally disturbed



children. This principle states that behavior normally occurring at a low rate may increase in frequency when it is followed by activities which are highly desirable to the child.

Through use of the Premack principle, Homme (1966) noted a mean academic gain of one-half grade level accomplished over a six week period by a group of adolescent dropouts.

Brackbill and Jack (1958) noted that in remedial reading classes underachievement appeared to be a function of insufficient motivation, not of inability. Rapid improvement took place when reinforcement was applied to reading achievement.

Through a controlled reading environment Schaeffer and Schaeffer (1969) obtained remarkable changes in attitude, work habits, and classroom behavior. Anxiety was kept at a minimum because students were not in competition with others in the class who read better than themselves. Motivation remained high because students soon realized that the teacher's function was to help them read better, not to assign work, test and rank them on a class curve.

Another interesting statement concerning motivation was made by Criscuolo (1966) who found that games can be used to motivate students to read. He also found that progress could be made tangible by means of progress charts and records.

A review of the literature suggests that operant reinforcement may be used as a technique for teaching reading. Such a method presents students with a predictable learning environment. Each child is aware that when he responds, something happens, for knowledge of results is an important part of operant conditioning.

Reading rate. The technique of reinforcing speed in oral reading rate should be used as only one aspect of a total approach to reading instruction. In this study it was not intended, in any sense, to be exclusive of other techniques.

Grob (1968) found that poor oral readers often have three characteristics: (1) the voice is used in a flat monotone, (2) volume is very low, and (3) frequent pauses and mistakes are often made on words that have previously been handled with ease. Such characteristics are often contributing factors to the student's poor concept of himself as a reader and student. Each time a student reads he has a strong reminder of what he may come to accept as a personal defect. He may easily hear how hesitating, mistake-ridden, expressionless, and uninteresting his own reading is. A closed circle in which expectation of failure based on past experience has caused students to read in a fashion which confirmed their own worst fears.

The study by Grob (1968) suggested that by encouraging speed the student's attention is focused, thus increasing the accuracy of his perception. This may account for the greatly reduced number of oral reading mistakes found by Grob. Speed increase often makes reading sound more coherent and thereby adds to the interest of the materials being used. Quick and repeated reinforcement from the teacher is vital if the student's rate is expected to increase. Student success may be enhanced by proper material and teacher help with pronunciations. Such technique may call for a rather artificially structured situation. But what of it? A sudden change in a student's work methods, arising by itself from natural causes, seems highly unlikely. His habits are long established and, in a way, comfortable. If an artificial situation can help bring about such an important change, then it seems most desirable.

A survey of studies concerned with reading performance revealed a rather general agreement that reading ability is composed of at least two elements; i.e., speed and comprehension (Tinker, 1932).

Braam and Berger (1968) found that since most students appear to feel a need to increase reading rate, and since gains in reading rate may be accomplished relatively easily and quickly, it may be psychologically advantageous to begin a program with emphasis on this

particular skill. It was also found that gains in reading rate were accompanied by no significant changes in comprehension level, which appears to refute the somewhat prevalent belief that increased reading rate results in decreased comprehension. This study suggested that significant gains in reading rate can be made in a relatively short time.

Research by Cosper and Mills (1953) found that increases in reading speed are accompanied by fairly constant comprehension scores. There were a few non-significant losses and gains.

Similar results were reported by Leeds (1961), who reported that the average student is capable of more than doubling his reading speed without changing his comprehension.

Simpson (1950) also found that many students were able to double their reading rate with a slight increase in comprehension.

According to Engelhardt (1965), "Speed does not necessarily mean the loss of comprehension. Many times it means a gain. Studies show that rate can be increased without loss of comprehension."

McCracken (1960) reported that gifted children could benefit from accelerated reading speeds without significant loss in comprehension.

Robinson and Smith (1962) found that an increase

in student reading rate is more likely to carry over to outside reading if students are encouraged to read a certain amount each day and to keep a record of the material read. Former students were asked to return to the reading clinic in six months and again in a year to determine the maintenance of their increased reading rate. As a rule students maintained the previous rate achieved.

The preceding literature suggests that reinforcement of reading rate may increase a student's reading rate without statistically significant loss in either vocabulary development or reading comprehension.

#### Definition of Terms

Baseline--period during which reinforcement was not administered.

Free time--time earned for increased oral reading rate; students were to pursue any one of several activities during free time.

Oral response--each word read correctly from stories assigned in the class text.

Reading rate--number of words read correctly per minute.

Time out--student was removed from the classroom setting by presentation of a time out card.

#### Hypotheses

It was hypothesized that, using free time as

reinforcement of correctly read oral words:

1. there would be no statistically significant difference in total student reading rates, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study;

2. there would be no statistically significant difference in total student vocabulary development, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study;

3. there would be no statistically significant difference in total student comprehension, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study;

4. there would be no statistically significant difference between boys' and girls' reading rates, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study;

5. there would be no statistically significant difference between boys' and girls' vocabulary development, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study;

6. there would be no statistically significant difference between boys' and girls' comprehension, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study;

7. there would be no statistically significant

difference in individual student oral reading rates, as indicated on individual six cycle semi-log graphs kept during baseline and reinforcement periods.

## CHAPTER II

### METHOD

#### Subjects

Students were selected from Lewis and Clark Junior High School, Yakima School District Seven, Washington. Two regular seventh grade reading classes were used, which consisted of forty-one students, seventeen girls and twenty-four boys. The chronological age range was from twelve to fifteen years. Subjects all had attended regular elementary school classes before entering Lewis and Clark Junior High School.

Reading is a required course for all seventh grade students attending Lewis and Clark. Classes were not grouped by their ability, but rather represented a cross-section of regular students at that particular school.

#### Material and Apparatus

Reading materials used in the study were selected from Ginn and Company's basic readers and were designed for use in the seventh and eighth grades. The title of the text used was Windows on the World. Each text consisted of eight sections, with each section containing from five to twelve stories. Each story was broken down



into the number of words per paragraph by the instructor, enabling students to practice working with reading rate.

The classroom used during the study was highly structured; it consisted of student, teacher, student aide, teacher aide, and reinforcement stations. Student desks were used for practicing daily reading lessons. The teacher's desk was used primarily as an observation point by the teacher during the reading session. Three competent student aides, selected from classes at Lewis and Clark, were provided with three stop watches and desks for the purpose of timing and recording each student's daily oral reading rate. Wall charts around the room were used by student aides, for the purpose of recording each student's daily oral reading rates. Student reading rates were also recorded, by one teacher's aide, on six cycle semi-log graph paper. Texts, used by students, were stored in classroom book cases.

Reinforcement stations consisted of several activities provided by the teacher and students. One large table housed paperback books for reading enjoyment. Games such as chess, cards, checkers, and scrabble were available. A Carom Board on which games of pool or bowling could be played was provided. A tape recorder listening center was used for playing student-selected music. One typewriter was provided for student use and five lawnmower engines were available for student dismantling and assembly.

The Gates Reading Tests, forms M(1) and M(2) were used as measuring devices in the study. Form M(1) was administered at the beginning of baseline period and form M(2) was administered at the end of reinforcement period.

### Procedure

Each student's daily response of oral words per minute was recorded on six cycle semi-log graph paper. This allowed the investigator to evaluate the effects of reinforcement on the variable of oral words read per minute.

Two periods of the design consisted of a baseline period and a reinforcement period.

Response specification. One type of response from each subject was measured; this was referred to as an oral response. An oral response was defined as each word read correctly from stories assigned in the class text. Each student was required to read orally for one minute. The time lapse was recorded by use of a stop watch. Student aides counted and recorded in words per minute, the number of oral words each student read correctly during the one-minute time lapse.

Baseline period. During this two week period students were assigned one story daily from their class text. After completion of the story each student's oral

reading rate, in words per minute, was computed and recorded by student aides. Students were not given reinforcement for increase in rate, nor were scores posted in the room for comparison with other students' rates. The scores were considered representative of each student's oral reading rate prior to reinforcement and were to be used as data from which to compare a behavioral change in the reinforcement period.

Reinforcement period. Students were shown, for the first time, records of their reading rate during the baseline period. They were also told their rate of words read correctly was being recorded. This information was unknown to students during the baseline period.

Graphs and charts of reading rate were posted in class for all to see. This allowed each student to become aware of his progress. Students were taught to read stop-watches and how to interpret the graph paper on which their daily reading rates were being recorded. Each student was also presented with a set of instructions for use during the reinforcement period; see Appendix A.

Students were instructed to bring their own reading materials to class; this was for use either as a reinforcement activity or as supplementary class work material. Typical materials were paperback books, comic books, magazines, newspapers, hard cover books checked out from the

library, or other materials approved by parents for reading.

Students were to be seated when the tardy bell rang. Specified students were responsible for passing out the reading texts. It was the responsibility of the same students to pick up books and put them back in appropriate racks when the oral reading rate test was completed.

Each student was told free time would be given for specified increases in reading rate over that obtained the preceding school day. An example of the chart used to compute free time from reading rate may be seen in Table 1. Subjects doing the timing were competent student aides selected from upper classmen at Lewis and Clark Junior High.

Table 1  
Free Time Chart

Rate Schedule	
1.	All students receive 5 min.
2.	Achieves at previous day's rate: 10 min.
3.	Achieves at 1-5 words over previous day's rate: 15 min.
4.	Achieves at 6-10 words over previous day's rate: 20 min.
5.	Achieves at 11+ words over previous day's rate: 25 min.

The instructor assigned a daily story and listed the number of words in each paragraph. Students were allowed to practice timed reading rates silently and orally; words causing difficulty were discussed by the teacher and class. Next students practiced improving reading rate either alone or in small groups; when ready the oral reading rate test was administered. Student aides put each subject's name and amount of free time earned on the room blackboard; students were instructed to remain seated and to read materials they brought to class until free time began. At the onset of free time, students were instructed to close their books and start free time activities for the remainder of the period.

The reinforcement period lasted thirty-two school days.

### CHAPTER III

#### RESULTS

Comparison of data disclosed many results that were not significantly different.

The first hypothesis of no statistically significant difference in total student reading rates, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2), at the beginning and end of the study was rejected. The t test analysis of the data on reading rate disclosed significant difference, as noted in Table 2.

The second hypothesis of no statistically significant difference in total student vocabulary development, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2) at the beginning and end of the study, could not be rejected. The t test analysis of the data on vocabulary development disclosed no significant difference, as noted in Table 3.

The third hypothesis of no statistically significant difference in total student comprehension, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2) at the beginning and end of the study,

could not be rejected. The t test analysis of the data on comprehension disclosed no significant difference, as noted in Table 4.

The fourth hypothesis of no statistically significant difference between boys' and girls' reading rate, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2) at the beginning and end of the study, was rejected. The t test analysis of the data on reading rate disclosed significant difference, as noted in Table 5.

The fifth hypothesis of no statistically significant difference between boys' and girls' vocabulary development, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2) at the beginning and end of the study, was not rejected. The t test analysis of the data on vocabulary development disclosed no significant difference, as noted in Table 6.

The sixth hypothesis of no statistically significant difference between boys' and girls' comprehension, as measured by equivalent forms of the Gates Reading Test forms M(1) and M(2) at the beginning and end of the study, was not rejected. The t test analysis of the data on comprehension disclosed no significant difference, as noted in Table 7.

The seventh hypothesis of no statistically significant difference in individual student oral reading rates, as indicated on individual six cycle semi-log graphs kept

during baseline and reinforcement periods, was rejected. The Fisher Exact Probability Formula analysis of the data disclosed statistically significant difference, as noted in Table 8.

Analysis of the data led to rejection of hypotheses one, four, and seven, as statistically significant difference was shown. Hypotheses two, three, five, and six were not rejected as there were no statistically significant differences.



Table 2

Comparison of Total Student Reading Rates, as  
 Measured by Equivalent Forms M(1) and M(2)  
 of the Gates Reading Test, at the  
 Beginning and End of the Study  
 N=41

Test Form	Mean	Std. Dev.	<u>t</u>
<u>Baseline</u>			
M(1)	6.736	1.667	
<u>Reinforcement</u>			
M(2)	8.197	1.675	
			-3.9564*

\*Significant at the .001 level with 80 df.

Table 3

Comparison of Total Student Vocabulary Development, as  
 Measured by Equivalent Forms M(1) and M(2)  
 of the Gates Reading Test, at the  
 Beginning and End of the Study  
 N=41

Test Form	Mean	Std. Dev.	<u>t</u>
<u>Baseline</u>			
M(1)	5.914	1.493	
<u>Reinforcement</u>			
M(2)	6.043	1.675	
			-.3960*

\*Not significant at the .05 level with 80 df.

Table 4

Comparison of Total Student Comprehension, as  
 Measured by Equivalent Forms M(1) and M(2)  
 of the Gates Reading Test, at the  
 Beginning and End of the Study  
 N=41

Test Form	Mean	Std. Dev.	<u>t</u>
<u>Baseline</u>			
M(1)	6.734	1.758	
<u>Reinforcement</u>			
M(2)	6.317	1.795	
			1.0627*

\*Not significant at the .05 level with 80 df.

Table 5  
 Comparison of Boys' and Girls' Reading Rate, as  
 Measured by Equivalent forms M(1) and M(2)  
 of the Gates Reading Test, at the  
 Beginning and End of the Study  
 N=41

Subject	Test Form	Mean	Std. Dev.	<u>t</u>
<u>Baseline</u>				
Girls	M(1)	7.011	1.825	
Boys	M(1)	6.541	1.557	
<u>Reinforcement</u>				
Girls	M(2)	9.200	1.977	
Boys	M(2)	7.487	.946	
				2.7949*

\*Significant at the .01 level with 39 df.

Table 6

Comparison of Boys' and Girls' Vocabulary Development, as  
 Measured by Equivalent forms M(1) and M(2)  
 of the Gates Reading Test, at the  
 Beginning and End of the Study  
 N=41

Subject	Test Form	Mean	Std. Dev.	<u>t</u>
<u>Baseline</u>				
Girls	M(1)	5.870	.825	
Boys	M(1)	5.945	1.845	
<u>Reinforcement</u>				
Girls	M(2)	5.876	1.236	
Boys	M(2)	6.162	1.617	
				-.5826*

\*Not significant at the .05 level with 39 df.

Table 7

Comparison of Boys' and Girls' Comprehension, as  
 Measured by Equivalent Forms M(1) and M(2)  
 of the Gates Reading Test at the  
 Beginning and End of the Study  
 N=41

Subject	Test Form	Mean	Std. Dev.	<u>t</u>
Girls	M(1)	6.388	1.090	
Boys	M(1)	6.979	2.097	
Girls	M(2)	6.405	1.512	
Boys	M(2)	6.254	2.001	
				1.3629*

\*Not significant at the .05 level with 39 df.

Table 8

Comparison of Daily Individual Oral Reading Rates,  
in Words Per Minute, During Baseline  
and Reinforcement Periods

Subject	Baseline Mean	Reinforcement Mean	Significance
1	50	113	$.450 \times 10^{-6}$
2	62	125	$.544 \times 10^{-5}$
3	90	169	$.169 \times 10^{-4}$
4	72	123	$.680 \times 10^{-6}$
5	141	244	$.765 \times 10^{-4}$
6	85	141	$.635 \times 10^{-5}$
7	66	123	$.116 \times 10^{-5}$
8	74	125	$.218 \times 10^{-5}$
9	80	128	$.173 \times 10^{-4}$
10	67	112	$.157 \times 10^{-5}$
11	114	203	$.748 \times 10^{-8}$
12	77	190	$.255 \times 10^{-6}$
13	98	176	$.104 \times 10^{-6}$
14	76	120	$.116 \times 10^{-5}$
15	92	162	$.126 \times 10^{-4}$
16	69	123	$.680 \times 10^{-9}$
17	129	226	$.516 \times 10^{-4}$
18	41	89	$.164 \times 10^{-4}$
19	96	165	$.627 \times 10^{-4}$
20	61	99	$.189 \times 10^{-3}$

Table 8 (continued)

Subject	Baseline Mean	Reinforcement Mean	Significance
21	40	123	$.381 \times 10^{-4}$
22	87	193	$.194 \times 10^{-6}$
23	103	204	$.605 \times 10^{-6}$
24	68	137	$.779 \times 10^{-7}$
25	168	229	$.945 \times 10^{-5}$
26	75	110	$.545 \times 10^{-5}$
27	115	191	$.204 \times 10^{-5}$
28	99	170	$.787 \times 10^{-4}$
29	94	180	$.472 \times 10^{-5}$
30	66	116	$.297 \times 10^{-4}$
31	83	177	$.355 \times 10^{-3}$
32	105	221	$.450 \times 10^{-6}$
33	73	166	$.157 \times 10^{-8}$
34	115	213	$.118 \times 10^{-4}$
35	101	160	$.821 \times 10^{-6}$
36	139	218	$.779 \times 10^{-7}$
37	101	180	$.333 \times 10^{-3}$
38	124	180	$.189 \times 10^{-6}$
39	95	141	$.204 \times 10^{-5}$
40	111	167	$.690 \times 10^{-3}$
41	88	189	$.169 \times 10^{-4}$



## CHAPTER IV

### DISCUSSION

This study suggested it is possible to design a motivating environment based upon operant reinforcement theory and adapt it to a classroom of twenty or more students. Traditionally such technique has been limited to smaller groups. In studies by Birnbrauer and others (1965), a classroom of seventeen special education students had four teachers in class at all times. Quay (1966) had one teacher in a classroom of five children.

Data revealed the variable of individual daily oral reading rate experienced extremely significant gains when subjected to a high degree of classroom structure and systematic application of operant reinforcement theory. One subject's average oral reading rate, in words per minute, increased from 87 to 193 between baseline and reinforcement periods.

Gains in both oral and silent reading rates were made without statistically significant loss in either comprehension or vocabulary development. Such results suggest each student was capable of covering much more

reading material, after the study, without significant loss of previous vocabulary development and comprehension.

### Observations

One outstanding feature observed during this study was the students' high degree of motivation. A video-tape was used to record a reading session and observers of this tape have remarked on the high degree of student motivation.

Teacher observation revealed that class discipline and unity improved during the program. Another observation noted students approaching an oral reading rate of two or three hundred oral words per minute became quite frustrated during timing of rates; i.e., several false starts were often required before a time was actually recorded. It was also observed that students openly enjoyed competing with one another when oral reading rates were posted.

Although many activities were available for use during free time, many students preferred to read silently. Student selected activities appeared to be highly reinforcing.

### Implications for Education

Results of this study suggest an excellent technique for teaching reading to regular junior high school students.

Teachers have long rewarded students for doing as they were instructed. In this study students were consistently rewarded when previously specified academic improvements were made. Each child found himself in a highly predictable learning environment. What was expected was clearly presented, and the rewards each student received were contingent upon his meeting expectations operating in the classroom. When each student responded, something happened; knowledge of such results is an important part of the behavior modification strategy.

One of the outstanding features of this study was its motivational quality. In addition to its adaption to the regular junior high student, it may also be an excellent technique for stimulating unmotivated students.

Students who reach frustrating oral reading speeds should either encounter more difficult reading material or change into different materials. This area is in need of further research.

## CHAPTER V

### SUMMARY

This investigation took place at Lewis and Clark Junior High School, Yakima, Washington. Participating were two regular seventh grade reading classes consisting of forty-one students: seventeen girls and twenty-four boys.

Tests used during this study were the Gates Reading Test forms M(1) and M(2). Form M(1) was administered at the beginning of baseline period and form M(2) was administered at the end of reinforcement period. Daily oral reading rates recorded on six cycle semi-log graph paper were also used in the evaluation.

Effects of reinforcement on oral reading rate, vocabulary development, and comprehension between a ten day baseline and a thirty-two day reinforcement period were measured.

A comparison of the baseline period with the reinforcement period disclosed that reading rates, as measured by equivalent forms of the Gates Reading Test, were accompanied by significant gains. However, vocabulary development and comprehension did not vary significantly

between baseline and reinforcement periods, as measured by the Gates Reading Test. The Fisher Exact Probability Formula disclosed a statistically significant difference in oral reading rate with gains being made.

The study also revealed a statistically significant difference between girls' and boys' oral reading rates, with girls making the gain. However, there were no significant differences in vocabulary development and comprehension between sex groups during reinforcement and non-reinforcement periods.

In conclusion, the use of controlled reading reinforcement as a technique for teaching reading to regular junior high school students appears to be a highly valuable method.

## REFERENCES

## REFERENCES

- Ayllon, T., and Azrin, N. The token economy. New York: Meredith Corporation, 1968. P.4.
- Bijou, S. W., and Orlando, R. Rapid development of multiple-schedule performances with retarded children. Journal of Experimental Analysis of Behavior, 1961, 4, 7-16.
- Birnbrauer, J. S., Wolf, M., Kidder, J. D., and Tague, C. Classroom behavior of retarded pupils with token reinforcement. Journal of Experimental Child Psychology, 1965, 2, 219-235.
- Braam, L. S., and Berger, B. Effectiveness of four methods of increasing reading rate, comprehension, and flexibility. Journal of Reading, 1968, 11, 346-352.
- Brackbill, V., and Jack, D. Discrimination learning in children as a function of reinforcement. Child Development, 1958, 29, 185-190.
- Busse, L. Effects of contingency management on reading achievement of junior high special education students. Unpublished thesis, Central Washington State College, 1969.
- Cosper, R., and Mills, B. Reading comprehension and speed. School and Society, 1953, 77, 359-362.
- Criscuolo, N. Motivating the problem reader. Education, 1966, 87, 233-235.
- Dyer, V. An example: reinforcement principles in a classroom for emotionally disturbed children. Exceptional Children, 1968, 45, 597-599.
- Englehardt, R. M. Speed is not a naughty word. Journal of Reading, 1965, 8, 330-331.
- Ferster, C. B. Positive reinforcement and behavioral deficits of autistic children. Child Development, 1961, 32, 437-456.

- Greenspoon, J. The reinforcing effect of two spoken sounds on the frequency of two responses. American Journal of Psychology, 1955, 68, 409-416.
- Grob, J. A. Forcing speed in oral reading. Journal of Reading, 1968, 11, 621-624.
- Guthrie, E. R. The psychology of learning. New York: Harper and Row, 1935.
- Haring, N., and Hauck, M. A. Improved learning conditions in establishment of reading skills with disabled readers. Exceptional Children, 1969, 35, 341-351.
- Hewett, F. The emotionally disturbed child in the classroom. Boston: Allyn and Bacon, Inc., 1968.
- Homme, L. Human motivation and the environment. In Haring and Whelan (Eds.), The Learning Environment: Relationship to Behavior Modification and Implications for Special Education. University of Kansas, 1966.
- Hull, C. L. Principles of behavior. New York: Appleton-Century-Crofts, 1943.
- Johnson, B. M. Reward schedules and instrumental conditioning in normal and retarded children. Child Development, 1966, 37, 633-644.
- Kirk, S., and Johnson, G. Educating the retarded child. Boston: Houghton Mifflin, 1951.
- Leeds, J. B. Speed reading and visual training. Education, 1961, 81, 554-556.
- Lindsley, O. R. Operant conditioning methods applied to research in chronic schizophrenia. Psychiat. Res. Rep., 1965, 5, 118-139.
- Long, E. R., Hammack, J. T., May, F., and Campbell, B. J. Intermittent reinforcement of operant behavior in children. Journal of Experimental Analysis of Behavior, 1958, 1, 315-339.
- McCracken, R. A. Accelerating the reading rate of 6th grade gifted children. Exceptional Children, 1960, 27, 27-28.
- Miller, N. E. Learnable drives and rewards. In S. S. Stevens (Ed.), Handbook of experimental psychology. New York: Wiley, 1951.



- Mowrer, O. H. Learning theory and personality dynamics. New York: Ronald, 1950.
- Nolen, P. A., Kunzelmann, H., and Haring, N. Behavior modification in a junior high learning disabilities classroom. Exceptional Children, 1967, 33, 163.
- Patterson, G., and Ebner, M. Application of learning principles to the treatment of deviant children. Paper presented to the American Psychological Association, Chicago, September, 1965.
- Porter, D. A. Critical review of a portion of the literature on teaching devices. Harvard Educational Review, 1957, 27, 126-147.
- Premack, D. Toward empirical behavior laws: I. Positive reinforcement. Psychological Review, 1959, 66, 219-233.
- Quay, H. C., Werry, J. S., McQueen, Marjrie, and Sprague, R. L. Remediation of the conduct problem child in the special class setting. Exceptional Children, 1966, 32, 509-515.
- Robinson, H. M., and Smith, H. K. Rate problems in the reading clinic. Reading Teacher, 1962, 15, 421-426.
- Schaeffer, L., and Schaeffer, J. Conditioning verbal behavior in a controlled learning environment. Journal of Reading, 1969, 12, 541-548.
- Simpson, E. A. Reading rate and its relationship to good reading. Education, 1950, 70, 565-569.
- Skinner, B. F. Teaching machines. Science, 1958, 128, 969-977.
- Skinner, B. F. The behavior of organisms: An experimental analysis. New York: Appleton-Century-Crofts, 1938.
- Spence, K. W. Behavior theory and conditioning. New Haven: Yale University Press, 1956.
- Staats, A., Minke, K., Finley, J., Wolf, M., and Brooks, L. A reinforcer system and experimental procedure for the laboratory study of reading acquisition. Child Development, 1964, 35, 209-231.
- Standing, E. The Montessori method--A revolution in education. Fresno: Academy Library Guild, 1962.

Thorndike, E. L. Human learning. New York: Appleton-Century-Crofts, 1931.

Thorndike, E. L. The psychology of wants, interests, and attitudes. New York: Appleton-Century-Crofts, 1935.

Whelan, R. The relevance of behavior modification procedures for teachers of emotionally disturbed children. In Knoblock (Ed.), Intervention Approaches in Educating Emotionally Disturbed Children. Syracuse: Syracuse University Press, 1966.

## APPENDICES

APPENDIX A  
INSTRUCTIONS FOR THE C.W.S.C. READING PROJECT

1. Bring your own reading materials to class.

This material could be a paperback book, comic book, magazine, newspaper, hard cover book checked out from the library, or anything of your choice which is approved by your parents for your reading.

THE DOOR GUARD FOR THE FIRST WEEK WILL BE \_\_\_\_\_.  
Nobody is to be admitted to class without their own reading materials.

2. Be seated when the tardy bell rings.

3. Those students sitting on the left end of the tables are responsible for getting the reading books and passing one out to each student sitting at their table. It is the responsibility of the same student to pick up the books and put them back in the appropriate rack when the test is completed.

4. Practice the story you will be tested on. If you want to, you may quietly time one another for the time reading test.

5. When ready and confident take the test.

6. Return to your seat and read the Reading

Materials you brought to class until your free time starts.

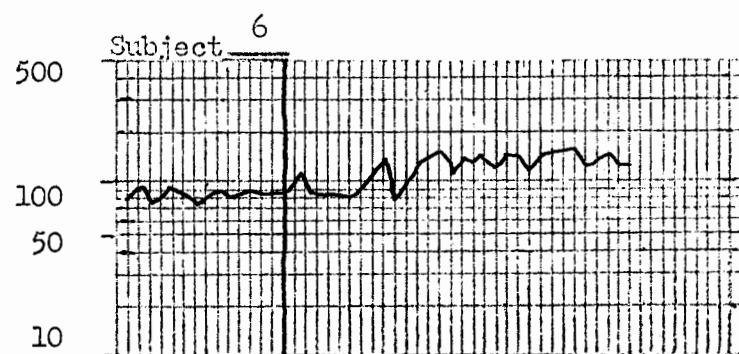
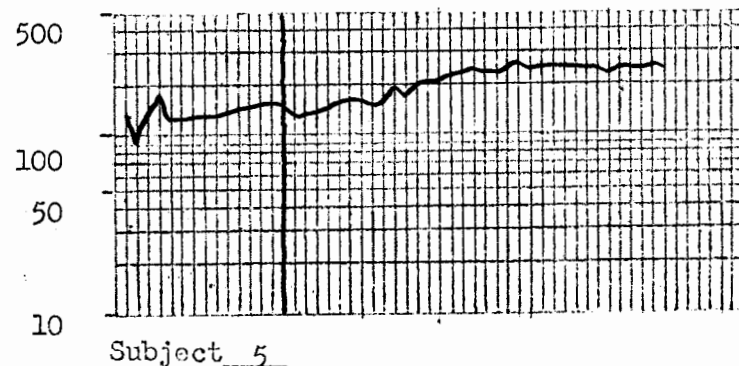
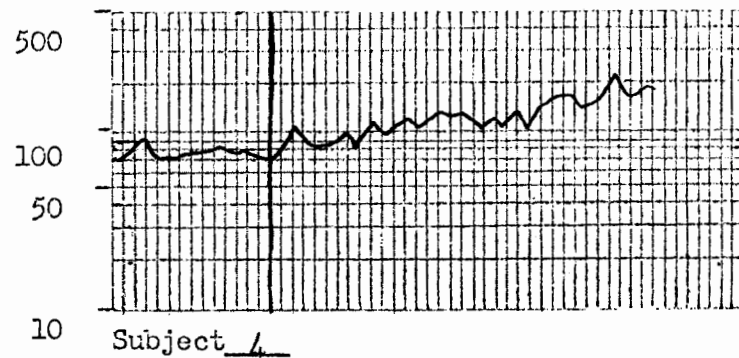
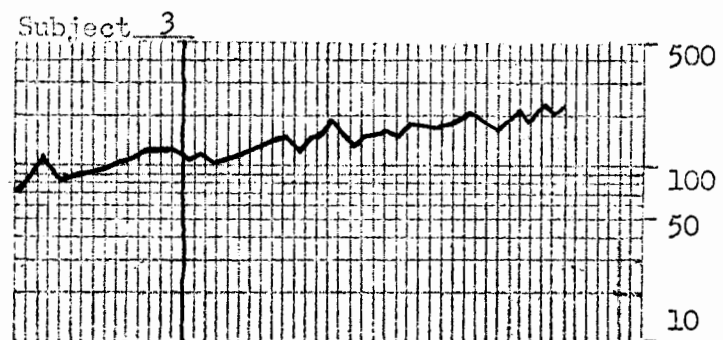
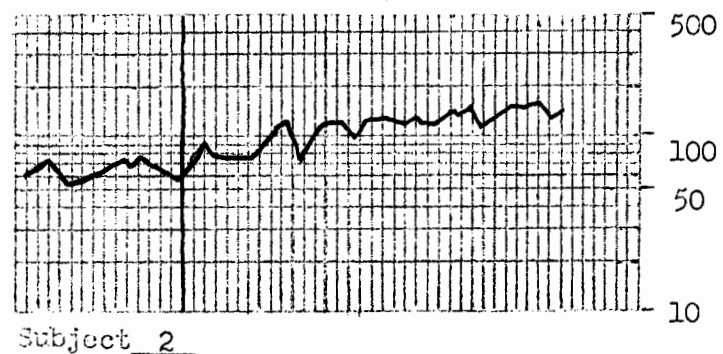
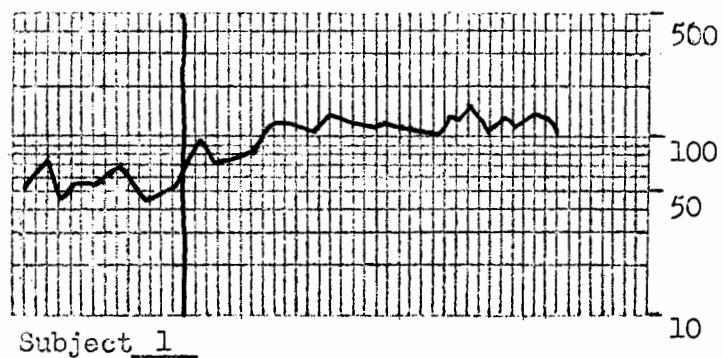
A. The student timers will put your name on the board and will indicate how much free time you are to receive.

7. When it is time for you to start your free time close your books, arrange neatly on your table and start your free time period.

8. When directed by the teacher to put play materials away, do so quickly and quietly and return to your assigned seat--and be seated.

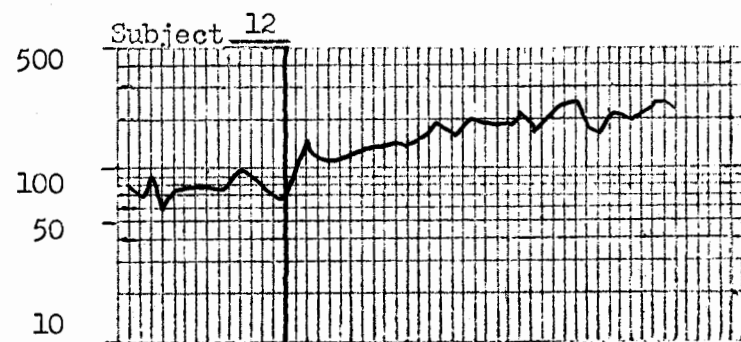
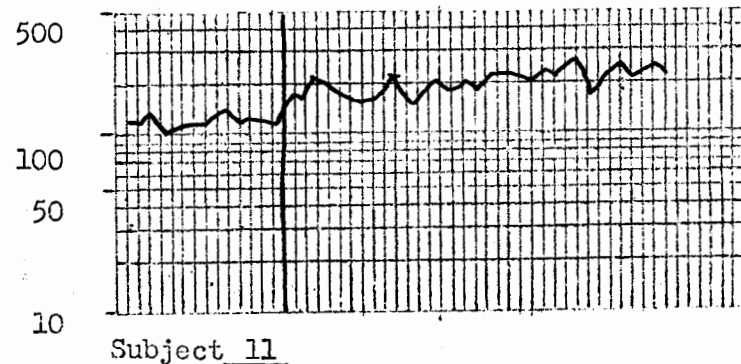
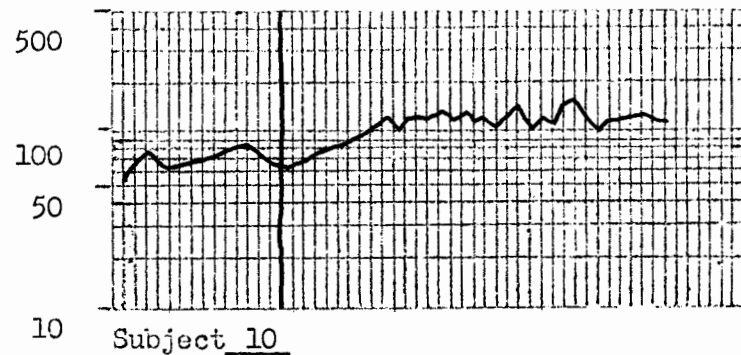
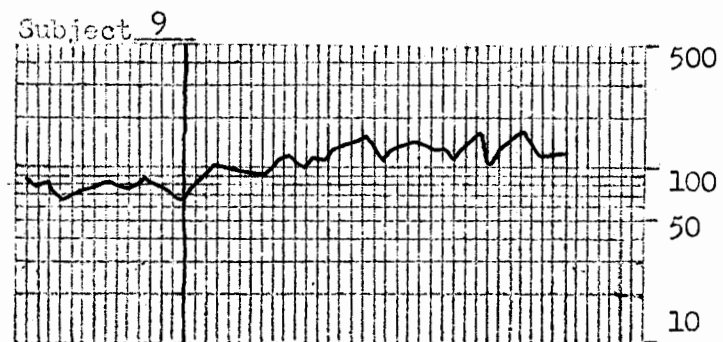
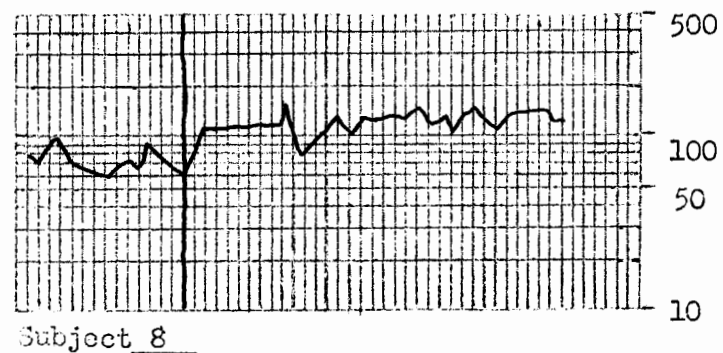
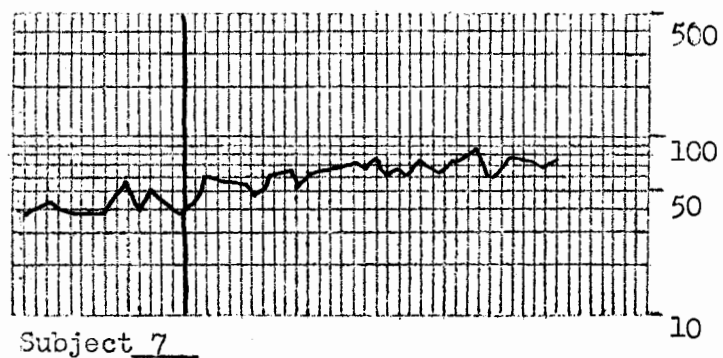
9. Those students that are conspicuous by their irregular conduct, or by disrupting the class in any way will be handed a card. If you receive a card go directly to the office and report to Mr. Marchbanks for a physical work project--washing lockers.

10. This program will be extremely beneficial to you if you try as hard as you can and co-operate to the fullest with everyone concerned.

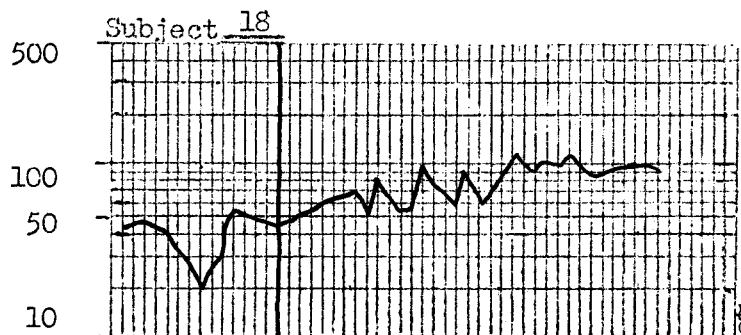
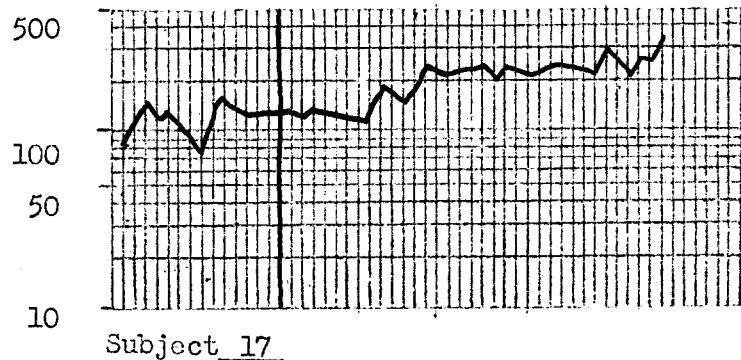
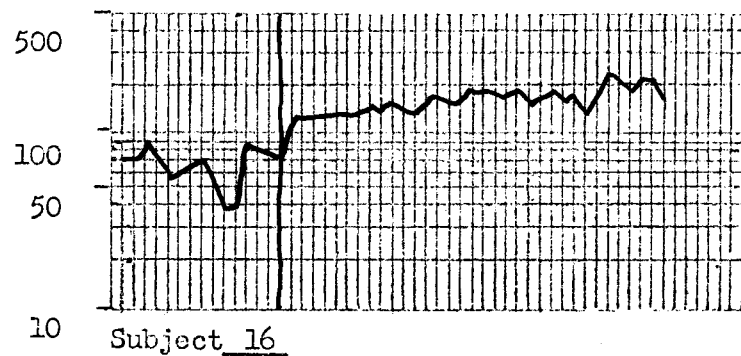
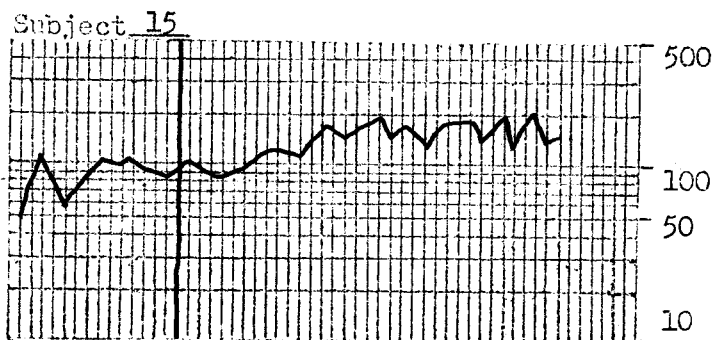
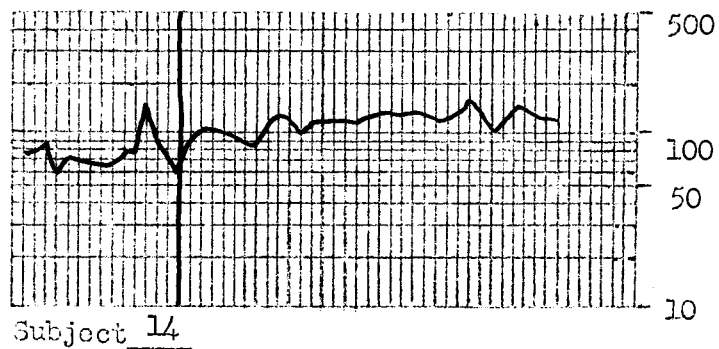
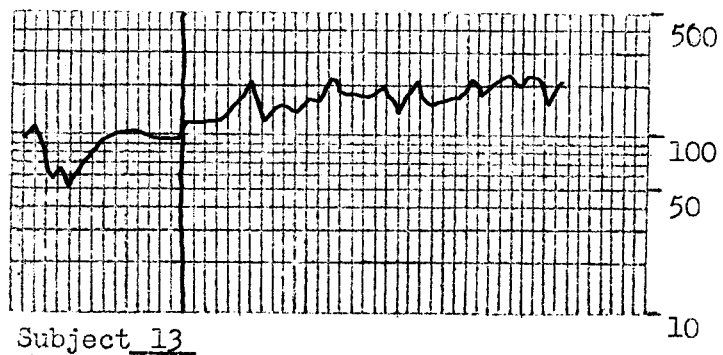


APPENDIX B--ORAL READING RATE CHARTS

Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.



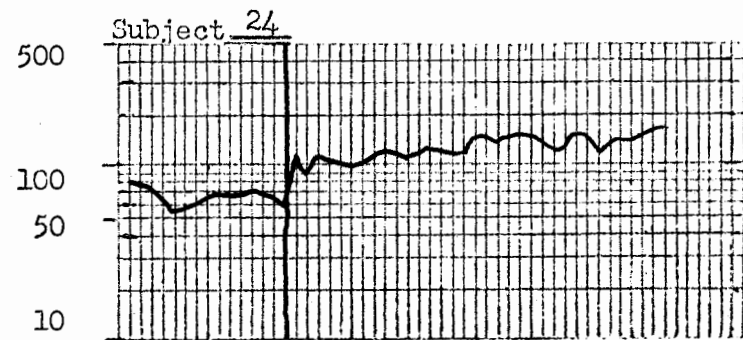
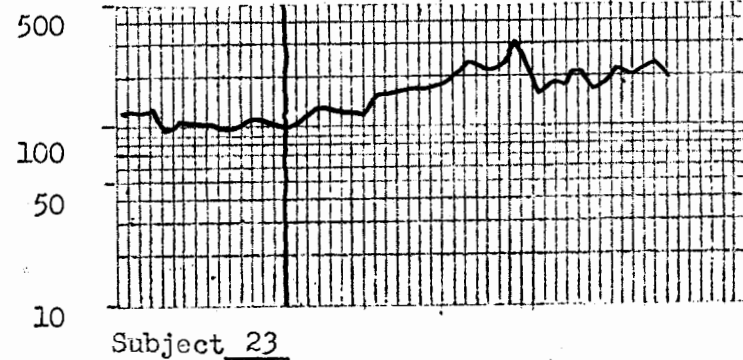
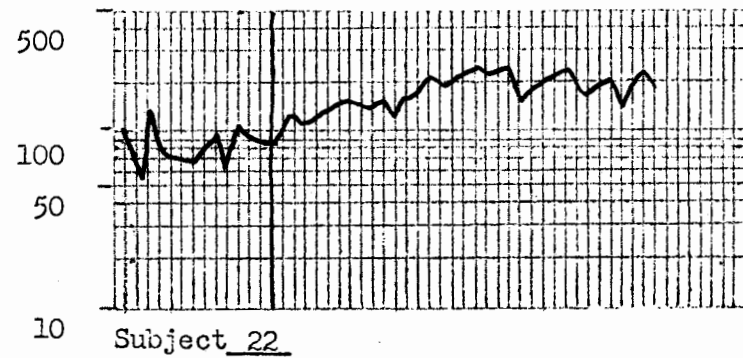
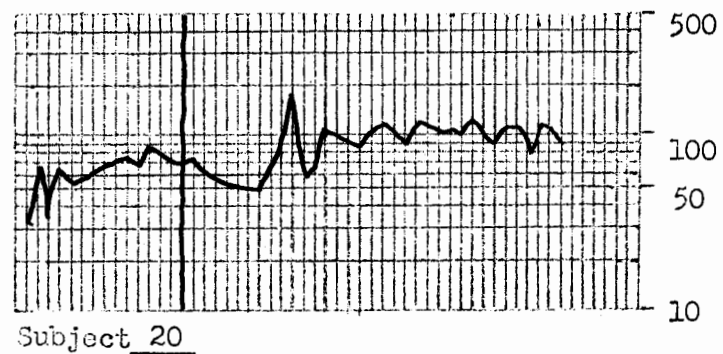
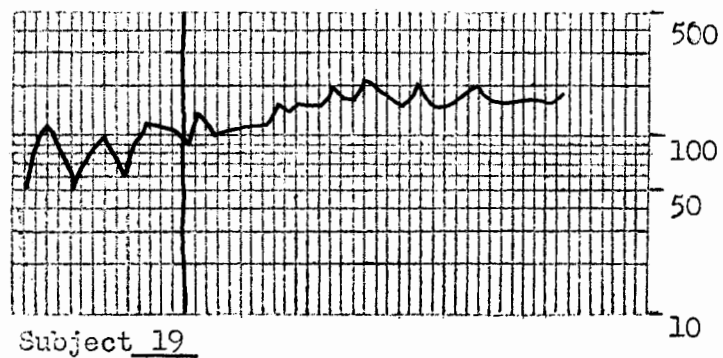
Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.



APPENDIX B-ORAL READING RATE CHARTS

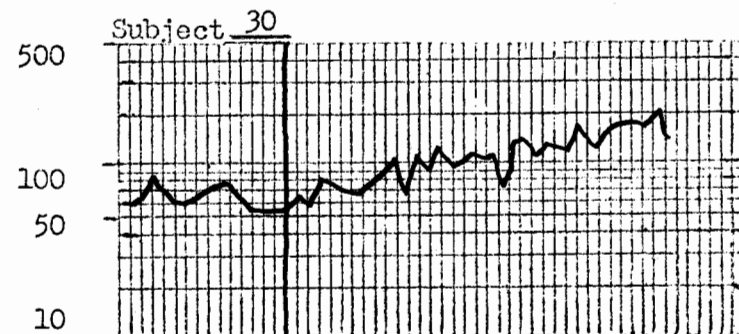
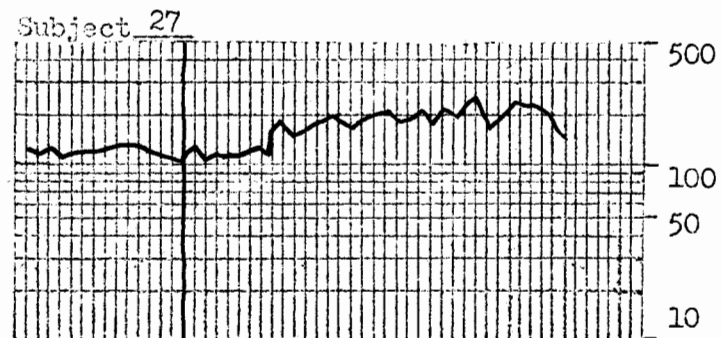
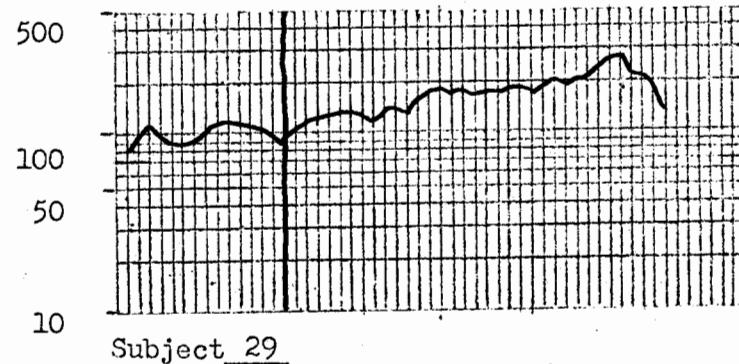
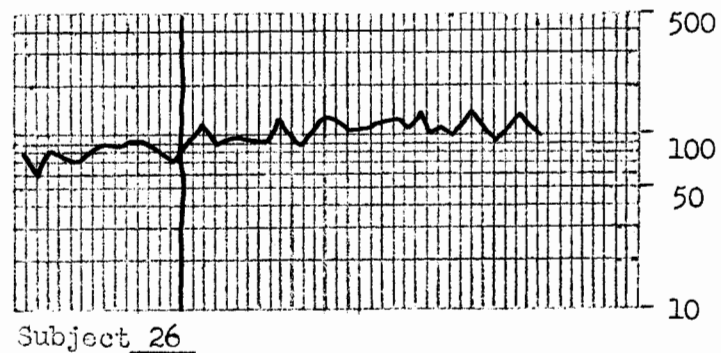
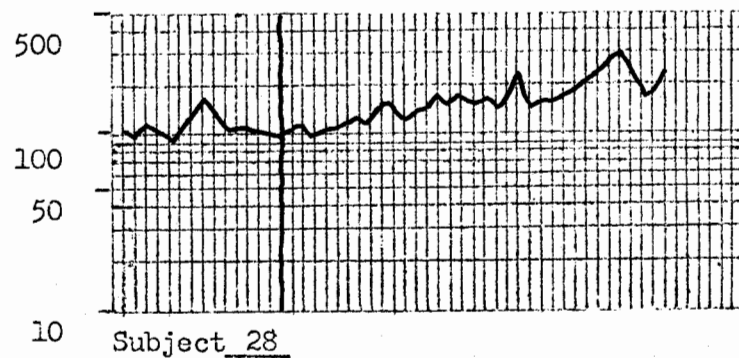
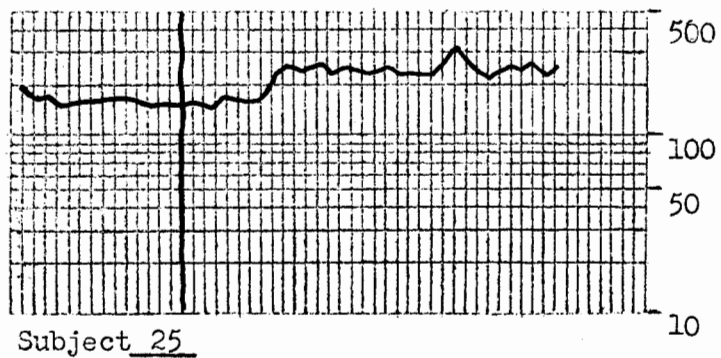
Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.





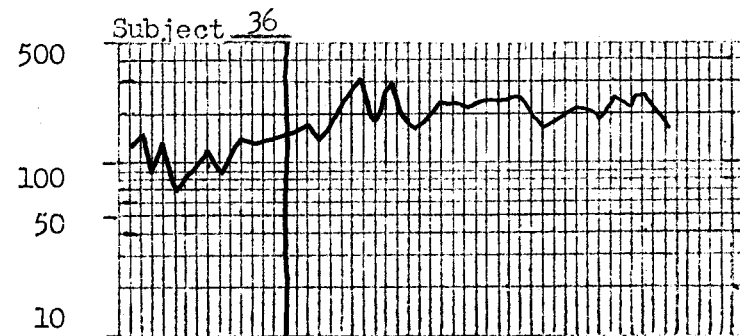
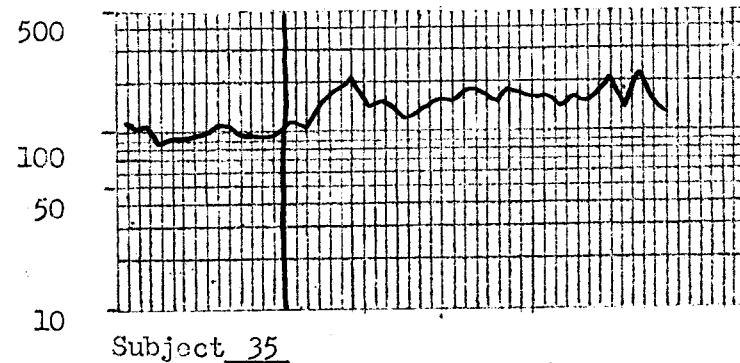
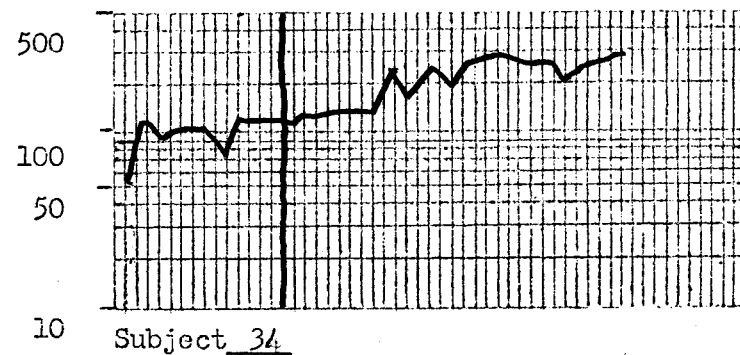
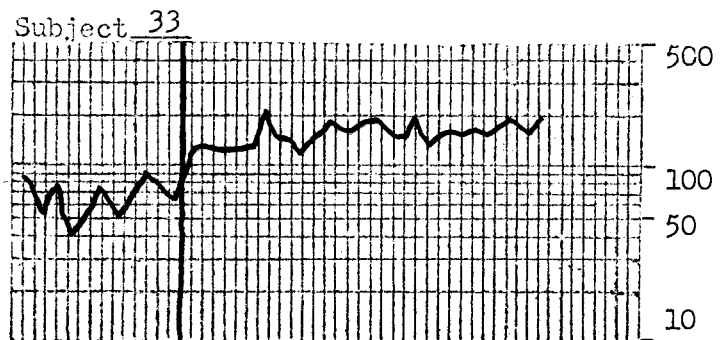
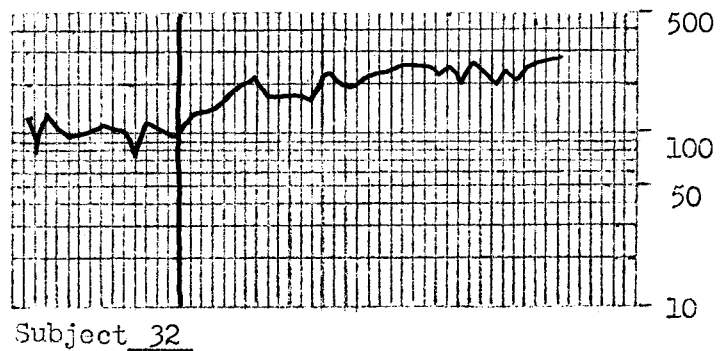
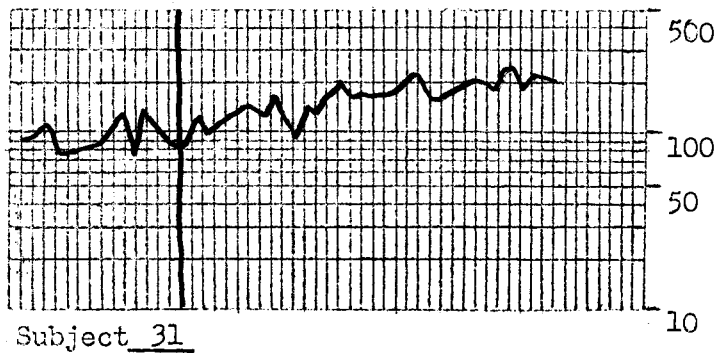
APPENDIX B-ORAL READING RATE CHARTS

Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.

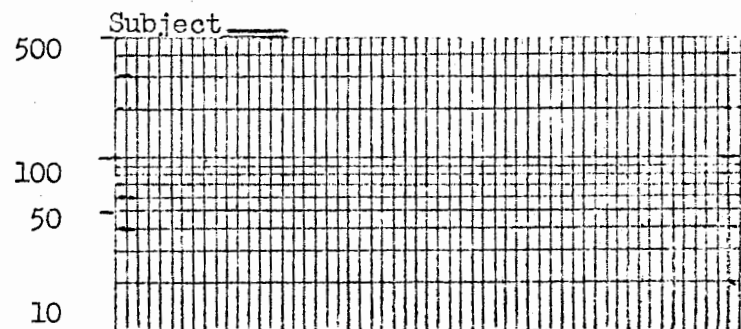
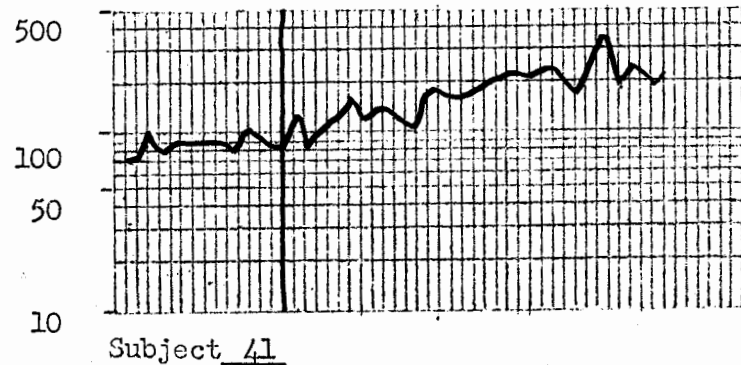
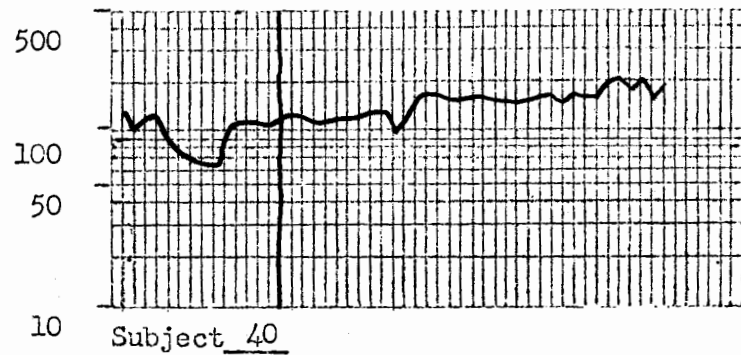
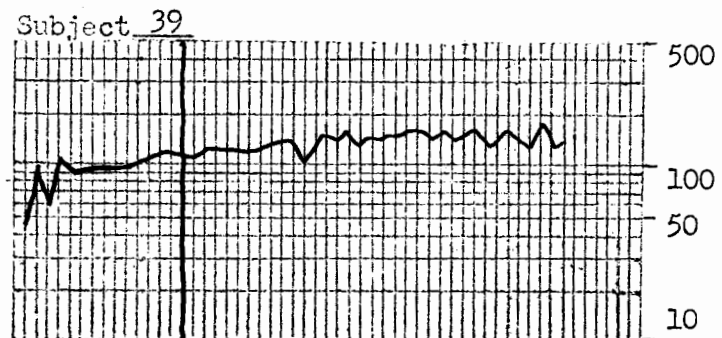
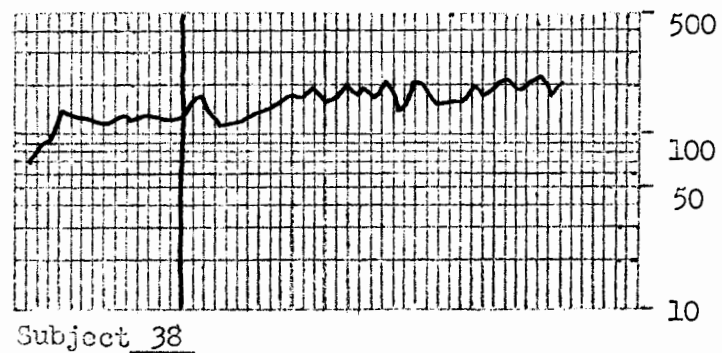
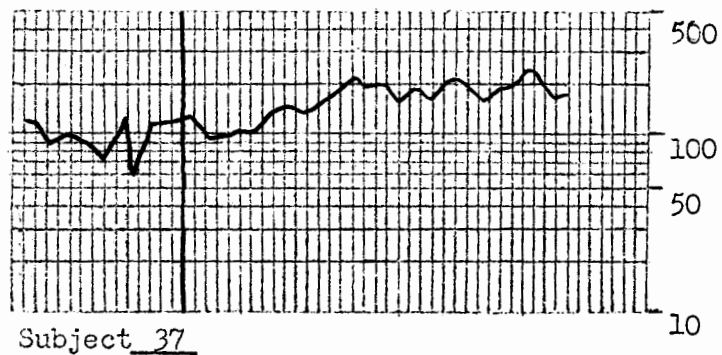


APPENDIX B-ORAL READING RATE CHARTS

Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.



Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.



Each Vertical Column Represents One Day. Horizontal Columns Represent Movements Per-Minute.