

13340
NATIONAL LIBRARY
OTTAWA



BIBLIOTHÈQUE NATIONALE
OTTAWA

NAME OF AUTHOR... *MARILYN ELIZABETH CROZIER*...

TITLE OF THESIS... *TUTORING... WITH... PRECISION*...

UNIVERSITY... *University of Alberta*...

DEGREE FOR WHICH THESIS WAS PRESENTED... *Ph. D.*...

YEAR THIS DEGREE GRANTED... *1972*...

Permission is hereby granted to THE NATIONAL LIBRARY
OF CANADA to microfilm this thesis and to lend or sell copies
of the film.

The author reserves other publication rights, and
neither the thesis nor extensive extracts from it may be
printed or otherwise reproduced without the author's
written permission.

(Signed) *Marilyn Crozier*

PERMANENT ADDRESS:

6 - 10525-83 Ave
EDMONTON, ALBERTA

DATED *Oct. 3/72* 1972

NL-91 (10-68)

THE UNIVERSITY OF ALBERTA

TUTORING WITH PRECISION IN THE ELEMENTARY SCHOOL

by



MARILYN ELIZABETH CROZIER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL, 1972

THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled TUTORING WITH PRECISION IN THE ELEMENTARY SCHOOL submitted by MARILYN ELIZABETH CROZIER in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

H. R. Cameron
.....
Supervisor

Veto J. Miller
.....
A. Hunter
Paul Hunter
.....

H. J. Jones
.....

A. H. H. H.
.....
External Examiner

Date *September 28, 1972*

ABSTRACT

The purpose of the present investigation was to design, implement and evaluate a tutoring program using pupils from higher grades as tutors for children in the early elementary grades who require additional instruction in basic word identification skills.

The tutoring program was implemented and tested in three elementary schools from the Edmonton Public School System. Ninety-eight grade five and six students from four different classrooms were trained to serve as tutors. A total of forty-nine pupils selected from seven grade two and three classrooms were included in the experiment and tutored on a systematic basis. Three teachers from grade six and one from grade five participated in the study as sending teachers; the project also involved seven receiving teachers (five from grade two and two from grade three), three school coordinators and the experimenter (program coordinator). Each of the various personnel involved in the tutoring program cooperated by completing specified tasks before and throughout the project.

The grade two and three tutees were tutored over a three-month period in twenty minute sessions four days each week. Direct and continuous monitoring of each tutee's correct and error rates in oral reading was done in each session with the aid of the Precision Teaching measurement system. In addition, three separate questionnaires were administered at the conclusion of the project to collect information concerning the reactions of the tutees, tutors and the participating school staff.

The experimental design provided for five different phases:

(a) Before (classroom instruction only - three weeks duration), (b) During I (classroom instruction plus tutoring - six weeks duration), (c) Between (classroom instruction only - two weeks duration), (d) During II (classroom instruction plus tutoring with points and candy rewards - two weeks duration), and (e) During III (classroom instruction plus tutoring - two weeks duration). Comparison of tutee performance in the various phases revealed that all tutees performed better under the tutoring procedures, and that, for some tutees, the added incentives of points and candy rewards further improved their performances.

ACKNOWLEDGMENTS

I would like to express my sincerest thanks to my husband, Dick, for the suggestions, constructive criticism and reinforcement provided throughout this entire investigation.

My appreciation is also extended to Mrs. Kay Chernowski of the Edmonton Public School System for her invaluable assistance, and to the participating teachers from the schools involved for their excellent cooperation. A very special acknowledgment is given to the grade five and six students who acted as tutors in this experiment. Their enthusiasm and dedication during the tutoring program was remarkable.

I am greatly indebted to the members of my committee for their interest and suggestions throughout this project. I would especially like to acknowledge the contribution of my supervisor, Dr. D. R. Cameron. Dr. Cameron's genuine concern for all children and their education served as a constant reminder of the ultimate purpose of educational research. Dr. S. Hunka also demonstrated this concern, in that he strongly supported and greatly assisted in the analysis of individual data.

The financial support provided by the Canada Council during my two years of doctoral study is gratefully acknowledged.

Finally, I wish to dedicate this thesis to my most loved and important teachers: my father and mother, Warren and Margaret Wortley.

TABLE OF CONTENTS

	Page
LIST OF TABLES	x
LIST OF FIGURES	xiii
Chapter	
I. INTRODUCTION	1
II. RELATED RESEARCH	6
Objectives of the Tutoring Program	6
Tutor Preparation	8
Tutor Motivation	10
Tutoring Procedures	11
Administrative Considerations	14
Measurement and Evaluation Procedures	15
Summary and Conclusions	18
PURPOSE OF THE STUDY	19
Specific Objectives of the Study	19
III. THE PRECISION TEACHING SYSTEM	21
Rate of Performance	21
Pinpointing	21
Calibration	22
Daily Behavior Chart	23
Project team members	23
Chart axes	25
Proportional scale	26

Chapter	Page
Behavior range	26
Summary	27
The Precision Teaching System Phases	27
Before	27
During	27
Between	28
After	28
Charting Conventions	28
Is Plan	31
Program	31
Program event	31
Movement Cycle	33
Arrangement (A)	33
Arranged event	33
Illustrative Studies Using the Precision Teaching System	34
Summary	39
IV. METHOD	40
ORGANIZATION OF THE EXPERIMENT	40
Experimental Subjects (Tutees)	40
Tutors	41
Receiving Teachers	43
Sending Teachers	44
School Coordinator	45
Experimenter (Program Coordinator)	45
Materials	47

Chapter

Page

Is Plan	47
Record sheet	47
Binders	47
Tutoring materials	47
Measures	49
The daily behavior chart	49
Questionnaires	49
EXPERIMENTAL CONDITIONS	50
Response Definitions and Recording	50
Measurement Reliability	51
Procedural Variations	52
Before phase (three weeks)	52
During I phase (six weeks)	52
Between phase (three weeks)	54
During II phase (two weeks)	54
During III phase (two weeks)	55
V. RESULTS	56
Data Analysis	56
SCHOOL A	58
Class a ₁	58
Student Questionnaires	61
Class a ₂	61
Student Questionnaires	66
Class a ₃	68
Student Questionnaires	73
Teacher Questionnaire	75

Chapter	Page
SCHOOL B	76
Class b_1	76
Student Questionnaires	80
Class b_2	80
Student Questionnaires	84
Teacher Questionnaire	88
SCHOOL C	91
Class c_1	91
Student Questionnaires	95
Class c_2	97
Student Questionnaires	101
Teacher Questionnaire	104
VI. SUMMARY, DISCUSSION AND IMPLICATIONS	107
Summary	107
Discussion	109
Objective 1	109
Objective 2	110
Objective 3	112
Objective 4	113
Objective 5	114
Objective 6	115
Educational Implications	120
REFERENCES	124
APPENDICES	129

LIST OF TABLES

Table	Page
1. Schools, Sending Classes, Receiving Classes and Personnel Participating in the Project	42
2. Program and Program Events for the Receiving Classes . . .	48
3. Comparison of Before and During I Phases for Class a ₁ (Trends and Step Changes)	59
4. Comparison of During I and Between Phases for Class a ₁ (Trends and Step Changes)	60
5. Summary of Questionnaire Responses for Tutors of Class a ₁	62
6. Comparison of Before and During I Phases for Class a ₂ (Trends and Step Changes)	63
7. Comparison of During I and Between Phases for Class a ₂ (Trends and Step Changes)	64
8. Comparison of During I and During II Phases for Class a ₂ (Trends and Step Changes)	65
9. Comparison of During II and During III Phases for Class a ₂ (Trends and Step Changes)	66
10. Summary of Questionnaire Responses for Tutors of Class a ₁	67
11. Comparison of Before and During I Phases for Class a ₃ (Trends and Step Changes)	69
12. Comparison of During I and Between Phases for Class a ₃ (Trends and Step Changes)	70
13. Comparison of During I and During II Phases for Class a ₃ (Trends and Step Changes)	71
14. Comparison of During II and During III Phases for Class a ₃ (Trends and Step Changes)	72
15. Summary of Questionnaire Responses for Tutors of Class a ₃	74

Table	Page
16. Comparison of Before and During I Phases for Class b_1 (Trends and Step Changes)	77
17. Comparison of During I and Between Phases for Class b_1 (Trends and Step Changes)	78
18. Comparison of During I and During II Phases for Class b_1 (Trends and Step Changes)	79
19. Comparison of During II and During III Phases for Class b_1 (Trends and Step Changes)	81
20. Summary of Questionnaire Responses for Tutors of Class b_1	82
21. Comparison of Before and During I Phases for Class b_2 (Trends and Step Changes)	83
22. Comparison of During I and Between Phases for Class b_2 (Trends and Step Changes)	85
23. Comparison of During I and During II Phases for Class b_2 (Trends and Step Changes)	86
24. Comparison of During II and During III Phases for Class b_2 (Trends and Step Changes)	87
25. Summary of Questionnaire Responses for Tutors of Class b_2	89
26. Comparison of Before and During I Phases for Class c_1 (Trends and Step Changes)	92
27. Comparison of During I and Between Phases for Class c_1 (Trends and Step Changes)	93
28. Comparison of During I and During II Phases for Class c_1 (Trends and Step Changes)	94
29. Comparison of During II and During III Phases for Class c_1 (Trends and Step Changes)	96
30. Summary of Questionnaire Responses for Tutors of Class c_1	98
31. Comparison of Before and During I Phases for Class c_2 (Trends and Step Changes)	99
32. Comparison of During I and Between Phases for Class c_2 (Trends and Step Changes)	100

Table	Page
33. Comparison of During I and During II Phases for Class c_2 (Trends and Step Changes)	102
34. Comparison of During II and During III Phases for Class c_2 (Trends and Step Changes)	103
35. Summary of Questionnaire Responses for Tutors of Class c_2	105

LIST OF FIGURES

Figure	Page
1. The Daily Behavior Chart	24
2. The Is Plan	32

Chapter I

INTRODUCTION

Reading is one of the most important skills required for academic success. While in the future it is conceivable that students may learn from other sources besides textual presentations (for example, films, recordings, television), the fact remains that much of what a student presently learns in school depends on his ability to read. Moreover, student performance on school-related tasks is evaluated primarily through the use of written material. Therefore, it seems that a student's academic success would be seriously hampered if adequate reading skills are not developed in the early school years. Dawson (1967), for example, has pointed out that a high positive correlation exists between poor reading performance, poor academic success and subsequent school dropout.

The problem of reading failure has received a great deal of attention in recent years. Mortimer Smith, a spokesman for the Council for Basic Education, has pinpointed this problem with the following statement:

Reading, of course, is the essential first skill and the child who has an inadequate grasp of it is doomed to academic failure all along the line. It is hardly necessary to point to the failure of most of our schools in teaching this skill; indeed, published (and unpublished) test scores show that the failure amounts to a scandal. CBE believes that the root of the trouble is the faulty whole-word method in beginning reading that has predominated in American schools for so many years. Until fairly recently, organized phonics, or what is becoming fashionable to call decoding, has been frowned on by almost all the reading specialists. Those who wanted to improve reading had to buck a monopoly and had to try to persuade

schoolmen to stop being intimidated by the "experts" and to try new approaches. Now there is reason for cautious optimism about reading improvement. In recent years a half dozen different phonics-based reading systems have come into successful use. Our very rough estimate is that 15 per cent of American school children are now learning to read by these systems. Enough comparative studies of the old and the new systems have been made to indicate the overwhelming superiority of the latter (1969, p.3).

The research to which Smith refers is exhaustively reviewed in Jeanne Chall's (1967) well-documented analysis of the meaning emphasis (whole-word) versus code emphasis controversy. From her review, Chall concluded that the code emphasis programs produce better over-all reading achievement than do the meaning emphasis programs, especially in the early grades. Since 1967, a number of longitudinal research studies have been published supporting Chall's earlier conclusion that the phonics approach is superior to the look-say or whole-word method of teaching reading (e.g., Dykstra, 1968; Hayes & Wuest, 1969).

One of the more successful phonics-based reading systems which has been published in recent years is the DISTAR program (S.R.A., 1969) by Siegfried Engelmann and his associates. In his widely publicized text, Preventing failure in the primary grades, Engelmann (1969) maintains that the controversy between the look-say method and the phonic approach is really based on an argument over what reading is: Is it an experience, with the whole child participating in it meaningfully? Or is it a mechanical code-cracking skill? Engelmann says that there are two ways to resolve the controversy between the two approaches. The first is to conduct experiments with the two approaches and note which approach produces better results. The second is to analyze the controversy and see which arguments are more reasonable. Research has already provided the empirical answer as to which of the approaches is

superior. Engelmann's excellent logical analysis of the issue provides the same answer:

The code-cracking, mechanical skills are logically prior to the gross experience of meaningful reading. To see why they are logically prior, consider the child who is asked to read the statement The horse is on the ridge. The child may read the statement correctly, or he may not. He may or may not understand what he reads. There are a number of possible combinations. The most publicized possibility is that the child may read the statement correctly and not be able to demonstrate in any way that he understands what he has read. However, an equally interesting possibility is that he may not read the statement correctly and yet demonstrate that he understands what he has incorrectly read. For example, he may read "The horse is on the bridge," and when he is asked to draw a picture of what he has read, he may draw a picture of a horse on a bridge. Does he understand what he read or doesn't he? If we say that he does, we are giving both "reading" and "comprehension" rather strange meanings. If we say that he doesn't, we are admitting that code cracking (the ability to translate written symbols into appropriate word sounds) is logically prior to comprehension. We are saying that the child cannot possibly demonstrate that he understands the statement unless he first reads it correctly. The most basic question is not "Can he understand what he reads?" but "Can he read what is written?" Before he can comprehend, he must correctly identify the words that appear in a statement. The first step in reading, therefore, must be to teach the child how to identify words correctly. This step has nothing to do with meaningful experiences or with total involvement (1969, p.82).

Comprehension, argues Engelmann, is not really a reading problem.

If a child cannot handle statements verbally, he will not be able to handle them in written form. Therefore, the child cannot be expected to pass tests of reading comprehension unless he is able to pass comparable tests of oral language comprehension. The remedy implied by a child's failure of such a language test is language instruction, not reading instruction. When a child cannot correctly identify the words that are presented, a reading remedy is required. In this situation, there is no possibility that the child can comprehend what is written; he must first learn to translate the written symbols into appropriate

sounds. The implication from the foregoing analysis is that in reading instruction the first step is to teach the child to identify words correctly.

In order to identify words correctly, a child must master the subskills involved in word identification. These subskills consist of: (a) learning the relation between individual letters and verbal sounds, (b) blending, and (c) learning that there are "regular" and "irregular" words (Engelmann, 1969, p.83). Since these subskills appear essential for word identification, and word identification is prerequisite to reading comprehension, it follows that children must master these decoding skills before proficient reading can be expected.

If some children fail to learn these essential skills in the course of their regular classroom instruction in reading, it would seem that additional instruction would be required to bring these children to an acceptable level of performance. Furthermore, to prevent such children from falling progressively further behind, it would appear highly desirable to implement "catch-up" programs in the early grades. The classroom teacher, however, often does not have sufficient time to provide the necessary remedial instruction for these low-performing children. One answer to this dilemma would be to train pupils from higher grades as tutors in reading. Potentially, these older students represent a convenient and economical solution to the problem of providing the additional instruction which the low-performing child requires.

In summary, it would seem that a worthwhile goal for applied research would be the development and evaluation of tutoring programs designed to increase reading proficiency. Therefore, the purpose of

the investigator in the present study was to focus on the problem of developing, implementing and evaluating a tutoring program using pupils from higher grades as tutors for children in the early elementary grades who require additional instruction in basic word identification skills. The following chapter raises certain key questions related to this problem and presents a summary of how the tutoring programs reviewed have dealt with these concerns.

Chapter II

RELATED RESEARCH

The problem of devising, implementing, and evaluating a tutoring program is a complex task. Analysis of this problem reveals that certain key questions must be considered. What are the specific objectives for the different personnel involved in the tutoring program? What procedures are required to select and train the tutors? What provisions are necessary to ensure the tutors' cooperation and motivation? What procedures should the tutors follow? What administrative details must be anticipated and planned for? How can the project best be evaluated to determine its effectiveness?

In this chapter, studies reporting on tutoring programs are reviewed. Since the writer was unable to find any published reports of tutoring programs using pupil tutors conducted in Canada, the review describes only those projects carried out in the United States. The focus throughout this review is on how the various programs dealt with the foregoing questions.

Objectives of the Tutoring Program

In many of the studies reviewed, the stated purpose of the tutoring program was to increase the reading skills of the tutee (e.g., McCleary, 1971; Norris & Wantland, 1972; Rossi, 1969; Schoeller & Pearson, 1970). Other studies, however, indicated that tutoring was provided in a variety of subject areas (Bell, Garlock & Colella, 1969; Fleming, 1969; Goodman, 1971; Gross, 1968). A series of tutoring

programs described by Staats and his associates (1965, 1967, 1970) were conducted with two major objectives for the tutee: (a) to increase reading skill, and (b) to increase appropriate classroom behavior.

Certain programs have emphasized potential gains for the tutor rather than gains for the tutee. For instance, many of the large-scale tutoring programs presently operating in the United States, such as the Youth-Tutoring-Youth and Mobilization for Youth programs (Gartner, Kohler & Riesmann, 1971), assume that disadvantaged, academically retarded high school tutors will "learn through teaching" and hence acquire the necessary skills for the completion of high school. Three other programs following this rationale have employed grade six students who were retarded in reading as tutors for younger elementary children, with the objective of increasing the reading skill of the tutor as well as that of the tutee (Frager & Stern, 1970; Harris, 1970; Rime & Ham, 1968).

Finally, authors such as Lippitt (1969) and Thelan (1969) have expressed their objectives in more subjective terms. These writers have generally stressed the attitudinal changes which might occur as a result of a cross-age tutoring program. These authors contend that cross-age tutoring may serve to increase motivation and help build self-esteem in both the younger and the older child. Furthermore, they say, the older child will learn to accept responsibility, to communicate more effectively with teachers and peers, and to assume leadership.

It would seem that future research involving the design (and evaluation) of tutoring programs would be greatly facilitated if the objectives were more clearly defined. According to Vargas (1972), specific objectives can perform three functions: they help the planner

select appropriate learning experiences; they communicate to others what is expected; and, they give everyone involved standards for evaluating progress. In view of the foregoing, it appears that a desirable first step to be taken in setting up a tutorial program would be to describe the tasks to be performed by the various personnel involved. Once these objectives have been established, appropriate tutoring procedures could be specified and suitable materials selected.

Tutor Preparation

Programs funded by the United States National Commission on Resources for Youth (e.g., Youth-Tutoring-Youth, Mobilization for Youth) have generally conducted both pre-service and in-service training programs for their tutors. For instance, Cloward (1967) describes a Mobilization for Youth program in New York which had four pre-service training sessions over a two week period, followed by two-hour weekly seminars during the twenty-six week tutoring program. A summer Youth-Tutoring-Youth program in Philadelphia (Gartner, Kohler & Riesmann, 1971) reported no pre-service training, but held six hours of training sessions each week during the tutoring program, for which the tutors were paid their regular wage. None of these government-funded programs, however, stated specific objectives for their tutor training sessions. Similarly, a program described by Anderson (1970) indicated that high school tutors were involved in three training seminars each week, but details of what was done during these seminars were not provided.

Lippitt (1969) has published a training package for training older elementary school students as tutors for younger pupils. Lippitt's program consists of records, filmstrips and textual materials which are

presented by an adult seminar leader in a series of ten pre-service or in-service sessions. The program concentrates almost entirely on developing interpersonal communication skills in the tutor, but fails to mention any criteria for assessing the tutor's behavior. The Lippitt training program has been used by Paicoma Elementary School (1969) in a school-wide tutorial project during which grade six students tutored grade three children, who in turn tutored grade one children.

A more objective attempt at tutor preparation was done by Niedermeyer (1970). Niedermeyer developed a Tutor Observation Scale to evaluate the results of a training program designed to teach the following sequence of tutor behaviors: (a) engages pupil in instructional, friendly conversation, (b) verbally confirms correct pupil responses, (c) praises pupil, (d) tells or shows pupil correct response when incorrect response is given, (e) elicits correct response before continuing, (f) repeats question or direction in different words following nonresponse to initial question or direction, and (g) avoids attempting to elicit correct response by prompting. Niedermeyer found that grade five tutors trained in the above behaviors were more effective as tutors than a group of untrained grade five students.

While Niedermeyer's results are not definitive, it seems reasonable to conclude that a tutor training program would be a desirable and necessary component of future tutoring projects. Properly trained personnel should be able to function more effectively in their role as tutors. Moreover, if the tutors were trained to follow systematic tutoring procedures, the effects of different tutoring techniques could be experimentally compared.

Tutor Motivation

Certain authors (Lippitt, 1969; Thelan, 1970) assume that children will be motivated to act as tutors because the tutoring experience allows them to help another individual. The young tutor, states Thelan (1970), will develop his own academic skills through tutoring, will form better attitudes towards learning, and will find new interests and commitments in life.

Several studies have reported attempts to use volunteers as tutors. The use of volunteer tutors, however, seems to have certain disadvantages. Problems with recruitment, training, communication and absenteeism are frequently encountered. For example, Rossi (1969) has described a program in Jersey City entitled HELP, in which one hundred high school volunteers tutored disadvantaged elementary children in reading, as suffering from tutor absenteeism and lack of communication between tutors and elementary school personnel. Other programs enlisting volunteers from the community have expressed similar concerns (Gross, 1968; Jones, 1968; Schoeller & Pearson, 1970).

Some programs have dealt directly with the problem of tutor motivation by paying the tutors an hourly wage. For example, an ongoing Homework Helper Program in New York employs over 1,500 tutors at \$1.50 - \$2.00 per hour to work with approximately 4,500 tutees (Gartner, Kohler & Riesmann, 1971) and a Youth-Tutoring-Youth program described by Cloward (1967) paid tutors eleven dollars a week for conducting six hours of tutoring and attending a two-hour meeting. Government-funded programs such as those above could serve the dual function of providing jobs for youths from low-income, disadvantaged families and a learning situation for both tutors and tutees.

Another approach to ensuring tutor cooperation was to give academic credit for acting as a tutor. Two such programs were reported by Anderson (1970) and Goodman (1971). They described studies in which high school students received academic credit for tutoring pupils from elementary and junior high. In these programs, the tutors were enrolled in a "service option" course which included tutoring as one of the possible assignment choices.

Giving academic credit to students who participate in a tutoring program would appear to be one economical way of providing motivated and cooperative tutors for those students requiring additional instruction. In any event, the question of how to motivate the tutors is an important consideration for further efforts in this area.

Tutoring Procedures

The great majority of the programs reviewed by the present investigator either did not have systematic procedures for the tutors to follow or failed to report them in sufficient detail to permit replication. However, the problem of devising and evaluating the relative effectiveness of different tutoring procedures has been extensively investigated in one series of experiments conducted by Arthur Staats and his associates.

Staats and Butterfield (1965) developed a set of systematic procedures for tutoring on a one-to-one basis which they called "programmed tutoring". Their program included specific tutoring procedures, continuous evaluation and reinforcement for appropriate responses. Staats and his associates successfully used token systems with preschoolers and educable retardates (aged eight to eleven) to teach reading

(Staats, Finley, Minke, Wolf & Brooks, 1964). On the basis of preliminary findings, they reasoned that a similar reinforcement system, together with very specific procedures, might comprise an effective remedial reading program for older children demonstrating severe behavior problems and academic failure. In a later study reported by Staats and Butterfield (1965), the following tutoring procedures were described (for use with the SRA reading laboratories):

1. New vocabulary was presented on separate cards and practiced until each word was read without prompting.
2. Each paragraph from the SRA story was read orally, until it was read without mistakes. Paragraphs were presented in the order in which they appeared in the story.
3. The entire story was read silently by the tutee. He then wrote out answers to comprehension questions.

In this pioneering venture, Staats and Butterfield developed and tested an elaborate reinforcement system using tokens of high, middle and low value. Tokens were given for individual words read correctly (step one), for completing paragraphs without errors (step two), for attending behavior during silent reading, and for correct answers to comprehension questions (step three).

The above procedures were initially employed with a fourteen-year-old Mexican boy exhibiting many behavior problems and very poor reading performance. After four and a half months of tutoring by a probation officer, the boy had advanced 2.3 grade levels in reading (from 2.0 to 4.3) and was achieving passing grades in school for the first time in his life.

The procedures were subsequently applied to eighteen additional children of junior high school age, using nine average high school students and nine adult volunteers as tutors (Staats, Minke, Goodwin & Landeen, 1967). In a later study employing Negro high school students and adults as tutors, thirty-two tutored Negro ghetto children achieved significantly higher results on standard reading tests than a control group (Staats, Minke & Butts, 1970). The investigators concluded that it was not necessary to have persons highly trained in education to administer the tutoring procedures, and suggested that delinquent children might even teach each other. Similarly, Becker, Thomas and Carnine (1971), after using Staats' procedures with grade two children, decided that the program could be carried out by persons with very little technical training in remedial reading.

Ellson, Barber, Harris and Adams (1968) have also developed a systematic tutoring program. Their program, the Ginn Tutorial, features commercially prepared tutoring materials and outlines highly specific procedures for the tutors to follow. The Ginn Tutorial has been widely used in recent years, both as a remedial reading program and as a part of the regular reading program (Ellson, Harris & Barber, 1968). For instance, in Lenoir County Public Schools, North Carolina, a preventative program was begun with first graders scoring below forty-four on the Metropolitan Reading Readiness Tests (McCleary, 1971). The Ginn tutoring sessions are conducted on an individual basis in fifteen-minute periods every day by nonprofessionals following very structured lesson plans. However, the complex format of the program necessitates the use of adult tutors. None of the other tutoring programs reviewed, except that

described by Niedermeyer (1970), detailed the specific procedures employed during the tutoring sessions.

It seems highly unfortunate that the large majority of the tutoring programs reported did not follow systematic tutoring procedures. Both evaluation of procedural effectiveness and systematic replication are practically impossible under these conditions. Systematic tutoring would thus appear to be essential if conclusive statements concerning the relative effectiveness of different tutoring procedures are to be made.

Administrative Considerations

Generally, the tutoring programs reviewed were conducted in close association with the schools. Volunteers from the community, college students, or pupils from higher grades tutored pupils during school time in sessions lasting from twenty minutes to one and a half hours (Anderson, 1970; Frager & Stern, 1970; Gross, 1968; Niedermeyer & Ellis, 1971). The funded tutoring programs, however, usually operated independently of the schools, with sessions being conducted after school and during the summer months (Gartner, Kohler & Riesmann, 1971). Many of the after school programs, in fact, began as summer programs (Hassinger & Via, 1969; Squires, 1971) in cooperation with the Neighbourhood Youth Corps, and later extended their operation throughout the school year (Cloward, 1967, Landrum & Martin, 1970).

The government sponsored tutoring programs have often attempted to recruit supervisory personnel from within the immediate area served by the tutoring program. Evidently this practice helped to provide needed employment and also ensured a greater amount of cooperation from

the community. School-operated programs obviously require supervision by the school staff. However, of the tutoring programs reviewed, none elaborated on the specific duties of the various school personnel involved in the tutoring program.

The administration of a tutoring program would undoubtedly involve the joint efforts of several different school personnel. In view of this fact, it would seem highly desirable to have a specification of the tasks (responsibilities) for each of the people involved. Thus, misunderstandings could be avoided, and, presumably, more efficient planning would be possible.

Measurement and Evaluation Procedures

Approximately two-thirds of the sixty-one studies reviewed did not attempt any objective form of evaluation concerning the effectiveness of their tutoring program. Consequently, any conclusions regarding the methods used in these programs would be extremely difficult to draw. Ten studies reported using some form of standard achievement test on a pre- and posttest basis, but only six of these studies (Gartner, Kohler & Riesmann, 1971; Hassinger & Via, 1969; Hill & Tolman, 1970; Landrum & Martin, 1970; Schoeller & Pearson, 1970; Staats & Butterfield, 1965) provided actual data. The results from these six studies showed significant academic gains for the tutees.

Cloward (1967) reported an interesting finding from a twenty-six week Mobilization for Youth program: although both tutors and tutees showed significant reading score gains, no difference was found in either group's school marks or attitudes towards school and school-related activities. Schoeller and Pearson (1970), on the other hand,

reported questionnaire results for 115 tutees which indicated a general improvement in (a) attitudes toward school, (b) work habits, and (c) reading enjoyment. These pupils also made significant gains in reading skills, according to pre- and posttest measures from the Spache Diagnostic Reading Scales (1963). Gartner et al. (1971) have advised that gains reported from summer tutoring programs should be interpreted cautiously, since "test-wisdom" would likely occur when only six weeks intervene between testing periods.

Two of the tutoring studies reported using more direct forms of measurement than standard achievement tests. Frager and Stern (1970) described a program in which grade six students tutored kindergarten children with the McNeil ABC Learning Activities readiness program. The tutored kindergarten children performed significantly better than a control group on the McNeil criterion test. A study by Niedermeyer and Ellis (1971) also employed criterion tests corresponding to the materials being used in the tutoring sessions. These tests were administered to the tutored and non-tutored children every three weeks. The children tutored by the grade five and six students did significantly better than pupils who were not tutored.

The tutoring procedures developed by Staats (programmed tutoring) and the program produced by Ginn required a form of measurement which was both direct and continuous. Both programs took daily measurements of pupil progress which were directly related to the instructional program. Staats, for instance, recorded the following for each tutoring session: (a) number of words read incorrectly on first presentation, (b) number of words read incorrectly after training, and (c) retention on words learned ten to fifteen days previously. The first measurement (a)

refers to words presented on individual word cards; the second measurement (b) refers to the number of these words read incorrectly in the oral paragraph reading after training.

The Ginn program requires that the tutors also record daily errors and subsequent tutee performance after training. Specified exercises completed by the tutee during the tutoring session are kept in the child's individual folder, but these exercises are not considered to be criterion tests. The emphasis in the Ginn program, as in the Staats' procedure, is on recording errors before and after tutoring. No record was kept of the total number of words read correctly during each training session in the Ginn program.

In summary, the evaluation procedures used by the various tutoring programs could be categorized as follows: (a) indirect and infrequent (standard achievement tests), (b) direct but infrequent (Frager & Stern, 1970; Niedermeyer & Ellis, 1971), and (c) direct and continuous (Ellson, Harris & Barber, 1968; Staats & Butterfield, 1965). It seems that one of the most important questions that should be asked about any tutoring program is "Was the program successful?" McGinnis (1972) stressed the importance of evaluating tutoring programs when she said:

If the schools decide to use non-professionals as tutors, careful and unbiased evaluations of their effectiveness must be made . . . The answer to the question "Should tutoring be encouraged?" can come only from a series of well-controlled studies of tutorial programs (p.1).

Evaluation, however, is difficult if program objectives and procedures are not clearly defined. Mager (1962), in fact, has stated that when clearly defined goals are lacking it is impossible to evaluate a course or program efficiently. Furthermore, he says, without specific

objectives there is no sound basis for selecting appropriate materials, content, or instructional methods.

In addition, direct and continuous evaluation within each tutoring session could provide particularly relevant information about the daily progress of the tutee toward the program's objectives. Such evaluation might possibly be carried out by upper elementary school tutors if the measurement techniques used were relatively easy to administer and the recording procedures were simplified.

Summary and Conclusions

In this chapter, various tutoring studies were reviewed and questions posed as to how the different investigators dealt with the problems of devising, implementing, and evaluating their tutoring programs. Since these studies differed widely in terms of goals, subjects, size, tutoring procedures, and scientific rigor, conclusive statements regarding optimal approaches to this problem are difficult to make at this time. However, on the basis of the present review, it would seem that, in general, tutoring programs can be successful if the tutors are given adequate training and follow systematic procedures within the tutoring sessions. On the other hand, many of the tutoring programs conducted to date may be criticized because of their lack of experimental rigor.

In summary, it seems highly desirable that additional research on the effectiveness of tutorial programs should be characterized by: (a) precise objectives; (b) provision for training the tutors to some specified criteria of performance; (c) arrangements for some form of incentive for the tutors; (d) systematic procedures for the tutors to

follow; (e) specification of the tasks to be performed by the various support personnel involved in the administrative aspects of the program; and (f) a more precise measurement and evaluation system to determine the effectiveness of the program.

PURPOSE OF THE STUDY

The general purpose of the present study was to design, implement and evaluate a tutoring program employing grade five and six students as tutors for younger elementary children who required additional instruction in word identification.

Specific Objectives of the Study

Objective 1. To detail the behavioral objectives (specific tasks) to be completed by the various personnel involved in the tutoring program: (a) tutors, (b) tutees, (c) grade five and six teachers (sending teachers), (d) grade two and three teachers (receiving teachers), and (e) the experimenter (program coordinator).

Objective 2. To delineate systematic tutoring procedures to teach word identification skills to beginning readers.

Objective 3. To devise a training program to teach the tutors to (a) administer the tutoring procedures, and (b) measure and record oral reading performance.

Objective 4. To monitor the effects of the tutoring procedures on the oral reading performance of each tutee on a daily basis.

Objective 5. To compare the effects of specified procedures on the oral reading performance of each tutee.

Objective 6. To determine the reactions toward the tutoring program of the tutees, the tutors and the participating school personnel.

In the following chapter, a conceptual and procedural framework is described which appears to hold considerable promise as a measurement system for evaluating tutoring programs in reading.

Chapter III

THE PRECISION TEACHING SYSTEM

The Precision Teaching System is an adaptation of the operant technology described by Skinner (1953). Both Precision Teaching and operant technology employ standard data collection materials, functional definitions, and complete, continuous recording of individual data. The fundamental difference between the two paradigms lies in the development by Lindsley (1965) of a language which can be used and understood by disciplines outside the basic research laboratory. Precision Teaching, says Lindsley, is not an "approach", but an easy, inexpensive measurement technique for monitoring daily improvement (1971, p.119). Gaashult (1970b) describes the basic "tools" of Precision Teaching as being: (a) rate of performance on an observable behavior, (b) a standard six-cycle chart, and (c) a planning formula called the IS Plan which includes the major components in an individual's environment which could affect his behavior.

Rate of Performance

As with operant technology, performance rate is the basic datum for the Precision Teaching System. Performance rate is preferred over percentage as a descriptive measure of academic behavior since rate supplies information about the quantity, accuracy and speed of a behavior, whereas percentage describes only accuracy of behavior.

Pinpointing. The identification and description of a behavior to be measured is referred to as "pinpointing". In pinpointing a

behavior, there are a number of criteria by which the adequacy of the description may be assessed. First, the behavior must be directly observable and described in terms which would allow any observer to identify its occurrence accurately and reliably. The observer should not have to make subjective decisions as to whether or not a particular behavior observed is an instance of the behavior being counted. Second, the behavior should involve movement. Acts such as "sitting", "resting" and "being quiet" are really the absence of observable behavior and are noticeable only because some other behavior is not occurring. Third, the behavior should be cyclical (i.e., terminate in a state of affairs such that the behavior may be repeated). If a behavior cannot be repeated, then it cannot be altered. Because of these last two criteria, the identified behavior is called a movement cycle.

Calibration. Calibration involves assuring that the standard units of measurement employed are the same. The response unit identified should convey as precisely as possible the amount of information covered and the approximate length of time necessary to emit each response. For example, pinpoints which may be identified for oral reading range from "books read" to "letters scanned". However, units such as books, chapters, pages and letter forms are non-functional units; words and syllables, on the other hand, are considered to be appropriate units for measurement purposes (Starlin, 1970, p.17). Although "syllables read" would be the more completely calibrated pinpoint, the most practical unit for recording purposes appears to be whole words.

After a movement cycle is pinpointed, a record may be obtained of the frequency of the movement within a certain time period. Dividing the frequency (that is, the number of movement cycles) by the duration

(minutes recorded) provides the rate of performance which is plotted on the daily behavior chart.

Daily Behavior Chart

The daily behavior chart (Figure 1) is a six-cycle logarithmic chart which allows recording of a wide range of human behaviors (from one behavior in a thousand minutes to a thousand behaviors in one minute). Twenty weeks of information may be kept on one chart; hence, only two or three charts per child are necessary for a particular pinpoint for the school year.

Project team members. The four project team members of supervisor, adviser, manager and behavior identified across the bottom of the chart are general terms that allow identification of a variety of persons involved in a behavior change project. The title of each project team member serves to describe the basic function that person performs and the involvement with the behavior or data which that function entails. White (1970) describes these various team members as follows:

1. Behavior: The individual whose behavior is being charted. (In the present study, the tutee is the behavior.)
2. Manager: That individual who is directly responsible for the implementation of the plan to affect a change in the rate of the movement cycle. The manager works directly with the behavior. (The tutor is the manager.)
3. Adviser: That individual who is in a supportive and advisory position to the manager. (The adviser is the teacher of the tutees.)
4. Supervisor: Any individual who is responsible for the training of managers and advisers. A person who teaches the principles and procedures

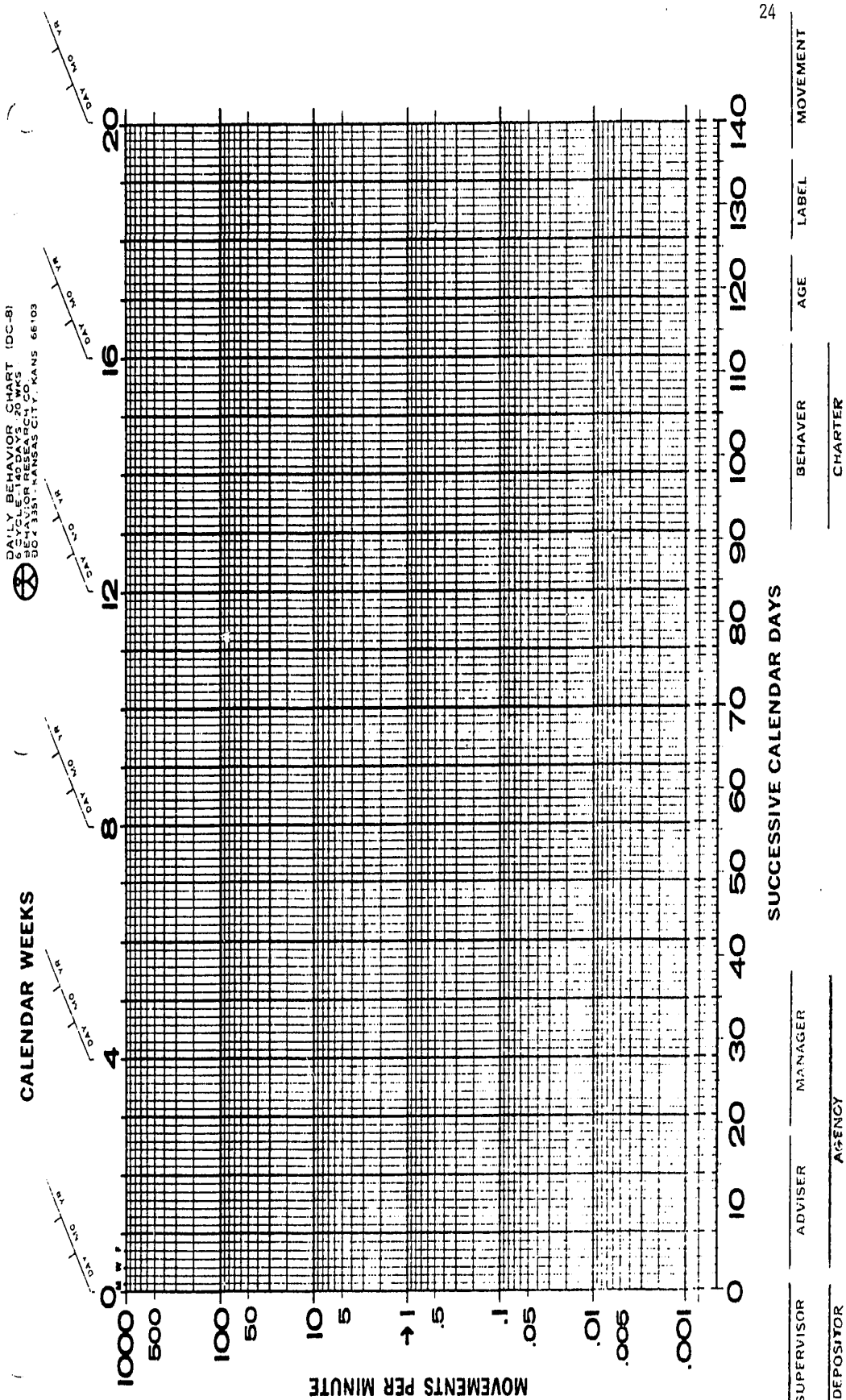


Figure 1
 The Daily Behavior Chart

of Precision Teaching to someone else. (The supervisor is the experimenter.)

The charter is the individual who charts the rates of responding on the standard behavior chart. The person who prepares and submits project reports for storage and/or analysis in some central facility is referred to as the depositor, and the agency is the institution in which the project is carried out (for instance, an elementary school). The age space following "behavior" refers to the age of the behavior. In the label space, the behavior's class placement, or occupation, if not a student, is entered. Finally, the movement category describes the movement that is being recorded (e.g., reads words orally).

Chart axes. Successive calendar days are represented across the bottom of the chart, with Sundays indicated by the heavy vertical lines in the grid. Charting follows the calendar; therefore, the days on which data are not collected are skipped on the chart. The numbers 0, 4, 8, 12, 16, and 20 at the top of the grid indicate the number of elapsed weeks, and above these cumulative week indicators is a space for the inclusion of specific dates once every four weeks.

On the vertical axis, labeled movements per minute, is the grid for performance rates (number of movements/minutes recorded). Rates ranging from one count in a thousand minutes (.001) to 1000 counts per minute may be recorded. Starlin (1970, p.31) suggests a useful way to remember how to convert rate statements to movements per minute statements:

1. Place all rates above one over one:

$$\text{e.g., } 1000 = 1000/1 = 1000 \text{ movements per minute}$$

$$50 = 50/1 = 50 \text{ movements per minute}$$

2. Convert all rates below 1 to fractions:

e.g., $.2 = 5$ movements in ten minutes

$.03 = 3$ movements in 100 minutes

Proportional scale. The horizontal lines are closer together near the top of each of the six sections of the chart because the vertical scale is a proportional scale on which equal gains are represented by equal visual distance. Lindsley (1971) states that the proportional scale is more appropriate for educational measurement than is the widely used arithmetic scale (equal distance between each unit of the scale). He argues that we should be concerned with significant change in a student's academic performance (such as a doubling of rate) but that with the arithmetic scale, small changes are given disproportionate credit. Furthermore, an arithmetic scale contracts the low end of the number scale and expands the high end, so that the low performing child is given less credit for improvement than the high performing child. The numerical and relational information provided by a proportional scale allows a description in terms of rate change (acceleration or deceleration) as well as in terms of percentage changes. Although the proportional nature of the chart makes it difficult to determine the exact scores once they have been placed on the chart, Lindsley claims that this is not too important, since the overall trend of academic growth is the real indication of progress.

Behavior range. Reducing the number of cycles on the chart would result in better spacing between the rate lines, but would decrease the range of behaviors able to be represented. The six-cycle chart represents the range (in terms of rate) of all observable human behavior that could occur in an average waking day (1000 minutes).

There are no human behaviors that occur at a rate of more than 1000 responses per minute, and the lowest rate of behavior that could be recorded in one waking day would be once in a thousand minutes (.001).

Summary. A standardized measure such as performance rate, and a chart with a standardized vertical axis that will represent all behavior rates that an educator might deal with should greatly facilitate communication. Comparisons may be made within students on different performances as well as between students on the same and different areas of performance. The information made available through such comparisons allows decisions as to whether educational interventions are necessary. The Precision Teaching System divides this educational planning into "Before", "During" and "After" phases.

The Precision Teaching System Phases

The three basic phases of the Precision Teaching System (Before, During, After) are temporally related to educational intervention, with the terms maintaining the same meaning as they have in every day usage.

Before. The Before phase refers to the period from the beginning of data collection in a project to the introduction of the first educational change. White (1971, p.105) emphasizes that "Before" is in reference to "before alteration" and should not imply that it is a phase "before anything"; the manager may, in fact, be doing several things which affect rates of responding. The purpose of the phase is to establish what the specific effects of those interactions are before changes are made.

During. The During phase is the period in which an attempt is made to affect the desired change in the rate with which the movement cycle is being emitted. More than one During phase may be needed, each

representing a different attempt at the alteration of the behavior. Different During phases are indicated by successive numberings (During 1, During 2, etc.). Whenever more than one During phase is needed, however, it is advisable that a "Between" phase occur between them.

Between. The Between phase is that phase in which conditions are returned (as nearly as possible) to the original conditions in the Before phase. This allows the manager to have a new reference against which he may determine the effectiveness of new alterations tried in the second During phase. Between phases, then, are similar to Before phases, except they occur between two During phases instead of at the very beginning of a project.

After. The After phase is a period of continued rate recording after the procedures of the During phase have been discontinued. The purpose of the After phase is to check on the permanence of the effects produced in the During phases. After phases may not be appropriate for projects in which new curriculum material is being introduced on a continuous basis.

As long as the educational conditions for a particular movement are constant, the daily data collected represent a given phase. A new phase is indicated only when an educational change is made. Lindsley (1971) suggests that such changes not be made until there are at least five data points (five days) for a particular phase.

Charting Conventions

Recording conventions for the daily behavior chart discussed by term, definition and convention are presented below. The use of black pencil only is advised for charting, since colors will not reproduce when xeroxed, and ink does not erase easily.

1. Charted day. A day in which the movement was omitted and recorded.

Convention: (1) Place a dot on the chart to indicate that day's correct movement rate, and an X to indicate the error movement rates.
(2) Connect data points with lines, skipping all "no chance" days and phase change spaces.

2. No chance day. A day in which the movement has no opportunity to occur.

Convention: Skip the day on the daily chart. Do not draw a line across a no chance day.

3. Ignored day. A day in which the movement could have occurred but was not recorded.

Convention: Do not place a dot or an X on the chart; draw a line from the last charted day, through the ignored day, to the next charted day.

4. Phase change space. The space between the last rated day of one phase and the first day of the next phase.

Convention: Draw a vertical line on the chart, and label the phases appropriately on either side of the line. Do not connect data points across a phase change space.

5. Record ceiling. The highest possible rate determined by the program or program event (e.g., if a child is given only ten problems to do in five minutes, a ceiling has been set of two problems per minute).

Convention: Draw a dashed horizontal line across Sunday lines at the maximum rate (+ + +).

6. Record floor. The lowest measurable performance rate, other than zero, which we are able to record. The record floor is determined by

the length of the performance sample, and is a convenient way of indicating recording time. The formula for the record floor is:

$$\frac{1}{\text{total observation time for the day}}$$

Example: If a behavior were recorded for five hours each day (5 hours = 300 minutes), the record floor would be:


$$\frac{1}{300} = .003$$


Convention: Draw a horizontal dashed line on the chart between Sunday lines (I-I-I)

7. Zero rate. No movement cycle recorded within the performance sample.

Convention: Place a question mark on the appropriate day directly below the record floor.

8. Middle rate. The median rate for any phase.

Convention: The correct middle rate is indicated by drawing a teardrop with its tail pointing to the middle point, and the value (rate) of that point is written inside the teardrop ().

The error middle rate is indicated by drawing a triangle with a tail pointing to the middle point, and the rate is written inside the triangle (.

9. Performance aim. The correct and/or error performance rate toward which the behavior is working.

Convention: Place a star (*) on the chart at the performance rate aim.

10. Calendar synchronize. Standard starting time for all charts in one project location. If a chart is started at some later date, there will be no data points at the beginning of the chart. This coordination

allows direct comparison of different performances by overlaying the appropriate charts.

Convention: All charts in one project location will have the same dates across the top of the chart.

In addition to establishing conventions for the recording of data, the Precision Teaching System has established a standard language for the description of educational plans. Lindsley has termed this description the IS PLAN, since what is described is what is happening in the child's educational environment, without reference to what effects these events may have on the behavior being observed.

Is Plan

Bradfield (1970) states that the Is Plan (Figure 2) is intended to include the various kinds of things which exist in the individual's environment which may affect his behavior. The five components of the Is formula are: the program, program event, movement cycle, arrangement and arranged event.

Program (P). The program is the general environmental setting and is usually equated with the time of day, duration of instruction, location of the class, and any other variable which remains constant for the period over which the movement cycle is counted and recorded.

Program event. Program events are those factors which might result in the behavior or movement cycle. For example, instructions, demonstration, and curriculum materials may result in some kind of academic behavior being emitted. Program events occur independently of the movement cycle (can occur whether the movement cycle occurs or not).

PROTEGE.

DECELERATION

[illegible]

Figure 2
Is Plan

Movement cycle. The movement cycle refers to the behavior which is to be changed or measured. A movement cycle must be directly observable and countable, have a definite cycle, and be repeatable.

Arrangement (A). The arrangement represents the relationship between the number of times the movement cycle occurs and the number of times the arranged event occurs. The convention for writing this relationship is to indicate the number of movement cycles, then place a colon (:) after that number; then, indicate the number of arranged events that would occur following that number of movement cycles. For instance, an arrangement of 1:1 would mean that an arranged event would occur for each movement cycle emitted.

Arranged event. Those environmental events which occur just following the emission of the movement cycle and are caused by the movement cycle are known as arranged events (for example, candy, praise, etc.). Arranged events have a higher probability of affecting rates of responding if they occur immediately after the movement cycle has been emitted.

Summary

Having described the basic components of the Precision Teaching System, it now seems appropriate to summarize with a detailing of the system's advantages. First, the daily behavior chart has a number of important and useful features:

1. The six cycles allow the entire range of observable human behavior to be represented on one chart, thus permitting comparisons within and between individuals for different behaviors.
2. Proportional changes are evident on the ratio chart; therefore, more credit is given to improvement from the low performing student

than is given on an arithmetic scale.

3. The use of correct and error rates furnishes information about the speed and accuracy of the performance as well as about total production. Percentage reflects accuracy, but not the amount or speed of the performance. Normal curves do not represent actual performance at all.

4. Trends and patterns may be seen which are not clear on an arithmetic chart.

5. The chart may be used to collect up to twenty weeks of information (including weekends).

6. The use of the record floor convention indicates the time sample, while the record ceiling shows limitations on performance set by the program events.

7. Information about "who", "what", "when" and "where" is contained in the chart labelling conventions.

The use of the behavior chart on a daily basis could provide continuous, up-to-date data to assist the classroom teacher or administrator in educational planning. Moreover, the specific pinpointing of behaviors and their evaluation in natural settings would seem to provide more precise and objective information about performance than does an IQ score, standard test score, or traditional letter grade. Lastly, the use of the Is planning formula would further increase communication among school and school-related personnel by providing information concerning the circumstances under which the performance data were collected.

Illustrative Studies Using the Precision Teaching System

The Precision Teaching measurement system has been employed in a variety of different situations to monitor behavior. Caldwell (1967),

for example, took pupil performance data to evaluate student teachers. A number of studies using the system have been carried out in special classes, where data have been collected on both academic and management behaviors (Cohen & Martin, 1971; Edwards, 1969; Gaasholt, 1970a; Johnston, 1971; Koenig, 1971). Academic performances evaluated in this manner have included mathematics (Lovitt & Curtiss, 1968), penmanship (Hopkins, Schutte & Gorton, 1970), spelling (Lovitt, Guppy & Blattner, 1969) and reading (Lovitt & Hurlbut, 1971; Lovitt, Schaaf & Sayre, 1970; Starlin, 1970). For purposes of illustration, a brief review of several studies which have used the Precision Teaching System for the evaluation of oral reading performance will be presented at this point.

Lovitt, Schaaf and Sayre (1970) assessed the effects of different curricula, instructional settings and teaching techniques on oral reading performance of young children using direct continuous measurement. In a project designed to determine performance rates in different reading curricula, a second grade boy read orally to a remedial reading instructor from each of two basal readers and a high-interest, low-vocabulary book each day. The pupil appeared to be making the most progress in the high-interest text, according to correct and error rates for oral reading performance.

The technique of "previewing" was evaluated by these authors in a study involving a nine-year-old third grade student. During the first phase, which lasted for ten days, the pupil read orally for three minutes while the manager recorded his errors. Throughout the second phase, which also lasted ten days, the pupil listened to a tape recording of the portion of the story which he would be required to read. Following the listening period, the boy was asked to read. In

phase three, the procedures were the same as those in phase two, except now, as the boy listened to a recording of the narration that he would subsequently read, he was provided with a book. The final phase was procedurally the same as the first: the pupil merely read from the text without seeing or hearing the material prior to reading. The results of this study indicated that the combination of seeing and hearing the material before reading it produced the best performance rates.

Another project by Lovitt, Schaaf and Sayre (1970) compared oral reading performance of third grade pupils in a group reading situation with an independent, or one-to-one situation with the teacher, and found that error rates were generally accelerated in the group situation, while correct rates remained stable. In the independent situation, however, correct rates accelerated.

Lovitt and Hurlbut (1971) have recently conducted a series of experiments on the modification of certain phonic skills and their relationship to oral reading. In one experiment, a ten-year-old fourth grade boy was given daily tutoring in five phonics skills by a remedial reading teacher. Seven measures were taken during each session in the experiment: five in phonics and two in oral reading. The five phonics behaviors dealt with short vowels, consonant blends, word blending, translocation of letters, digraphs and diphthongs. To obtain the two oral reading rates, the Lippincott 2² (McCracken & Walcutt, 1966) and Ginn 2² (Dusley & Russell, 1961) readers were used. During the boy's five-minute reading sample, the teacher, using her copies of the readers, followed along and noted his errors. In the Before phase of the experiment, no instruction was given in the phonics skills listed above. In the second phase of the experiment (During I), a ten-minute

period of instruction based on the Slingerland method (Slingerland, 1969) was scheduled before the seven measurements were recorded. In the During I phase, performance in all five phonics skills improved (correct rates increased and error rates decreased). In addition to the student's phonics competencies being affected by the Slingerland procedures, his performance in both readers was positively influenced. Improvement was more noted in the phonics based reader (Lippincott) than in the non-phonics text (Ginn). Lovitt and Hurlbut concluded from these results that, apparently, as the pupil acquired more phonics skills, this improved performance affected oral reading.

In a later experiment, Lovitt and Hurlbut attempted to evaluate the effectiveness of two phonics instructional techniques - the Slingerland and Palo Alto (Glim, 1968) methods. Not only were the direct effects of the two methods on two phonics skills assessed, but their indirect influence on oral reading was also determined. This project was conducted with four nine-year-old boys, two of whom had been classified as "dyslexic", and two of whom had been classified as "slow learners". In the Before phase, all four boys were assessed in two phonics areas, consonants and vowel discriminations. In addition, performances in reading from a Palo Alto reader (Glim, 1968) were measured each day. As in the previous experiment, in the During I phase ten minutes of phonics instruction was scheduled prior to the daily measurements. For the dyslexic pair, this instruction followed the procedures outlined by Slingerland; for the slow learners, the phonics training was the program recommended in the Palo Alto reading method. Both methods of phonics instruction produced significant differences in the phonics and oral reading performances of all four

boys, with the greatest gains being made by a Slingerland trained (dyslexic) pupil. In summarizing the results of these investigations, Lovitt and Hurlbut suggested that if phonics or reading behaviors are explicitly defined, and if a systematic technique is arranged to teach these skills, even difficult to teach children can be taught, regardless of the diagnostic label.

Starlin (1970), in a dissertation thesis recently completed at the University of Oregon, has demonstrated nicely how the Precision Teaching System may be used to advantage in monitoring oral reading performance. He tested thirty-nine children at the end of grade one following the completion of an intensive phonics program to determine performance rates for "saying letter sounds correctly". Starlin had identified this pinpoint as one of the two basic movements directly related to the acquisition of proficient oral reading performances, and hypothesized that children should probably be able to say letter sounds at a certain rate before efficient blending of sounds into words can occur. Some support for this hypothesis was obtained when he found that children whose performance rate of saying letter sounds correctly was much below sixty sounds per minute had difficulty with reading words in context (the second basic movement related to proficient oral reading performance).

A second objective of Starlin's thesis project was to obtain estimates of performance aims for oral reading rates at different grade levels. Oral reading data were collected over a two-year period from 244 students in grades kindergarten to twelve. Discussing his results, Starlin concluded that two patterns seemed to emerge: (a) above grade three, average and median oral reading performances tended to fall

between 100 and 200 words per minute, and (b) there appeared to be a steady increase in oral reading rate in the first and second grade performances, with a transition of the 100 to 200 range occurring during the third grade (p.139). Starlin also pointed out that these figures were consistent with oral reading rates reported by Gilmore (1952) for first (45 words per minute), second (80 words per minute) and third (110 words per minute) grade children. Starlin concluded that a correct rate of 100 words per minute, with an error rate of one per minute represented a very acceptable level of performance for a third grade child.

Summary

In this chapter, a detailed description of the Precision Teaching measurement system has been provided. In addition, several studies which have utilized this measurement system were presented to illustrate its flexibility and utility. Attention was focused on those studies which investigated the oral reading performance of young elementary school children. The results from these studies would appear to indicate that the Precision Teaching System constitutes a potentially powerful new measurement tool for applied research in school settings.

Chapter IV

METHOD

Three elementary schools from the Edmonton Public School System took part in the experiment. Five schools had initially expressed interest in the tutorial program and three eventually agreed to participate after the experimenter had explained in detail the objectives of the project. Grade five and six students were trained as tutors in oral reading for pupils selected from grade two and three classes in the cooperating schools. A tutor pair was assigned to each younger child, with each member of the pair conducting two twenty-minute tutoring sessions weekly during school time; thus, each tutee was tutored four times weekly (eighty minutes). Tutoring sessions were conducted for ten weeks, providing a possible 800 minutes of tutoring for each child. A record of the tutee's oral reading performance was obtained at the beginning and end of each session. The specific functions of the various personnel involved in the project are described in detail in the following pages.

ORGANIZATION OF THE EXPERIMENT

Experimental Subjects (Tutees)

Selection of the grade two and three students who were experiencing difficulty in reading was done by the receiving teachers (the teachers of the grade two and three tutees). A student was considered to be experiencing difficulty in reading if, in the teacher's opinion:

(a) he had trouble with basic decoding skills of sounding out words and blending; and (b) his oral reading rate was in the lowest one-third of his class. Every student who met this criterion and obtained parental consent (see Appendix A) was included in the program. A total of forty-nine students selected from seven different classrooms was subsequently included in the experiment and given tutoring on a systematic basis.

Tutors

The ninety-eight students who served as tutors in the experiment were grade five and six pupils selected from four different classrooms (Table 1). Essentially, all students from the participating grade five and six classes were included, with the condition that they obtain parental consent (see Appendix B). These students were required to demonstrate mastery of the following tasks before qualifying as tutors:

1. Chart data points on the daily behavior chart at a rate of two correct per minute with zero errors.
2. Complete the record sheet using sample data with 100 percent accuracy on at least two successive trials.
3. Demonstrate proficiency in the recording of oral reading errors to a criterion of eighty percent accuracy.
4. List the steps in the tutoring correction procedure with 100 percent accuracy.
5. Demonstrate, in a tutoring session with their partner, the appropriate procedures for: (a) giving instructions, (b) correcting errors, (c) praising, and (d) recording.

The above objectives were reached in a series of six training sessions (approximately forty-five minutes each) carried out by the experimenter.

Table 1

Schools, Sending Classes, Receiving Classes and
Personnel Participating in the Project

School	Sending Class (Tutors)	Receiving Class (Tutees)
A	Grade five (A ₁) n = 24	Grade 1-2 (a ₁) n = 12
	Grade six (A ₂) n = 20	Grade 2 (a ₂) n = 4
		Grade 2 (a ₃) n = 6
B	Grade six (B ₁) n = 28	Grade 2 (b ₁) n = 7
		Grade 3 (b ₂) n = 7
C	Grade six (C ₁) n = 26	Grade 2 (c ₁) n = 7
		Grade 3 (c ₂) n = 6

over a period of five consecutive weeks prior to the collection of baseline data. During the training sessions, the experimenter demonstrated the appropriate behaviors and provided practice activities for the participating students. The sending teacher (the teacher of the tutors) cooperated by scheduling an additional half-hour practice session each week, using exercises supplied by the experimenter.

In each school, the participating grade five and six tutors were divided into teams of four to six, with a captain heading each team. The tutor captains were selected on the basis of enthusiasm and performance demonstrated during the tutor training program. They assisted the experimenter throughout the project by:

1. Helping their team members with recording procedures.
2. Relaying instructions from the experimenter when changes in procedure were required.
3. Reporting any problems observed during the tutoring sessions.

Receiving Teachers

In order to familiarize the seven receiving teachers with the recording and tutoring procedures, a half-day workshop was scheduled before the tutoring sessions began. Major topics introduced during the workshop included: (a) charting, (b) the record sheet, (c) procedures for recording oral reading, and (d) the tutoring procedures. The major task requirements for the receiving teachers were determined to be, as follows:

1. Select students for participation in the tutoring program.
2. Obtain parental consent for those students selected.
3. Complete referral forms for their tutees (Appendix C).

4. Consult with the sending teacher to: (a) arrange scheduling and places for the tutoring sessions, and (b) appoint a tutor pair for each of the tutees.
5. Provide appropriate curriculum materials for use in the tutoring sessions.
6. Meet with the tutors to explain changes in scheduling or curriculum when necessary.
7. Inform the sending teacher of any tutee's absence.
8. Meet with the sending teacher, school coordinator and experimenter if required.
9. Report any major difficulties to either the school coordinator or the experimenter (program coordinator).

Sending Teachers

Three teachers from grade six and one from grade five participated in the study as sending teachers. The tasks performed by these teachers were mainly preparatory, and were completed, for the most part, before the tutoring sessions began. More specifically, the sending teachers were requested to:

1. Attend the tutor training sessions carried out by the experimenter.
2. Administer follow-up practice exercises supplied by the experimenter.
3. Obtain parental consent for the tutors to participate.
4. Supervise the formation of the tutor pairs.
5. Consult with the sending teacher to: (a) arrange scheduling and places for the tutoring sessions, and (b) appoint a tutor pair for each tutee.

6. Keep precise measurement materials in a convenient place in the classroom.
7. Inform the receiving teacher if both tutors were absent.
8. Meet with the receiving teacher, school coordinator, and the experimenter when necessary.
9. Report any major difficulties to either the school coordinator or the experimenter (program coordinator).

School Coordinator

In two of the participating schools, the vice-principal acted as school coordinator; the principal served in this capacity in the third school. The main function of the school coordinator was to monitor the over-all program for his particular school. The coordinator also assisted the experimenter by arranging any meetings held during the course of the project.

Experimenter (Program Coordinator)

The experimenter performed a number of integral tasks prior to and during the tutoring program. Stated another way, the experimenter's activities could be divided into two major categories: (a) preparation and training, and (b) monitoring of the tutoring sessions.

In preparation for the tutorial program, the experimenter performed these tasks:

1. Explained the objectives of the project to the five schools that had expressed interest. These schools were initially approached by a member of the Staff Development department of the Edmonton Public School System. A meeting was held by the experimenter in each of the five schools, with interested staff attending.

2. Conducted six tutor training sessions in each of the four grade five and six classrooms in the three schools that agreed to participate in the experiment.

3. Held a half-day workshop for the seven receiving teachers to explain recording and tutoring procedures.

4. Assembled and distributed all the recording materials used in the tutoring program (the daily behavior charts, the tutor record sheets, Is Plans, binders and pencils).

One day a week was spent in each of the participating schools while the tutoring sessions were in progress. During these weekly visits, the experimenter:

1. Monitored the tutoring sessions to ensure that proper instructional and data collection procedures were being followed.

2. Checked the tutor record sheets and charts for recording accuracy.

3. Provided regular feedback on the progress of the tutees to the receiving teachers.

4. Instructed the tutors concerning any changes in the tutoring procedures when necessitated by the different phases of the experiment.

5. Met with the receiving teachers, sending teachers and tutor captains.

6. Checked to see if sufficient materials were present and replaced recording forms when necessary.

Following the final phase of the project, an evaluation meeting was held in each of the three participating schools with the experimenter, school coordinator, receiving teachers and sending teachers in attendance. The questionnaire completed by the staff was reviewed, and

the experimenter presented summary data on the progress of the tutees from that particular school.

Materials

Is Plan. The Is Plan was used in the present study to describe the various conditions of the experiment for each tutee, and was completed jointly by the receiving teacher and the experimenter. Any changes in program events, arrangement or arranged events were subsequently recorded on each tutee's Is Plan.

Record sheet. A record sheet designed by the experimenter was used by the tutors to record data on oral reading performance in the tutorial sessions (Appendix D). For each session, the tutor recorded the following information on the tutee's record sheet: (a) date, (b) session number, (c) the tutor for that particular session, (d) total number of words read, (e) total number of errors made, (f) words correct per minute, (g) errors per minute, and (h) numbers of the pages read during the recording sample timing. The preceding information for up to sixteen tutoring sessions could be included on one record sheet.

Binders. A binder containing the Is Plan, record sheets, charts and tutor instructions was prepared for each tutee in the program. The binders were stored in the classroom of the sending teachers so that, if necessary, the tutors could complete unfinished calculations and check their work following the tutoring session. The binders were, however, readily accessible to the receiving teachers.

Tutoring materials. Table 2 shows that three different reading curriculums were in use in the seven grade two and three classes. Four grade two classes and one grade three were using the Ginn Basic Readers

Table 2

Program and Program Events for the Receiving Classes

Receiving	Program		
Class	Time	Place	Program Event
a ₁	10:30-10:50 11:00-11:20	Tutees' class- room	Ginn Basic Readers
a ₂	10:30-10:50	Science Room Hallway	McKee Series
a ₃	11:00-11:20	Room 4 Hallway	Ginn Basic Readers
b ₁	9:40-10:00	Science Room	Ginn Basic Readers
b ₂	9:40-10:00	Library	Open Highways Series
c ₁	9:00-9:20	Orange Room	Ginn Basic Readers
c ₂	9:00-9:20	Orange Room	Ginn Basic Readers

(Ginn and Company), one grade two class used the McKee Reading Series (Nelson & Sons), and the remaining grade three class was using the Open Highways reading program (Scott, Foresman and Company). These materials constituted the program events for each tutee in the tutoring sessions.

Measures

The daily behavior chart. The daily behavior chart (Figure 1) was used to graph the data recorded on the record sheet. Correct and error data for the pinpoint "reads words orally" were displayed together on the tutees' individual charts. Other information contained on the chart included: (a) beginning and ending dates for the various conditions of the experiment, (b) names of the experimenter, receiving teacher, tutors and tutee, (c) age and grade of the tutee, and (d) median correct and error rates for the different experimental phases.

Questionnaires. Three separate questionnaires (Appendix E) were prepared by the experimenter to collect less objective information concerning reactions of the tutors, tutees, and the school staff to the tutoring program. The questionnaires were completed by the tutors under supervision of the grade five and six teachers and by the tutees through interviews with the receiving teachers. The participating staff members of each school met as a team to formulate answers to their questionnaire.

A questionnaire was administered to the tutors in order to determine what the tutors thought about: (a) being a tutor, (b) tutoring and recording procedures, and (c) other administrative aspects of the project. The tutors were also asked to offer suggestions for improving the program. Questions for the tutees centered mainly on whether

(a) they enjoyed being tutored, and (b) they wanted to be tutored again. The staff questionnaire was designed to identify the major problems encountered in the administration of the tutoring program and to obtain suggestions as to how the program might be improved.

EXPERIMENTAL CONDITIONS

Response Definitions and Recording

The basic movement cycle pinpointed for oral reading was reads words orally in the context of running sentences. "In context" was included in the basic pinpoint to distinguish the behavior from words read out of context, such as from a word list or from flash cards. An error was recorded if the tutee: (a) mispronounced a word (that is, a word was said which was different from the stimulus word presented) or, (b) did not attempt a word within a four-second period. Words read correctly could be calculated by subtracting the number of errors from the total number of words read.

The tutor recorded oral reading performance for a two-minute interval at the beginning and end of each tutoring session, using the tutee's regular reading series as test material. The particular pages read for any given session were assigned by the receiving teacher and consisted of those pages most recently covered during classroom instruction. During the initial timing, the errors were marked lightly in pencil in the tutee's copy of the textbook, while the tutee read the assigned pages from an unmarked text. Mispronounced words were underlined; words which were not attempted were checkmarked. If a child hesitated on a word four seconds, the tutor supplied the word, but if the child immediately stated that he did not know a word, the tutor

supplied the word without delay. The end of the two-minute sample was indicated in the text by a slashmark (/), and the tutee was permitted to read to the end of the assigned pages before being asked to stop. The number of words in the passage and the number of errors within the two-minute time sample were counted and recorded by the tutor. Identical procedures were followed for the second timing which followed remedial instruction on the errors noted during the initial trial. The foregoing procedure provided a record in each session of words read correctly per minute and errors per minute for each tutee prior to and after tutoring. The specific instructions given the grade five and six tutors for recording oral reading performance are outlined in Appendix F.

Measurement Reliability

Reliability assessment was done before and during the tutorial program. During the tutor training program, reliability was checked on the recording of errors by having each tutor listen to tape-recorded passages read from the grade two Ginn Basic Reader. Each passage was read at a rate of approximately seventy-five words per minute and contained a variety of common error responses. A sample transcript, with the specific instructions given to the tutor, is given in Appendix G.

The general procedure in assessing the tutors' recording reliability involved the following steps (a) giving the tutor a copy of the material which was to be read, (b) having the tutor indicate the errors while listening to the tape recording, and (c) determining his recording reliability by using the percent agreement method:

$$\frac{\text{agreements}}{\text{agreements \& disagreements}} \times 100$$

(Bijou, Peterson, Harris, Allen & Johnston, 1969). A similar procedure

was repeated at the beginning of each experimental phase. The overall range of reliability indexes was eighty to one hundred percent with a mean reliability of ninety-two percent. Reliability ranges and means for each of the five experimental phases are presented in Appendix H.

Procedural Variations

The procedures of the various experimental conditions are grouped under the phase headings Before, During I, Between, During II and During III. Detailed descriptions of the procedures employed during the phases follow.

Before phase (three weeks duration). Baseline data on oral reading performance were obtained over a period of twelve school days for those children referred for tutoring by the receiving teachers. Scheduling the assignment of tutees to tutor pairs was done prior to the beginning of the Before phase. The use of tutor pairs minimized the loss of class time for the older students, and ensured a continuous program for the tutee.

During the Before phase, the tutors were instructed to: (a) record oral reading performance for two minutes; (b) complete the record sheet and chart the data; and (c) return to their classrooms without providing any remedial assistance for the words read incorrectly.

During I phase (six weeks duration). In During I, tutoring sessions were conducted twice weekly by each member of the tutor pair. Oral reading performance was recorded at the beginning of each session, followed by systematic remediation of errors. The corrections procedure followed by the tutors in this phase consisted of these steps:

1. The tutee was asked to read the words read incorrectly during the

initial timing. If the word was read properly, the tutor moved on to the next error.

2. If the tutee was not able to read the word, he was asked to sound it out. The tutor supplied any sounds with which the tutee experienced difficulty.

3. The tutee was asked to "put the sounds together" or to "say it fast". If the tutee was not able to do this, the tutor demonstrated the correct performance and the tutee was asked to try again.

4. The tutee was "spot-checked" on a corrected word after the other words had been corrected. If he was still unable to read the word, the correction procedure was repeated.

5. The tutee was praised for his correct responses. Praise was also given for working hard and paying attention throughout the tutoring session.

In addition, the tutors were instructed to guide the child's reading by using a pencil or bookmark if the child omitted words, inserted words, or lost his place frequently. The tutee was also told that he could point to the words himself if he had trouble following the text. Finally, marked incorrect expression of punctuation (periods, question marks and exclamation marks) were corrected through demonstration of correct expression by the tutors. These errors, however, were not recorded.

After approximately fifteen minutes of tutoring, a second two-minute timing was begun, using the same pages the tutee had read during the first timing. The information from the two timings was then recorded on the appropriate record sheets. In summary, the tutors executed the following procedures in the During I phase: (a) recorded oral reading

performance for two minutes; (b) applied systematic correction procedures when necessary; (c) praised correct responding and working hard; (d) measured oral reading for a second two-minute timing; and (e) recorded the data on the appropriate forms.

Between phase (two weeks duration). The Between phase represented a return to the conditions employed in the Before period: that is, oral reading performance was recorded for two minutes but no tutoring was provided. Following the two-minute reading, the tutors completed the record sheet, charted the data, and returned to their classrooms.

During II phase (two weeks duration). In During II, points and candy rewards were used as consequences for improvement in performance and appropriate behavior in the tutoring sessions. The tutors followed the same correction procedures outlined for During I, with one added condition: a point system was devised whereby the tutee could earn a total of three points during the sessions. Specifically, each tutee was told that he could earn points by:

1. Reading more words than he had read on the previous day.
2. Making fewer errors than he had made on the previous day (or maintaining zero errors).
3. Behaving properly (paying attention, following instructions and working hard).

The second timing was used as the criterion measure. The tutor completed the point sheet after the second timing and the sheet was then returned to the receiving teacher by the tutee. Each point earned during the session could be exchanged for one candy (jelly bean, smartie, or chocolate-covered peanut) at some convenient time following the tutoring (usually morning recess or noonhour). During this phase of

the experiment, the classroom teachers were also instructed to praise appropriate behavior immediately prior to presenting the candy reward.

During III phase (two weeks duration). The final experimental phase was identical to During II with one exception: the candy rewards were withdrawn. However, points and praise were used as consequences for behavior during the tutoring sessions, as in the During II phase.

Chapter V

RESULTS

Data Analysis

In this chapter, results are presented separately for each of the seven receiving classrooms. The forty-nine daily behavior charts, which graphically represent the progress of every tutee, are contained in Appendix 1.

For each tutee, an estimate of trends within phases was calculated by finding the median rate for the first and last half of each phase, and then dividing the smaller number into the larger. If the direction of change were positive (e.g., the first half rate was sixty, and the second half rate was seventy) a times (x) sign was attached to the resulting number (x1.2). If the direction of change were negative (e.g., first half rate of seventy and second half rate of sixty) a divide (÷) sign was attached (÷1.2), indicating deceleration within the phase. This simplified method of trend estimation described above was devised by the experimenter for descriptive purposes and was based on the split-middle technique of trend estimation described by White (1971).

Individual data were statistically analyzed using a time series analysis (Sween & Campbell, 1965). Certain phase comparisons were completed in order to determine (a) whether the correct-per-minute trends of the pre- and post-phase were significantly different, and (b) whether a "step" change occurred in the correct-per-minute rate between the pre- and post-phase. The step change was determined by evaluating the difference between a regression estimate obtained by

predicting ahead from the pre-phase and a regression estimate obtained by predicting back from the post-phase. The difference between these two estimates was evaluated by the t ratio.

$$\left(\frac{\text{pre}}{\text{-----}} \middle| \frac{\text{post--}}{\text{step}} \right)$$

The time series analysis was applied to the following phase comparisons and appear summarized, by classroom, in table form:

- | Pre | Post |
|-------------------|------------|
| 1. Before with | During I |
| 2. During I with | Between |
| 3. During I with | During II |
| 4. During II with | During III |

The first two comparisons were made in order to determine whether classroom instruction plus tutoring was significantly different from classroom instruction only. The purpose of the last two comparisons was to examine the effect of applying certain motivational procedures on the performance of the tutees in the tutoring sessions.

Correct and error performances should be considered simultaneously when evaluating the progress of a tutee during a particular phase, with more emphasis given to the deceleration of errors, since the major purpose of the tutoring sessions was to increase the tutees' reading accuracy. A short discussion precedes each comparison presented, describing tutee performance in terms of correct trends and error rates. The error trends are represented on the daily behavior charts, but error rates (errors per minute) are presented in the results chapter because they furnish a clearer picture of the tutees' actual level of reading accuracy. The daily behavior charts in Appendix I provide a more detailed presentation of individual data.

SCHOOL A

Class a1

Table 3 shows that eight tutees accelerated their correct-per-minute trends (three significantly) in the During I phase, and four of these eight also had positive step changes. The four remaining tutees had positive step changes, but three maintained their correct-per-minute trends (Clint, Carol and Georgia) and one decelerated his correct trend (Danny). Although Danny's correct trend decelerated in the During I phase, his positive step change and error deceleration (to 0) resulted in an overall improvement in performance.

As correct rates increased for these twelve tutees, error rates decreased. Eight tutees reached and maintained a 0 rate in the During I phase, while the remaining four tutees (Allan, Darryl, Maurie and Clint) maintained an error rate of only 1 error per minute.

In the Between phase (Table 4), eight tutees decelerated their correct trends and four of these eight also had negative step changes. Three other tutees showed negative step changes without deceleration of their correct trends. Although Carol had neither a negative step change nor a trend deceleration for words correct in the Between phase, her error rate rose from 0 to 1 per minute when tutoring was withdrawn. Two other tutees (Bruce and Danny) also had accelerations in error rates. Darryl decreased his errors to 0, and the remaining eight tutees maintained the same error rate as in the During I phase. Since this particular class did not undergo a reward phase, further comparisons are not applicable.

Table 3

Comparison of Before and During I Phases
for Class a₁ (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute trend		Correct per minute trend	Errors per minute trend
1. Christine	x1.1	1	pos.*	x1.2	0
2. Allan	÷1.1	1		x1.1**	1
3. Darryl	1.0	2		x1.3	1
4. Bruce	x1.2	2	pos.**	x1.3	0
5. Danny	x1.1	1	pos.*	1.0	0
6. Maurie	x1.2	2		x1.6**	1
7. Clint	x1.1	2	pos.**	x1.1	1
8. Randy	1.0	1		x1.3	0
9. Troy	÷1.2	1	pos.*	x1.2**	0
10. Carol	1.0	2	pos.**	1.0	0
11. Georgia	x1.1	1	pos.**	x1.1	0
12. Cindy	÷1.1	1	pos.**	x1.1	0

*p < .05

**p < .01

Table 4

Comparison of During I and Between Phases
for Class a_1 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	Between	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Christine	x1.2	0		1.0	0
2. Allan	x1.1	1	neg.*	x1.1	1
3. Darryl	x1.3	1		±1.2*	0
4. Bruce	x1.3	0	neg.**	x1.1	1
5. Danny	1.0	0	neg.*	x1.2	1
6. Maurie	x1.6	1	neg.**	x1.4	1
7. Clint	x1.1	1		±1.1	1
8. Randy	x1.3	0		x1.1	0
9. Troy	x1.2	0	neg.**	1.0	0
10. Carol	1.0	0		1.0	1
11. Georgia	x1.1	0	neg.*	x1.1	0
12. Cindy	x1.1	0	neg.*	1.0	0

* $p < .05$ ** $p < .01$

Student Questionnaires

All tutees from Class a₁ reported that they liked the tutoring sessions and that they wished to continue being tutored. These tutees also thought they were better readers than they were before being tutored. The tutors for this class expressed positive attitudes towards tutoring, with only 1 tutor out of 24 indicating that he did not enjoy being a tutor. Twenty-two tutors felt that their tutees enjoyed being tutored, and only 4 felt their tutees were glad that the program was over.

These grade five tutors thought their parents and teacher were in favour of the tutoring program, and only 3 tutors expressed concern over missing class time. The tutors apparently considered the program to be useful, as all 24 felt they had helped their tutees to become better readers. Sixteen tutors felt that they, too, had become better readers as a result of being a tutor.

The tutors seemed generally satisfied with the organizational aspects of the program, such as working with a partner, having team captains and the length of the tutoring sessions. Only 3 tutors expressed dissatisfaction with the recording procedures, indicating that the record sheets were too much work to fill out, and that they did not like measuring how well the tutee read each day. A summary of questionnaire responses for tutors of Class a₁ is presented in Table 5.

Class a₂

Table 6 indicates that all four tutees from Class a₂ performed better during classroom instruction plus tutoring (During I) than during classroom instruction only (Before). Three of the four tutees had

Table 5

Summary of Questionnaire Responses for Tutors of Class a1

Questions	Responses	
	Yes	No
<u>A. Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	23	1
2. Would you like to be a tutor again if you had a chance?	23	1
<u>B. Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	22	2
2. Do you think your tutee was glad the tutoring program was over?	4	20
<u>C. Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	23	1
2. Do you think your classroom teacher liked you being a tutor?	24	0
3. Do you think the tutoring made you miss too much class work?	3	21
<u>D. Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	24	0
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	17	7
3. Do you think your tutee's teacher liked having your help?	24	0
4. Do you think being a tutor helped you to be a better reader?	16	8
<u>E. Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	21	3
2. Did you like having team captains?	20	4
3. Do you think points and candy rewards should be used all the time for tutoring?	-	-
4. Do you think the tutoring session each day was too long?	1	23
5. Were you glad the tutoring ended at Easter?	4	20
6. Did Mrs. Crozier give you enough help?	23	1
<u>F. Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	3	21
2. Did you like measuring how well the tutee read each day?	21	3
3. Did you look at the blue graph to see how the tutee was improving?	19	5
4. Did your tutee like looking at his blue graph?	16	8

positive step changes (Angela, Kevin and Dwayne, and two of these three (Angela and Dwayne) also accelerated their correct-per-minute trends. Although Kevin's correct trend decelerated in During I, his positive step change and error deceleration resulted in an overall improvement in performance. Teddy experienced an initial drop in correct trend in During I, but decreased his errors from 4 to 1 per minute, while maintaining a correct rate of ninety-four words per minute. The other tutees also decreased their error rates.

Table 6

Comparison of Before and During I Phases

for Class a_2 (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Angela	÷1.3	4	pos.*	x1.2**	1
2. Kevin	x1.3	6	pos.**	x1.1	1
3. Dwayne	x1.1	5	pos.*	x1.2	2
4. Teddy	x1.3	4	neg.*	1.0*	1

* $p < .05$

** $p < .01$

When tutoring was withdrawn in the Between phase (Table 7), three of the tutees (Angela, Dwayne and Teddy) had negative step changes. Kevin did not have a negative step change, but his correct-per-minute trend decelerated and his error rate accelerated over his error rate in the During I phase. Error rates also increased for the three other tutees from Class a_2 in this phase.

Table 7

Comparison of During I and Between Phases
for Class a_2 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	Between	
	Correct per minute trend	Errors per minute trend		Correct per minute trend	Errors per minute trend
1. Angela	x1.2	1	neg.**	x1.1	3
2. Kevin	x1.1	1		1.0	3
3. Dwayne	x1.2	2	neg.**	+1.1**	5
4. Teddy	1.0	1	neg.*	1.0	3

* $p < .05$

** $p < .01$

In the During II phase (Table 8), three tutees demonstrated an improvement over their performance in During I. Angela had a positive step change and her error rate decreased to 0, while Teddy had both a positive step change and a correct trend acceleration. Although Kevin's correct-per-minute trend decreased slightly, his error rate dropped to 0 and he maintained a correct rate of one hundred words per minute. Dwayne seemed to do worse in the During II phase, and, when candy rewards were withdrawn in the During III phase, his performance improved. The other three tutees did not perform as well in During III as in During II (Table 9). Angela and Kevin increased their error rates, and both Angela and Teddy decelerated their correct trends.

Table 8

Comparison of During I and During II Phases
for Class a₂ (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	During II	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Angela	x1.2	1	pos.*	x1.2	0
2. Kevin	x1.1	1		1.0	0
3. Dwayne	x1.2	2	neg.**	1.0	1
4. Teddy	1.0	1	pos.*	x1.2*	1

* $p < .05$

** $p < .01$

Student Questionnaires

The results from the questionnaire administered to the tutees were very positive. All four tutees indicated that they liked being tutored, that they thought they were better readers, and that they would like to continue the tutoring sessions. The tutors for this particular class were less positive than their tutees. Two of the 8 tutors said they did not enjoy tutoring and did not want to be a tutor again. Three tutors felt that they had missed too much class time and 3 were dissatisfied with the recording procedures. Table 10 presents the tutor responses for Class a₂.

Table 9

Comparison of During II and During III Phases
for Class a₂ (Trends and Step Changes)

Tutee	During II		Step change (Correct per minute)	During III	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Angela	x1.2	0		x1.1	1
2. Kevin	1.0	0		x1.2	1
3. Dwayne	1.0	1	pos.**	x1.4	1
4. Teddy	x1.2	1		1.0	1

*p < .05

**p < .01

Table 10

Summary of Questionnaire Responses for Tutors of Class a₂

Questions	Responses	
	Yes	No
A. <u>Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	6	2
2. Would you like to be a tutor again if you had a chance?	6	2
B. <u>Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	5	3
2. Do you think your tutee was glad the tutoring program was over?	5	3
C. <u>Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	8	0
2. Do you think your classroom teacher liked you being a tutor?	6	2
3. Do you think the tutoring made you miss too much class work?	5	3
D. <u>Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	7	1
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	6	2
3. Do you think your tutee's teacher liked having your help?	8	0
4. Do you think being a tutor helped you to be a better reader?	4	4
E. <u>Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	6	2
2. Did you like having team captains?	3	5
3. Do you think points and candy rewards should be used all the time for tutoring?	6	2
4. Do you think the tutoring session each day was too long?	3	5
5. Were you glad the tutoring ended at Easter?	5	3
6. Did Mrs. Crozier give you enough help?	7	1
F. <u>Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	5	3
2. Did you like measuring how well the tutee read each day?	3	5
3. Did you look at the blue graph to see how the tutee was improving?	5	3
4. Did your tutee like looking at his blue graph?	5	3

Class a3

A comparison of the performances of the six tutees in Class a3 for the Before and During I phases is presented in Table 11. Four of the six tutees (Jeff, Gary, Richard and Sandra) accelerated their correct trends (two significantly) in the During I phase, and a fifth tutee (Wayne) had a positive step change. Errors decelerated for all tutees, with four tutees maintaining error rates of only 1 per minute (Gary, Sandra, Bradley and Wayne). Jeff reached a 0 error rate and Richard maintained an error rate of 2 per minute, which was a considerable improvement over his Before rate of 6 errors per minute.

Table 12 shows that four tutees (Jeff, Gary, Richard and Wayne) experienced correct-per-minute trend decelerations when tutoring was withdrawn; three of these four also had negative step changes (Gary, Richard and Wayne). The two remaining tutees, Sandra and Bradley, maintained their correct trends, but Bradley accelerated his error rate and Sandra had a negative step change. Jeff and Wayne also accelerated their error rates.

In During II (Table 13), only one tutee had a correct trend acceleration (Sandra), and three tutees actually decelerated their correct-per-minute trends (Jeff, Richard and Wayne). Gary and Bradley maintained both the correct and error performances they had demonstrated in the During I phase. Error rates of 1 or 0 per minute were maintained by Jeff, Sandra and Wayne, and Richard decreased his error rate from 2 per minute to 0.

When candy rewards were withdrawn in the During III phase (Table 14), the performances of tutees Sandra and Richard deteriorated (Richard's error rate rose and Sandra's correct trend decelerated).

Table 11

Comparison of Before and During I Phases
for Class a_3 (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Jeff	1.0	2		x1.3**	0
2. Gary	1.0	4		x1.1	1
3. Richard	÷1.2	6		x1.4**	2
4. Sandra	÷1.1	4	pos.*	1.0	1
5. Bradley	x1.1	3		1.0	1
6. Wayne	x1.1	4	pos.*	x1.1	1

* $p < .05$

** $p < .01$

Table 12

Comparison of During I and Between Phases
for Class a₃ (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	Between	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Jeff	x1.3	0		1.0*	1
2. Gary	x1.1	1	neg.*	1.0	1
3. Richard	x1.4	2	neg.*	x1.2	1
4. Sandra	1.0	1	neg.*	1.0	1
5. Bradley	1.0	1		1.0	2
6. Wayne	x1.1	1	neg.**	1.0	2

*p < .05

**p < .01

Table 13

Comparison of During I and During II Phases
for Class a_3 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	During II	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Jeff	x1.3	0		x1.1	0
2. Gary	x1.1	1		x1.1	1
3. Richard	x1.4	2		x1.1	0
4. Sandra	1.0	1		x1.1	1
5. Bradley	1.0	1		1.0	1
6. Wayne	x1.1	1		1.0	1

* $p < .05$

** $p < .01$

Table 14

Comparison of During II and During III Phases
for Class a₃ (Trends and Step Changes)

Tutee	During II		Step change (Correct per minute)	During III	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Jeff	x1.1	0		1.0	0
2. Gary	x1.1	1		x1.1	0
3. Richard	x1.1	0		x1.1	1
4. Sandra	x1.1	1		±1.1	1
5. Bradley	1.0	1		1.0	0
6. Wayne	1.0	1		x1.2	0

*p < .05

**p < .01

Bradley, however, demonstrated the same performance level as in During II. Gary and Wayne did better in the During III phase than they had in During II, while Jeff continued to maintain his correct rate above one hundred words per minute with a 0 error rate.

Student Questionnaires

The six tutees from Class a3 said that they liked being helped by the grade six students, but only four of the tutees wished to continue being tutored. They all felt that they were better readers than they were before being tutored, and said their tutors had been "good teachers".

Nine of the 12 tutors for Class a3 reported that they enjoyed the experience of being a tutor and would like to be a tutor again. Ten of the tutors also felt that their tutees had enjoyed being tutored. The majority (9) of the tutors felt that they had not missed too much class time, and all 12 felt that their classroom teacher was in favor of the program.

Eleven of the 12 tutors seemed to think that they had been able to help their tutees become better readers and had perhaps prevented the grade two children from having future difficulties in reading. Eight of the grade sixes thought that their own reading had improved because of the tutoring experience.

In this class, the greatest criticism of the organizational aspects of the program was directed against having team captains (6 tutors did not like this arrangement). The attitudes toward recording and charting were, for the most part, favorable. The questionnaire responses for the tutors of Class a3 are presented in Table 15.

Table 15

Summary of Questionnaire Responses for Tutors of Class a3

Questions	Responses	
	Yes	No
<u>A. Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	9	3
2. Would you like to be a tutor again if you had a chance?	9	3
<u>B. Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	10	2
2. Do you think your tutee was glad the tutoring program was over?	6	6
<u>C. Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	11	1
2. Do you think your classroom teacher liked you being a tutor?	12	0
3. Do you think the tutoring made you miss too much class work?	3	9
<u>D. Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	11	1
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	11	1
3. Do you think your tutee's teacher liked having your help?	12	0
4. Do you think being a tutor helped you to be a better reader?	8	4
<u>E. Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	8	4
2. Did you like having team captains?	6	6
3. Do you think points and candy rewards should be used all the time for tutoring?	9	3
4. Do you think the tutoring session each day was too long?	3	9
5. Were you glad the tutoring ended at Easter?	7	5
6. Did Mrs. Crozier give you enough help?	12	0
<u>F. Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	3	9
2. Did you like measuring how well the tutee read each day?	10	2
3. Did you look at the blue graph to see how the tutee was improving?	8	4
4. Did your tutee like looking at his blue graph?	8	4

Teacher Questionnaire

The teachers from School A seemed ambivalent about the merits of the tutoring program. Two of the receiving teachers were quite satisfied and indicated a desire to continue the program in the following year; the third receiving teacher, however, said that she did not want the tutors actually helping the younger children, but would agree to having the tutors "listen" to the younger child reading. The two sending teachers expressed concern over missed class time and scheduling problems (cross-setting and subject area divisions necessitated a complex timetable for this particular school).

The teachers did agree that the program had definite advantages for the tutees, the receiving teachers and the tutors. The advantages for the tutees were listed as: "(a) one-to-one attention, (b) immediate help when required, (c) immediate reinforcement, and (d) social interaction benefits". The receiving teachers felt that the tutoring program facilitated individualization of instruction in their classrooms. The benefits for the tutors were thought to be largely social:

- "1. self-concept strengthened
2. realization that others also have problems
3. sense of responsibility for someone else
4. ability to follow instructions improved
5. new purpose for learning the mechanics of reading".

Data collection was felt to be "overdone" during the program. Although the teachers thought that the data indicated improvement in the child's performance, they decided that the "returns did not justify the time input". It was felt that the information supplied by the experimenter throughout the program was adequate, and that the tutors

were sufficiently prepared. The attitudes of the tutors toward the tutees were regarded as excellent, but the teachers expressed concern about the weak reading skills of a few of the tutors. Finally, the teachers agreed that a project coordinator would again be required to "initiate" activities if the program were to be repeated.

SCHOOL B

Class b₁

Four tutees from Class b₁ (Ken, Terry, Robin and Mark) had positive step changes in the During I phase (Table 16), and two of these four accelerated their correct-per-minute trends (Ken and Mark). Kevin's correct trend markedly decelerated in the During I phase, but his error rate decreased from a rate of 6 per minute to a rate of 3 per minute. Ward and Kenny decelerated both their error rates and their correct trends in the During I phase. (All seven tutees decreased their error rates in During I.)

Table 17 shows that six tutees decelerated their correct-per-minute trends when tutoring was withdrawn (Between phase). The remaining tutee (Kevin) accelerated his correct trend but his error rate accelerated as well. Three other tutees also increased their error rates (Ward, Robin and Kenny). Thus, although some of the tutees from Class b₁ did not seem to be doing very well in the During I phase, they performed even less well in the between phase when they were no longer receiving assistance from the grade six tutors.

In the During II phase (Table 18), there were definite improvements in performance in five of the seven tutees (Terry, Kevin, Ward, Robin and Mark). These five tutees all accelerated their correct

Table 16

Comparison of Before and During I Phases
for Class b_1 (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Ken	÷1.3	3	pos.*	÷1.1**	0
2. Terry	x1.1	3	pos.*	1.0	2
3. Kevin	x1.4	6		÷1.1**	3
4. Ward	x1.1	4		1.0	0
5. Robin	x1.3	1	pos.*	1.0	0
6. Kenny	x1.2	1		1.1	0
7. Mark	÷1.1	4	pos.*	1.0	2

* $p < .05$ ** $p < .01$

Table 17

Comparison of During I and Between Phases
for Class b_1 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	Between	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Ken	÷1.1	0		÷1.2	0
2. Terry	1.0	2		÷1.1	2
3. Kevin	÷1.1	3		1.0	4
4. Ward	1.0	0		÷1.2	2
5. Robin	1.0	0		÷1.1	1
6. Kenny	x1.1	0		1.0	1
7. Mark	1.0	2		÷1.2	2

* $p < .05$ ** $p < .01$

Table 18

Comparison of During I and During II Phases
for Class b_1 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	During II	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Ken	÷1.1	0		÷1.1	0
2. Terry	1.0	2		x1.4**	1
3. Kevin	÷1.1	3		x1.1	1
4. Ward	1.0	0	pos.**	x1.2	0
5. Robin	1.0	0		x1.3*	1
6. Kenny	x1.1	0		1.0	0
7. Mark	1.0	2		x1.3**	0

* $p < .05$

** $p < .01$

trends (three significantly) and one of these tutees (Ward) also had a positive step change. Error rates for all seven tutees maintained at 1 or 0 errors per minute throughout this phase, with three tutees decelerating their error rates (Terry, Kevin and Mark). Four of the five tutees (Terry, Kevin, Robin and Mark) who had accelerated their correct trends in the During II decelerated their correct trends when candy rewards were withdrawn in During III (Table 19), but their error rates did not accelerate. The other three tutees from this class maintained their During II performances in the During III phase.

Student Questionnaires

The seven tutees from Class b₁ stated that they liked being tutored and felt they were better readers than before tutoring began. Five tutees wanted to continue the tutoring sessions, one was undecided, and one tutee did not wish to continue. All 14 tutors for this class enjoyed being tutors and wanted to be tutors again. The grade six students seemed to consider the program useful to the tutees, the receiving teachers and themselves. The tutors indicated general satisfaction with the organization of the tutoring program and with the recording and charting procedures. Tutor questionnaire responses for tutors of Class b₁ appear summarized in Table 20.

Class b₂

Table 21 shows that six tutees accelerated their correct-per-minute trends in During I over their correct trends in the Before phase. Of these six, three had positive step changes as well (Chris, Brad and Darcy). Michael, the remaining tutee, had a slight deceleration in his correct trend, but he decelerated his errors to 0 from a rate of 3 per

Table 19

Comparison of During II and During III Phases
for Class b_1 (Trends and Step Changes)

Tutee	During II Correct per minute trend	Errors per minute	Step change (Correct per minute)	During III Correct per minute trend	Errors per minute
1. Ken	÷1.1	0		÷1.1	0
2. Terry	x1.4	1		1.0	1
3. Kevin	x1.1	1		÷1.2	2
4. Ward	x1.2	0		x1.2	0
5. Robin	x1.3	1		1.0*	1
6. Kenny	1.0	0		1.0	0
7. Mark	x1.3	0		÷1.3**	0

* $p < .05$

** $p < .01$

Table 20

Summary of Questionnaire Responses for Tutors of Class b₁

Questions	Responses	
	Yes	No
<u>A. Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	14	0
2. Would you like to be a tutor again if you had a chance?	14	0
<u>B. Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	14	0
2. Do you think your tutee was glad the tutoring program was over?	4	10
<u>C. Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	14	0
2. Do you think your classroom teacher liked you being a tutor?	13	1
3. Do you think the tutoring made you miss too much class work?	3	11
<u>D. Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	14	0
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	10	4
3. Do you think your tutee's teacher liked having your help?	14	0
4. Do you think being a tutor helped you to be a better reader?	10	4
<u>E. Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	9	5
2. Did you like having team captains?	13	1
3. Do you think points and candy rewards should be used all the time for tutoring?	6	8
4. Do you think the tutoring session each day was too long?	1	13
5. Were you glad the tutoring ended at Easter?	13	1
6. Did Mrs. Crozier give you enough help?	14	0
<u>F. Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	2	12
2. Did you like measuring how well the tutee read each day?	14	0
3. Did you look at the blue graph to see how the tutee was improving?	11	3
4. Did your tutee like looking at his blue graph?	9	5

Table 21

Comparison of Before and During I Phases
for Class b₂ (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Michael	x1.3	3		x1.2	0
2. Chris	1.0	2	pos.*	x1.3	1
3. Dianne	÷1.2	2		x1.1	1
4. Brad	÷1.3	4	pos.**	x1.1	2
5. Carla	1.0	3		x1.4	1
6. Allan	x1.3	3		x1.4	1
7. Darcy	x1.4	5	pos.**	x1.5	1

*p < .05

**p < .01

minute during the Before phase. All seven tutees from Class b₂ decelerated their errors in the During I phase, with only one tutee maintaining an error rate above 1 per minute (Brad stayed at 2 errors per minute).

In the Between phase (Table 22), every tutee decelerated his correct-per-minute trend, and three tutees also had negative step changes (Dianne, Brad and Darcy). Only Brad maintained his During I error rate; the other six tutees accelerated their error rates in the Between phase.

In During II (Table 23), two tutees had positive step changes (Michael and Chris) and one tutee (Brad) accelerated his correct trend. Carla and Allan had decelerations in correct trends, but at this point, both these tutees were maintaining correct rates of over one hundred words per minute with low error rates (Carla = 0; Allan = 1). Dianne and Darcy performed worse under the During II conditions (their correct-per-minute trends decelerated).

When candy rewards were withdrawn in During III (Table 24), four tutees decelerated their correct-per-minute trends (Michael, Brad, Carla and Allan), and one of the four had a negative step change (Allan). Even with these decelerations, however, Michael, Carla and Allan maintained correct rates above one hundred words per minute with no errors. Brad decelerated his error rate to 1 per minute, and the remaining tutees (Chris, Dianne and Darcy) accelerated their correct trends in the During III phase, while maintaining a 0 error rate.

Student Questionnaires

All tutees from Class b₂ reported that they liked being helped by the grade six tutors, and six of the seven tutees wanted to continue

Table 22

Comparison of During I and Between Phases
for Class b_2 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	Between	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Michael	x1.2	0		+1.1	2
2. Chris	x1.3	1		x1.1	2
3. Dianne	x1.1	1	neg.*	1.0	2
4. Brad	x1.1	2	neg.*	+1.1	2
5. Carla	x1.4	1		1.0	3
6. Allan	x1.4	1		x1.1	2
7. Darcy	x1.5	1	neg.*	1.0	2

* $p < .05$

** $p < .01$

Table 24

Comparison of During II and During III Phases
for Class b₂ (Trends and Step Changes)

Tutee	During II		Step change (Correct per minute)	During III	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Michael	x1.2	0		1.0	0
2. Chris	x1.1	1		x1.2	0
3. Dianne	÷1.1	1		x1.4**	0
4. Brad	x1.2	2		÷1.2*	1
5. Carla	1.0	0		÷1.1	0
6. Allan	x1.2	1	neg.*	1.0	0
7. Darcy	1.0	1		x1.1	0

*p < .05

**p < .01

the tutoring sessions. Only one tutee didn't seem to think that he was a better reader than he was before being tutored.

The 14 tutors for this class all said they enjoyed being tutors and 13 wanted to be a tutor again. Twelve believed their tutees also enjoyed the experience, and only 4 felt their tutees were glad when the program was over. Thirteen tutors thought their parents and classroom teacher liked their being a tutor, but 3 tutors felt that the tutoring had made them miss too much class time.

The grade six tutors apparently saw the program as being useful, as all 14 believed they had helped their tutees become better readers. The tutors also felt that their help was appreciated by the teacher of the tutees. Thirteen of the 14 tutors thought that being a tutor had helped them to become more proficient readers.

Five tutors said they would have preferred to have their own tutee, rather than work with a partner, and 8 tutors did not like having team captains. Ten of the 14 tutors were opposed to using points and candy rewards for all tutoring sessions. The tutors seemed generally satisfied with the recording and charting procedures. Table 25 summarizes the tutor responses for the tutors of Class b₂.

Teacher Questionnaire

The teachers from School B expressed highly positive attitudes toward the tutoring program. All participating teachers wished to carry on a tutoring program in the following year, but felt that some outside coordination would be necessary at the beginning. The major concern was the training of the tutors. The teachers thought that the grade six students had been well-prepared for their tutoring duties,

Table 25

Summary of Questionnaire Responses for Tutors of Class b2

Questions	Responses	
	Yes	No
<u>A. Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	14	0
2. Would you like to be a tutor again if you had a chance?	13	1
<u>B. Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	12	2
2. Do you think your tutee was glad the tutoring program was over?	4	10
<u>C. Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	13	1
2. Do you think your classroom teacher liked you being a tutor?	13	1
3. Do you think the tutoring made you miss too much class work?	3	11
<u>D. Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	14	0
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	10	4
3. Do you think your tutee's teacher liked having your help?	14	0
4. Do you think being a tutor helped you to be a better reader?	13	1
<u>E. Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	9	5
2. Did you like having team captains?	6	8
3. Do you think points and candy rewards should be used all the time for tutoring?	4	10
4. Do you think the tutoring session each day was too long?	1	13
5. Were you glad the tutoring ended at Easter?	3	11
6. Did Mrs. Crozier give you enough help?	14	0
<u>F. Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	1	13
2. Did you like measuring how well the tutee read each day?	13	1
3. Did you look at the blue graph to see how the tutee was improving?	9	5
4. Did your tutee like looking at his blue graph?	8	6

and the teachers were especially impressed with the training given in reinforcement techniques.

A number of benefits from the tutoring program were identified for the tutees and the tutors. Both receiving teachers felt that their tutees had developed a better attitude towards reading as a result of the tutoring program. The teachers also felt that the one-to-one relationship during the tutoring sessions had increased the confidence of the young tutees and had made them feel "special". The grade two teacher said that her tutees asked more questions about their reading performance in class since the tutoring had begun, and the grade three teacher reported that her tutees were more eager to read orally in the group setting.

The grade six teacher stated that her students were much more willing to accept criticism of their own reading performance after correcting their young tutees. The teacher said that prior to the tutoring experience, the grade sixes had seemed relatively unconcerned about accurate oral reading, but since they had become tutors, they even stayed in at recess to have their teacher evaluate their performance. The grade sixes also requested more assistance from the teacher in pronouncing words correctly.

Data collection was deemed an important and necessary part of the project. The teachers said they particularly appreciated the summaries supplied by the experimenter throughout the project. The teachers felt that they had been kept well-informed concerning the various procedures employed throughout.

SCHOOL C

Class c1

In the During I phase (Table 26), three tutees accelerated their correct trends (Gary, Sandra and Scott) and another tutee had a positive change (Tina). Kerry's correct trend decelerated but his errors dropped from 4 per minute, in the Before phase to a rate of 1 per minute in During I. Daniel also decelerated his errors from 4 to 1 per minute, while maintaining his correct trend. Russell reached and maintained a 0 error rate in the During I phase (he had 4 errors per minute in the Before phase) but his correct decelerated (his correct rate, however, remained at around one hundred words per minute). Error rates decreased for six tutees in this phase; the seventh tutee, Tina, maintained a 0 error rate.

Table 27 presents the performances of the tutees in the During I and Between phases. When tutoring was withdrawn, five tutees (Gary, Tina, Sandra, Russell and Scott) decelerated their correct-per-minute trends and two of the five (Sandra and Scott) also had negative step changes. The two remaining tutees (Daniel and Kerry) had negative step changes but their correct trends did not decelerate. Error rates increased for four of the seven tutees (Kerry, Sandra, Russell and Scott) in the Between phase; the other three tutees maintained the same error rates as in the During I phase.

Three tutees (Gary, Russell and Scott) had positive step changes when the During II phase began (Table 28), and two of these tutees also had accelerations in their correct trends (Gary and Russell). Tina maintained her excellent performance of 150 words correct per minute

Table 26

Comparison of Before and During I Phases
for Class c₁ (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Gary	±1.2	3		x1.2	2
2. Kerry	x1.3	4		x1.2	1
3. Tina	x1.1	0	pos.*	1.0	0
4. Daniel	1.0	4		1.0	1
5. Sandra	x1.1	3		x1.4	2
6. Russell	x1.4	4		1.0**	0
7. Scott	x1.1	4		x1.3	0

*p < .05

**p < .01

Table 27

Comparison of During I and Between Phases
for Class c_1 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	Between	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Gary	x1.2	2		÷1.1	2
2. Kerry	x1.2	1	neg.**	x1.3	2
3. Tina	1.0	0		÷1.1	0
4. Daniel	1.0	1	neg.*	1.0	1
5. Sandra	x1.4	2	neg.**	÷1.1	3
6. Russell	1.0	0		÷1.2	1
7. Scott	x1.3	0	neg.**	÷1.1	1

* $p < .05$

** $p < .01$

Table 28

Comparison of During I and During II Phases
for Class c_2 (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	During II	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Gary	x1.2	2	pos.*	x1.3*	2
2. Kerry	x1.2	1		1.0	1
3. Tina	1.0	0		1.0	0
4. Daniel	1.0	1		1.0	0
5. Sandra	x1.4	2	neg.*	x1.3	2
6. Russell	1.0	0	pos.*	x1.1	1
7. Scott	x1.3	0	pos.*	x1.2	1

* $p < .05$ ** $p < .01$

with 0 errors, and Daniel dropped from 1 error per minute to 0 errors per minute. Sandra, however, seemed to have trouble recovering from the effects of the Between phase, and her performance in During II was not as good as that in During I. Finally, Kerry performed worse in the During II phase than he had performed in During I (his correct trend decelerated).

In During III (Table 29), four tutees had decelerations in their correct-per-minute trends (Gary, Sandra, Russell and Scott). Three of these tutees, however, maintained error rates of either 1 or 0. Daniel and Kerry improved in the During III phase (correct trends accelerated), and Tina maintained her performance.

Student Questionnaires

The seven tutees from Class c₁ all reported that (a) they liked being tutored, (b) they would like to continue the tutoring sessions, and (c) they felt they were better readers than they were before being tutored.

The tutors were also very positive towards the tutoring program, with all 14 reporting that they had enjoyed being a tutor and would like to be a tutor again. Every tutor thought his tutee liked being tutored, and 12 did not think their tutees were glad the program was over.

Although all the tutors thought that their parents were in favor of their tutoring, only 9 thought their teacher wanted them to act as tutors. Four felt they had missed too much class time as a result of the tutoring program. Most of the tutors (12) felt they had helped their tutees to read better and all 14 thought that their help

Table 29

Comparison of During II and During III Phases
for Class c_1 (Trends and Step Changes)

Tutee	During II		Step change (Correct per minute)	During III	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Gary	x1.3	2		±1.1*	1
2. Kerry	1.0	1	neg.*	x1.3*	0
3. Tina	1.0	0		1.0	0
4. Daniel	1.0	0		x1.2	0
5. Sandra	x1.3	2		±1.2*	1
6. Russell	x1.1	1		±1.2	0
7. Scott	x1.2	1		1.0	0

* $p < .05$

** $p < .01$

had been appreciated by the grade two teacher. Twelve tutors said they thought they, too, had become better readers through the tutoring experience.

Attitudes toward the organization of the program and recording and charting procedures were generally favorable. Only 1 tutor felt that the record sheets were too much work to fill out, and said he did not like measuring the tutee's reading performance each day. A summary of tutor questionnaire responses for tutors of Class c₁ appears in Table 30.

Class c₂

Table 31 shows that two of the six tutees (Michael and Rodney) accelerated their correct-per-minute trends in the During I phase over their correct trends in the Before phase. Simon maintained the same correct trend during both phases, but decelerated his errors from a rate of 4 per minute in the Before phase to a rate of 1 per minute in During I. Shelley's performance seemed to deteriorate in the During I phase (a negative step change and a deceleration of correct-per-minute trend). She did, however, decrease her error rate from 3 (Before rate) to 1 per minute (During I phase). Chris and Trevor decelerated in both error rate and correct trend in During I. All six tutees decreased their error rates in the During I phase.

In the Between phase (Table 32), four tutees (Michael, Shelley, Chris and Rodney) decelerated their correct trends and two of these tutees (Michael and Shelley) had negative step changes. Simon also had a negative step change and his errors accelerated. Trevor accelerated his correct trend while maintaining his error rate at 2 per minute,

Table 30

Summary of Questionnaire Responses for Tutors of Class c₁

Questions	Responses	
	Yes	No
<u>A. Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	14	0
2. Would you like to be a tutor again if you had a chance?	14	0
<u>B. Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	14	0
2. Do you think your tutee was glad the tutoring program was over?	2	12
<u>C. Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	14	0
2. Do you think your classroom teacher liked you being a tutor?	9	5
3. Do you think the tutoring made you miss too much class work?	4	10
<u>D. Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	12	2
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	9	5
3. Do you think your tutee's teacher liked having your help?	14	0
4. Do you think being a tutor helped you to be a better reader?	12	2
<u>E. Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	10	4
2. Did you like having team captains?	12	2
3. Do you think points and candy rewards should be used all the time for tutoring?	9	5
4. Do you think the tutoring session each day was too long?	0	14
5. Were you glad the tutoring ended at Easter?	2	12
6. Did Mrs. Crozier give you enough help?	14	0
<u>F. Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	1	13
2. Did you like measuring how well the tutee read each day?	13	1
3. Did you look at the blue graph to see how the tutee was improving?	9	5
4. Did your tutee like looking at his blue graph?	9	5

Table 31

Comparison of Before and During I Phases

for Class c₂ (Trends and Step Changes)

Tutee	Before		Step change (Correct per minute)	During I	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Simon	1.0	4		1.0	1
2. Michael	÷1.2	2		x1.1*	1
3. Shelley	x1.2	3	neg.*	1.0	0
4. Chris	x1.3	1		x1.1	0
5. Trevor	1.0	4		÷1.1	2
6. Rodney	1.0	1	pos.**	x1.1	0

*p < .05

**p < .01

Table 32

Comparison of During I and Between Phases
for Class c₂ (Trends and Step Changes)

Tutee	During I Correct per minute trend	Errors per minute	Step change (Correct per minute)	Between Correct per minute trend	Errors per minute
1. Simon	1.0	1	neg.*	1.0	3
2. Michael	x1.1	1	neg.*	1.0	2
3. Shelley	1.0	0	neg.*	±1.2	1
4. Chris	x1.1	0		1.0*	0
5. Trevor	±1.1	2		x1.2	2
6. Rodney	x1.1	0		±1.4	1

*p < .05

**p < .01

and the error rates of Michael, Shelley and Rodney accelerated in the Between phase.

The performances of the tutees in Class c₂ for the During II phase are shown in Table 33. All six tutees accelerated their correct-per-minute trends in During II (four significantly) and two of the tutees (Shelley and Chris) had positive step changes. Throughout this phase, all tutees maintained error rates of either 1 or 0 errors per minute.

In During III (Table 34), four tutees decelerated their correct trends (Simon, Michael, Chris and Rodney) and three of these four had negative step changes as well. Shelley accelerated her correct trend slightly but had a negative step change. Trevor accelerated his correct trend in the During III phase but increased his error rate from 0 to 1 error per minute. Error rates for Simon, Shelley, Chris and Rodney remained at 0 per minute in During III, but Michael's errors rose from 1 per minute in During II to a rate of 2 per minute in the During III phase.

Student Questionnaires

Class c₂'s six tutees stated that they liked the tutoring and five tutees said they would like to continue the tutoring sessions (one tutee was undecided). All six felt they were better readers than they had been prior to the tutoring program.

The twelve tutors for Class c₂ expressed positive attitudes about being a tutor, but 5 were concerned about missing class time (in particular, math class). Eleven tutors felt their tutoring had benefited their young tutees, and all 12 felt their help had been appreciated by the grade three teacher.

Table 33

Comparison of During I and During II Phases
for Class c₂ (Trends and Step Changes)

Tutee	During I		Step change (Correct per minute)	During II	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Simon	1.0	1		x1.5**	0
2. Michael	x1.1	1		x1.3*	1
3. Shelley	1.0	0	pos.*	x1.4**	0
4. Chris	x1.1	0	pos.**	x1.4**	0
5. Trevor	x1.1	2		1.0	0
6. Rodney	x1.1	0		x1.2	0

*p < .05

**p < .01

Table 34

Comparison of During II and During III Phases
for Class c₂ (Trends and Step Changes)

Tutee	During II		Step change (Correct per minute)	During III	
	Correct per minute trend	Errors per minute		Correct per minute trend	Errors per minute
1. Simon	x1.5	0	neg.*	1.0	0
2. Michael	x1.3	1	neg.*	÷1.1**	2
3. Shelley	x1.4	0	neg.*	x1.5	0
4. Chris	x1.4	0	neg.**	x1.1**	0
5. Trevor	1.0	0		x1.1	1
6. Rodney	x1.2	0		x1.1	0

*p < .05

**p < .01

Only 1 tutor did not like working with a partner, and 3 of the 12 were not in favor of having team captains. The tutors for this class were divided on whether points and candy rewards should be used for all tutoring sessions (6 for, 6 against). The length of the sessions was deemed satisfactory by 11 tutors.

Three tutors said that they did not like measuring the tutee's reading performance each day, but only 1 tutor thought that the record sheets were too demanding. Table 35 summarizes the questionnaire responses for tutors of Class c₂.

Teacher Questionnaire

The participating teachers from school C were generally in favor of continuing the tutoring program the following year. The major reservation expressed was that the grade sixes missed too much time from the same subject, and the suggestion was made that a specific "tutoring period" be set aside in future. The receiving teachers seemed very positive toward the program, and indicated a number of benefits for their tutees:

- "1. increased motivation because of the novelty of the program
2. improved in reading skills (now read every word, decreased guessing)
3. improved in attitude towards reading
4. practice in responsibility (getting materials ready for the tutoring sessions, leaving the classroom on time, behaving properly during the session)
5. improved peer relationships".

The receiving teachers noted that they could accomplish more with the individuals remaining in the classroom when the tutees left

Table 35

Summary of Questionnaire Responses for Tutors of Class c₂

Questions	Responses	
	Yes	No
<u>A. Attitudes toward being a tutor</u>		
1. Did you enjoy being a tutor?	12	0
2. Would you like to be a tutor again if you had a chance?	12	0
<u>B. Attitudes toward tutee</u>		
1. Do you think your tutee liked being tutored?	11	1
2. Do you think your tutee was glad the tutoring program was over?	3	9
<u>C. Attitudes toward missing class time</u>		
1. Do you think your parents would like you to be a tutor again?	12	0
2. Do you think your classroom teacher liked you being a tutor?	9	3
3. Do you think the tutoring made you miss too much class work?	5	7
<u>D. Perceived usefulness of the tutoring program</u>		
1. Do you think you were able to help your tutee to read better?	11	1
2. Do you think your tutee would have had trouble in reading later on if you had not helped him?	9	3
3. Do you think your tutee's teacher liked having your help?	12	0
4. Do you think being a tutor helped you to be a better reader?	11	1
<u>E. Attitudes toward the organization of the program</u>		
1. Did you like working with a partner?	11	1
2. Did you like having team captains?	9	3
3. Do you think points and candy rewards should be used all the time for tutoring?	6	6
4. Do you think the tutoring session each day was too long?	1	11
5. Were you glad the tutoring ended at Easter?	0	12
6. Did Mrs. Crozier give you enough help?	12	0
<u>F. Attitudes toward recording and charting</u>		
1. Did you think the record sheets were too much work to fill out?	1	11
2. Did you like measuring how well the tutee read each day?	9	3
3. Did you look at the blue graph to see how the tutee was improving?	9	3
4. Did your tutee like looking at his blue graph?	9	3

for their tutoring session. These teachers also said they were able to progress more quickly with the whole group because the tutees had already been given assistance with the reading assignment.

The gains from the program for the tutors were described by the teachers in the following words:

- "1. increased acceptance of responsibility
2. greater understanding of younger people
3. increased proficiency in mathematics
4. improved oral communication skills".

The staff of School C thought that there should be an "in-resident administrator" for the tutoring program. The teachers were in favor of close monitoring of the program through data collection and suggested that the program administrator could be responsible for preparing the grade six students in recording and charting procedures.

Chapter VI

SUMMARY, DISCUSSION AND IMPLICATIONS

In this final chapter, the rationale, method and major findings of the investigation are summarized. Following this summary, a more general discussion of results and educational implications is presented.

Summary

It is generally accepted that reading is one of the most important skills required for academic success. The first step in reading instruction involves teaching the child to identify words correctly. In order to perform this complex task, the child must master the subskills involved in word identification. These subskills consist of: (a) learning the relation between individual letters and verbal sounds, (b) learning to blend, and (c) learning that there are "regular" and "irregular" words.

Since these subskills appear essential for word identification, and word identification is prerequisite to reading comprehension, it follows that children must master these decoding skills before proficient reading can be expected. Unfortunately, many children fail to learn these basic skills in the course of their regular classroom instruction in reading, and the elementary school teacher is often unable to provide the remedial instruction that these children require because of heavy demands on her time. One solution to this problem would be to introduce additional manpower into the elementary classroom. Grade five and six students represent a convenient and economical

source of such manpower, and, if properly trained, might be able to function effectively as tutors in reading for younger students. Therefore, the purpose of the investigator in the present study was to focus on the problem of developing, implementing and evaluating a tutoring program using pupils from higher grades as tutors for children in the early elementary grades who require additional instruction in basic word identification skills.

A review of the available literature on tutoring programs revealed that, in general, there is a need for more systematic approaches to tutoring, as well as a need for more precise measures of student achievement. On the basis of these findings, the investigator endeavored to design a tutoring program with the following characteristics: (a) precise objectives; (b) specified performance criteria for the tutor training program; (c) incentives for the tutor; (d) systematic procedures for the tutors to follow; (e) specification of the specific tasks to be performed by the various personnel involved in the administrative aspects of the program; and (f) continuous monitoring of the progress of the tutees in order to determine the effectiveness of the program.

The tutoring program was subsequently implemented and tested in three elementary schools from the Edmonton Public School System. Ninety-eight grade five and six students from four different classrooms were trained to serve as tutors. A total of forty-nine students selected from seven grade two and three classrooms were included in the experiment and tutored on a systematic basis. Three teachers from grade six and one from grade five participated in the study as sending teachers; the project also involved seven receiving teachers (five from grade two and two from grade three), three school coordinators and the

experimenter. Each of the various personnel involved in the tutoring program cooperated by completing specified tasks before and throughout the project.

The grade two and three tutees were tutored over a three-month period in twenty-minute sessions four days each week. The experimental design provided for five different phases: (a) Before (classroom instruction only - three weeks duration), (b) During I (classroom instruction plus tutoring - six weeks duration), (c) Between (classroom instruction only - two weeks duration), (d) During II (classroom instruction plus tutoring with candy rewards - two weeks duration), and (e) During III (classroom instruction plus tutoring - two weeks duration).

Direct and continuous monitoring of each tutee's correct and error rates in oral reading was done in each session with the aid of the Precision Teaching measurement system. In addition, three separate questionnaires were administered at the conclusion of the project to collect information concerning the reactions of the tutees, tutors and the participating school staff.

The next section restates the specific objectives of the present investigation and discusses the results relative to each objective.

Discussion

Objective 1. To specify the behavioral objectives (specific tasks) for the various personnel involved in the tutoring program:
(a) tutors, (b) tutees, (c) grade five and six teachers (sending teachers),
(d) grade two and three teachers (receiving teachers), and (e) the exper-
imenter (program coordinator).

The specific tasks for the various personnel in the program have been detailed in Chapter IV. The strategy of providing each person in the project with tasks to be completed greatly helped to (a) avoid misunderstandings, (b) facilitate efficient planning, (c) foster communication among the various personnel involved, and (d) provide objective criteria against which progress could be evaluated. The questionnaire results from the three participating schools indicated that the task requirements had been adequately defined for both the sending and receiving teachers.

The teachers suggested that, in future programs, the role of program coordinator might possibly be filled by a person who would be available in the school on a regular basis (for instance, the school counselor, reading specialist or language arts consultant). In the event that such an arrangement were not feasible, a possible alternative to having a program coordinator could be a sharing of the coordinator's tasks by the sending and receiving teachers. For example, the grade five and six teachers might undertake the training of the student tutors, and the grade two and three teachers might assume responsibility for the supervision of data collection. In any case, it is important to emphasize that schools interested in implementing a tutoring program similar to the one described in the present investigation should make provision for some person to assume responsibility for the tasks completed by the experimenter.

Objective 2. To delineate systematic tutoring procedures to teach word identification skills to beginning readers.

The procedures to teach word identification skills were derived primarily from Engelmann's (1969, p.83) analysis of the subskills

involved in word identification. In review, the basic procedures employed by the tutors to teach word identification skills were:

1. The tutee was asked to read the words which he had read incorrectly during the initial timing. If the word was read properly, the tutor moved on to the next error.
2. If the tutee was not able to read the word, he was asked to "sound it out". The tutor supplied any sounds with which the tutee experienced difficulty.
3. The tutee was asked to "put the sounds together" or to "say it fast". If the tutee was not able to do this, the tutor demonstrated the correct performance and the tutee was asked to try again.
4. The tutee was "spot-checked" on a corrected word after the other words had been corrected. If he was still unable to read the word, the correction procedure was repeated.
5. The tutee was praised for his correct responses. Praise was also given for working hard and paying attention throughout the tutoring session (points and candy rewards were added incentives in the During II phase).

The foregoing procedures were implemented by the tutors throughout the experimental phases of the project. The program coordinator (experimenter) monitored many of the tutoring sessions to ensure that appropriate instructional procedures were being systematically followed. Periodically, tutoring sessions were audio-taped and checked for consistency.

Measures of effectiveness of these tutoring procedures have been presented in detail in Chapter V. Also, Appendix I contains a graphic summary of each tutee's daily performance throughout the project.

Objective 3. To devise a training program to teach the tutors to: (a) administer the tutoring procedures, and (b) measure and record oral reading performance.

Behavioral objectives were established for the tutor training program, and tutor preparation was completed in a series of six training sessions. The sessions, which lasted approximately forty-five minutes each, were conducted over a period of five consecutive weeks prior to the collection of baseline data. These training sessions were repeated in each of the four sending classrooms. The criterion objectives to be reached by each tutor were defined as follows:

1. Charts data points on the daily behavior chart at a rate of two correct per minute with zero errors.
2. Completes the record sheet using sample data with one hundred percent accuracy on at least two successive trials.
3. Demonstrates proficiency in the recording of oral reading errors to a criterion of eighty percent accuracy.
4. Lists the steps in the tutoring correction procedure with one hundred percent accuracy.
5. Demonstrates, in a tutoring session with his partner, the appropriate procedures for: (a) giving instructions, (b) correcting errors, (c) praising, and (d) recording.

Each of the grade five and six students employed as tutors in the experiment demonstrated mastery of the above objectives before being permitted to collect baseline information (Before phase). However, in spite of adequate performance on the criterion tasks, some tutors experienced difficulty in charting tutee performance during the actual tutoring sessions. These tutors (approximately twenty) required

additional assistance in completing the daily behavior chart from either their team captain or the experimenter. Evidently, provision for more practice in charting would be desirable in future training programs.

In summary, the tutor training program appeared adequate to teach the tutors the prerequisite behaviors for the tutoring sessions, with the exception of charting the data on the daily behavior chart. In addition, it seems desirable that one further criterion should be added to the five previously stated: that is, the tutors should be required (taught) to demonstrate proficiency in saying and blending letter sounds before acting as tutors. This requirement would provide additional effectiveness in instruction.

Objective 4. To monitor the effects of the tutoring procedures on the oral reading performance of each tutee on a daily basis.

The daily behavior charts (see Appendix I) provided information on the performance of each tutee in the daily tutoring sessions. Although Is Plans were completed for every tutee, these have not been included with the charts since standardized procedures were followed for all tutees in the different phases of the experiment. The program and program events for each of the seven receiving classrooms are described in Table 2 (page 48), and the procedures applied in the various phases are detailed in Chapter IV. The Is Plan would be particularly valuable when programs, program events, and arranged events vary for different students within the same classroom, or when pupils are working on different movement cycles (behaviors).

The Precision Teaching measurement system proved to be an invaluable tool for planning, providing continuous information, and facilitating communication among the various project personnel. The daily behavior charts were especially useful in summarizing and analyzing the performance of each tutee during the different phases of the experiment.

Objective 5. To compare the effects of specified procedures on the oral reading performance of each tutee.

A comparison of the Before and During I phases revealed that, in the During I phase, twenty tutees experienced positive step changes, seven tutees significantly accelerated their correct trends, and four other tutees had both a positive step change and a significant correct trend acceleration. Thus, a total of thirty-one tutees showed significant changes in their correct performances when tutoring was introduced. Although only eleven tutees significantly accelerated their correct trends, twenty-seven of the forty-nine tutees accelerated their correct trends in the During I phase over their correct trends in the Before phase. Forty-eight tutees decreased their error rates in the During I phase (Allan, Class a_1 , did not).

The comparison of the During I and Between phases showed that when tutoring was withdrawn (Between phase), twenty-three tutees had negative step changes, four tutees significantly decelerated their correct trends and one other tutee experienced both a negative step change and a significant correct trend deceleration. Twenty-eight tutees, then, significantly decelerated their correct performances in the Between phase. Decelerations in correct trends occurred in thirty-

seven tutees altogether, and twenty-seven tutees accelerated their error rates.

An attempt was made to assess the utility of supplementing the tutoring procedures with points and candy rewards in the During II phase. The performances of the thirty-seven tutees to whom these additional procedures were applied were compared to the performances of these same tutees in the During I phase. In the During II phase, six tutees demonstrated positive step changes, five tutees showed significant trend accelerations and four tutees had both a significant trend acceleration and a positive step change. Hence, fifteen tutees in all significantly accelerated their correct performances in the During II phase over their correct performances of the During I phase. Error rates decelerated for sixteen of the thirty-seven tutees.

A comparison of the During II and the During III phases disclosed that when candy rewards were withdrawn, nineteen of the thirty-seven tutees decelerated their correct trends (four significantly), two had negative step changes and three other tutees showed both a negative step change and a significant correct trend deceleration. Error rates accelerated for seven tutees in this phase.

In summary, these comparisons indicate that all tutees performed better under the tutoring procedures, and that, for some tutees, the added incentives of points and candy further improved their performances.

Objective 6. To determine the reactions toward the tutoring program of the tutees, the tutors and the participating school personnel.

The reactions of the various project personnel toward the tutoring program were considered to be an important part of program

evaluation, since these reactions probably determine to a large extent whether the program will be repeated. Consequently, questionnaires were administered to the tutees, the tutors and the participating school staff to collect information concerning their reactions to different aspects of the tutoring program.

The grade two and three tutees appeared to feel very positive about the tutoring experience. All forty-nine children stated that they liked being tutored, and all but one felt that they were better readers than they were before tutoring. Forty-three tutees said they wished to continue being tutored, two were undecided and only three tutees did not wish to continue.

The large majority of the tutors also expressed positive attitudes toward the tutoring program. Ninety-two of the ninety-eight tutors reported that they had enjoyed tutoring, and ninety-one students said that they would like to be tutors again. Five of the six students who apparently did not enjoy tutoring came from one grade six classroom which had particular problems in arranging standard times and places for the tutoring sessions. Even though most of the tutors (eighty-eight) felt that their tutees liked being tutored, twenty-eight tutors assumed their tutees were glad that the program ended at Easter. This finding suggests that perhaps the tutees should be taught to reinforce their tutors, since some grade five and six students seemed uncertain about the enthusiasm of their tutees.

The tutors seemed to regard their parents as having more favorable attitudes toward tutoring than their teachers (ninety-five tutors thought their parents would like them to be tutors again; eighty-six thought their classroom teachers were in favor of their being tutors).

Twenty-six tutors thought tutoring had caused them to miss too much class time. It should be mentioned at this point that, although the experimenter recommended the tutoring become a class assignment for which the grade five and six students would receive credit, none of the sending teachers followed this suggestion. If credit had been given for the tutoring sessions, perhaps as a social studies unit or a language arts project, these tutors would probably not have been as concerned about missed class time.

Ninety-three tutors said they thought they had helped their tutees become better readers, and seventy-four tutors believed that being a tutor had also improved their own reading performance. Since every tutor thought that his help had been appreciated by the receiving teacher, the grade two and three teachers must have adequately reinforced their young tutors.

Approximately one-fourth of the tutors reported that they did not like working with a partner or under team captains. Possibly, changes should have been made in both the tutor pairs and team captains throughout the program (perhaps being a team captain could be made contingent upon demonstrated proficiency in the tutoring sessions). Of the seventy-four tutors who had used the additional incentives in the During II phase, only forty thought these rewards should be applied in all tutoring sessions. One might speculate that these eleven-and twelve-year-old students had already been taught that it is "wrong" to receive tangible rewards for doing something which "should" be done.

Most of the tutors seemed satisfied with the recording procedures employed in the tutoring sessions (sixteen tutors thought the record sheets were too much work, and fifteen said they did not like measuring

the tutee's performance each day). However, only seventy tutors said that they frequently referred to the daily behavior chart to check their tutee's progress, and only sixty-four tutors reported that their tutees asked to look at their charts.

In summary, although almost all of the tutors indicated that they had enjoyed the tutoring program, it seems that certain changes could be made to overcome problem areas identified from the tutor questionnaires. For instance, additional motivational procedures for the tutors seem desirable. Incentives for the tutors might take the form of academic credit, recognition in a school assembly, or through tutoring clubs and "certificates of merit". Furthermore, the tutors should be taught to respond more positively toward data collection and interpretation. In fact, it is possible that the data could become conditioned reinforcers for the tutors.

The responses from the teacher questionnaires indicated that the teachers were generally pleased with the administration and results of the tutoring program. The procedures employed in the tutoring sessions were considered to be quite satisfactory, and all but one of the receiving teachers felt that the emphasis on word identification skills was appropriate. The teachers stated that they were particularly impressed with the behavior of the grade five and six students, and felt that the training given the tutors in reinforcement techniques was especially valuable.

The suggestions which were made concerning scheduling and locating of the tutoring sessions lead to certain recommendations to be made for future tutoring programs:

1. The sessions should be scheduled at the end of the tutors'

academic period rather than at the beginning or in the middle. Just before recess or lunch seems to be a particularly good time for tutoring, since both tutors and tutees are motivated to finish in the required time.

2. The sessions should be held as close as possible to the tutees' classroom, so that periodic supervision might be given by the receiving teacher.

3. The sessions should be held in a place which permits relative privacy. The library was found to be a very suitable location, and supervision was assured if a librarian was present. Tutoring sessions should not be conducted in hallways and playrooms where lighting and facilities are poor and distractions numerous.

4. Once the time and place of the tutoring sessions have been established, the other staff members in the school should be notified so that the tutors will not be interrupted unnecessarily.

The teachers identified a number of advantages from the tutoring program for both the tutees and the tutors. The tutees were thought to have benefited from the individual attention, immediate reinforcement and social interaction provided by the tutors in the daily sessions. Besides improving their reading skills, the receiving teachers also felt that their tutees had developed better attitudes toward reading. The majority of the grade two and three teachers remarked that their tutored students were much more willing to read aloud in class, and that they also made more positive remarks about their own reading performance.

The benefits from the program identified for the grade five and six students consisted of: (a) improved oral communication skills,

(b) improved mathematics skills, (c) improved reading skills, (d) increased understanding of younger children, (e) increased acceptance of responsibility, and (f) a general improvement in following instructions. However, these findings must be regarded as only suggestive, since changes in tutor behavior were not systematically evaluated in the present investigation.

Educational Implications

Mortimer Smith (1969, p.3) has stated that the failure of our schools in teaching the essential first skill of reading amounts to a scandal. Further, Smith has claimed that phonics, or code emphasis approaches could radically decrease the number of reading failures. The evidence from the present investigation strongly supports his contention. Children from grades two and three who were identified as "poor readers" by their classroom teachers eventually improved their reading performances when provided with remedial instruction in decoding.

In addition to improving teaching intensity (e.g., through the use of pupil tutors), there are compelling reasons to believe that the acquisition of reading skills could be greatly facilitated if reading curricula were more carefully sequenced phonetically. Most of the reading series presently in use concentrate on developing a "sight" vocabulary in the early grades (e.g., Ginn, McKee and Nelson readers) hence, there is no logical sequencing of phonic skills. The DISTAR Reading Program (SRA, 1969) is an example of a program which does present phonic skills in a carefully programmed sequence.

DISTAR exaggerates differences when difficult discriminations are encountered: for instance, the symbols for sounds are not confused

because they are purposely drawn very differently. Also, when different sounds can go with the same symbol, such as "o" in edit, "o" in be, or "e" in write, the symbols are modified to signal these differences. Accordingly, long "e" has a bar over it (\bar{e}), and silent "e" is made smaller. Furthermore, when two symbols make only one sound, they are physically tied together (e.g., th). Finally, to make learning to read letters less confusing, for the first year the program does not include capital letters (except I), and does not teach letter names, since these are not really important to reading. These objectives (learning capital letters and letter names) are introduced only after the initial objectives are mastered. The effectiveness of these techniques has been demonstrated by Engelmann (1971) in a study with disadvantaged preschool subjects. Following two years of direct instruction, his subjects obtained an average grade level score of 2.6 in reading on the Wide Range Achievement Test. Science Research Associates has recently published a summary of 21 other case studies in which comparable results were obtained.

The results from DISTAR and other experimental reading programs (for example, the Initial Teaching Alphabet program, Copp Clark Publishing Company) strongly suggest that educators need to reexamine the traditional assumptions about why children fail to learn to read. Generally, teachers have tended to direct their instruction to the level of the "average" student in their class. However, the teacher who adopts such an approach is bound to lose (not teach) the children who are not prepared to follow this instruction. The children who already know what the teacher is teaching will appear to be smart and "catch on quickly". That is, if the home has provided the skills the teacher

assumes children should have, the child has a chance. On the other hand, if the child lacks these skills, it is likely that he will be labelled "dull" and be started on the road to failure.

Another presumed explanation of reading failure is implied by the label "learning disability". The most common learning disability is the failure to learn to read. The most frequently stated cause of learning disability is "minimal brain damage" - that is, possible brain damage. It is currently fashionable to assume that such damage interferes with the "perception" of stimuli or with "attention". However, only in a small percentage of cases is there any real evidence of the neurological defects that are hypothesized. Furthermore, an approach to the problem of reading failure that simply defines a new kind of problem child, rather than looking closely at the conditions needed to teach children, overlooks the very real possibility that many children said to have learning disabilities simply have not been taught effectively. Becker, Engelmann and Thomas (1971) state the case against such labelling procedures well:

With the advent of "learning disabilities", there now exists no teaching failure that cannot be blamed on something being wrong with the child. If the teacher can ship out all her failures, she will never have reason to learn to prevent them through better teaching (p.444).

In view of recent improvements in teaching technology, it would appear that it is no longer reasonable to assume that children do not learn because they are "dumb", or have some form of "learning disability". It is necessary to examine teaching methods more carefully in order to determine why they fail. Children learn when they are taught and fail when they are not taught. The major responsibility for a child's failure in school rests on the teacher's shoulders, not the child's.

The attitude that all children can be taught is essential for teachers concerned with change.

In summary, the "know-how" appears available to achieve important changes in the teaching of reading. These changes can be itemized as follows:

1. Improve the teaching of reading by implementing code-cracking approaches with the use of well-programmed curricula. Give the teacher better programs and begin the teaching of basic skills at a younger age.
2. Improve teacher education by training teachers how to motivate children in positive ways, how to teach any task, and how to devise and evaluate programs. Teachers need to adopt the attitudes that children learn when they are taught, and that teachers are responsible for each child in their classes.
3. Provide more teaching assistants (paraprofessionals, parents, volunteers, students) in the classroom at beginning levels. Properly trained, older students or adults can function very effectively in providing individual attention to students.
4. Measure educational achievement with the aid of available tools such as the Precision Teaching measurement system. Accountability in education can only come when parents, teachers and administrators have to live with feedback on the performance of students.
5. Evaluate innovations with hard data. Experimental programs, such as the one described in the present study, should be subjected to rigorous critical evaluation before being implemented on a large scale basis.

REFERENCES

- Anderson, J. P. Reading and writing can be fun for the underachiever. English Journal, 1970, 59, 1119-21.
- Becker, W. C., Engelmann, S., & Thomas, D. R. Teaching: A course in applied psychology. Chicago: Science Research Associates, 1971.
- Becker, W. C., Thomas, D. R., & Carnine, D. Reducing behavior problems: An operant conditioning guide for teachers. In Becker, W. C. (Ed.) An empirical basis for change in education. Chicago: Science Research Associates, 1971.
- Bell, S. L., Garlock, N. L., & Colella, S. L. Students as tutors: High schoolers aid elementary pupils. Clearing House, 1969, 44, 242-44.
- Bradfield, R. N. Precision teaching: A useful technology for special education teachers. Educational Technology, 1970, 22-26.
- Caldwell, F. E. Can pupil performance rates tell us when a student teacher is ready for her own class? Unpub. doctoral diss., U. of Kansas, 1967.
- Chall, J. Learning to read: The great debate. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967.
- Cloward, R. D. Studies in tutoring. Journal of Experimental Education, 1967, 36, 14-25.
- Cohen, N., & Martin, G. Applying precision teaching to academic assessment. Teaching Exceptional Children, 1971, 3, 147-150.
- Dawson, M. (Ed.) Developing high school reading programs. Newark, Del.: International Reading Association, 1967.
- DISTAR Instructional System. Chicago: Science Research Associates, 1969.
- Dykstra, R. The effectiveness of code- and meaning-emphasis beginning reading programs. The Reading Teacher, 1968, 22, 17-23.
- Edwards, J. Precisely teaching children labeled learning disabled. Unpublished doctoral dissertation, University of Kansas, 1969.
- Ellson, D. G., Harris, P., & Barber, L. A field test of programmed and directed tutoring. Reading Research Quarterly, 1968, 3, 307-367.
- Ellson, D. G., Barber, L. W., Harris, P. L., & Adams, R. Ginn Tutorial. Boston: Ginn and Company, 1968.

- Engelmann, S. Preventing failure in the primary grades. New York: Simon and Schuster, 1969.
- Engelmann, S. The effectiveness of direct verbal instruction on IQ performance and achievement in reading and arithmetic. In Becker, W. C., An empirical basis for change in education. Chicago: Science Research Associates, 1971, p.461-483.
- Fleming, J. C. Pupil tutors and tutees learn together. Education Digest, 1969, 35, 38-40.
- Fraga, S., & Stern, C. Learning by teaching. Reading Teacher, 1970, 23, 403-5.
- Gaasholt, M. Precision techniques in the management of teacher and child behaviors. Exceptional Children, 1970, 37, 129-135. (a)
- Gaasholt, M. A precision teaching management project. Unpub. Manus. Univ. of Oregon, 1970. (b)
- Gartner, A., Kohler, M., & Riessman, F. Children teach children: Learning by teaching. New York: Harper and Row, 1971.
- Glim, T. C. The Palo Alto reading program: Sequential steps in reading. New York: Harcourt, Brace and World, 1968.
- Glim, T. C. The Palo Alto reading program: Book 2. New York: Harcourt, Brace and World, 1968.
- Goodman, L. Tutoring for credit. American Education, 1971, 7, 26-7.
- Gross, M. Teacher's "big" helper. School Activities, 1968, 38, 20-1.
- Harris, M. M. Learning by tutoring others. Today's Education, 1971, 60, 48-9.
- Hassinger, J., & Via, M. How much does a tutor learn through teaching reading? Journal of Secondary Education, 1969, 44, 42-4.
- Hayes, R. B., & Wuest, R. C. A three-year look at i.t.a., Lippincott, Phonics and word power, and Scott Foresman. The Reading Teacher, 1969, 22, 363-70.
- Hill, C. H., & Tolman, R. Tutoring: An inexpensive alternative. Journal of the Reading Specialist. 1970, 10, 19-23.
- Hopkins, B., Schutte, C., & Gorton, W. The effects of access to a playroom on the rate and quality of printing and writing of first- and second-grade students. Journal of Applied Behavior Analysis, in press.
- Initial Teaching Alphabet Publications. Toronto: Copp Clark Publishing Company.
- Johnson, L. C. Precision teaching helps children learn. Teaching Exceptional Children, 1971, 3(3), 106-110.

- Jonos, J. Tutoring project. Los Angeles Times, March 11, 1968, pp.1-2.
- Kounig, C. Precision teaching with emotionally disturbed pupils. Dec., 1967. Research Training Paper No. 17. Bureau of Child Research and School of Education.
- Landrum, J. W., & Martin, M. D. When students teach others. Educational Leadership, 1970, 27, 446-8.
- Lindsley, O. R. Direct measurement and prostheses of retarded behavior. Journal of Education, 1965, 147, 62-80.
- Lindsley, O. R. Precision teaching in perspective: An interview with Ogden R. Lindsley. Teaching Exceptional Children, 1971, 3, 114-119.
- Lippitt, P. Children can teach other children. Instructor, 1969, 78, 41.
- Lippitt, P., Eiseman, J., & Lippitt, R. Cross-age helping program: Orientation, training and related materials. Ann Arbor, Michigan: Institute for Social Research, 1969.
- Lovitt, T., & Curtiss, K. Effects of manipulating an antecedent event on mathematics response rate. Journal of Applied Behavior Analyses, 1968, 1, p.329-333.
- Lovitt, T. C., Guppy, T. C., & Blattner, J. E. The use of a free-time contingency with fourth graders to increase spelling accuracy. Behavior Research and Therapy, 1969, 7, 151-156.
- Lovitt, T. C., & Hurlbut, M. The analysis and modification of certain phonics skills and their relationship to oral reading. Unpub. manus. Experimental Education Unit, Univ. of Wash., Feb. 1971.
- Lovitt, T. C., Schaaf, M. E., & Sayre, E. The use of direct and continuous measurement to evaluate reading materials and procedures. Focus on Exceptional Children, 1970, 2, 1-11.
- Mager, R. F. Preparing instructional objectives. Palo Alto, California: Fearon Press, 1962.
- McCleary, E. K. Report of results of tutorial reading project. Reading Teacher, 1971, 24, 556-60.
- McCracken, G., & Walcutt, C. Basic reading. Philadelphia: Lippincott, 1966.
- McGinnis, D. J. Should tutoring be encouraged? Reading Horizons, 1972, 12.
- Niedermeyer, F. C. Effects of training on the instructional behaviors of student tutors. Journal of Educational Research, 1970, 64, 119-123.

- Niechmoyor, F. C., & Ellis, P. Remedial reading instruction by trained pupil tutors. Elementary School Journal, 1971, 71, 400-5.
- Norris, R. L., & Wantland, P. J. Big brothers and sisters assist readers. School and Community, 1972, 58, 8.
- Ousley, O., & Russell, D. Around the corner. Boston: Ginn and Company, 1961.
- Paicoma Elementary School Teachers: students assist each other at tutorial project school: Paicoma elementary school in the Los Angeles school district. Nations Schools, 1969, 84:44.
- Rime, L., & Ham, J. Sixth grade tutors. Instructor, 1968, 77, 104-105.
- Rossi, T. P. Help: Students teach students. Reading Improvement, 1969, 6, 47-9.
- Schoeller, A. W., & Pearson, D. A. Better reading through volunteer reading tutors. Reading Teacher, 1970, 23, 625-30.
- Science Research Associates, Summaries of case studies on the effectiveness of the Distar Instructional System. Chicago, 1971.
- Skinner, B. F. Science and human behavior. New York: MacMillan, 1953.
- Slingerland, B. H. A multi-sensory approach to reading, writing and spelling. Cambridge, Massachusetts: Educators Publishing Service, 1969.
- Smith, M. The reforms most needed in education. Council for Basic Education Bulletin, 1969, 13, 1-6.
- Spache, G. D. Diagnostic reading scales. Monterey, California: California Test Bureau, 1963.
- Squires, E. R. Youth tutoring youth (YTY). School and Community, 1971, April, 57, 20-1.
- Staats, A. W., & Butterfield, W. H. Treatment of non-reading in a culturally deprived juvenile delinquent: An application of reinforcement principles. Child Development, 1965, 36, 925-942.
- Staats, A. W., Menke, K. A., & Butts, P. A token-reinforcement remedial reading program administered by black therapy-technicians to problem black children. Behavior Therapy, 1970, 1, 331-353.
- Staats, A. W., Menke, K. A., Finley, J. R., Wolf, M., & Brooks, L. O. A reinforcer system and experimental procedure for the laboratory study of reading acquisition. Child Development, 1964, 35, 209-231.
- Staats, A. W., Menko, K. A., Goodwin, W., & Landeen, J. Cognitive behavior modification: Motivated learning reading treatment with sub-professional therapy-technicians. Behavior Research and Therapy, 1967, 5, 283-299.

- Starlin, C. M. The use of daily direct recording as an aid in teaching oral reading. Unpub. doctoral dissertation, Univ. of Oregon, 1970.
- Sween, J., & Campbell, D. D. The interrupted time series as quasi-experiment: Three tests of significance. A Fortran program for the CDC 3400 computer. August, 1965. Distributed by the Vogelback Computing Center, Northwestern University.
- Thelan, H. A. Tutoring by students: What makes it so exciting? The School Review, 1969, 77, 229-244.
- Thelan, H. A. Tutoring by students. Education Digest, 1970, 35, 17-20.
- Vargas, J. Writing worthwhile behavioral objectives. New York: Harper & Row, 1972.
- White, O. Glossary of behavioral terminology. Champaign, Ill.: Research Press, 1971.
- White, O. R. The "split-middle": A "quickie" method of trend estimation. Unpub. manus., Department of Special Education, Univ. of Oregon, March, 1971.

Appendix A

Parent Consent Form: Tutoring

Dear Parents:

As you may already have heard from your child, some 6th grade students are being given the opportunity of helping children in lower grades. This will be a part of the older children's regular school work. They will be given special training in how to relate successfully to younger children and to help them learn. The work they do with the younger children will be under the supervision of the younger child's teacher. This program will give the younger children a chance to have more of the individual attention every child needs than could otherwise be scheduled for them.

It will give the older child a chance to learn better the subjects he is helping the younger child to master. It will also give him experience in being a trusted member of a team of classmates and teachers who are working on ways to help children learn.

Your child _____ has been selected to be one of the younger children to receive individual attention from a trained older child, for 20 minutes 4 days a week.

If you consent to this program, please sign below and have your child return this form to his classroom teacher.

If you have any questions, please feel free to call me. We would be very much interested in hearing of any reactions your child may have to this new program.

Sincerely yours,

Principal

I would like my child to take part in this program.

Appendix B

Parent Consent Form: Tutors

Dear Parents:

As you may already have heard from your child, some 6th grade students are being given the opportunity of helping children in lower grades. This will be a part of the older children's regular school work. They will be given special training in how to relate successfully to younger children and to help them learn. The work they do with the younger children will be under the supervision of the younger child's teacher. This program will give the younger children a chance to have more of the individual attention every child needs than could otherwise be scheduled for them.

It will give the older child a chance to learn better the subjects he is helping the younger child to master. It will also give him experience in being a trusted member of a team of classmates and teachers who are working on ways to help children learn.

Your child _____ has been selected to be one of the older helpers for 2 twenty-minute periods each week.

If you consent to this program, please sign below and have your child return this form to his classroom teacher.

If you have any questions, please feel free to call me. We would be very much interested in hearing of any reactions your child may have to this new program.

Sincerely yours,

Principal

I would like my child to take part in this program.

Appendix C

Referral Form: Tutees

School _____

Referring Teacher _____ Date _____

Name of Child _____ Sex _____

Age of Child _____ Grade _____

Present reading series
(text name and level) _____

Latest reading achievement score _____

Test used _____

Date test administered _____

Pinpoint (with what specific reading skill does this child need help?)

_____Suggested tutoring method and materials

_____Schedule (at what times could this child receive help, in 4 20-minute
sessions?)

Monday _____ Thursday _____

Tuesday _____ Friday _____

Wednesday _____

Additional Comments _____

RECORD SHEET

[illegible]

Appendix E

Tutor Questionnaire

NAME: _____ SCHOOL: _____

Please answer yes or no to the following questions:

1. Did you enjoy being a tutor? _____ 1.
2. Would you like to be a tutor again if you had a chance? _____ 2.
3. Do you think your tutee liked being tutored? _____ 3.
4. Do you think your parents would like you to be a tutor again? _____ 4.
5. Do you think your classroom teacher liked your being a tutor? _____ 5.
6. Do you think your tutee's teacher liked having your help? _____ 6.
7. Were you glad that the tutoring ended at Easter? _____ 7.
8. Do you think your tutee was glad the tutoring program is over? _____ 8.
9. Do you think you were able to help your tutee to read better? _____ 9.
10. Do you think your tutee would have had trouble in reading later on if you had not helped him? _____ 10.
11. Do you think being a tutor helped you to be a better reader? _____ 11.
12. Did you like working with a partner? _____ 12.
13. Did you like having team captains? _____ 13.
14. Did you think the tutoring session each day was too long? _____ 14.
15. Do you think points and candy rewards should be used all the time for tutoring? _____ 15.
16. Did you think the record sheets were too much work to fill out? _____ 16.

17. Did you like measuring how well the tutee read each day? 17.
18. Do you think the tutoring made you miss too much class work? 18.
19. Did Mrs. Crozier give you enough help? 19.
20. Did you look at the blue graph to see how the tutee was improving? 20.
21. Did your tutee like looking at his blue graph? 21.
22. Do you think any changes should be made in the tutoring program? 22.
23. What changes would you suggest (please write them underneath)?

Appendix E

Staff Questionnaire

TUTORIAL PROGRAM

Please answer the following questions as fully as possible. The list at the bottom of the page may help to focus on some relevant points.

1. List the advantages from the tutoring program that you could identify for: the tutees, the tutors, the teachers of the tutees.
2. What suggestions do you have for improving the administration of the tutoring program?
3. What were the disadvantages of the program?
4. Do you feel that data collection is an important part of a tutoring program?
5. Did you feel that you were well-enough informed concerning procedures throughout the program?
6. Did you feel that the tutors were given adequate preparation and direction?
7. Do you feel that outside coordination is necessary for such a program?
8. Do you plan to carry on a tutoring program next year?

Please consider the following when completing this questionnaire:

- length of tutoring program (3 months)
- length of daily sessions
- number of sessions per week
- time of daily sessions
- place where sessions were held
- effect on classroom organization
- handling of tutoring materials
- communication among school personnel involved
- movement of students throughout the school
- student behavior

Appendix E

Tutor Questionnaire

1. Did you like being helped by the grade 6 (5) student?
2. What did you like about it?
3. Were the helpers good teachers?
4. How did they help you read?
5. Are you a better reader now?
6. What part of the tutoring did you like best?
7. Would you like to get help after Easter?

Appendix F

Instructions to Tutors for Recording Reading

Materials: timing device, two sets of books, pencil, eraser, tutee's binder.

Method:

- (1) Have the child turn to the story he is reading in class right now. Turn your book to the same place.
- (2) Make sure you are facing the clock.

- (3) Say to the tutee:

"I would like to hear you read. Please start when I tell you to. If you finish a page or a story, keep going until I tell you to stop. Read as well as you can, and read every word.

Ready -- start reading."

- (4) If you are interrupted by such things as the child dropping his book or by someone coming over, try not to get upset. Start over when everything is settled.
- (5) Don't be too "easy" on the tutee. Count every mistake, or he won't learn the right way.
- (6) If the time is up and child is in the middle of a sentence or paragraph, put a slash (/) after the word where the time was up, but allow the child to continue reading to the end of the assigned pages. Never stop too soon.
- (7) Always thank the child for reading and try to find something good to say about his reading.
- (8) Fill out the record sheet and the chart.

Appendix G

Instructions and Transcript for Reliability Assessment

AT THE BIG STORE

Joe liked to go to the big store with Mother. He liked to look at the toys. He liked to ride in the big elevators.

"We shall get some balloons and candles for Mary Ann's birthday party," said Mother.

"Her birthday is coming soon. We shall get a toy today, too. The toy will be a prize at the party."

"Here is the elevator," said Joe. "Let's go up and see the toys now."

"I shall get the balloons and candles," said Mother. "You may look at the toys."

Joe wanted to find a toy that everyone would like. There were so many toys!

Joe looked at a toy fire truck. He sat on a blue toy tractor. Then he saw a toy telephone and some big building blocks. He stopped to bounce a rubber ball. Bounce, bounce, went the rubber ball. Joe saw many toys - drums, boats, cars.

"I shall look some more," said Joe. He walked around the store looking and looking.

"Joe! Where are you?" called Mother. "Where did you go?"

"That's funny," said the man. "He was right here. Where can he be?" Then the man laughed.

"Joe has found our big playhouse," said the man.

Appendix G

Reliability Assessment

Instructions to Tutors

1. Keep your paper face down until you are asked to turn it over. Be sure you have a pencil.
2. While the tape is playing, read your copy of the story and check the errors you hear:
 - (a) says word wrong: underline the word
 - (b) hesitates 4 seconds or says "I don't know": put a checkmark over the word.

Note: Do not say the word out loud - someone on the tape will tell the "tutee" the word.

3. Pass your paper to the person behind you.
4. Put a checkmark on all the errors marked which agree with the right answers.
5. Put an X on all the errors which:
 - (a) were not marked but should have been
 - (b) were marked, but should not have been marked.
6. Add up the "agreements" and "disagreements" separately.
7. Calculate the following as a percent:

$$\frac{\text{agreements}}{\text{agreements \& disagreements}}$$
8. Put the percent at the top of the paper and circle it.
9. The person at the back of each row will collect the papers when he is asked to.

Appendix H

Reliability Ranges and Means for the Five Experimental Phases

Before phase: range, 80-100%; mean = 88%

During I phase: range, 88-100%; mean = 90%

Between phase: range, 88-100%; mean = 92%

During II phase: range, 92-100%; mean = 96%

During III phase: range, 92-100%; mean = 96%

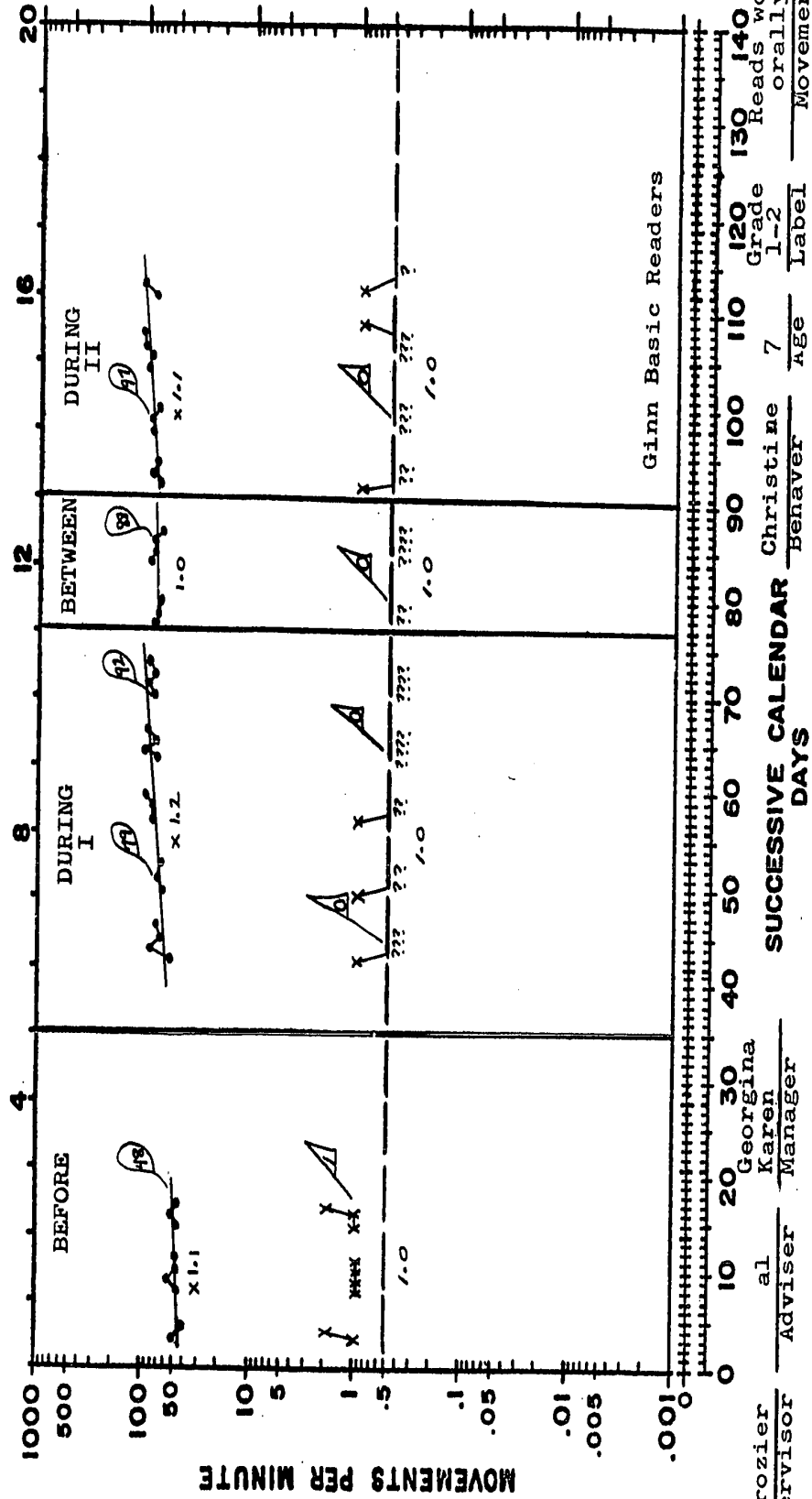
Appendix I

Index for Daily Behavior Charts

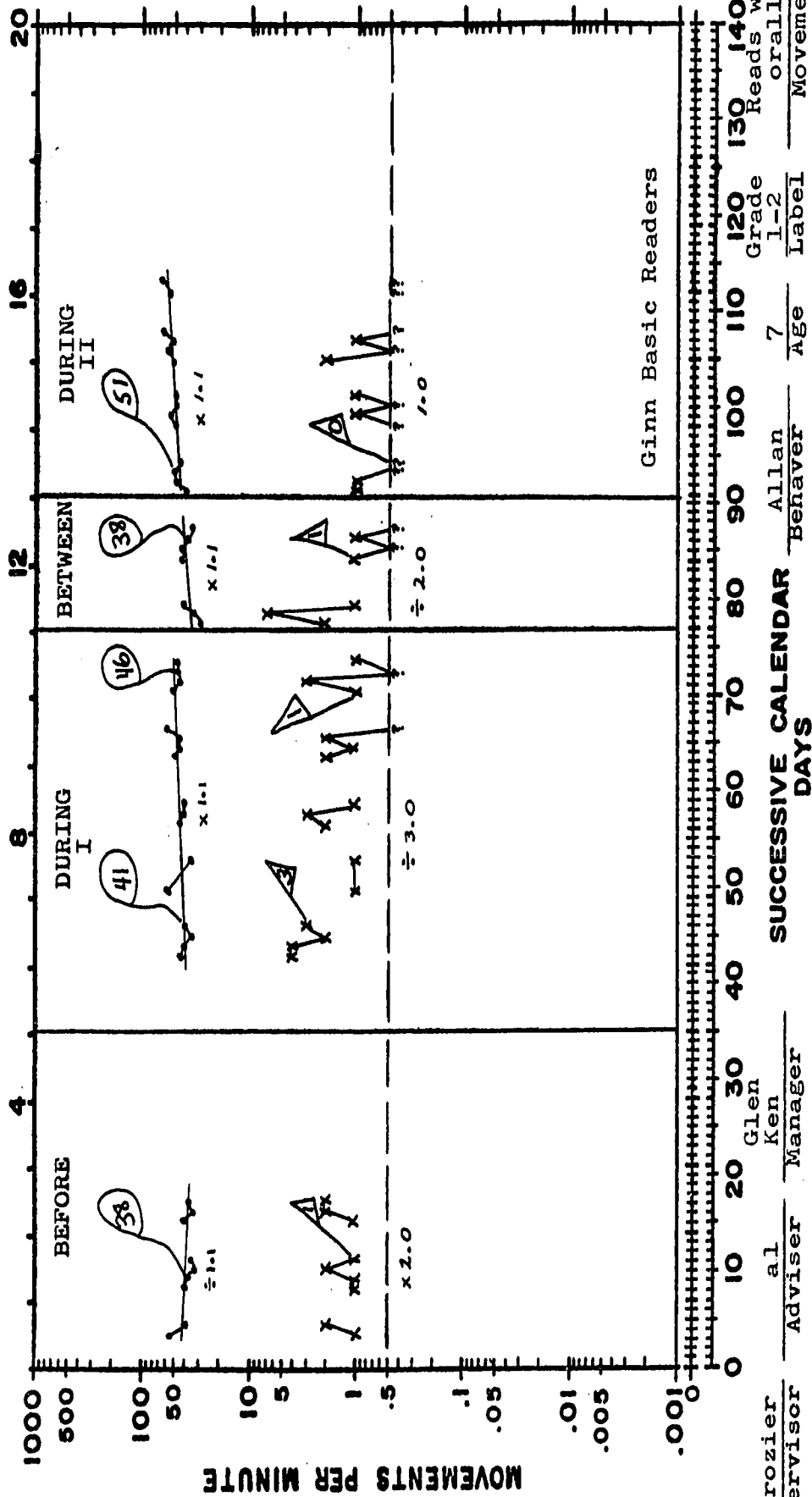
<u>Tutee</u>	<u>Chart Number</u>
<u>Class a1</u>	
1. Christine	1
2. Allan	2
3. Darryl	3
4. Bruce	4
5. Danny	5
6. Maurie	6
7. Clint	7
8. Randy	8
9. Troy	9
10. Carol	10
11. Georgia	11
12. Cindy	12
<u>Class a2</u>	
1. Angela	13
2. Kevin	14
3. Dwayne	15
4. Teddy	16
<u>Class a3</u>	
1. Jeff	17
2. Gary	18
3. Richard	19
4. Sandra	20
5. Bradley	21
6. Wayne	22
<u>Class b1</u>	
1. Ken	23
2. Terry	24
3. Kevin	25
4. Ward	26
5. Robin	27
6. Kenny	28
7. Mark	29
<u>Class b2</u>	
1. Michael	30
2. Chris	31
3. Dianne	32
4. Brad	33
5. Carla	34
6. Allan	35
7. Darcy	36

<u>Tutee</u>	<u>Chart Number</u>
<u>Class c1</u>	
1. Gary	37
2. Kerry	38
3. Tina	39
4. Daniel	40
5. Sandra	41
6. Russell	42
7. Scott	43
<u>Class c2</u>	
1. Simon	44
2. Michael	45
3. Shelley	46
4. Chris	47
5. Trevor	48
6. Rodney	49

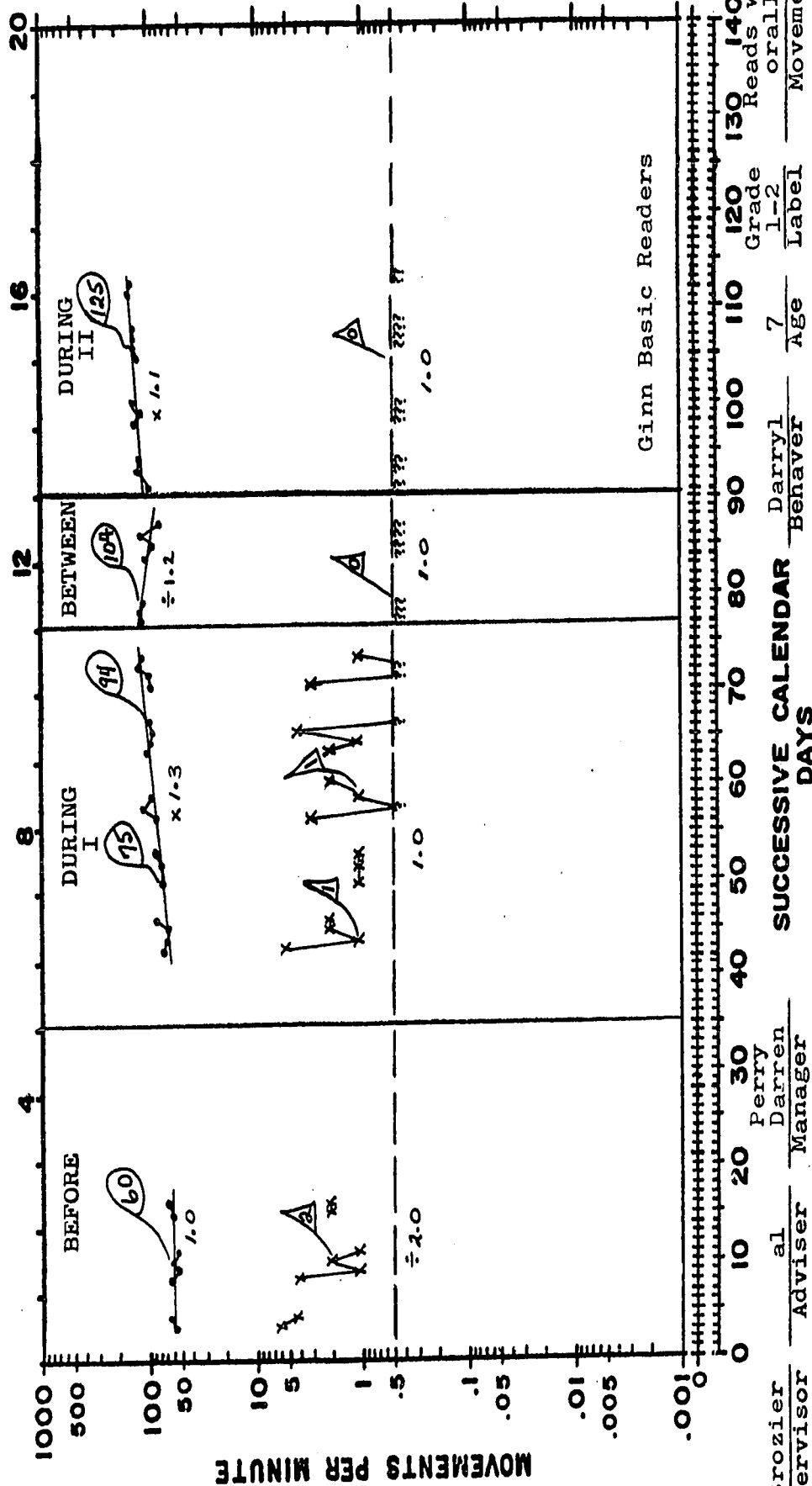
CALENDAR WEEKS



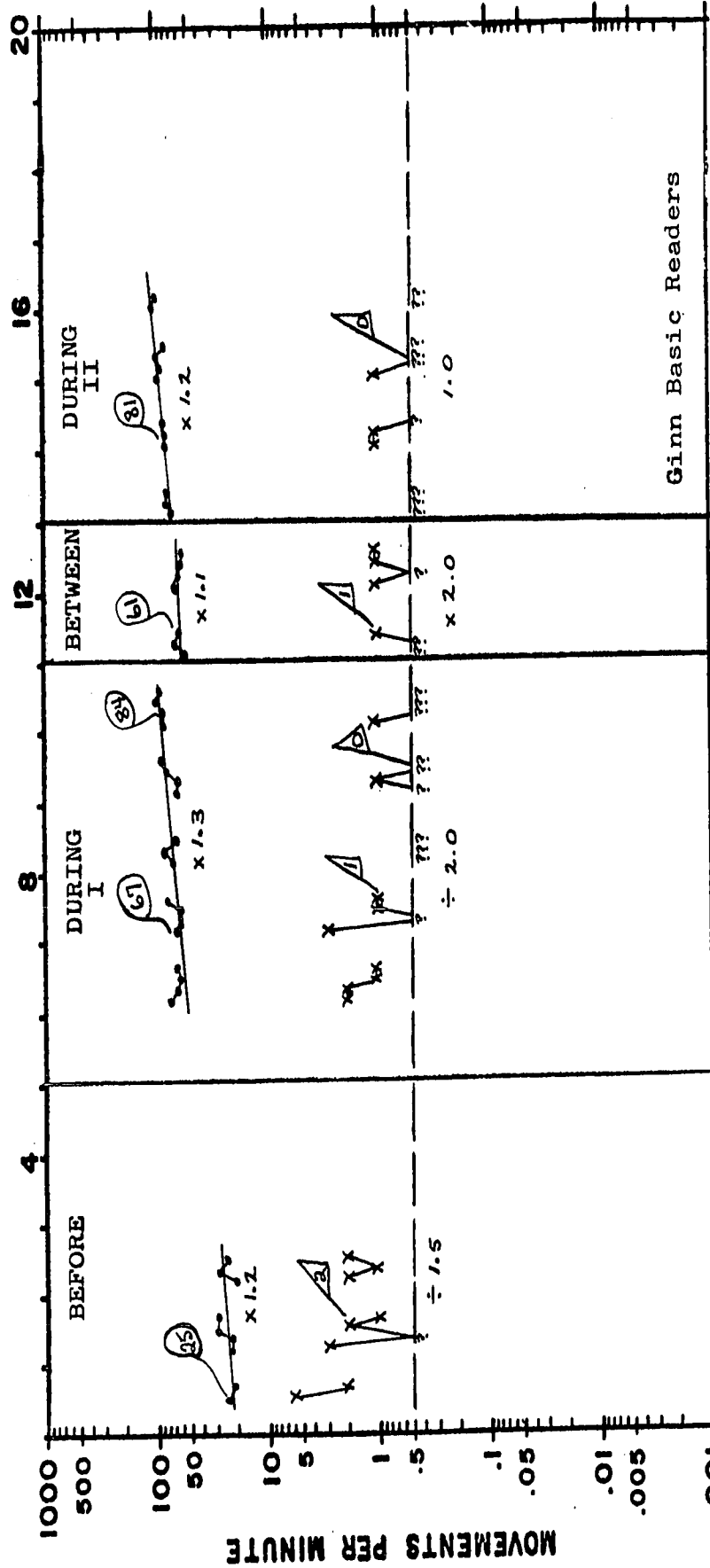
CALENDAR WEEKS



CALENDAR WEEKS



CALENDAR WEEKS



Crozier al Perry Danny
Supervisor Adviser Manager

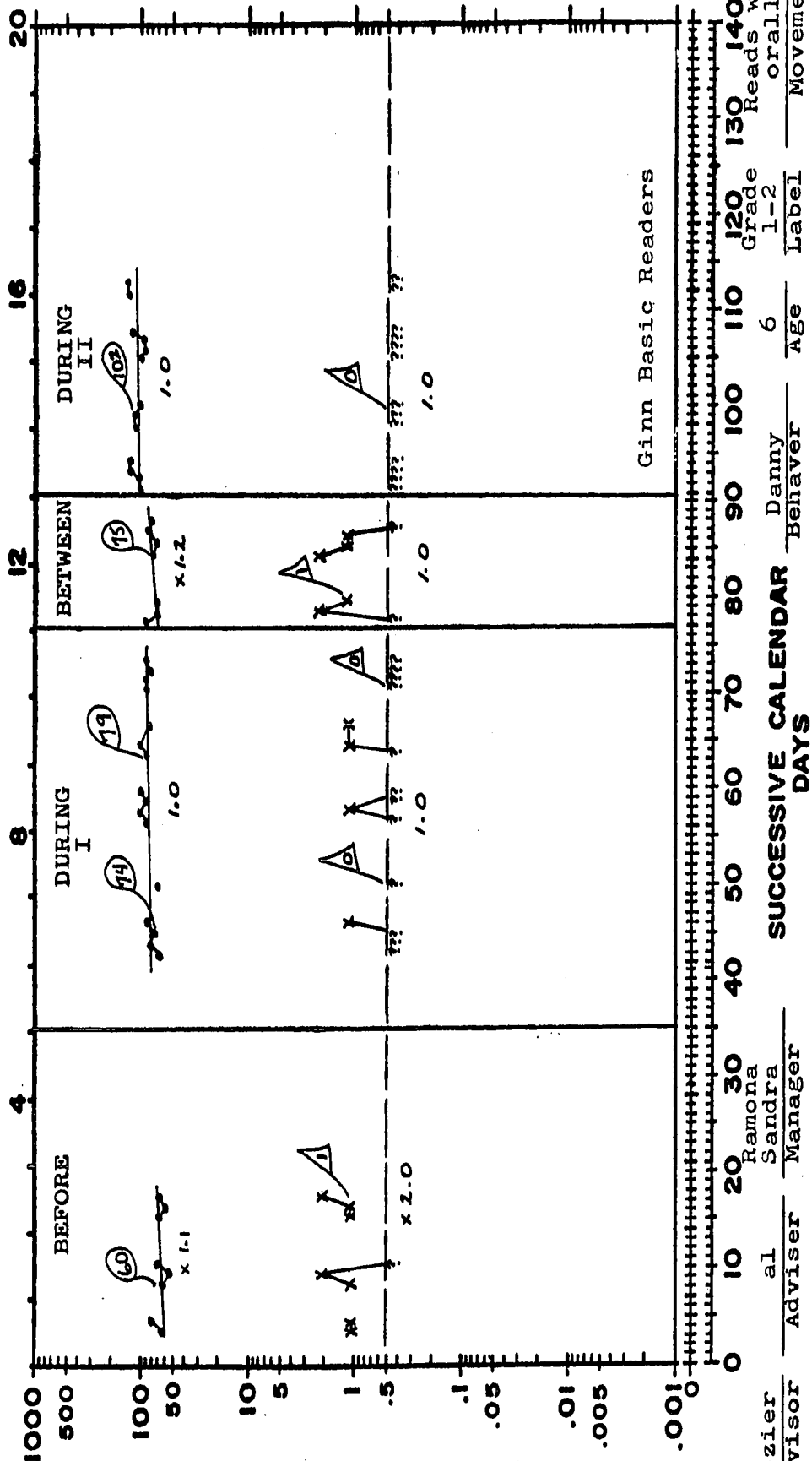
SUCCESSIVE CALENDAR DAYS

Bruce Behavior Age 7

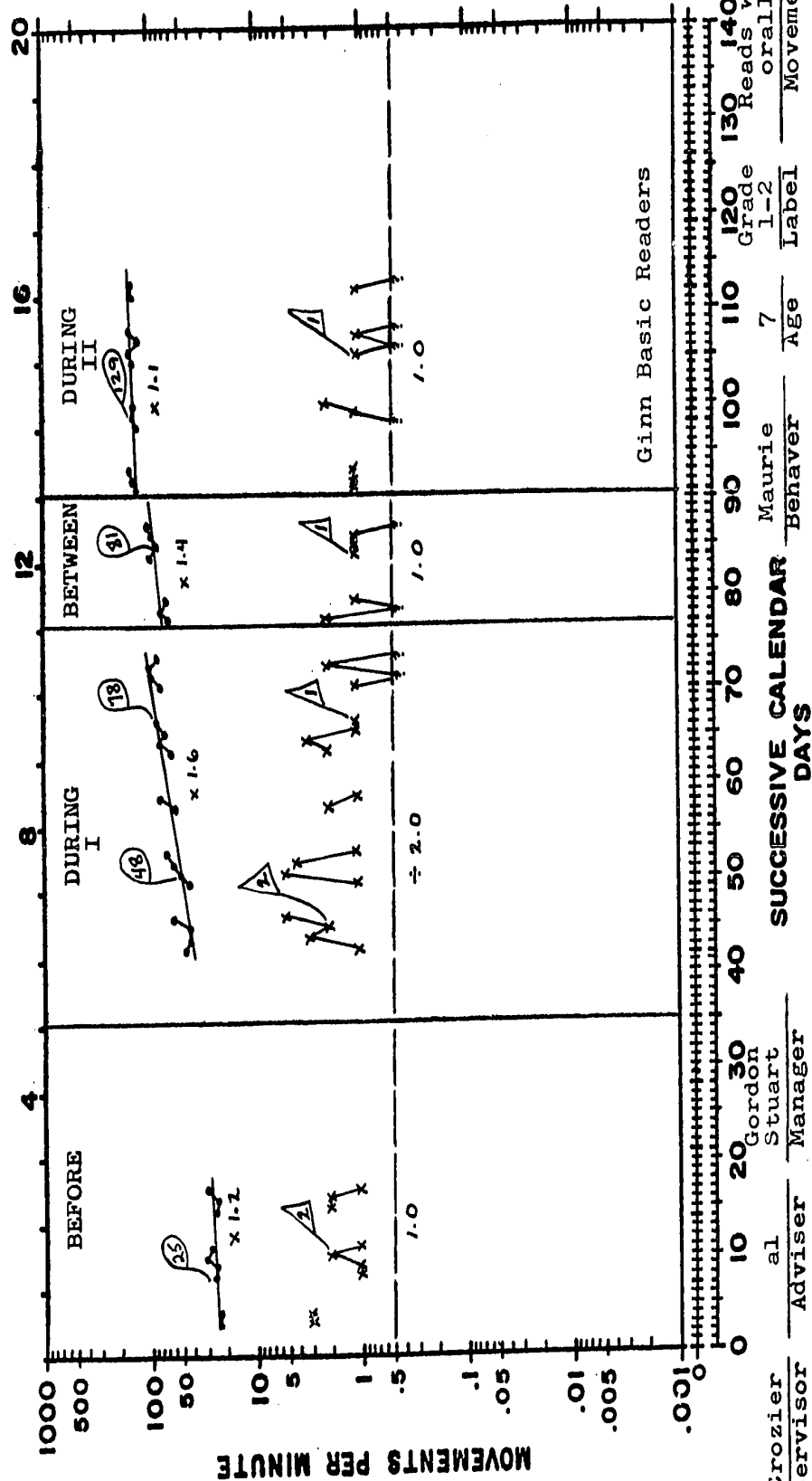
Grade 1-2 Label

Reads words orally Movement

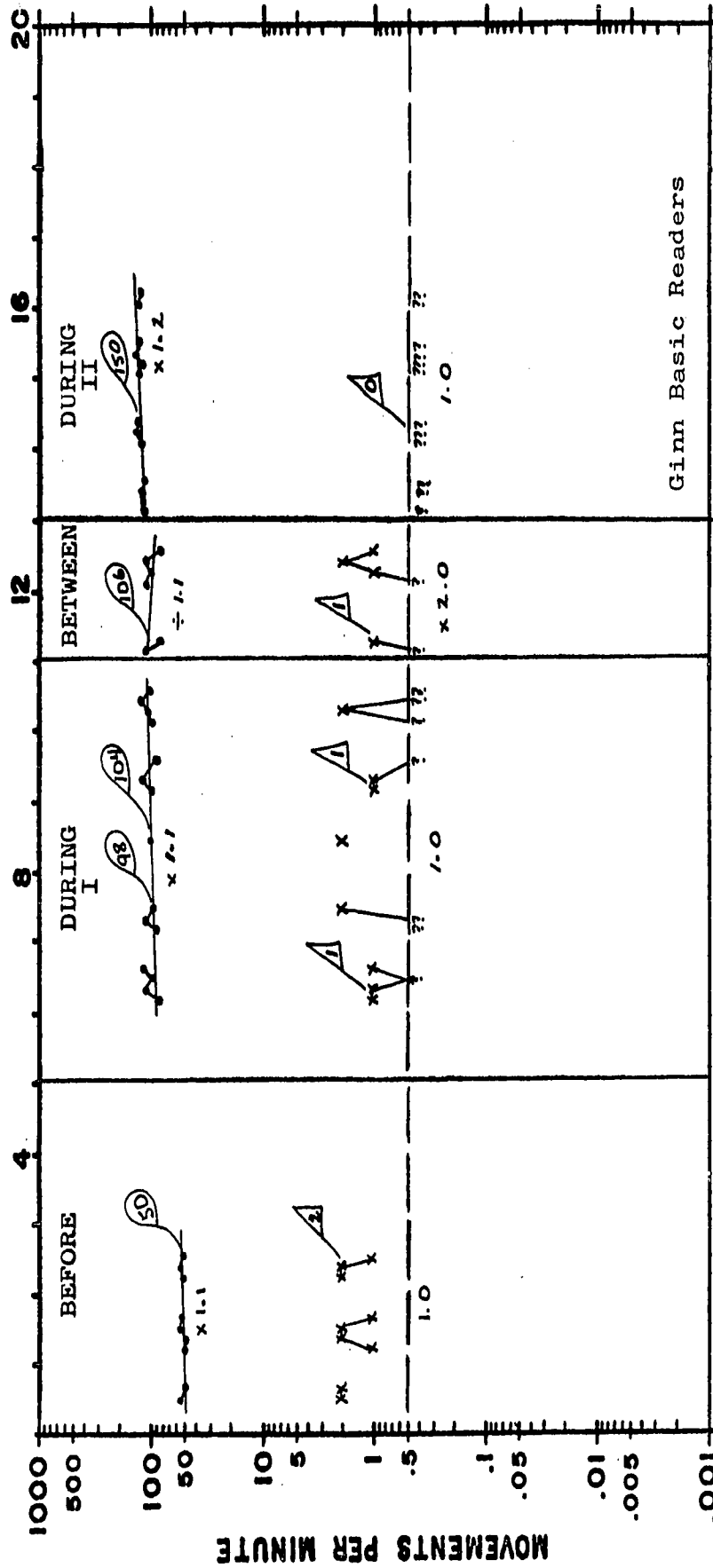
MOVEMENTS PER MINUTE



CALENDAR WEEKS

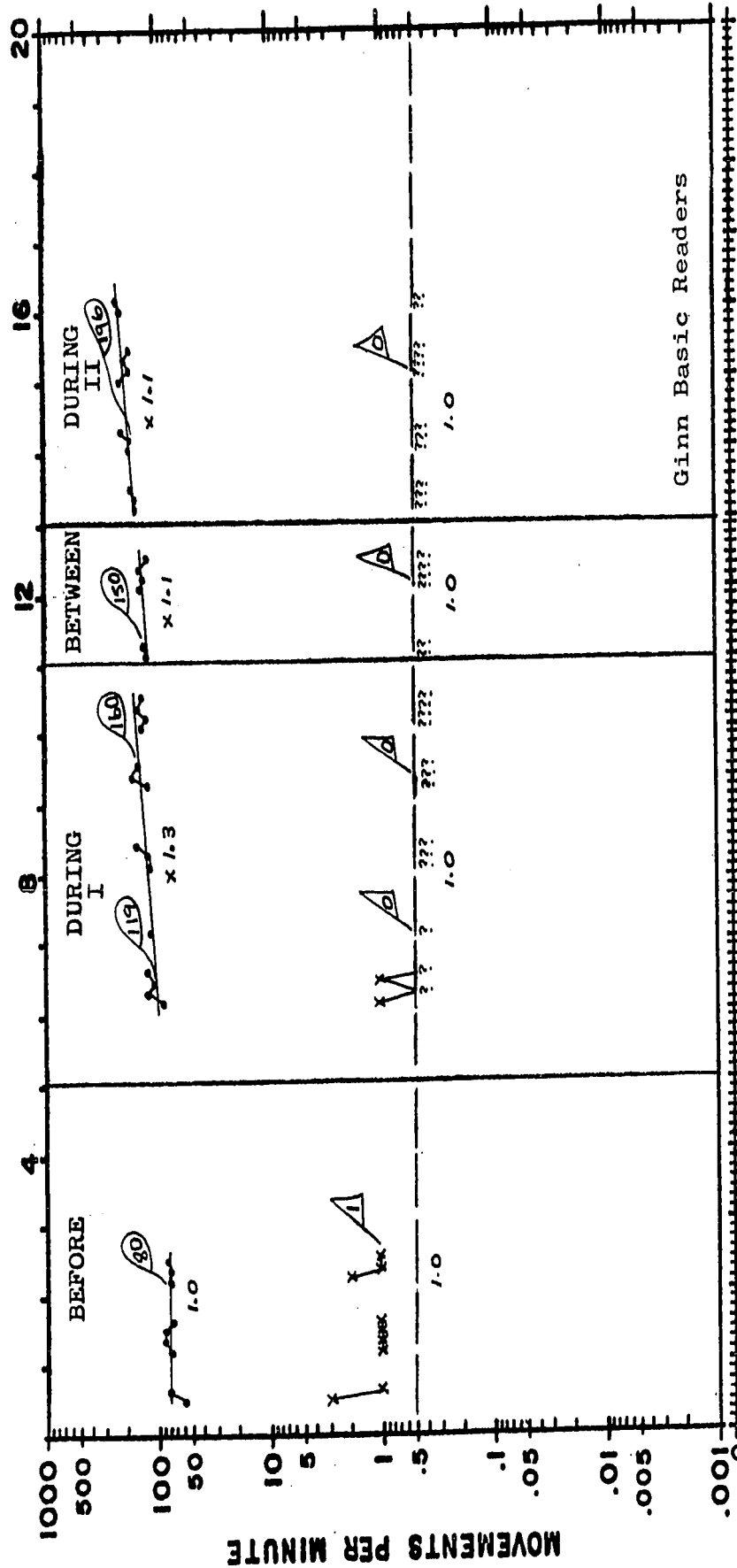


CALENDAR WEEKS

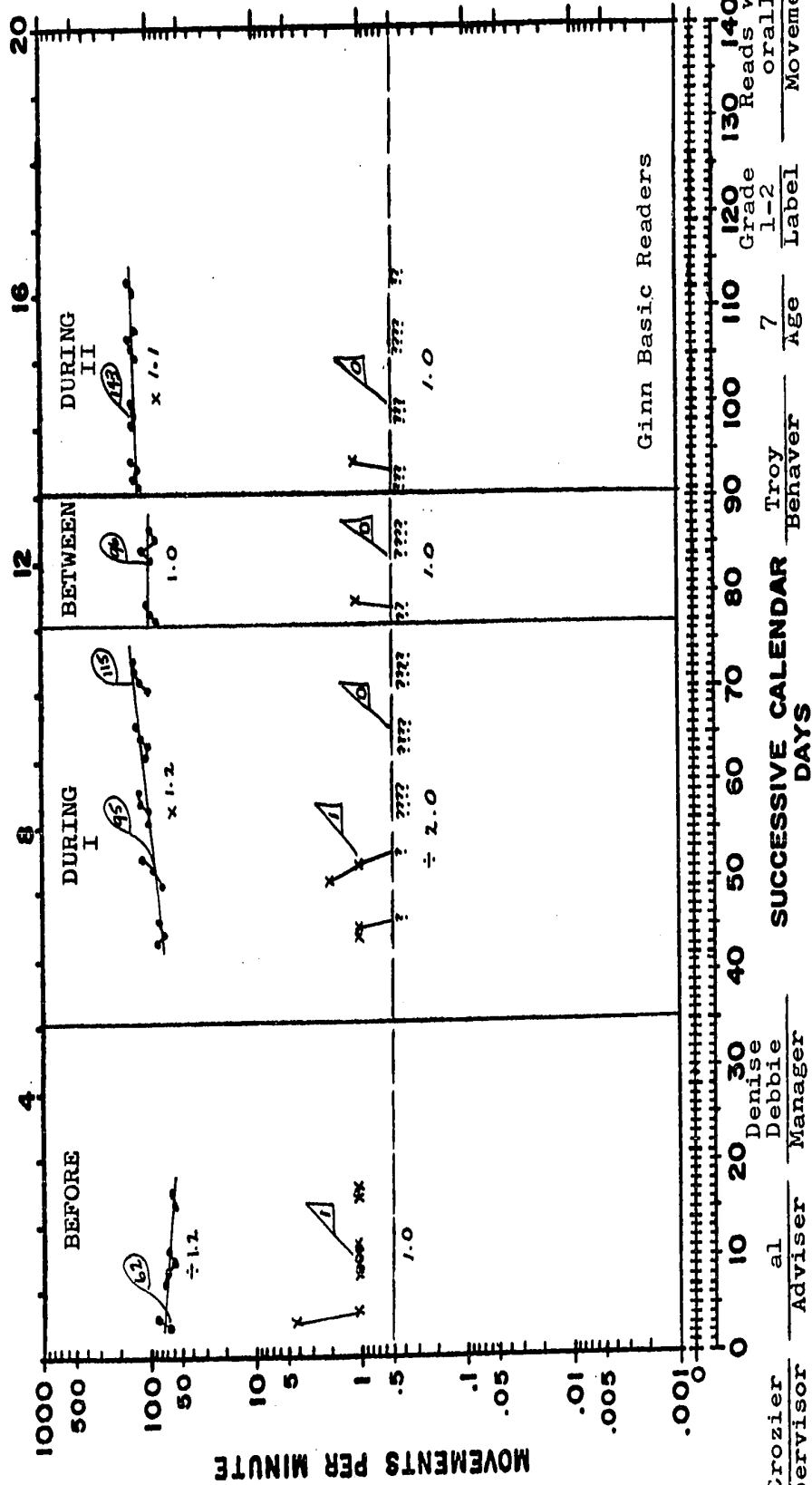


Crozier al
 Supervisor Adviser
 Duane Scott
 Manager
 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
 SUCCESSIVE CALENDAR DAYS
 Clint Behavior Age 7
 Grade 1-2 Label
 Reads words orally Movement

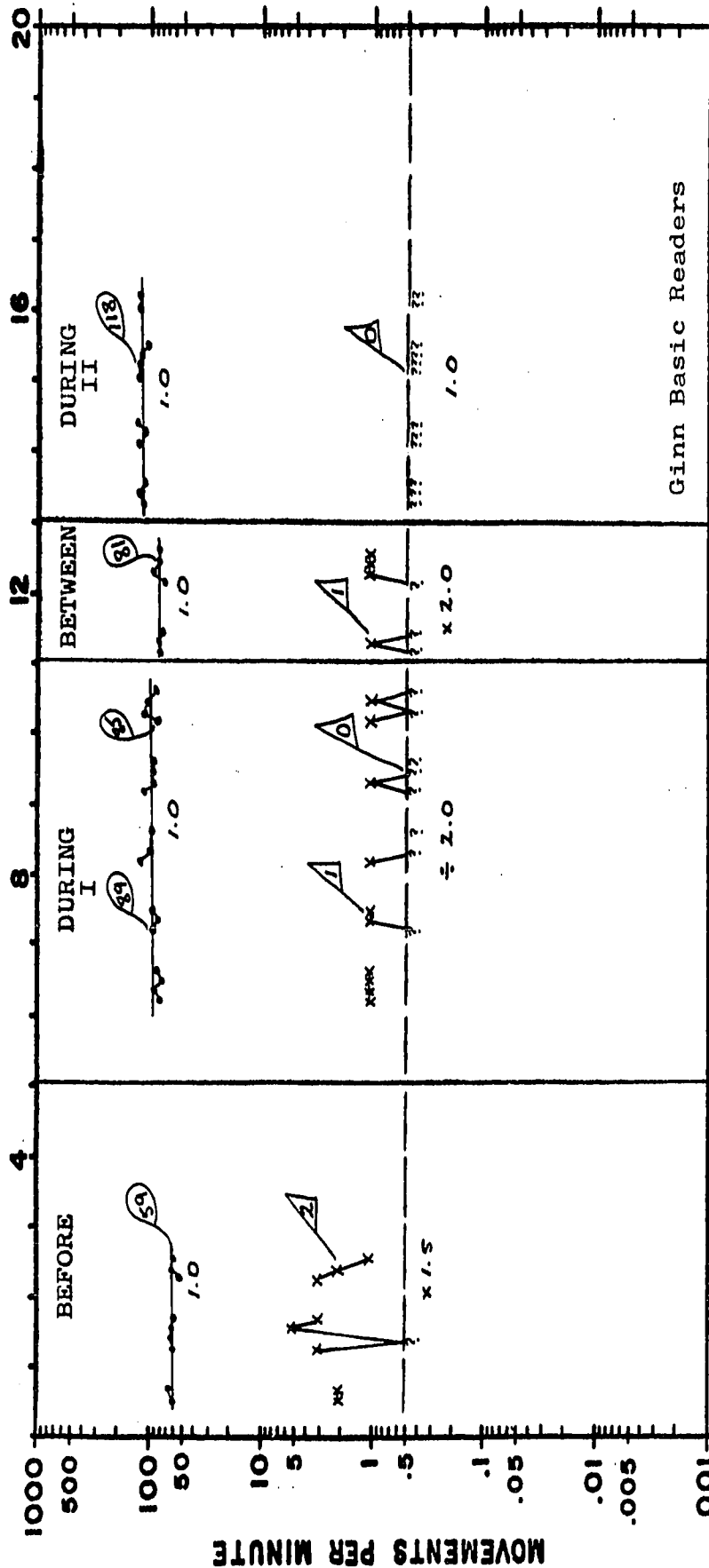
CALENDAR WEEKS



CALENDAR WEEKS



CALENDAR WEEKS



Crozier
Supervisor

al
Adviser

Penny
Gloria
Manager

SUCCESSIVE CALENDAR
DAYS

Carol
Behavior

Age 6

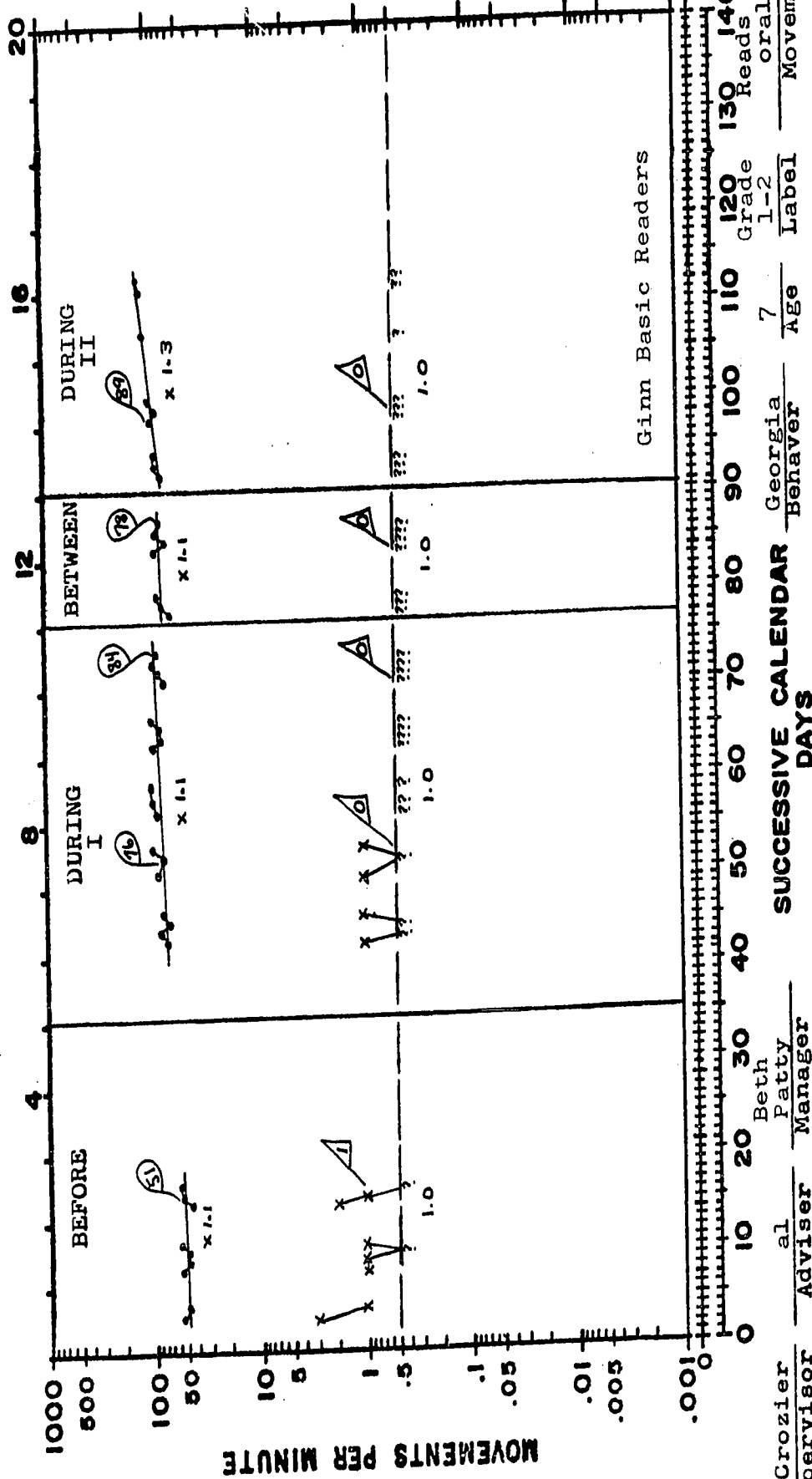
Grade 1-2

Label

Reads words orally

Movement

CALENDAR WEEKS



Crozier
Supervisor

al
Adviser

Beth
Patty
Manager

SUCCESSIVE CALENDAR
DAYS

Georgia
Behaver

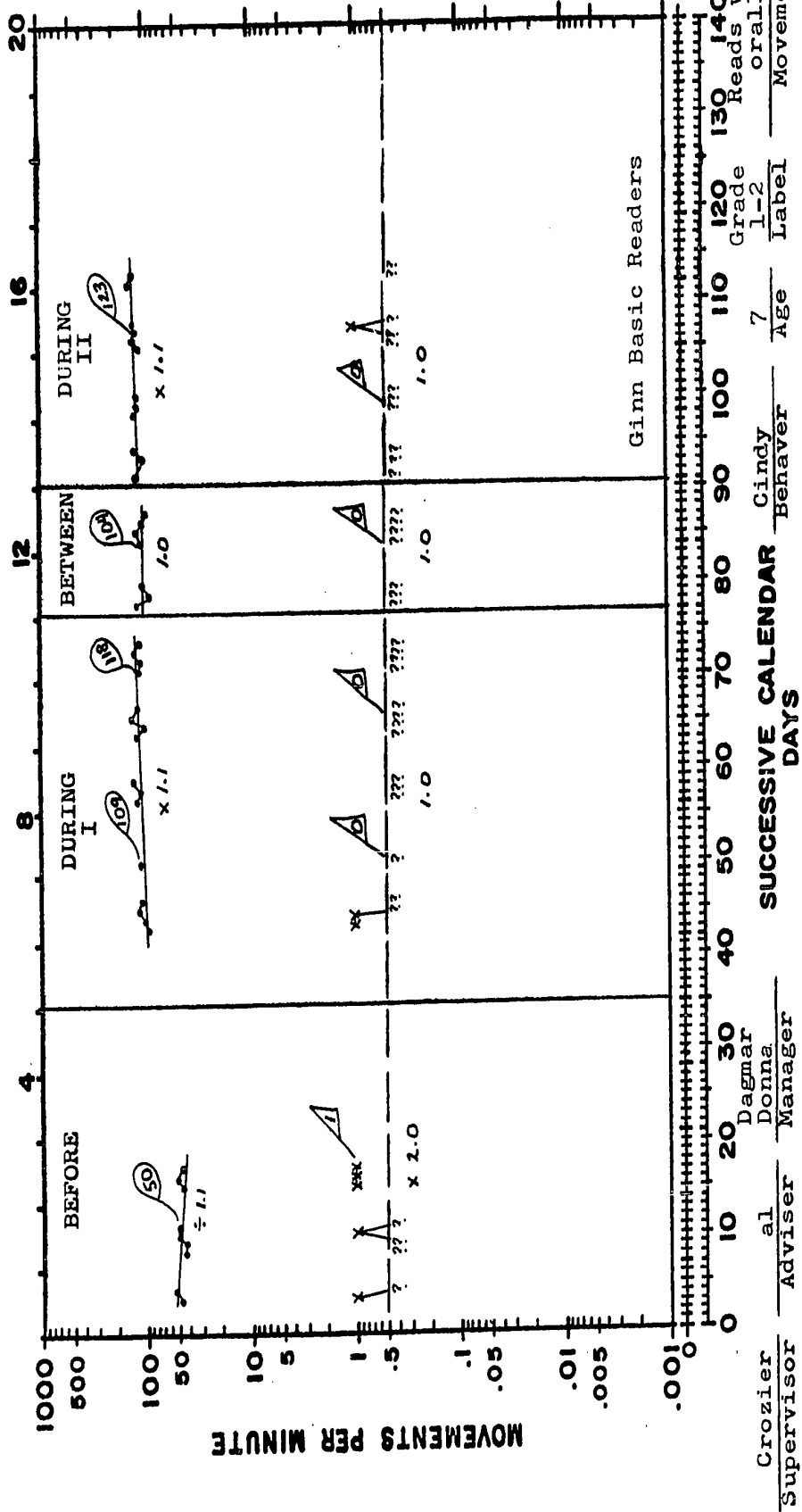
7
Age

1-2
Label

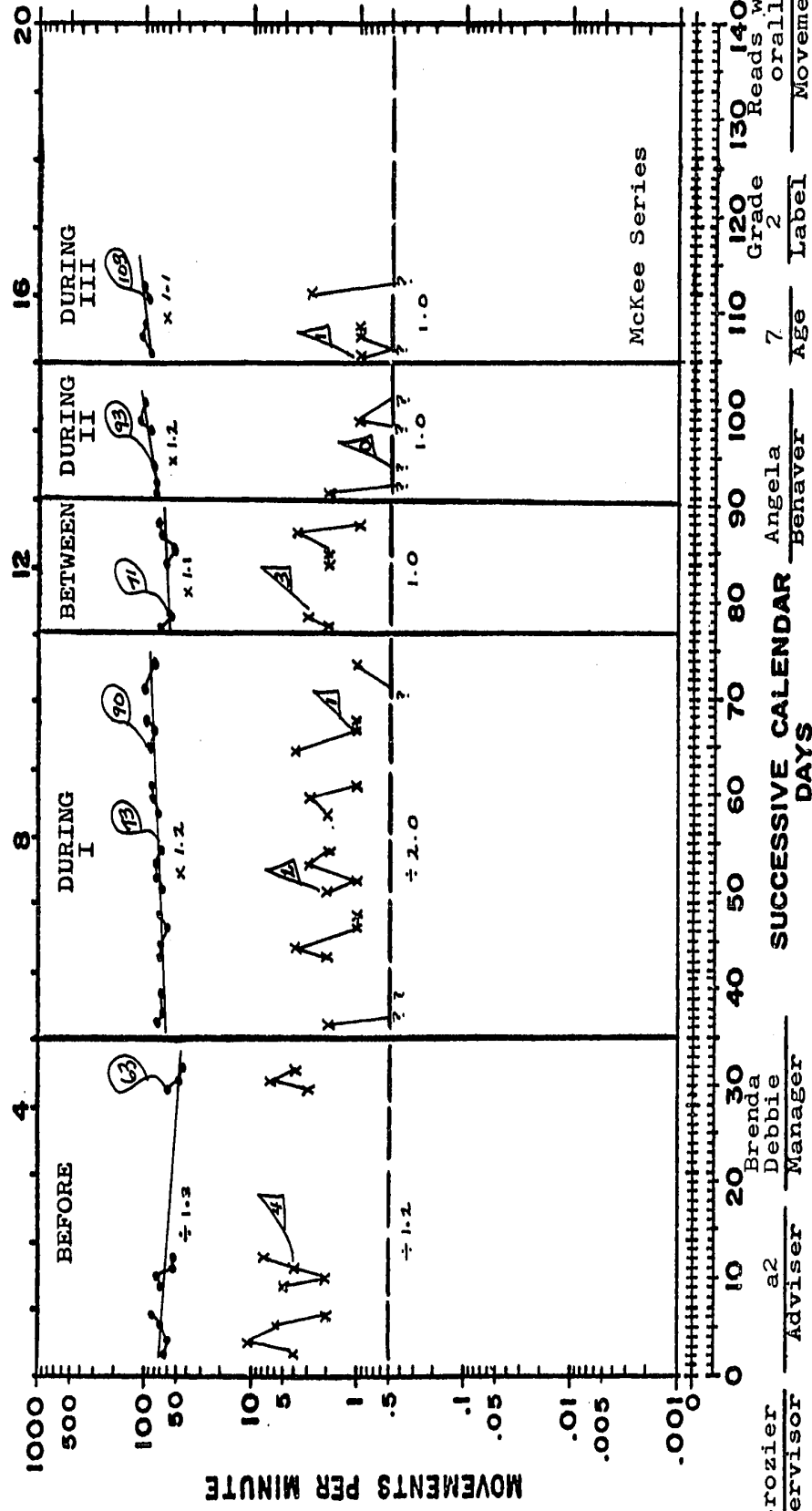
130
Reads words orally

140
Movement

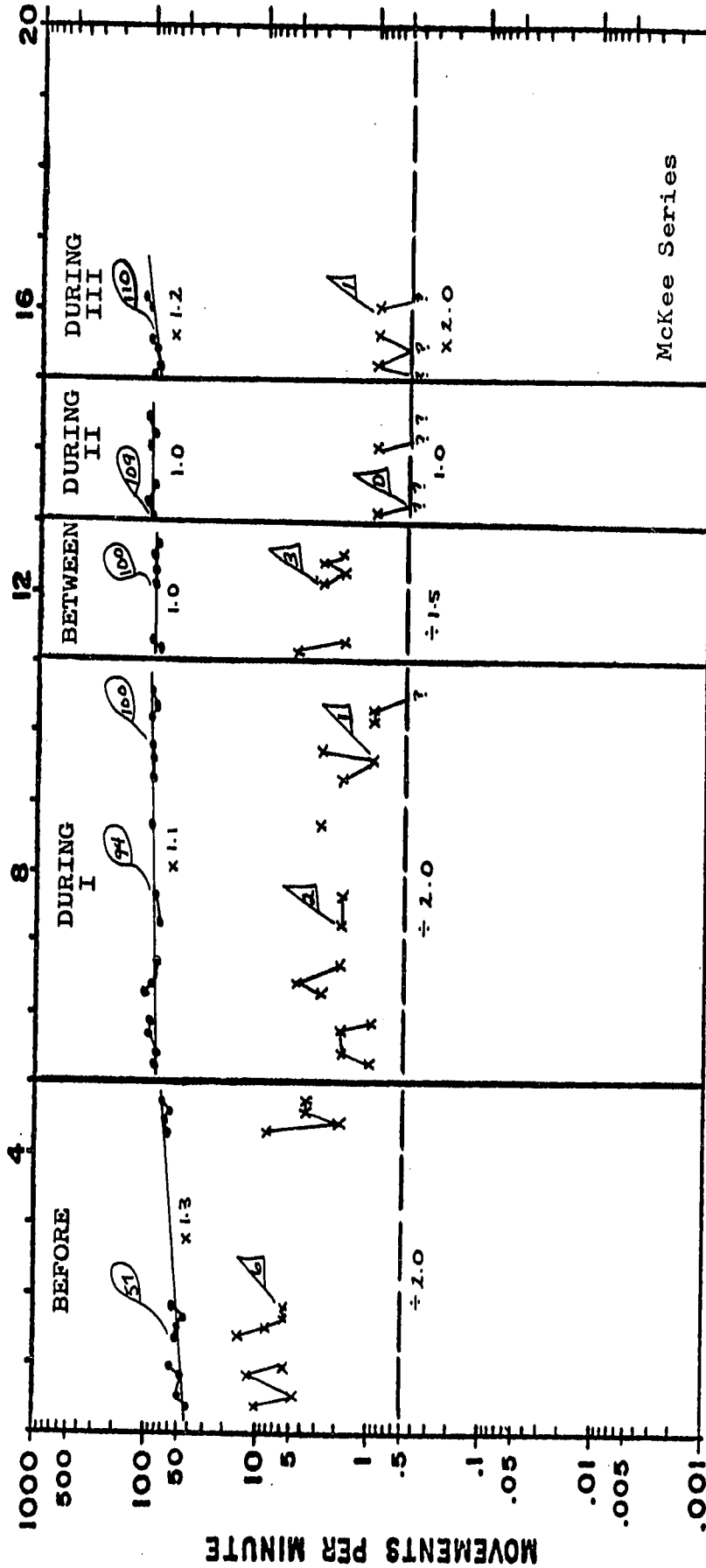
CALENDAR WEEKS



CALENDAR WEEKS

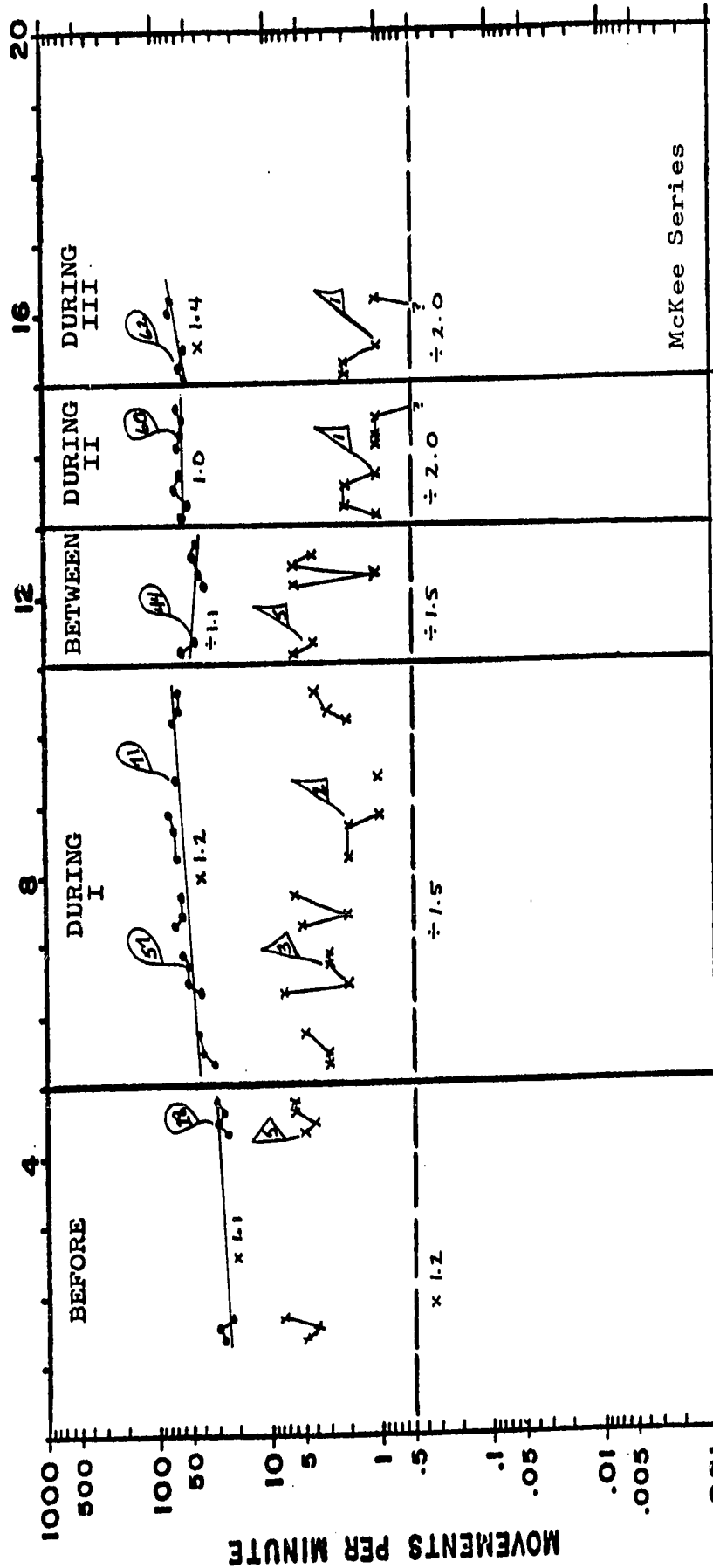


CALENDAR WEEKS



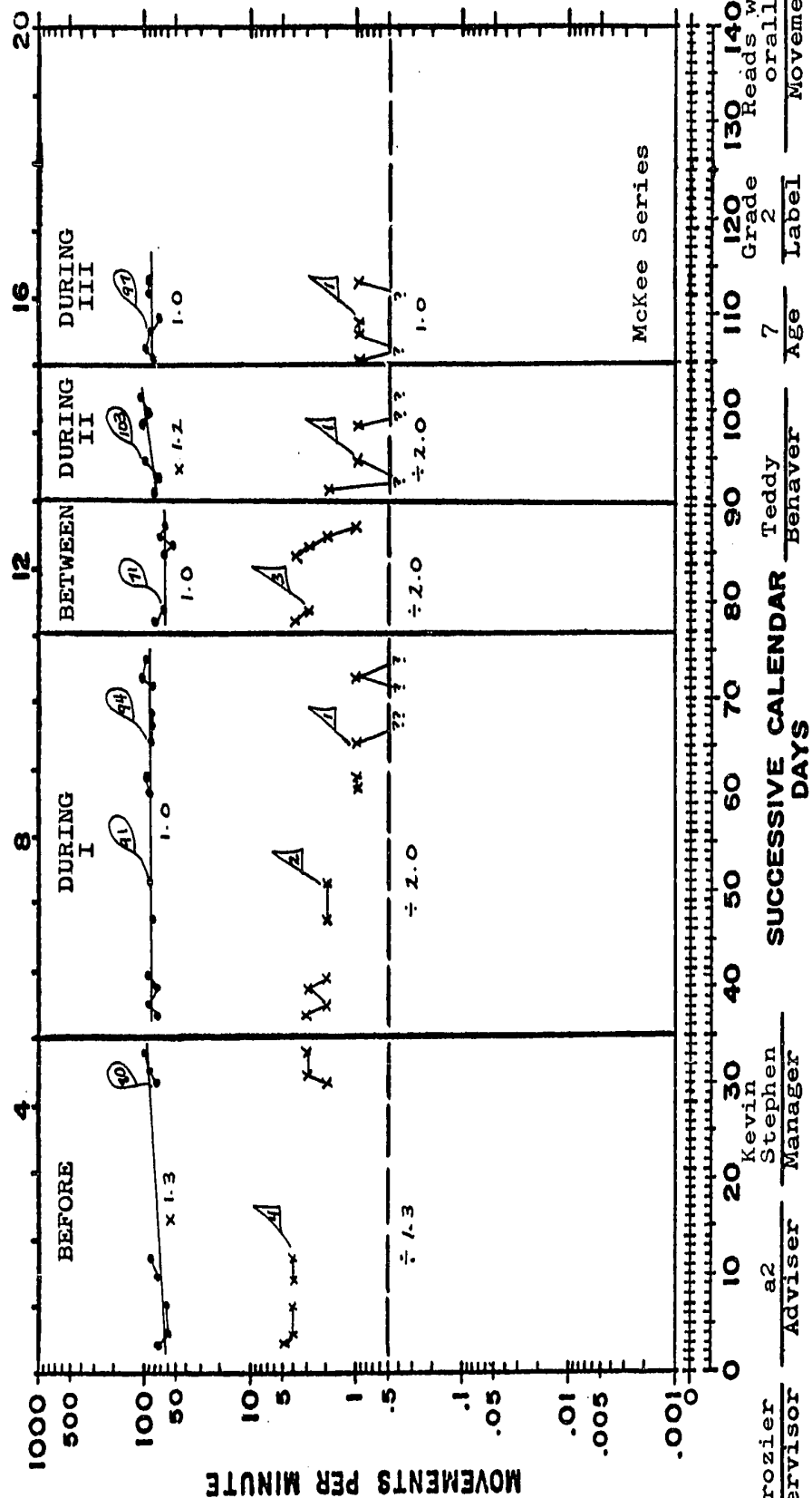
Crozier
 Supervisor a2
 Adviser Tim
 Manager Kevin
 Behavior Kevin
 Age 8
 Grade 2
 Label 120
 Reads orally 130
 Words orally 140
 Movement 156

CALENDAR WEEKS

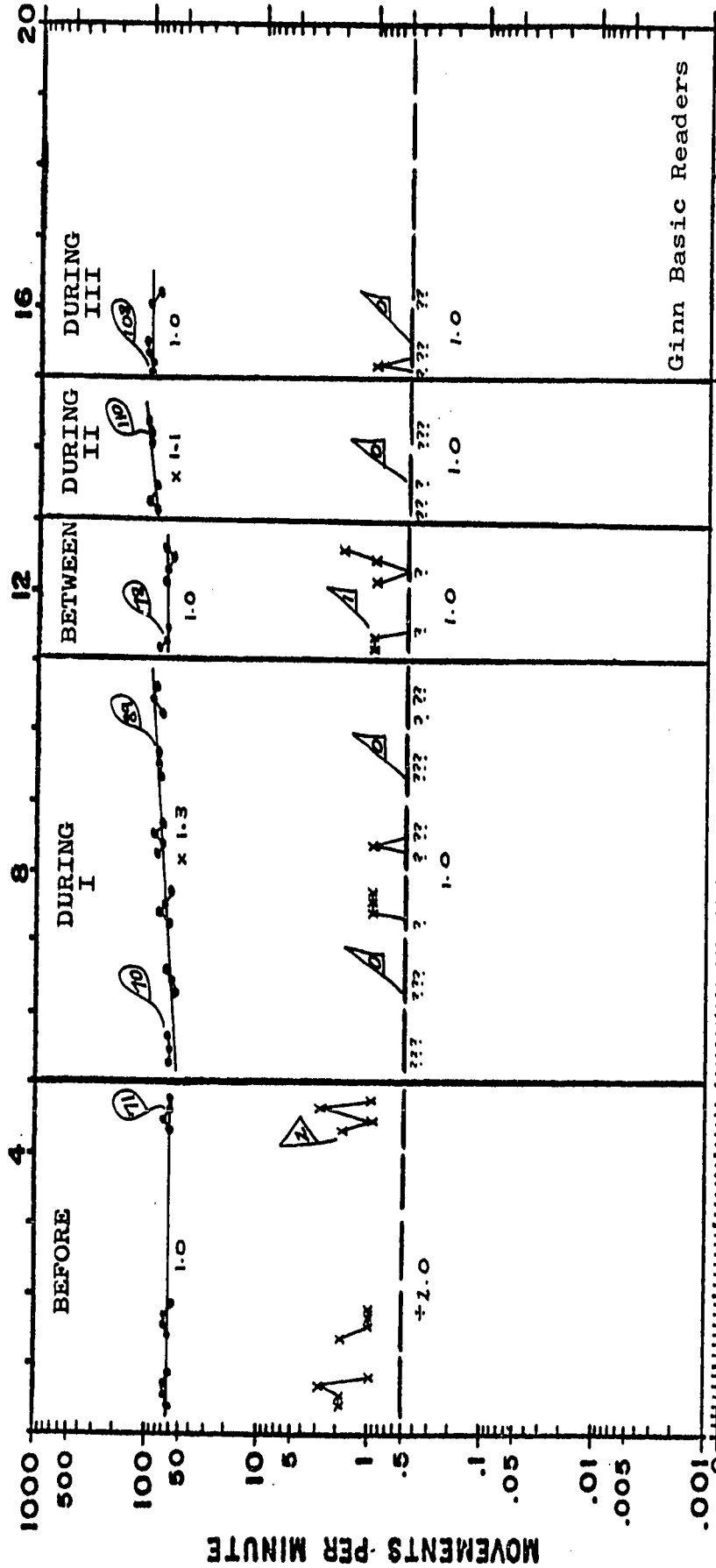


Crozier Supervisor a2 Adviser Manager Gordon Archie
 Dwayne Behavior
 7 Age
 2 Grade
 120 130 140 Reads words orally Movement
 SUCCESSIVE CALENDAR DAYS

CALENDAR WEEKS

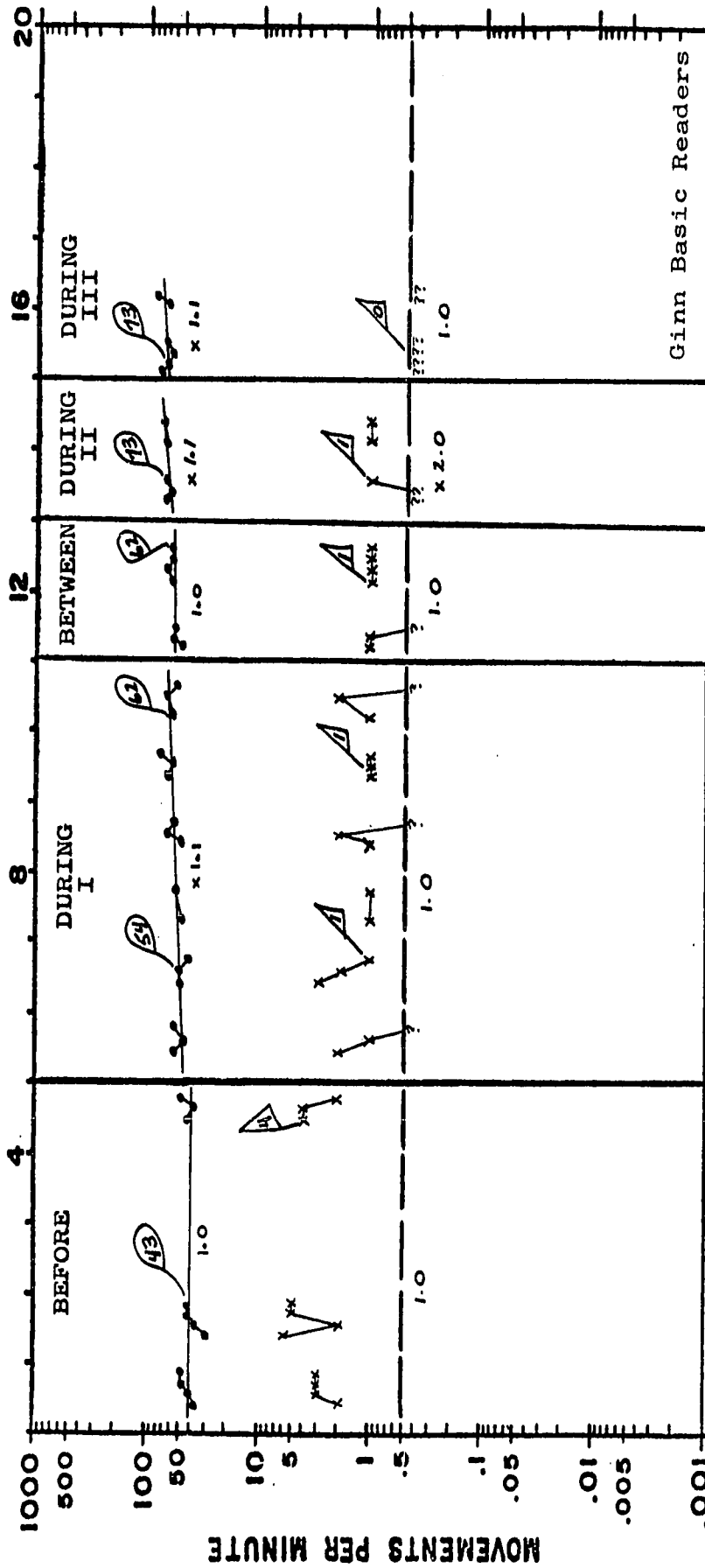


CALENDAR WEEKS



Crozier
 Supervisor a3
 Bobby Dale
 Manager
 10 20 30 40 50 60 70 80 90 100 110 120 130 140
 Days
 Jeff
 Behavior
 Age 7
 Grade 2
 Reads words orally
 Movement

CALENDAR WEEKS



Supervisor

Adviser a3 Evelyn Gordon Manager

SUCCESSIVE CALENDAR DAYS

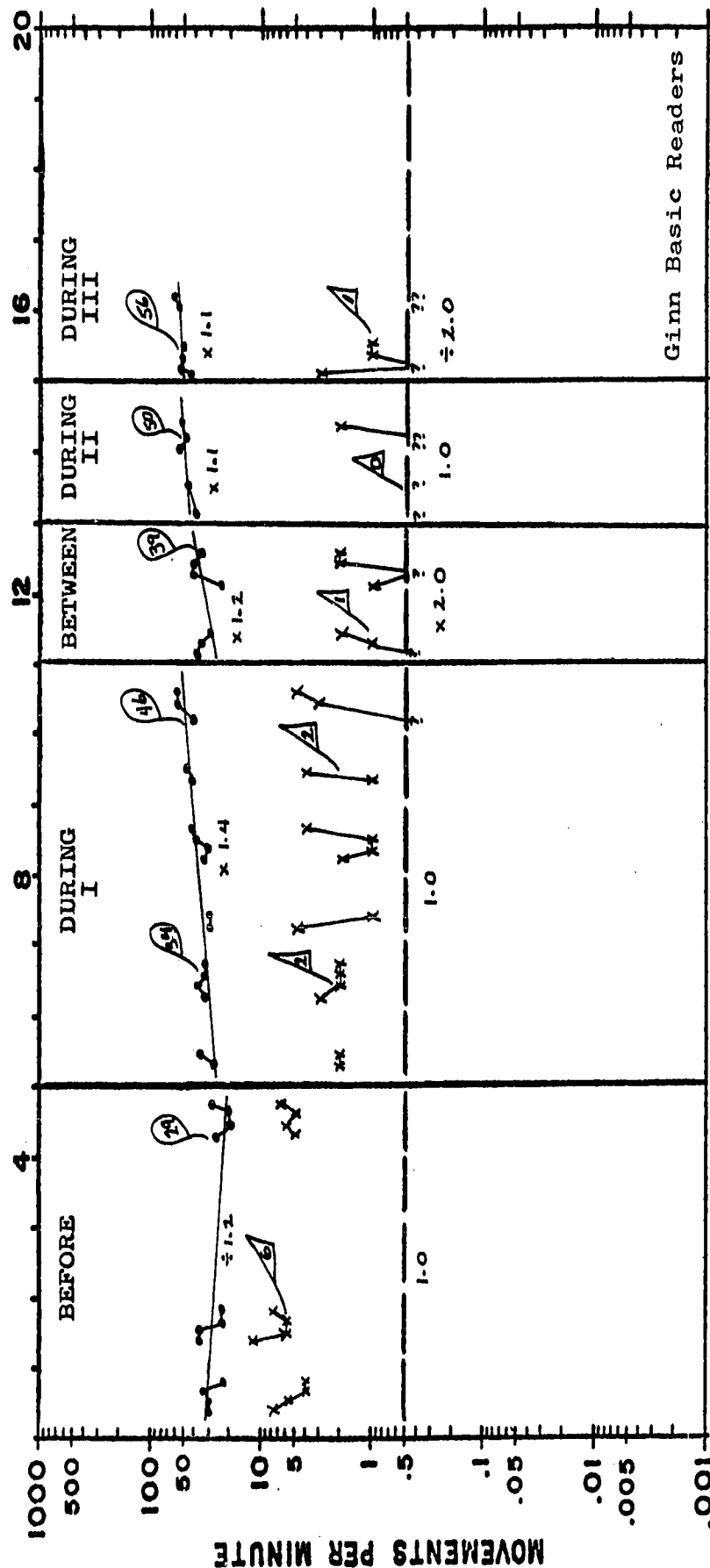
Age 8

Grade 2

Label

Reads words orally Movement

CALENDAR WEEKS



Ginn Basic Readers

161

Crozier
Supervisor

Advise a3

Edwin
Greg
Manager

SUCCESSIVE CALENDAR DAYS

Richard
Benaver

Age 7

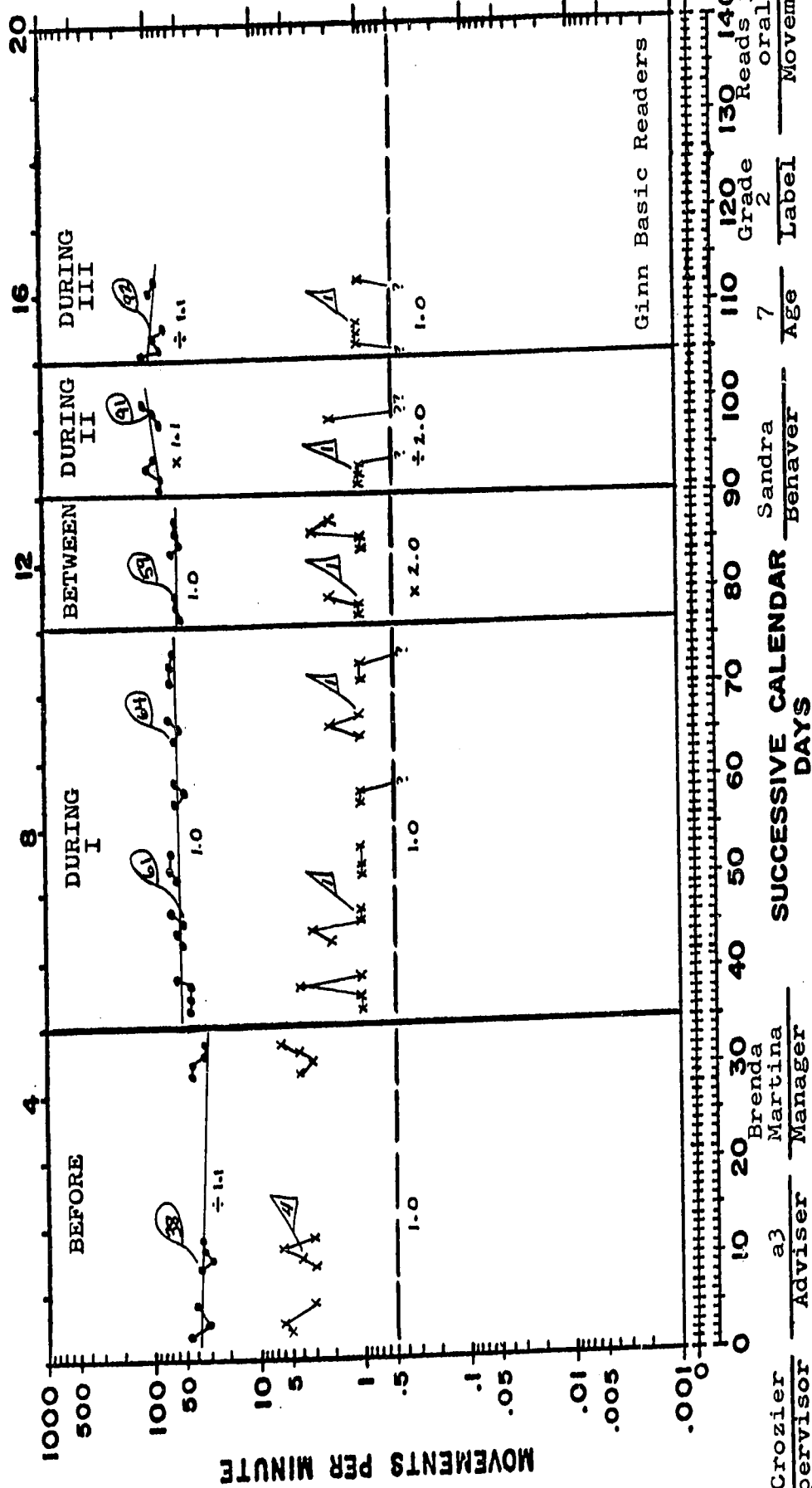
Grade 2

Label

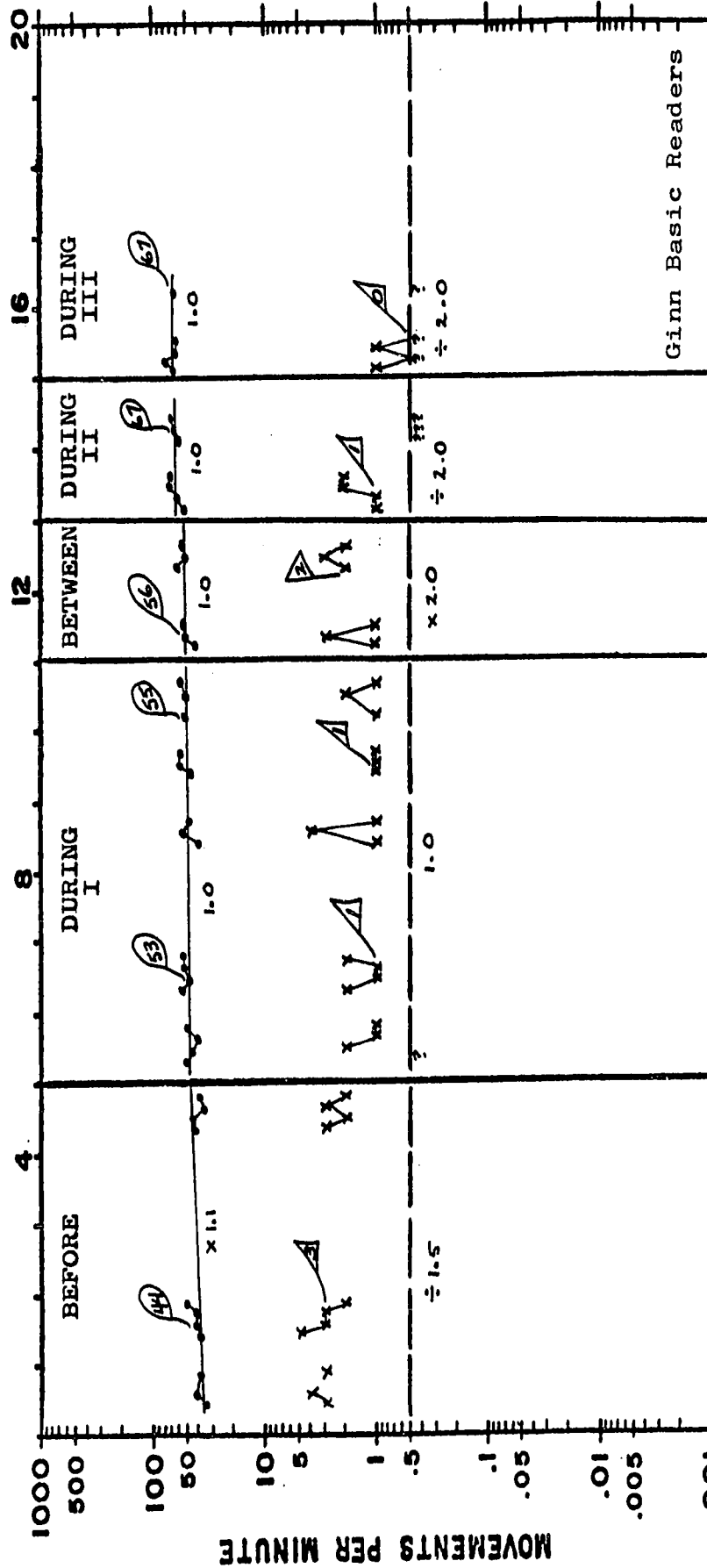
Reads words orally

Movement

CALENDAR WEEKS



CALENDAR WEEKS



Reads words orally

Grade 2

Age 8

Bradley Behavior

Calendar

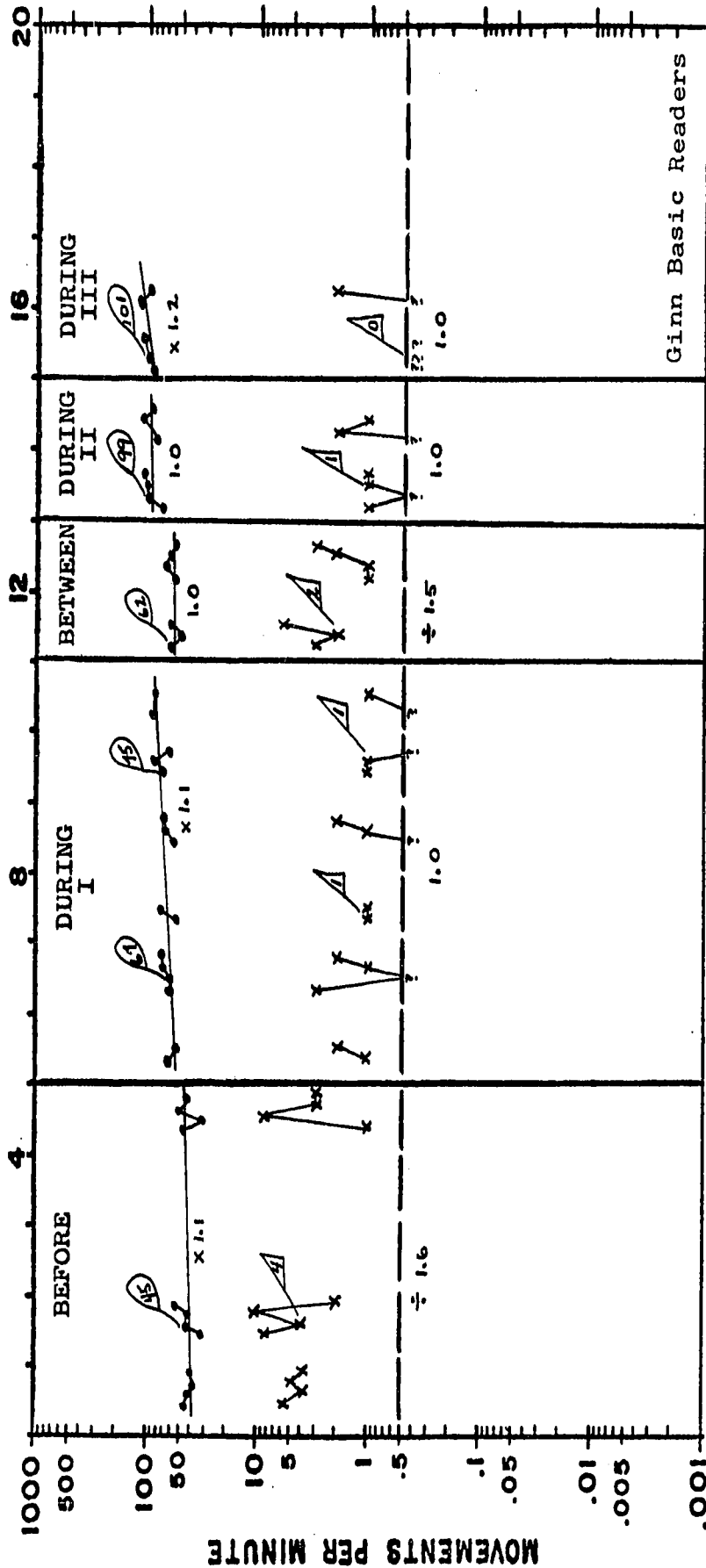
SUCCESSIVE CALENDAR DAYS

Harry Brent Manager

a3 Adviser

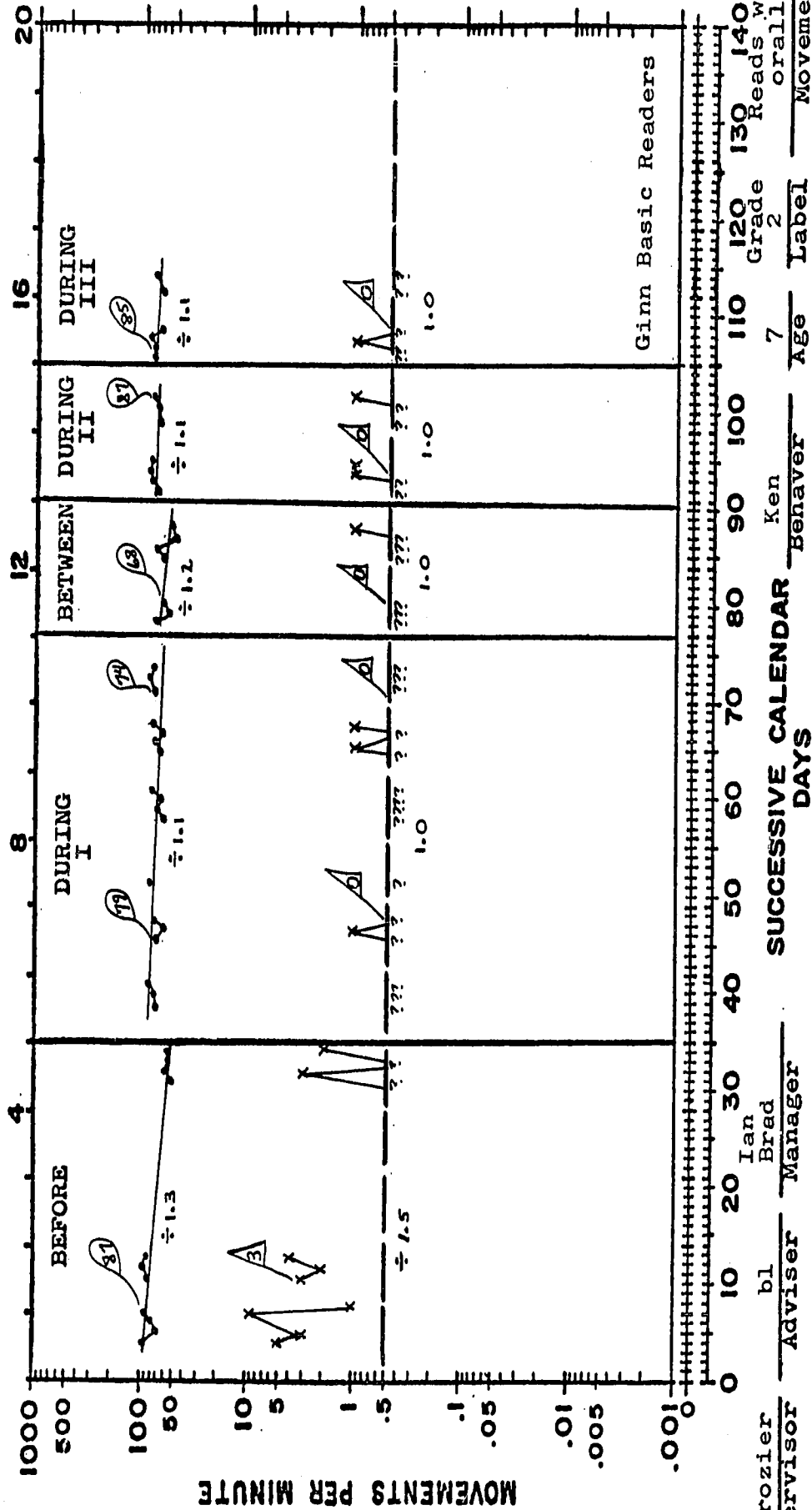
Crozier Supervisor

CALENDAR WEEKS

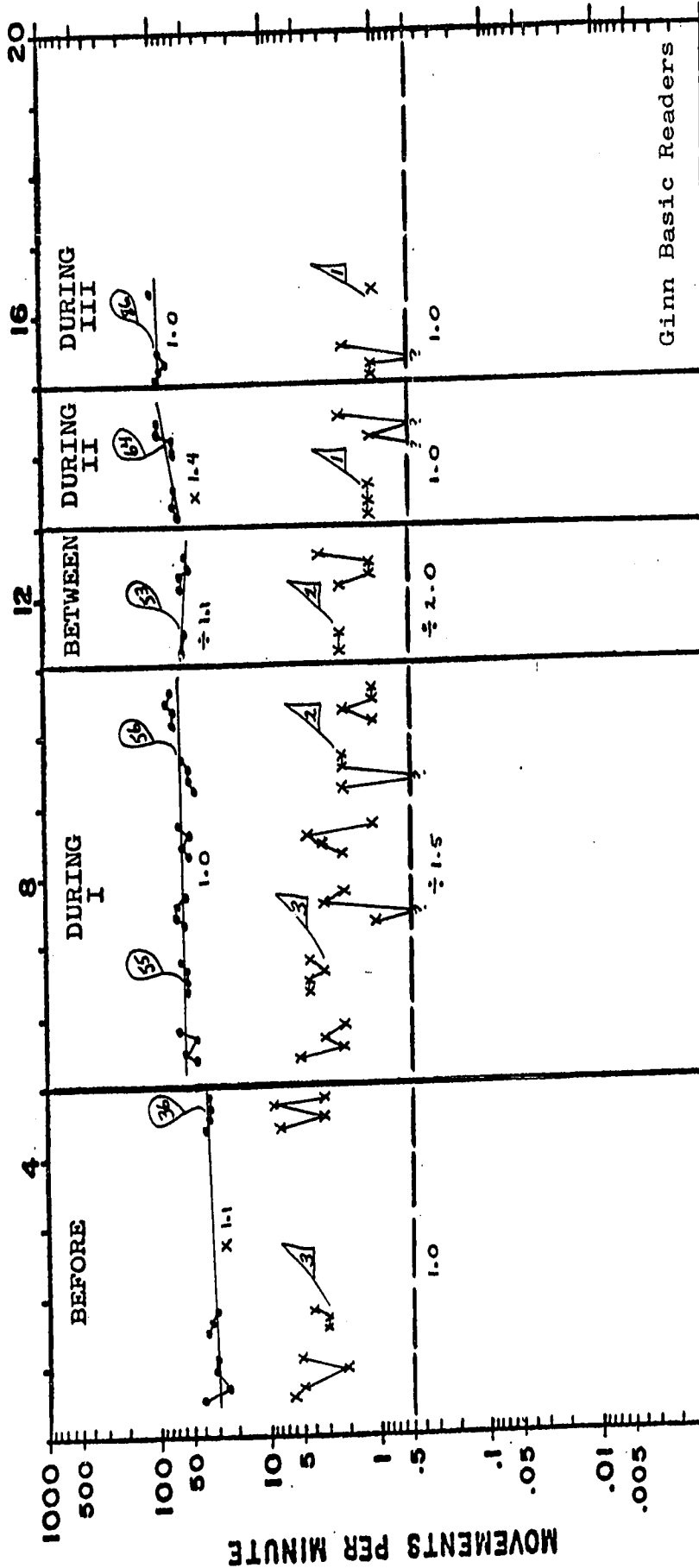


Supervisor Crozier a3 ADVISER Ron MANAGER Brent SUCCESSIVE CALENDAR DAYS Wayne Benaver Age 8 Grade 2 Label 120 130 140 Reads words orally Movement

CALENDAR WEEKS

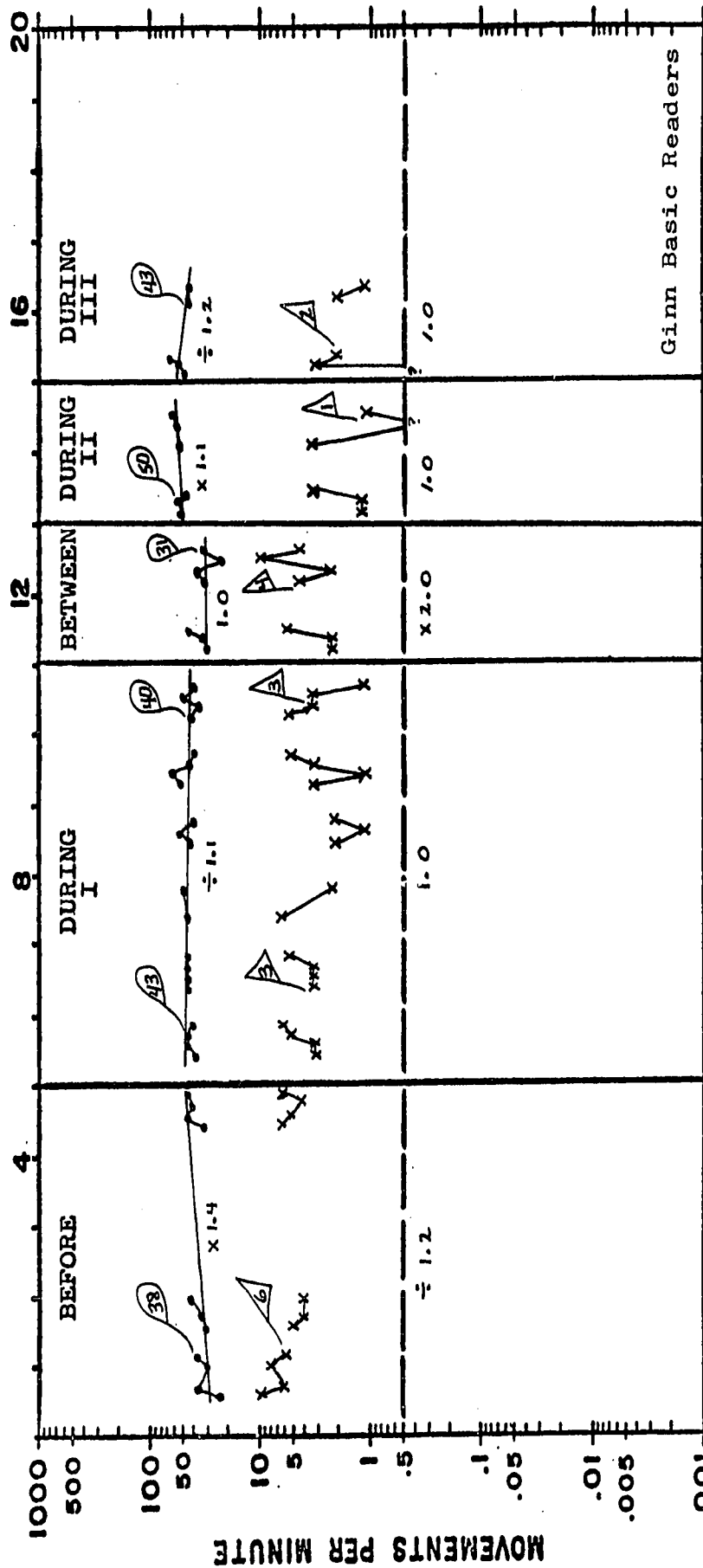


CALENDAR WEEKS



Crozier	bl	Susan	Terry	110	120	130	140
Supervisor	Adviser	Manager	Behavior	Age	Grade	Reads words orally	Movement
				7	2		

CALENDAR WEEKS



167

Reads words orally

Grade 2

Age 7

Behavior Kevin

SUCCESSIVE CALENDAR DAYS

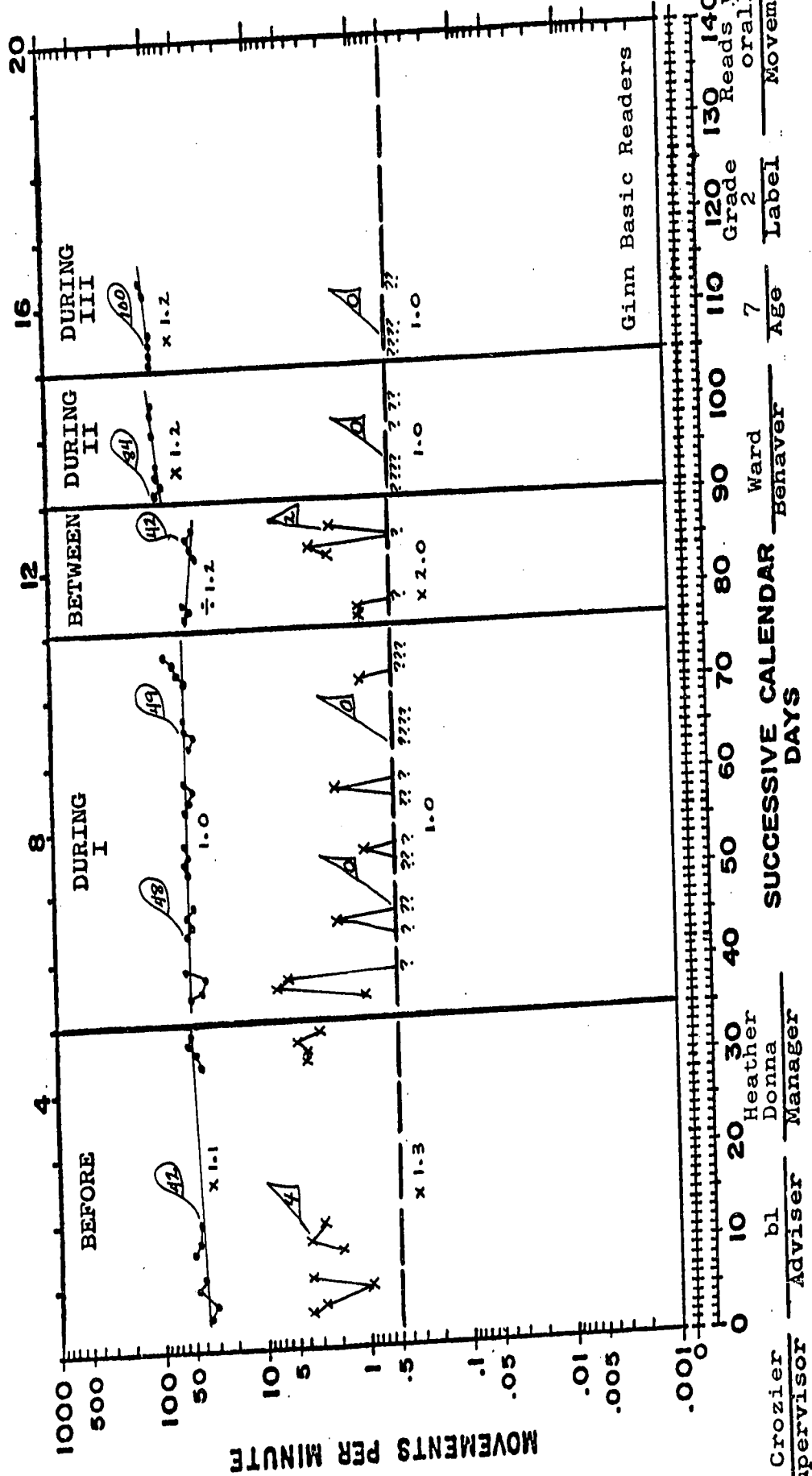
Supervisor

Adviser bl

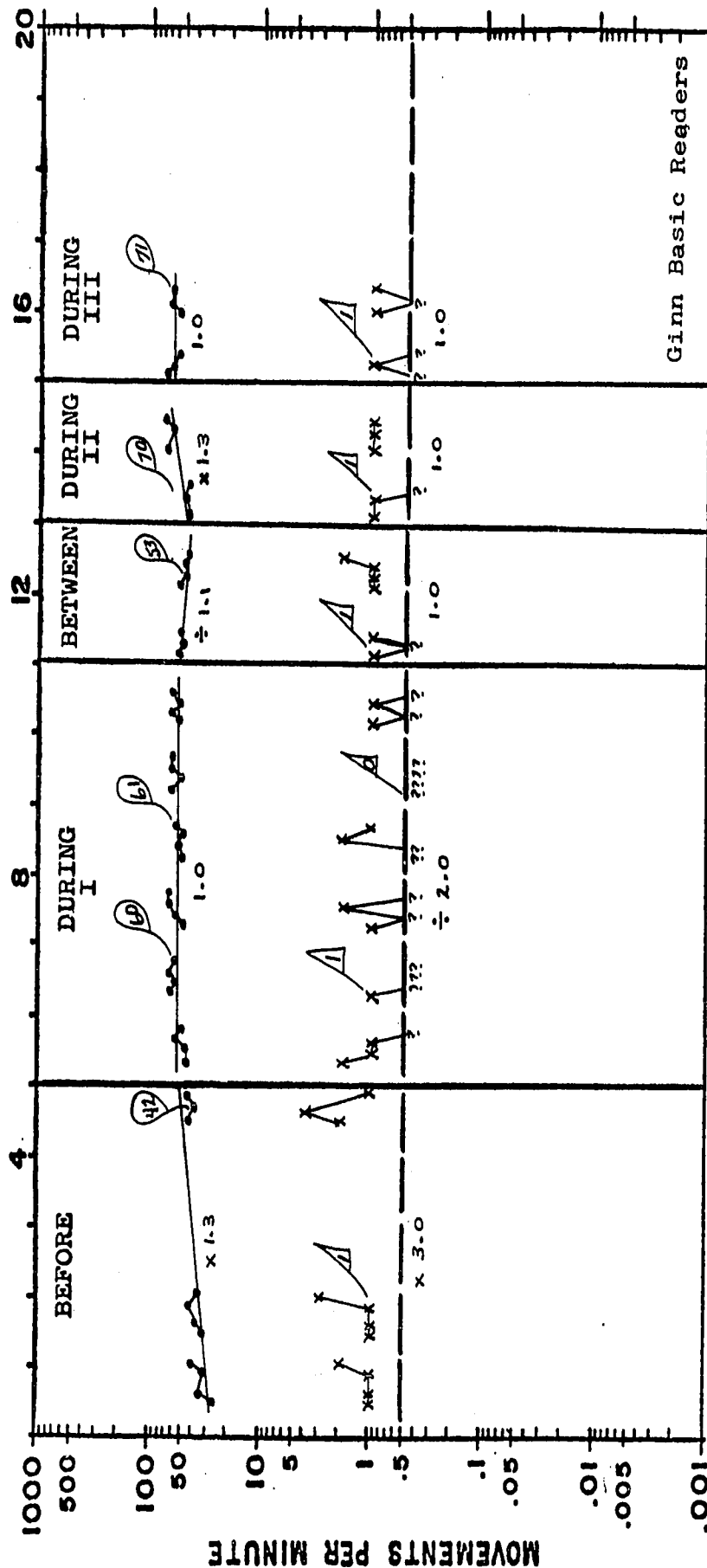
Manager Todd Walter

Supervisor

CALENDAR WEEKS



CALENDAR WEEKS



Crozier
Supervisor

bl
Adviser

Kim
Leslie
Manager

SUCCESSIVE CALENDAR
DAYS

Robin
Behavior

Age

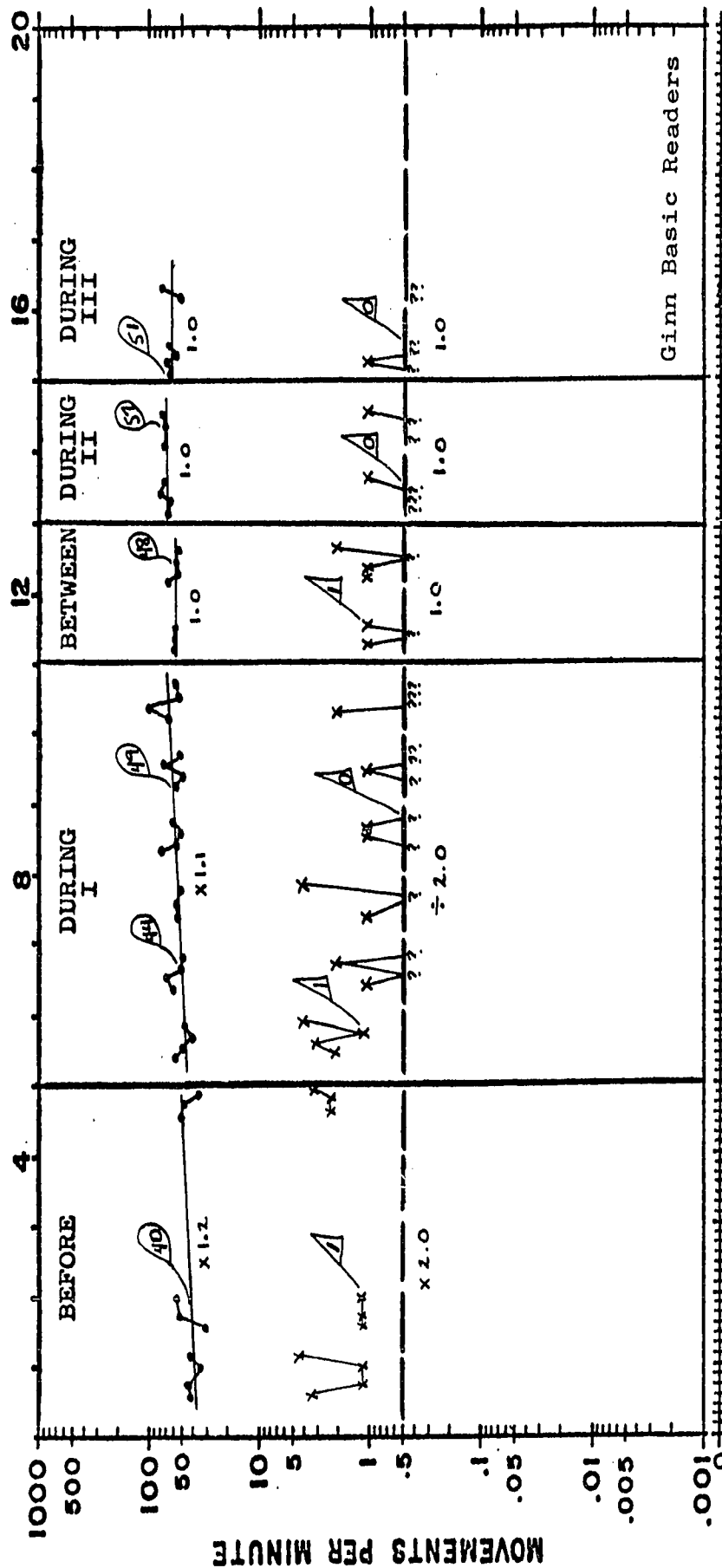
Grade
2

Label

Reads words
orally

169

CALENDAR WEEKS



Crozier
Supervisor

bl
Adviser

Heather
Dawn
Manager

SUCCESSIVE CALENDAR
DAYS

Kenny
Behaver

Age

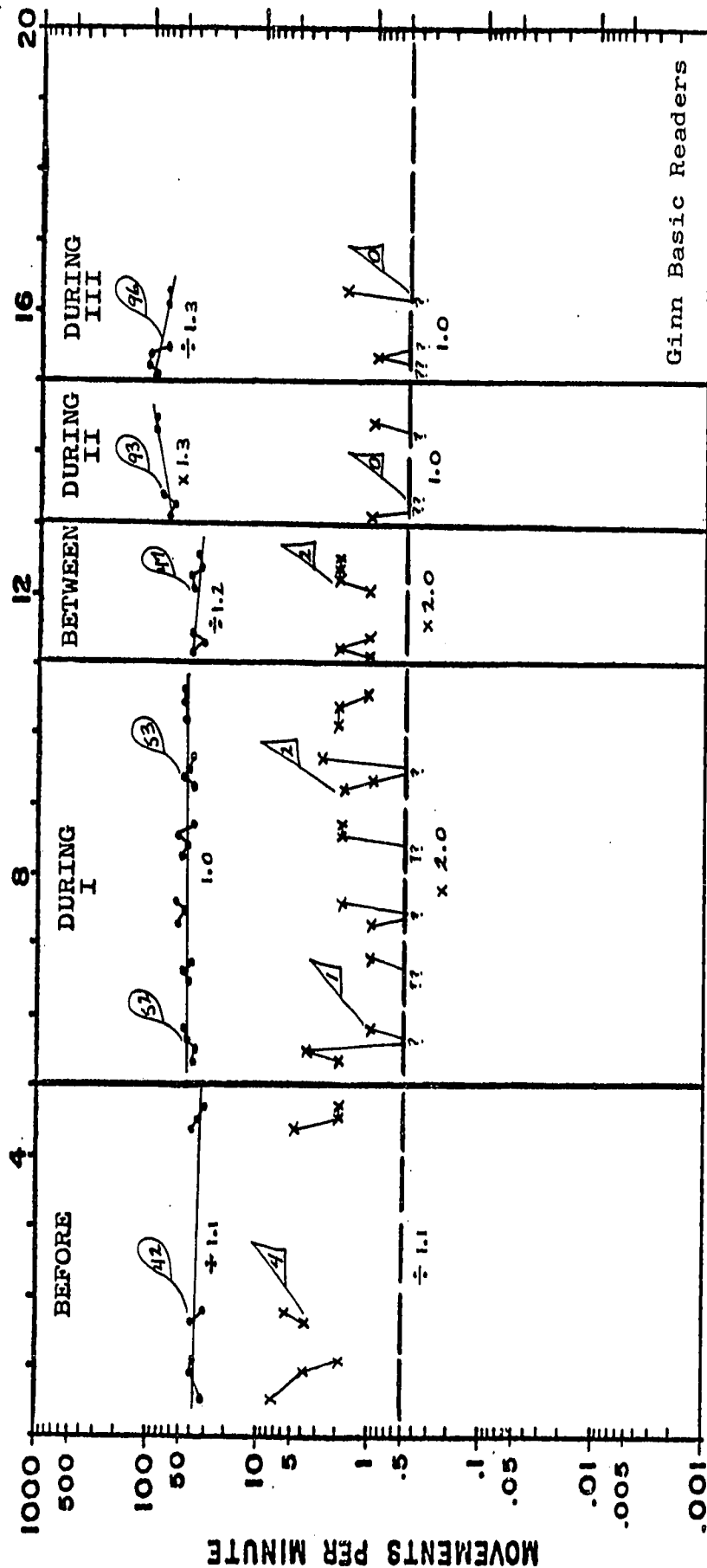
7

Label

120 130 140
Grade Reads words orally

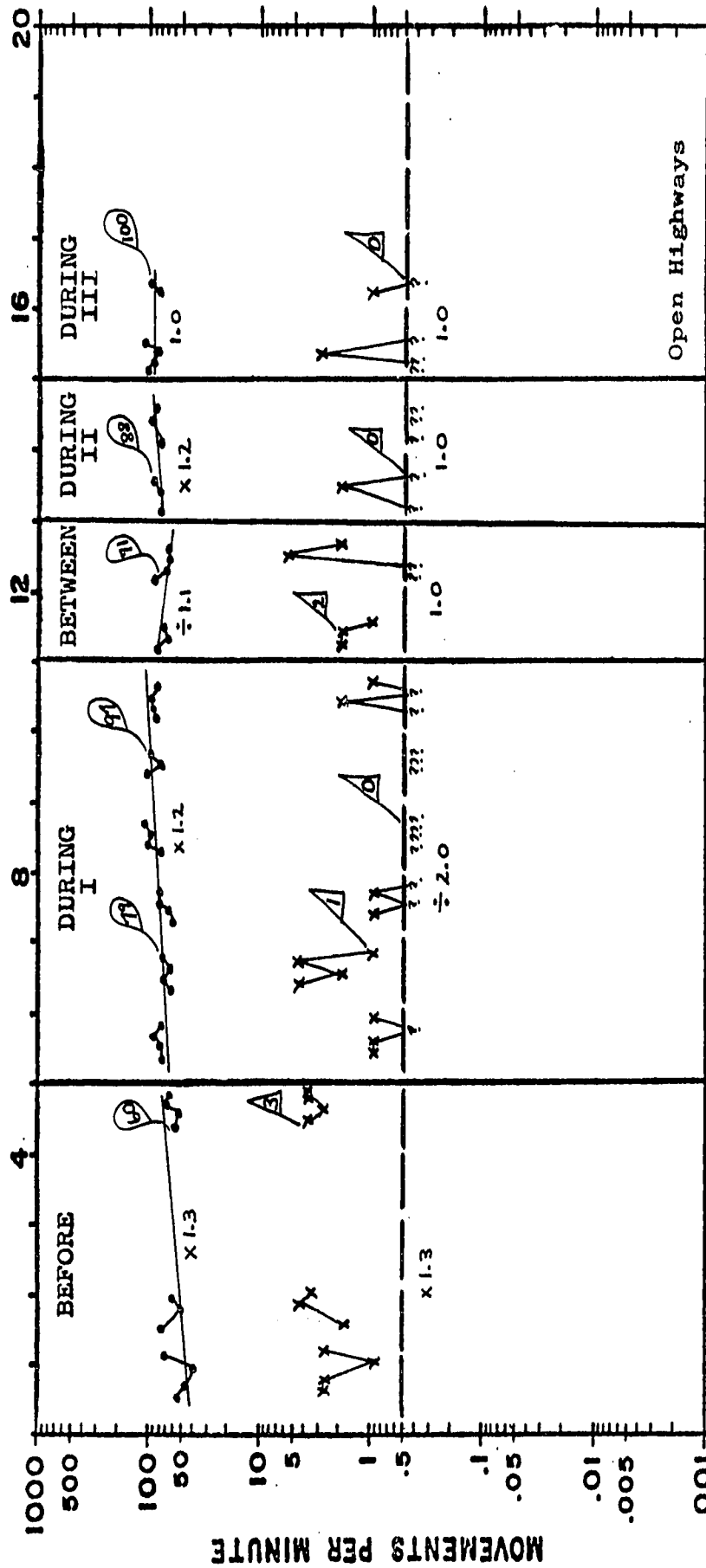
2 Movement

CALENDAR WEEKS



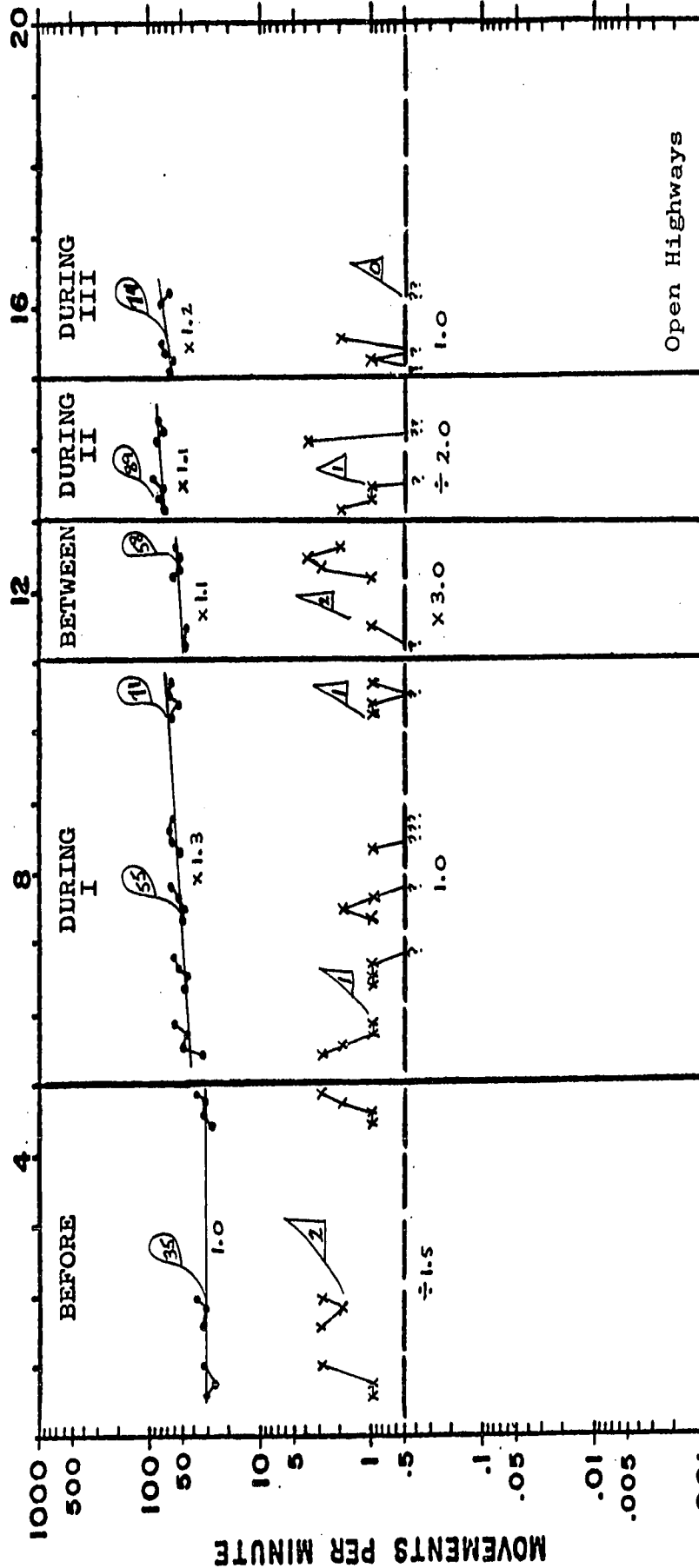
Supervisor Crozier bl Adviser Manager Ricky Dan Manager Mark Behavior Age 7 Label Grade 2 120 130 140 Reads words orally Movement

CALENDAR WEEKS

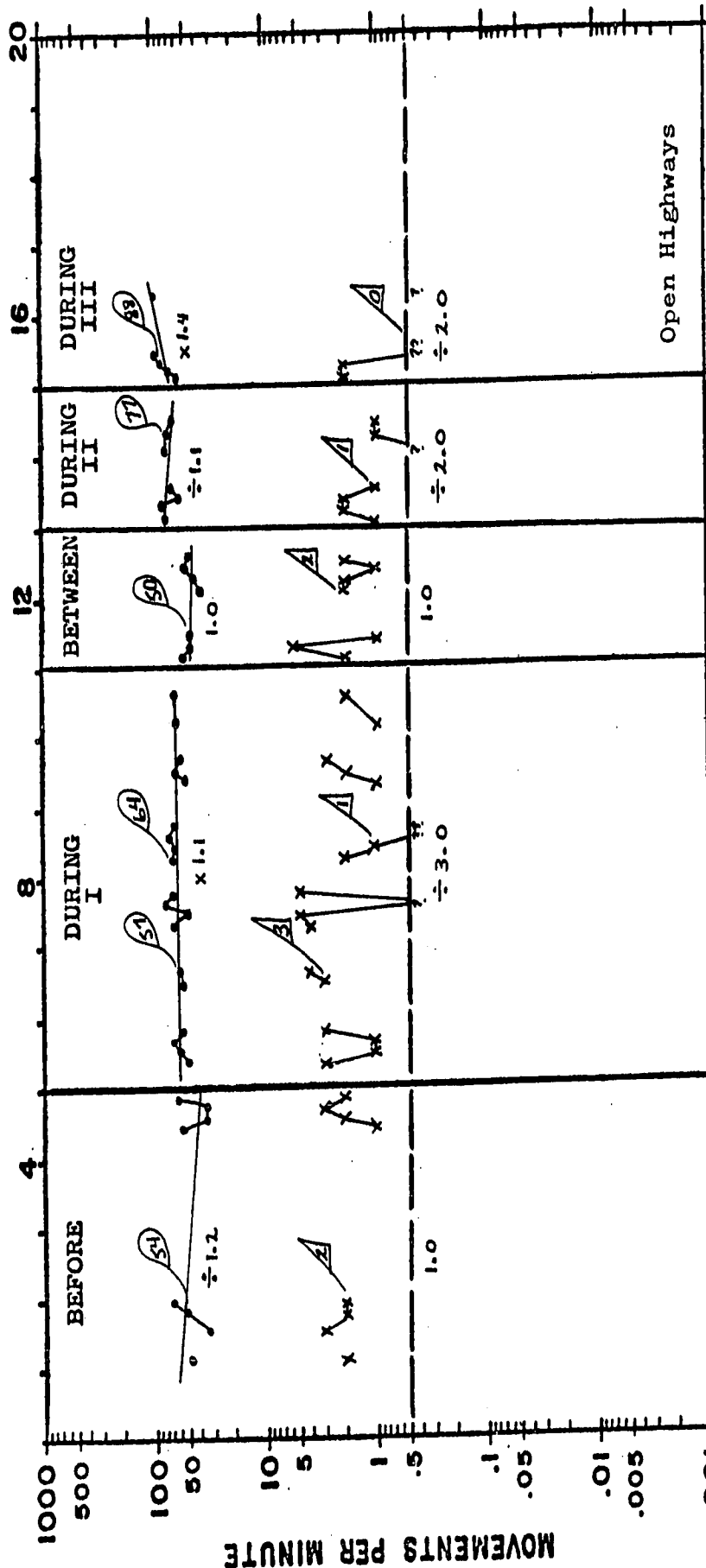


Supervisor Crozier b2 Adviser Dean Larry Manager Michael 8 Grade 3 Reads words orally Movement

CALENDAR WEEKS

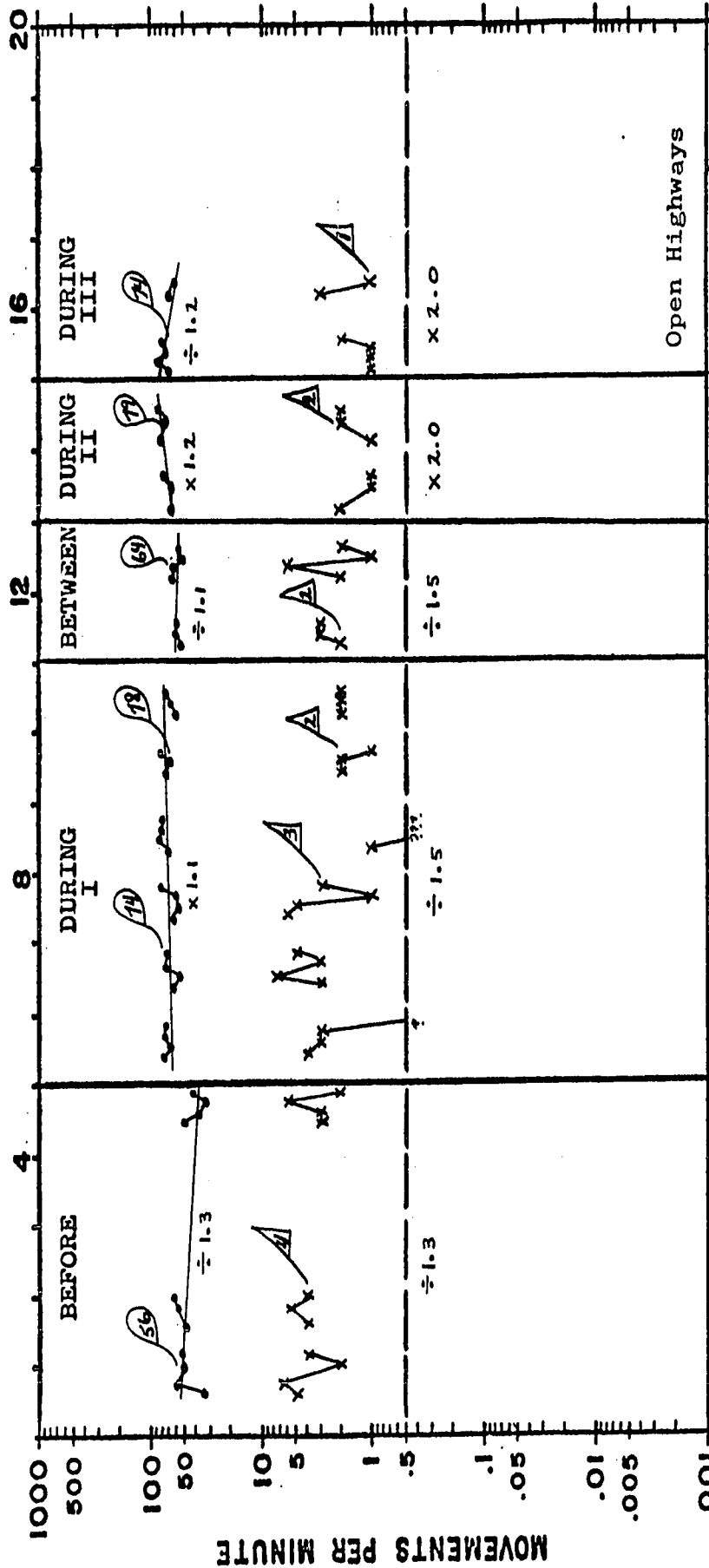


CALENDAR WEEKS



Crozier Supervisor b2 Adviser Jeanna Manager Brenda Manager Dianne Benaver Age 8 Grade 3 Label 3 Reads orally Movement

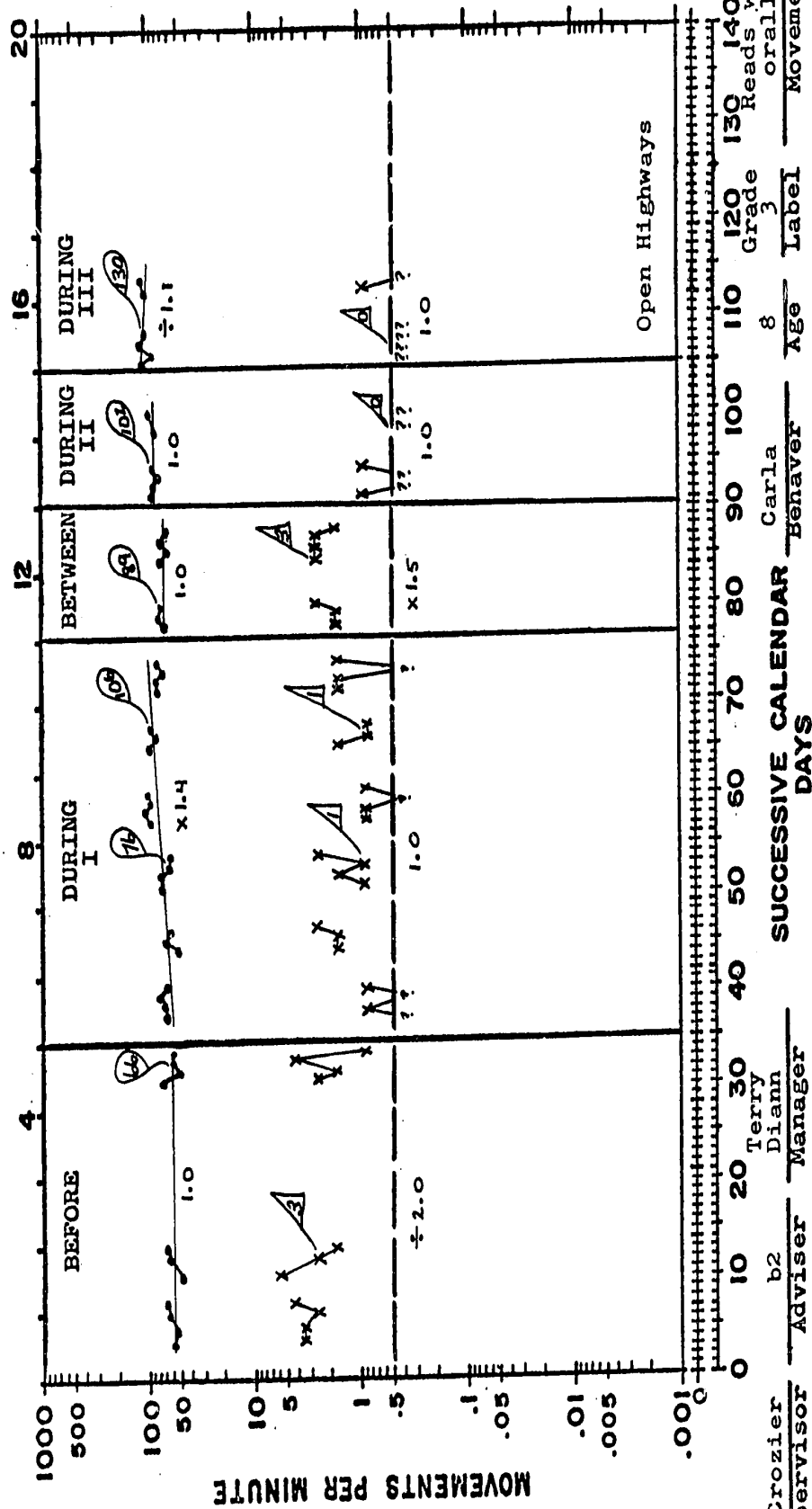
CALENDAR WEEKS



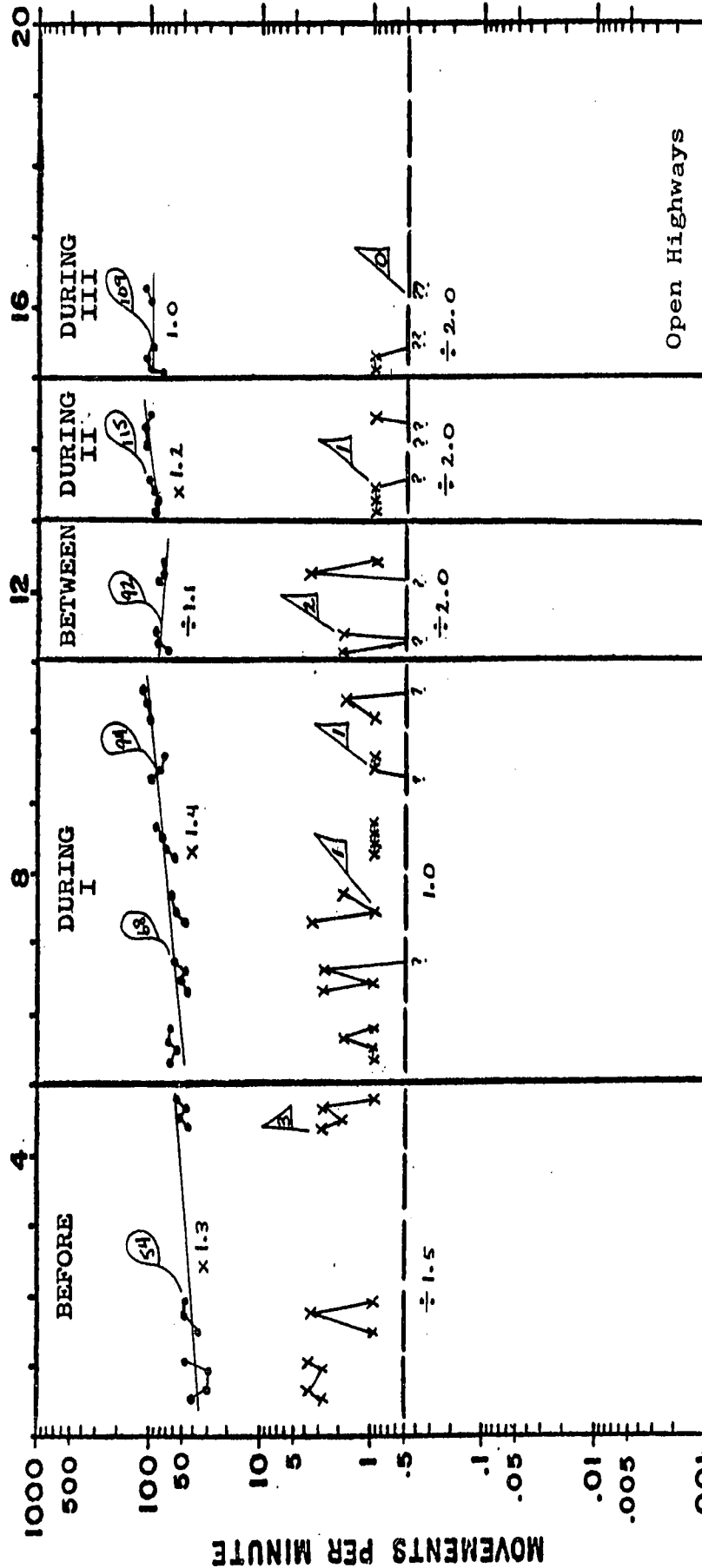
SUCCESSIVE CALENDAR DAYS														Movement		
0	10	20	30	40	50	60	70	80	90	100	110	120	130	140		
Crozier										Brad		Grade 3		Reads words orally		
Supervisor										Benaver		Age 8		Movement		
Adviser b2										Label						
Robert																
Karen																
Manager																

Crozier
Supervisor

CALENDAR WEEKS



CALENDAR WEEKS



Crozier
 Supervisor

b2
 Adviser

Robert
 Dean
 Manager

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
 SUCCESSIVE CALENDAR DAYS

Allan
 Behavior

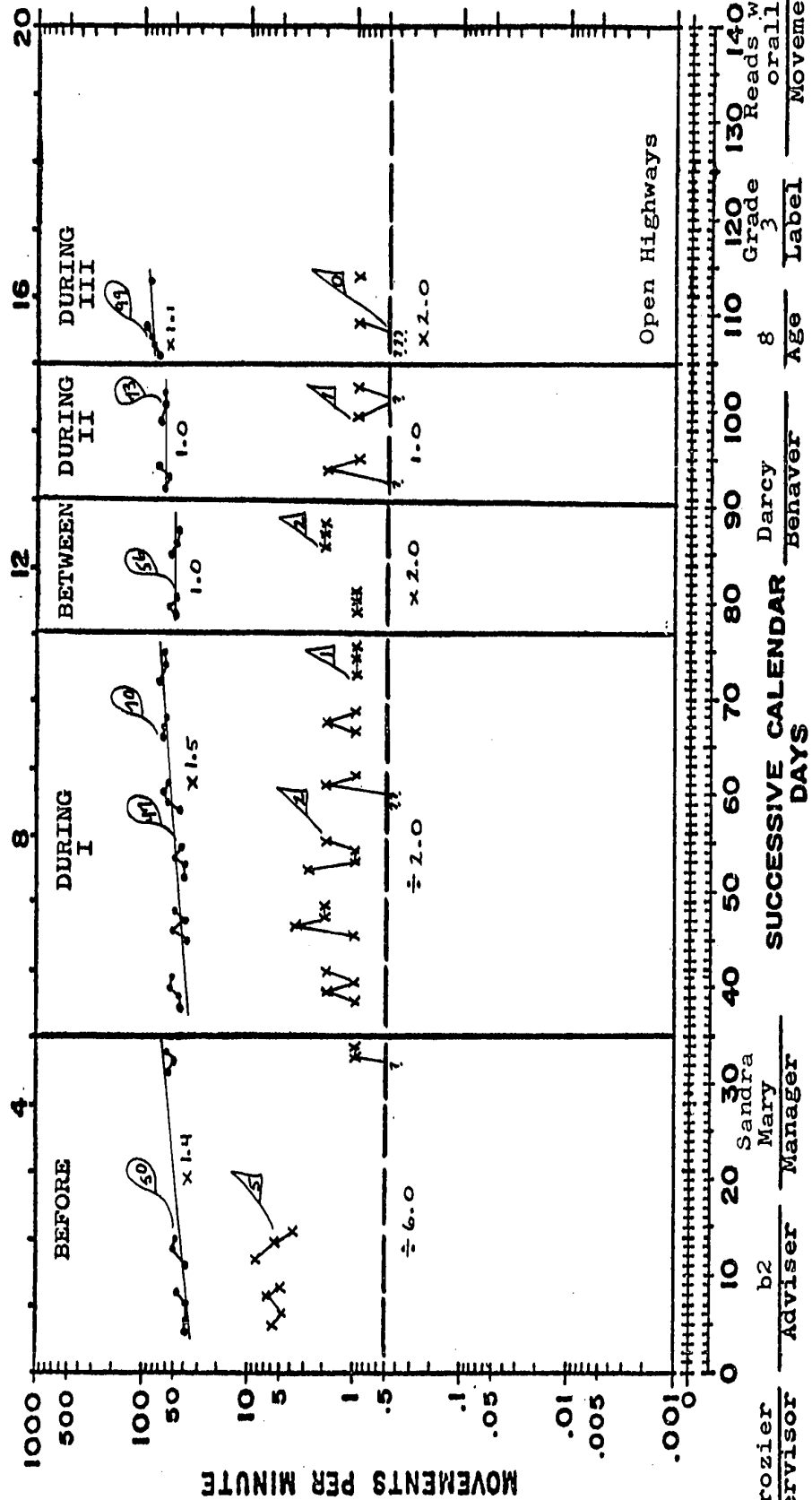
8
 Age

Grade
 3

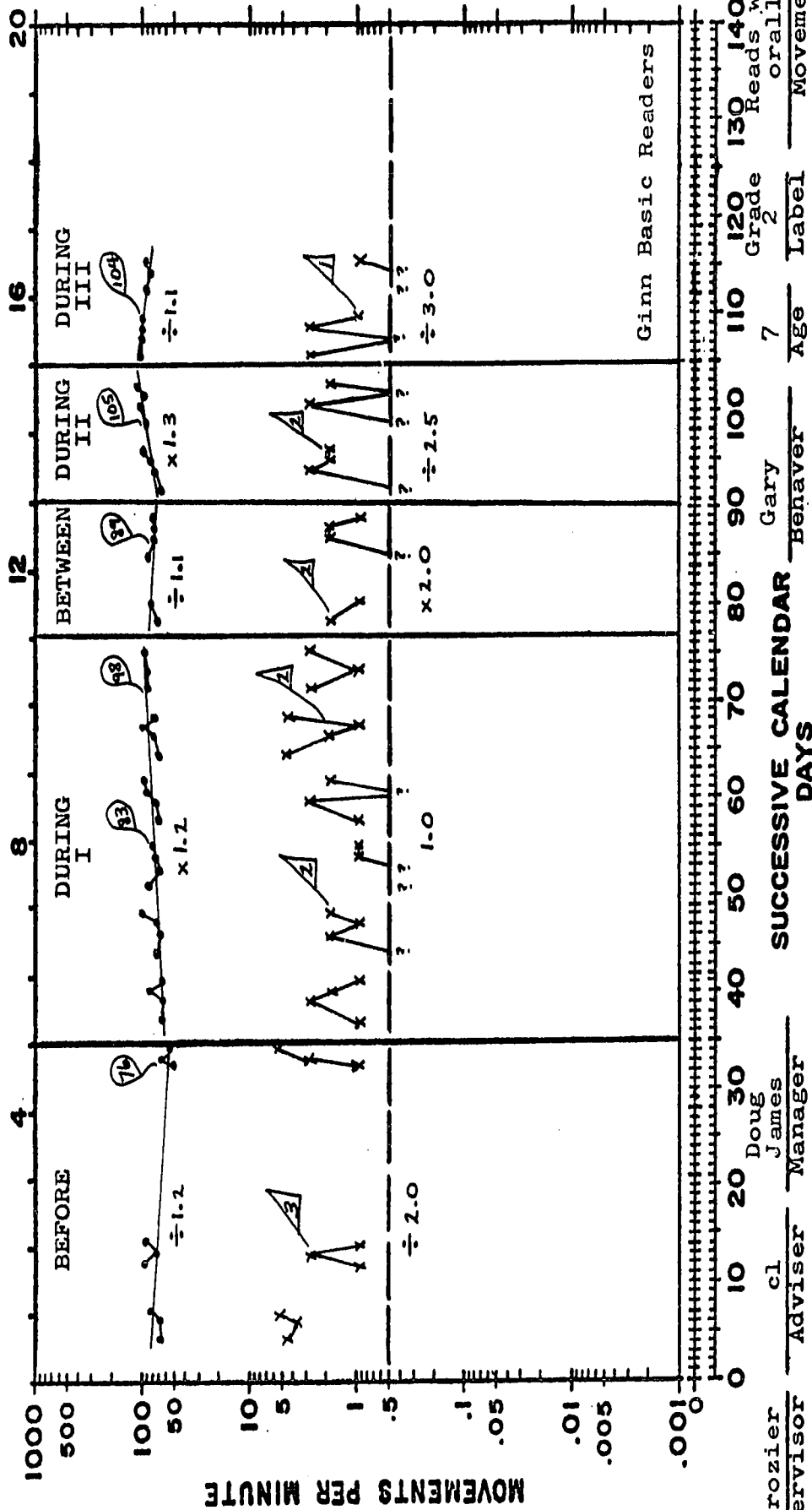
Reads words
 orally

Movement

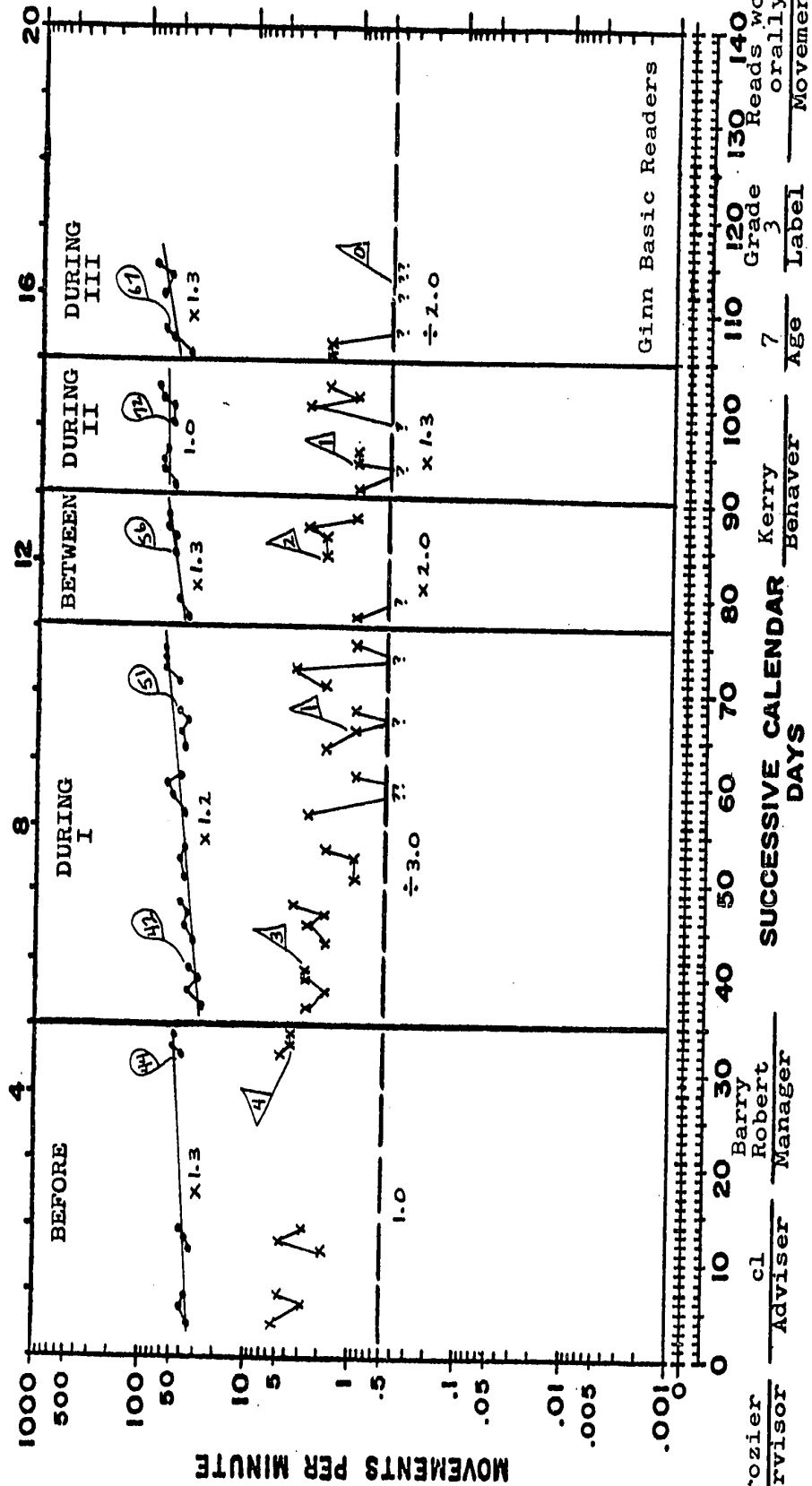
CALENDAR WEEKS



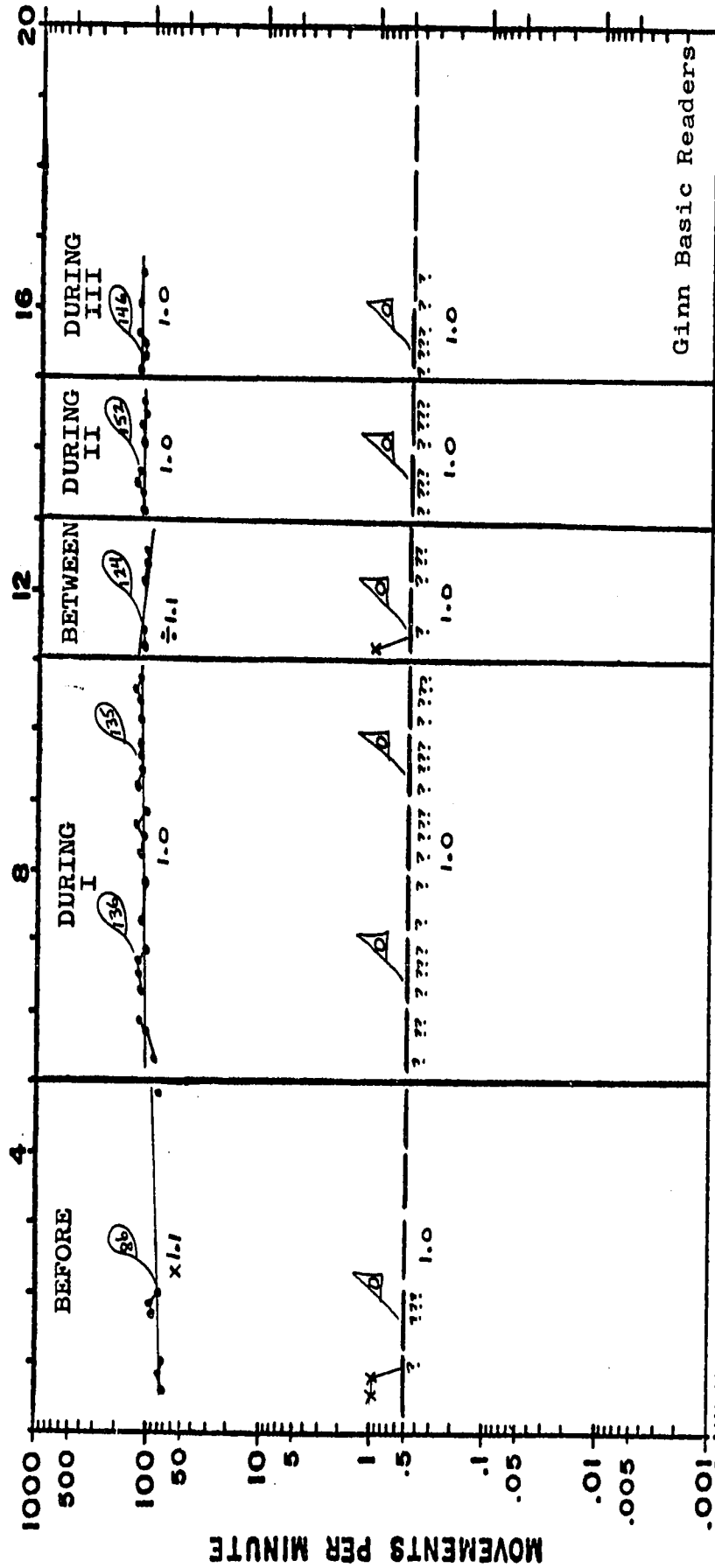
CALENDAR WEEKS



CALENDAR WEEKS

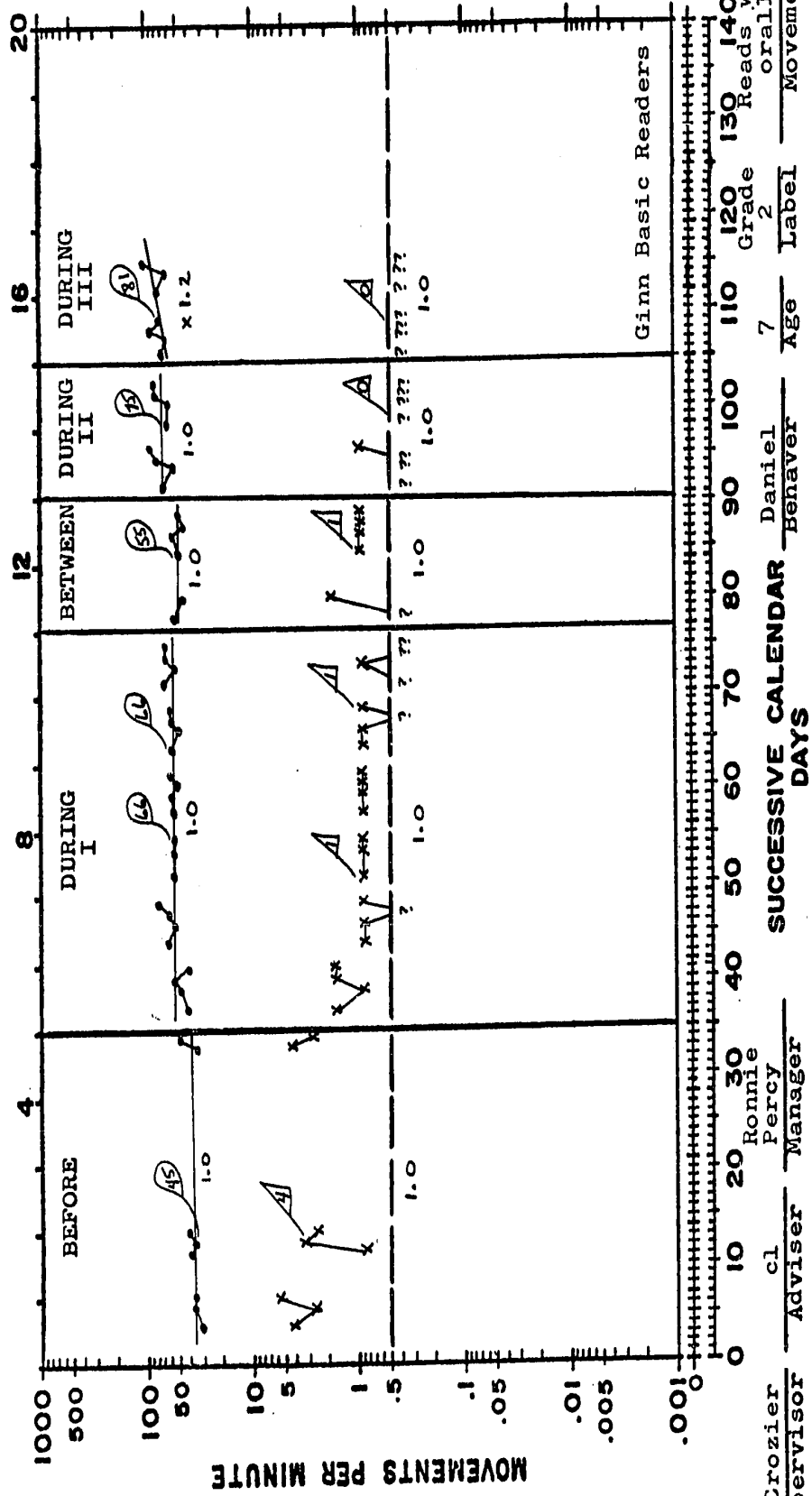


CALENDAR WEEKS

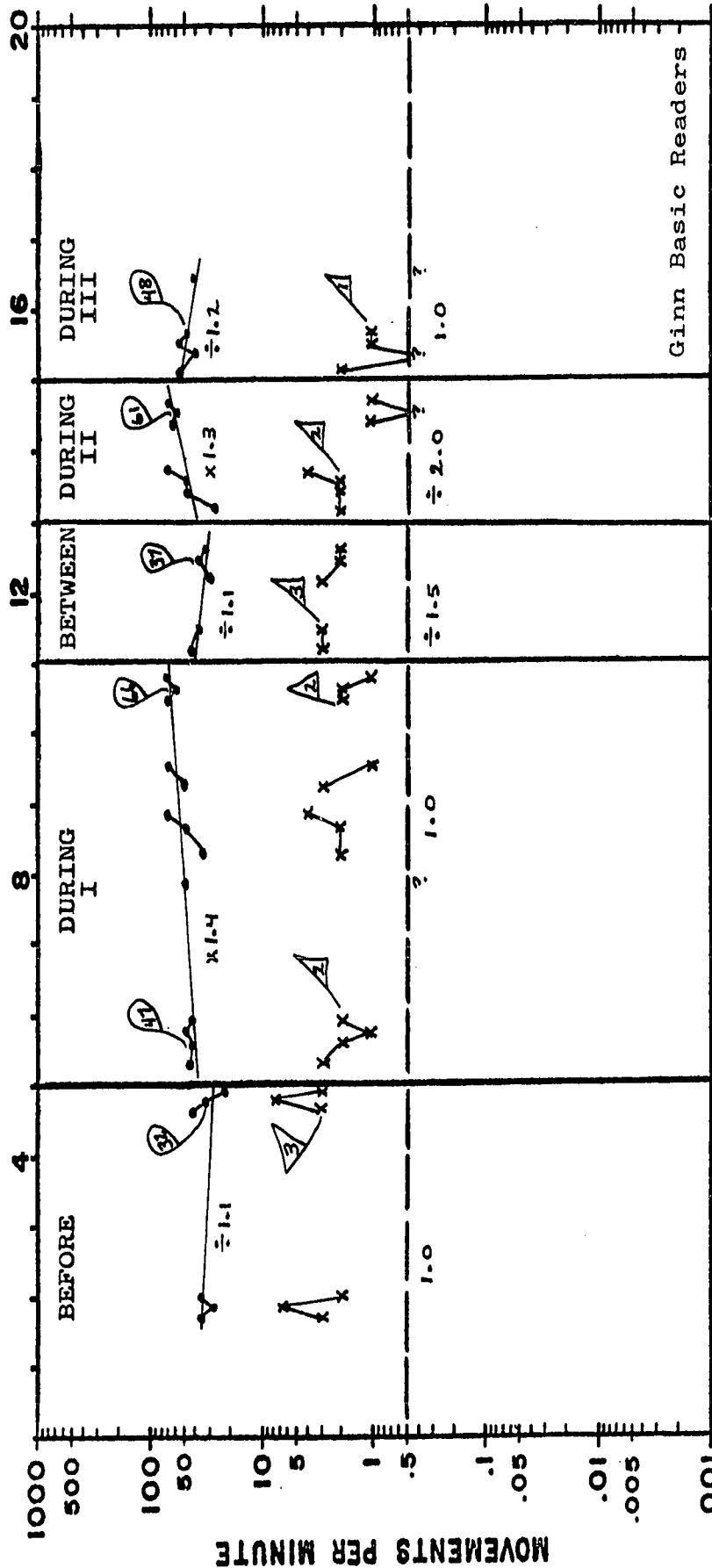


Crozier		Irene		100		140	
Supervisor	cl	JoAnn	Tina	7	Grade	Reads words orally	Movement
	Adviser	Manager	Behavior	Age	Label		
SUCCESSIVE CALENDAR DAYS							

CALENDAR WEEKS



CALENDAR WEEKS



Crozier
Supervisor

cl
Adviser

Laurie
Barb
Manager

Sandra
Benaver

7
Age

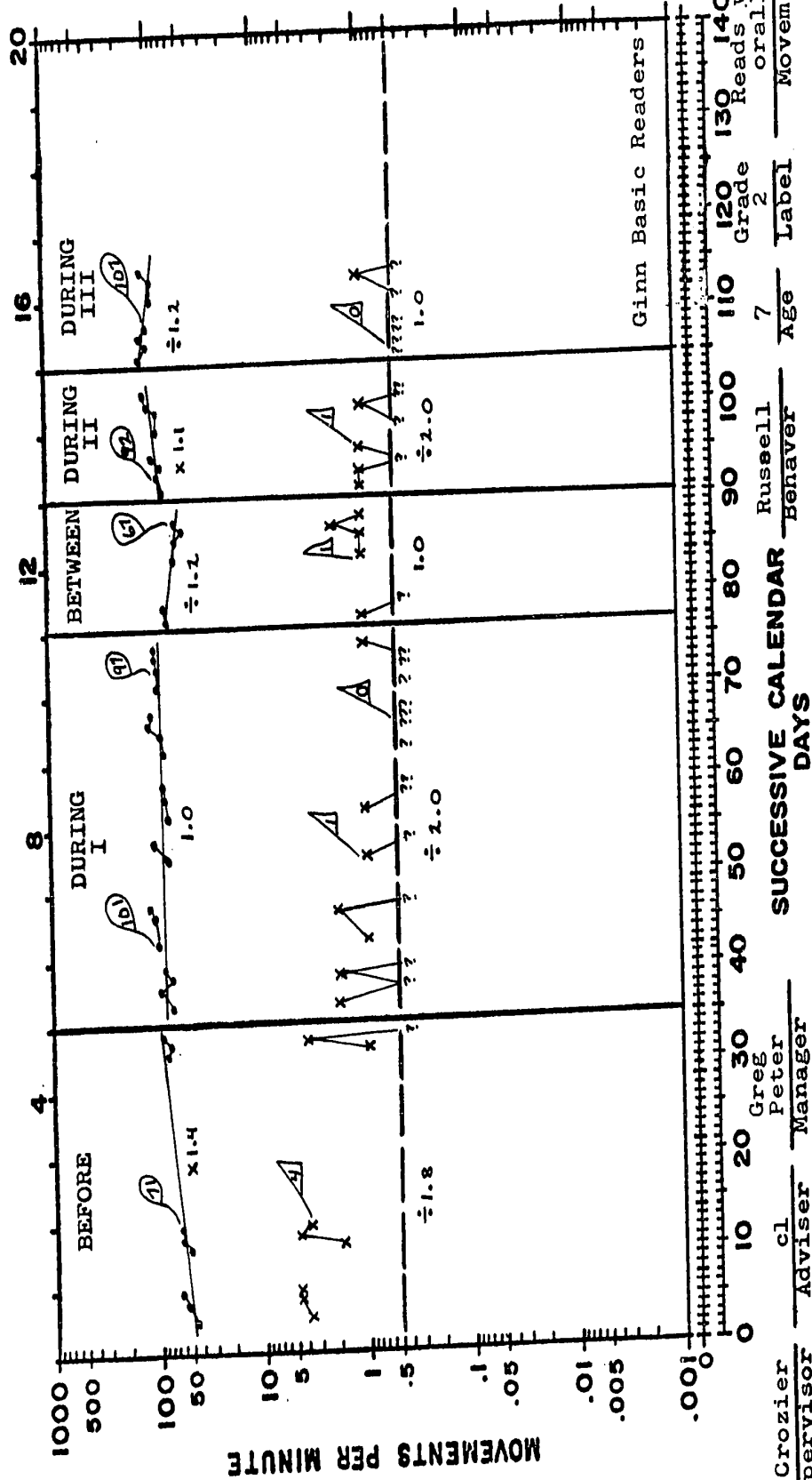
120
Grade

130
Reads words orally

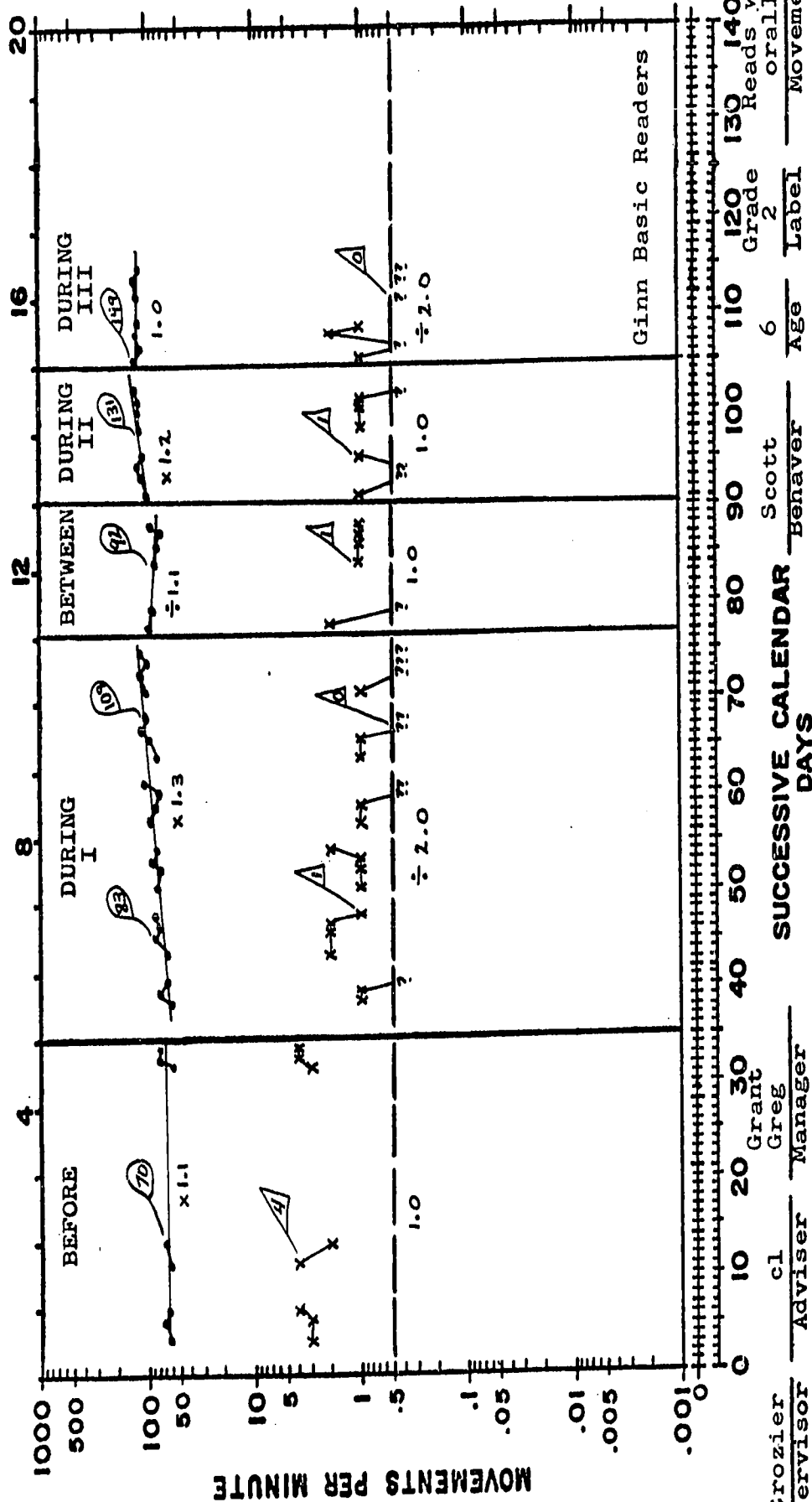
140
Movement

183

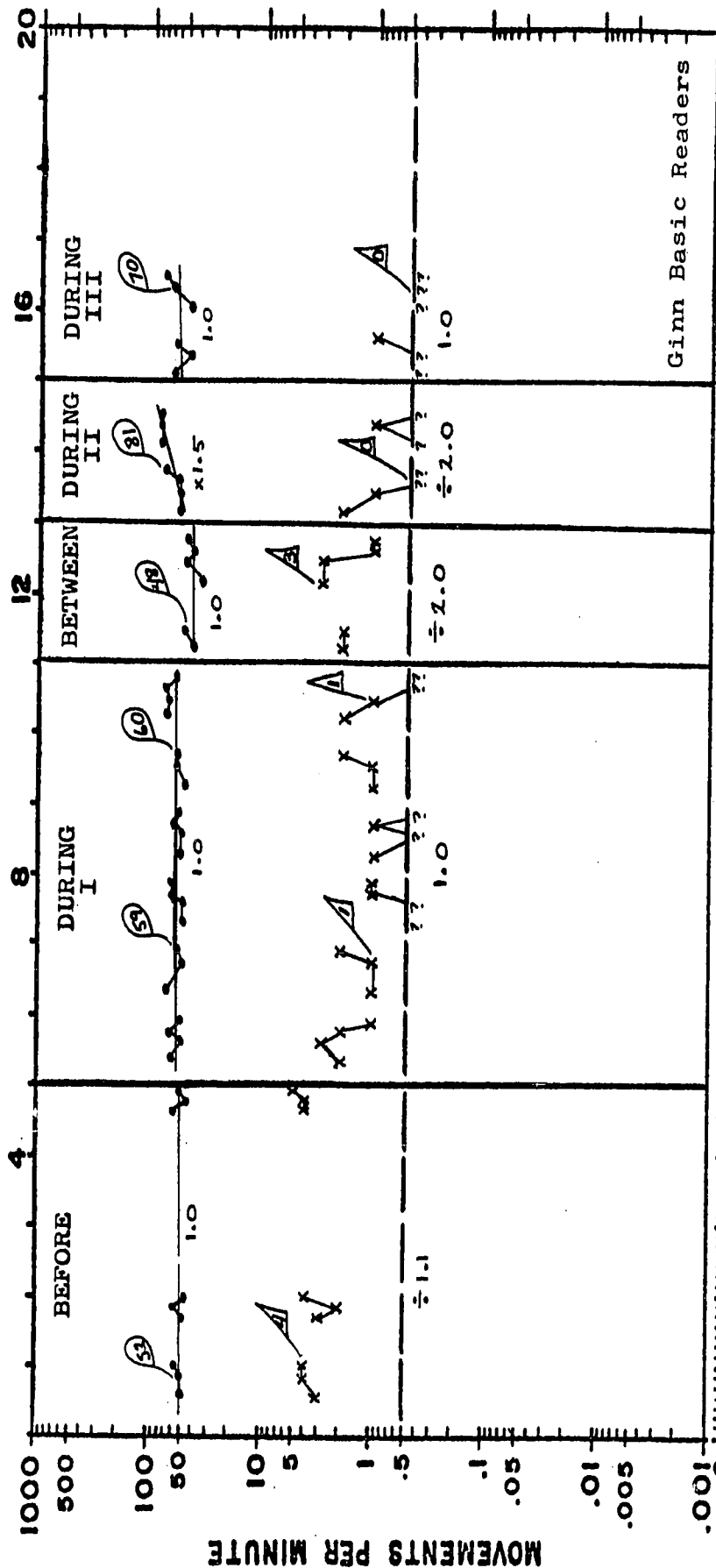
CALENDAR WEEKS



CALENDAR WEEKS



CALENDAR WEEKS



Crozier
Supervisor

Adviser c2

Manager Cheryl Gillian

SUCCESSIVE CALENDAR DAYS

Simon Behavior

Age 8

Grade 3

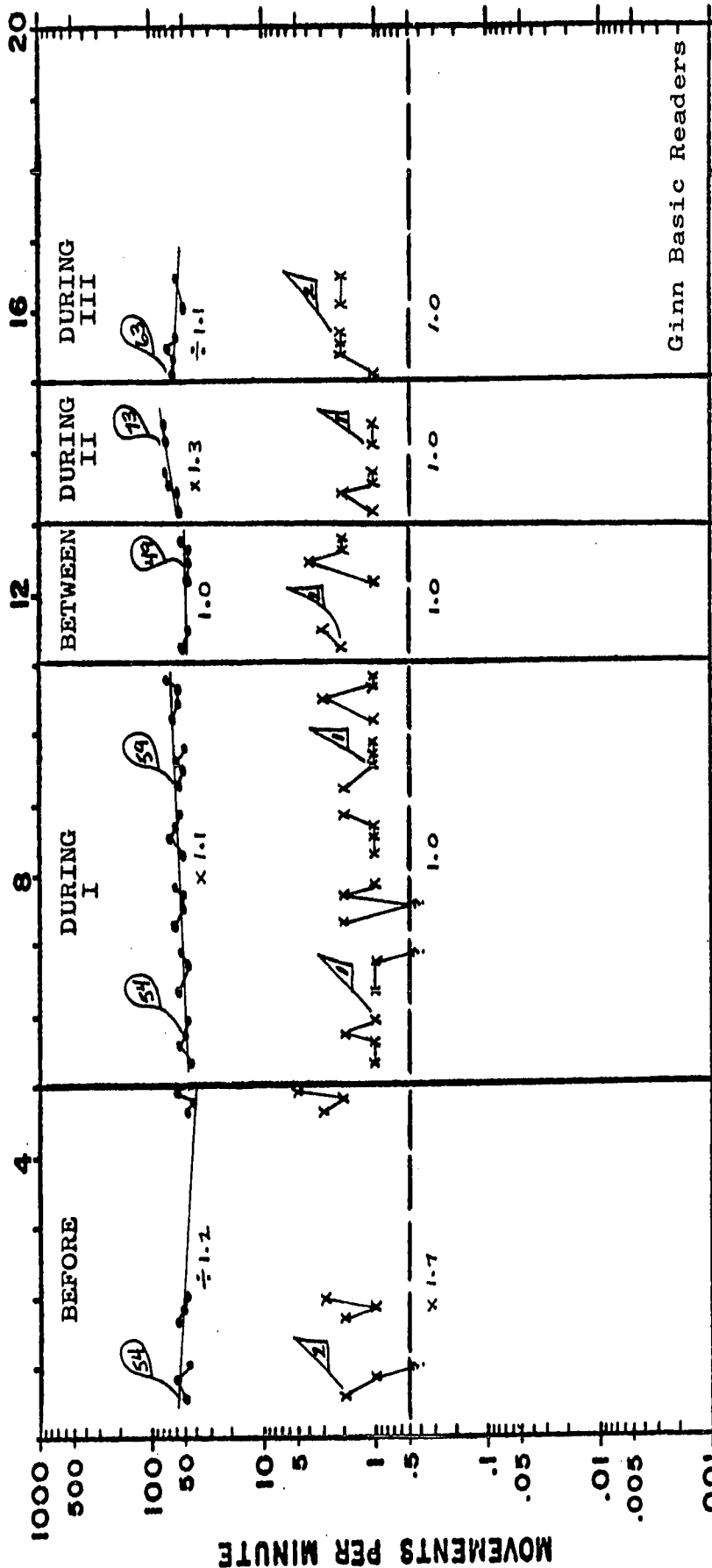
Label

Reads words orally

Movement

186

CALENDAR WEEKS



187

Reads words orally

Grade 3

Age 8

Michael

Behavior

SUCCESSIVE CALENDAR DAYS

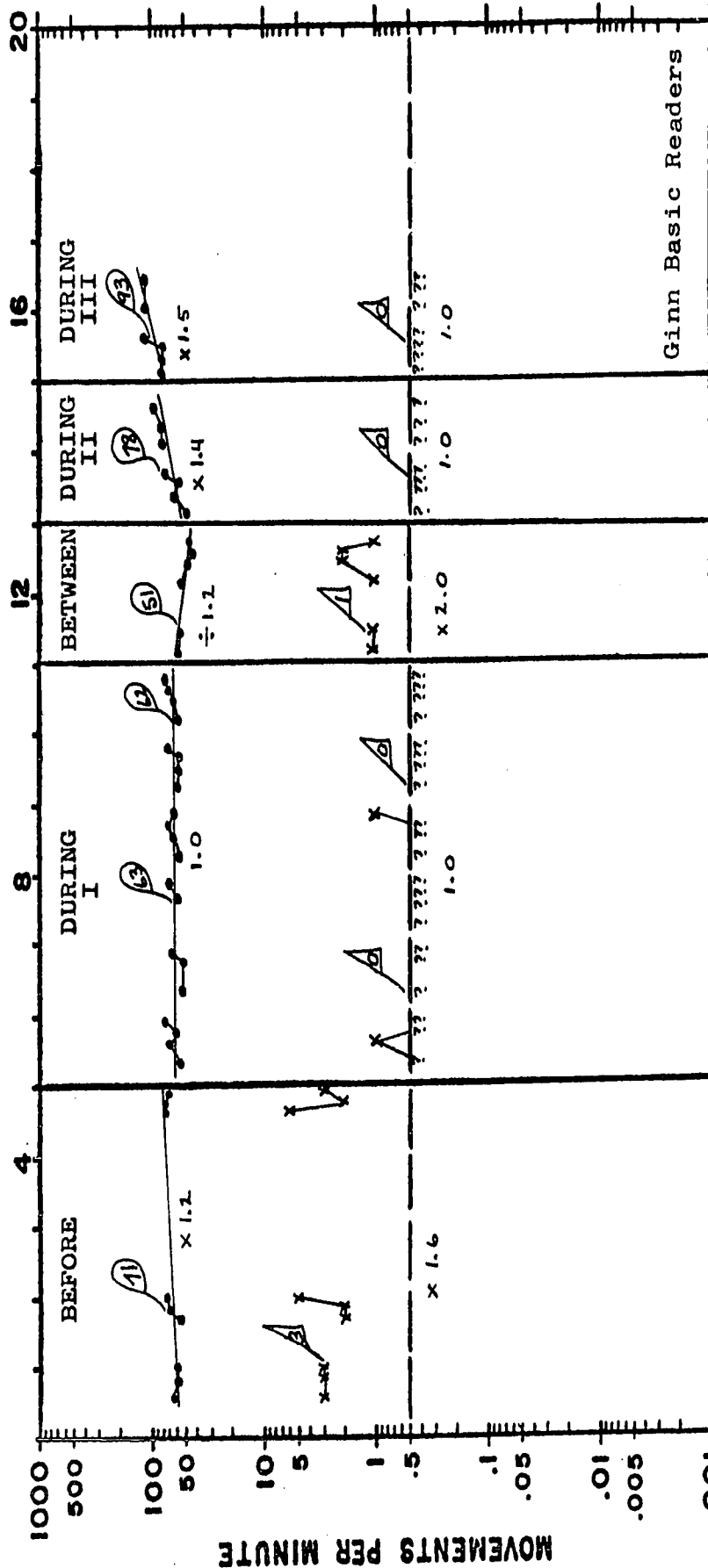
Eleanor
Holly
Manager

Adviser

Supervisor

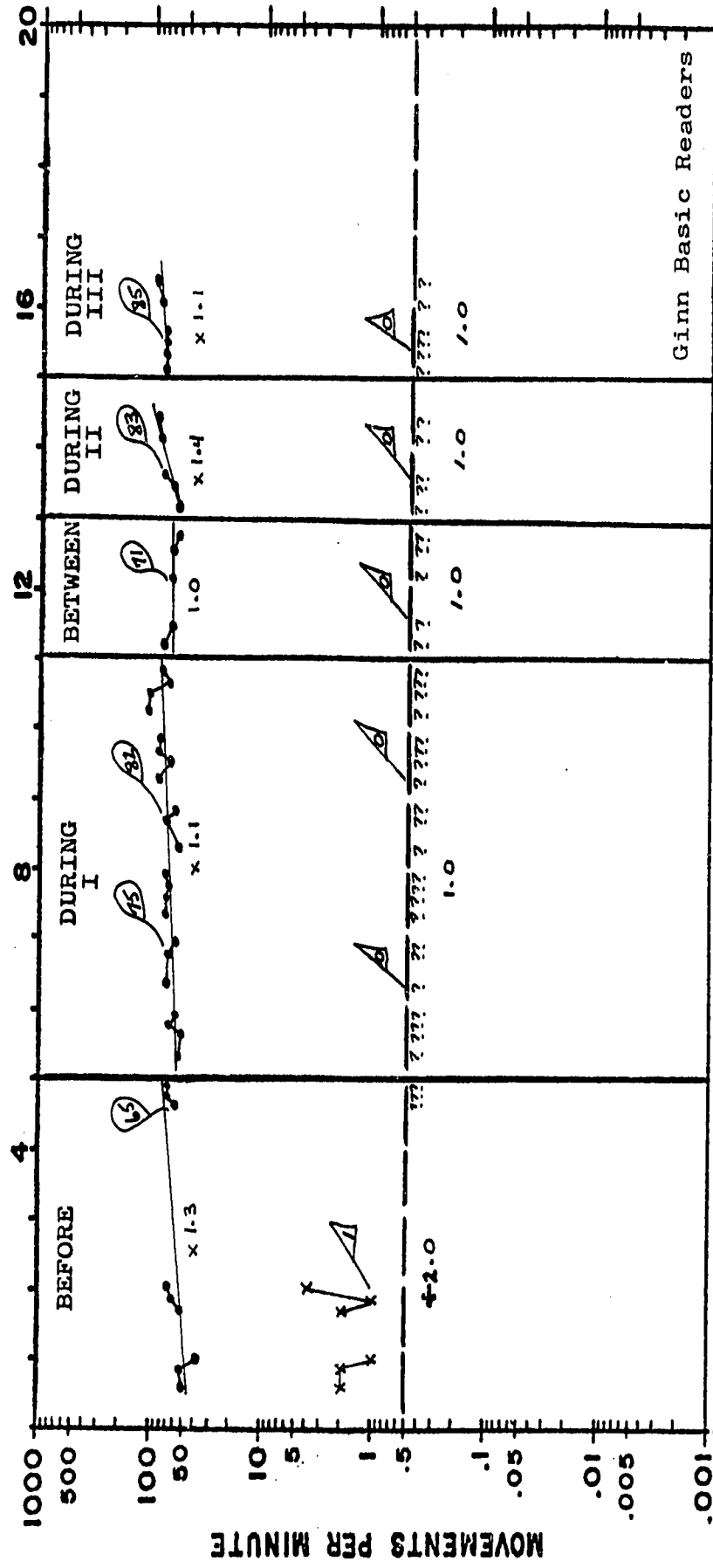
Crozier

CALENDAR WEEKS



Crozier
 Supervisor
 c2
 Adviser
 Sharon
 Helen
 Manager
 SUCCESSIVE CALENDAR DAYS
 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
 188
 Reads words orally
 Movement
 Label
 Age
 8
 Shelley
 Benaver
 Grade
 3
 120
 130
 140
 188
 Reads words orally
 Movement

CALENDAR WEEKS



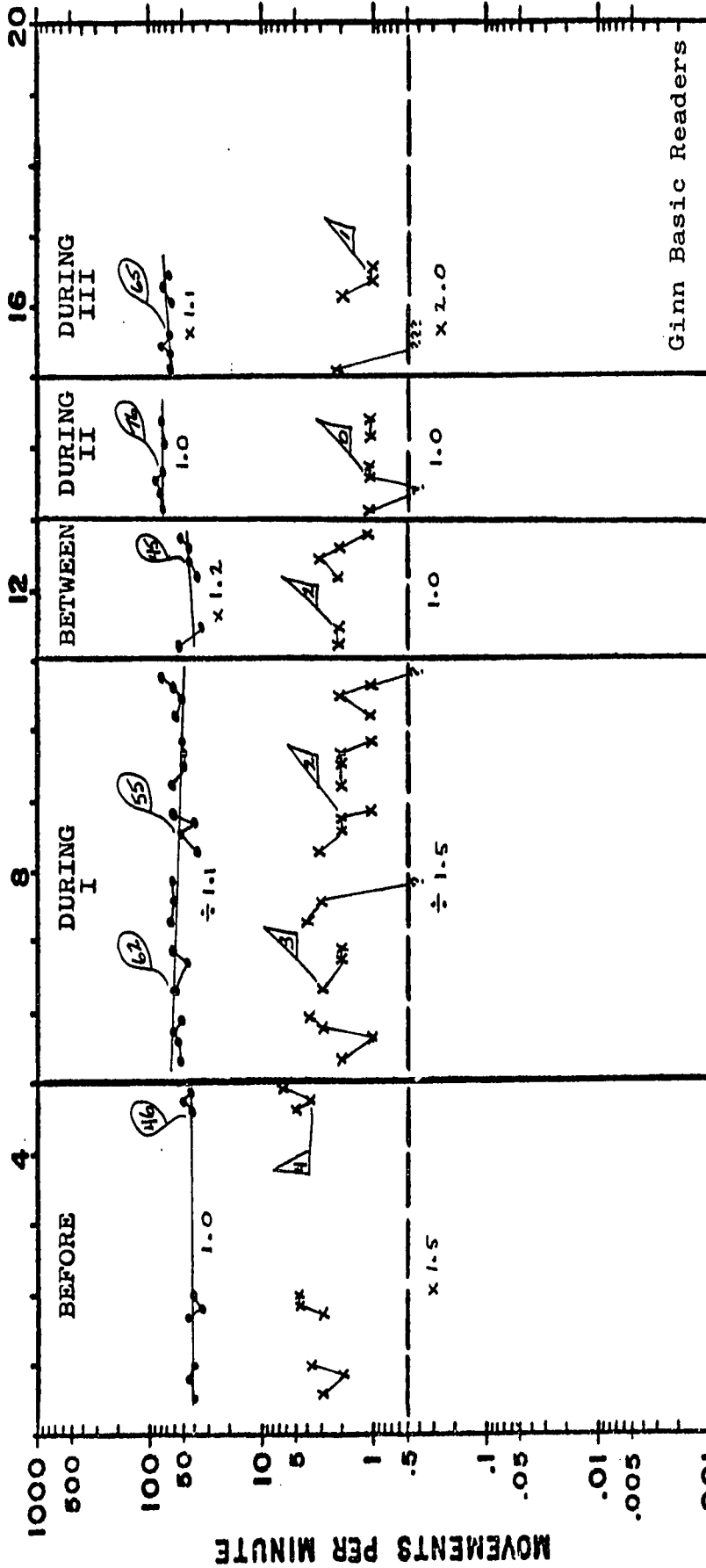
Supervisor Crozier c2 Adviser David Wayne Manager Chris

SUCCESSIVE CALENDAR DAYS

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

Grade 3 Label Age 8 Behavior Chris Movement Reads words orally

CALENDAR WEEKS



Ginn Basic Readers

190

140 Reads words orally

130 Grade 3

120 Label

110 Age 8

100 Trevor Behavior

90

80

70

60

50

40

30 Harvey Manager

20 Shaun Manager

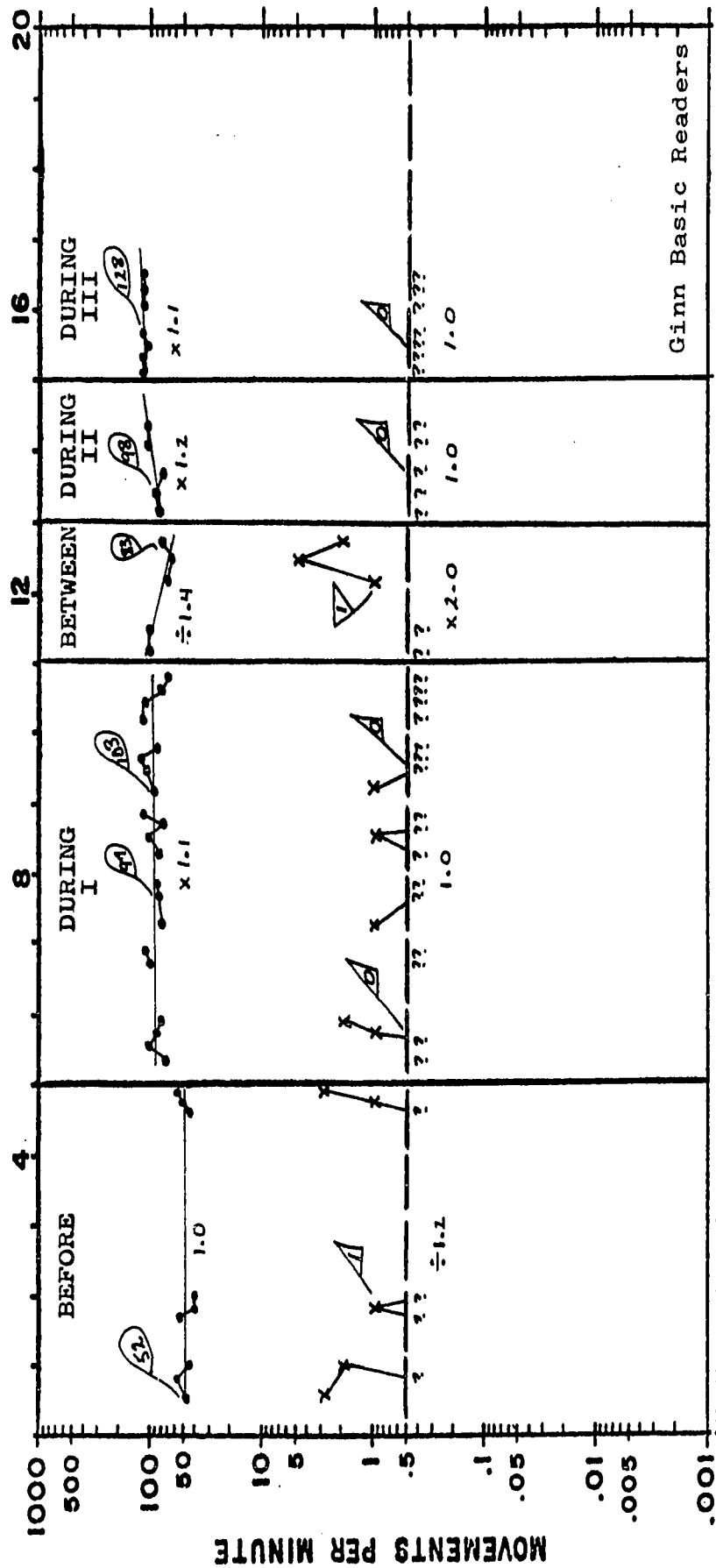
10 c2 Adviser

0

SUCCESSIVE CALENDAR DAYS

Crozier Supervisor

CALENDAR WEEKS



Crozier
Supervisor

c2
Adviser

Mamie
Manager

Rodney
Behavior

8
Age

3
Label

140
Reads words orally

130
Movement