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ABSTRACT

The report describes the operation of a model preservice special education teacher preparation practicum designed from a competency based teacher education frame of reference and utilizing a computer assisted teacher training system (CATTS). Chapter I provides introductory information (including teacher training objectives) and an explanation of practicum organization (with sections on such program components as physical setting, criteria for trainee and pupil selection, and accountability and assessment techniques). Chapter II focuses on the Oral Reading Observation System (OROS), a research and evaluation tool that enables a trained observer to code teacher and child verbal behaviors during an oral reading activity. Chapter III, which makes up a major portion of the document, presents five related studies of teacher behavior conducted in conjunction with the CATTS-OROS teacher preparation practicum. Addressed in each study are the subjects, procedures, background of the study, and training interventions, along with the specific treatment or empirical questions. Among the 18 sections of the appendix are sample training manuals, summary of responses to tutor evaluation, lesson plan checklist and form, bibliography of child-use materials, and tabulation of pupil responses to interviews. (SBH)

THE COMPUTER-ASSISTED TEACHER TRAINING SYSTEM (CATTS) DEVELOPMENT AND APPLICATIONS

THE DEVELOPMENT OF ORAL READING PROMPTING SKILLS IN A CATTS-CBTE PROGRAM FOR PRE-SERVICE TEACHERS OF THE MILDLY HANDICAPPED

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CHAPTER I.

DEMONSTRATION OF A CATTS PRE-SERVICE PRACTICUM FOR TRAINING TEACHERS OF THE MILDLY HANDICAPPED

Introduction

This report describes the operation of a model pre-service special education teacher preparation practicum conducted at the Center for Innovation in Teaching the Handicapped (CITH), Indiana University, during the 1975-76 school year. Each aspect of the training program was designed from a competency-based teacher education (CBTE) frame of reference (Semmel, Semmel, Morrissey, 1976). For example, expected trainee competencies and performance objectives were made known in advance of assessment; assessment criteria were competency-based and mastery levels were specified; trainees were accountable for pupil performance and for reporting to parents and classroom teachers; trainee-tested modular units of instruction were employed; trainees received unique Computer-Assisted Teacher Training System (CATTS) feedback of information on selected aspects of their teaching performance; and assessment of trainee performance was continuous throughout the duration of the program. Furthermore, setting of the training program in a laboratory classroom provided an ideal opportunity to study teacher/pupil behavior through the collection of behavioral data under carefully controlled laboratory conditions. The training program design provided for both continuous assessment of trainee behavior and for the evaluation of the effectiveness of the training interventions developed for this program.

The goal of the training program was the development of trainee skills in teaching reading to mildly handicapped pupils. The ability to structure a reading program and effectively teach reading are vital competencies required of all elementary level teachers. Competence in the adaptation of skills for teaching the mildly handicapped pupil to read requires prior mastery of the basic instructional skills. The program was developed to provide trainees with a wide range of knowledge and skills related to the development of a reading program for mildly handicapped pupils, and with specific skills associated with the teaching of word recognition strategies. The practicum was structured so that trainees would have a full school year of experience in planning and conducting an individual tutorial reading program.

The Computer-Assisted Teacher Training System (CATTS) (Semmel, 1975) was employed in all phases of training teachers to develop the interactive skills necessary for improvement of pupil strategies of decoding unknown words. CATTS is an automated, computer-based system used for collection of observation system data and for real-time feedback of selected data to the trainee while he/she is still teaching. An extended discussion of CATTS and a review of research on the feedback of observation system data in teacher education may be found in Semmel and Semmel (1976).

Utilizing CATTS technology, trained observers coded all oral reading lessons conducted by trainees. A computerized data base was thus collected which served as the basis for a related series of studies of trainee behavior under two alternative feedback conditions, and for the evaluation of other teacher training interventions. CATTS was also employed as the method for assisting trainees to generate a specific set of teaching behaviors by means of its capacity for real-time feedback of information. In this project, behavioral data was displayed on a TV monitor within eyeview of the trainee while the trainee was engaged in teaching. CATTS feedback was also made available to the trainees in the form of computer printout summaries of observation data for each lesson.

Skills in responding to pupil miscues during the oral reading of continuous text were selected as the main focus of trainee interactive skill development.

Previous research with inservice teachers of the Educable Mentally Retarded (EMR), during reading instruction (Brady, 1976; Lynch, in preparation), has shown that experienced teachers do not respond to pupil miscues in functional ways and that they employ few, or inconsistent, decision rules in determining how to help a pupil. Most teachers responded to all pupil miscues, even those that did not differ in meaning from the text word. The teacher responses, or prompts, to miscues tended to be of three types - requesting the pupil to spell the text word; sounding out the text word for the pupil; and telling the pupil the text word - none of which encourage pupil development of effective strategies for decoding words. Also, when questioned as to the decision rules used in determining how to prompt, few teachers mentioned pupil skills in reading or characteristics of the word and text as information they considered before responding to the pupil.

As a result of these earlier studies, an instructional module on decision-making and prompting pupil miscues, entitled Prompting (Brady, 1975), and a reading observation system specific to pupil miscues and teacher strategies of helping pupils recognize words, the Oral Reading Observation System (OROS), Observers Training Manual (Brady, Lynch, and Cohen, 1976), were developed. The self-instructional Prompting module was employed in the present study to guide trainees in selecting appropriate prompting behaviors. The OROS was employed as the basis for collection of data on pupil/trainee behaviors during oral reading. OROS also served as the basis for training tutors to discriminate between various classifications of pupil miscues and teacher prompts and for feedback of behavioral data.

The general goal of the CATTS-OROS teacher preparation program was to develop a competency-based teacher education program in reading for pre-service trainees in the field of special education.* The specific objectives of the program were:

* The program was designed so that it would meet the criteria of CBTE and be maximally replicable by other interested teacher trainers and/or researchers.

1. To provide trainees with knowledge, skills, and experience necessary for planning and conducting reading instruction for mildly handicapped children.

2. To train pre-service teachers in specific prompting techniques.

3. To test the relative efficiency of two alternative feedback conditions (CATTS and Audio) in producing desired teacher performance

4. To increase trainee decision-making skills through the use of CATTS technology.

5. To determine the transferability of the trained skills.

6. To increase pupil general achievement levels and to modify pupil strategies of decoding.

The Selection of Teacher-Training Objectives of the CATTS-OROS Project

A CBTE format for the design of the training program was selected because of its potential for facilitating program development in which the validity of outcomes can be documented (Semmel, Semmel & Morrissey, 1976). Throughout the design of the program, CBTE implementation criteria (Elam, 1971) were employed particularly in the specification, operationalization and publication of training objectives, and in the conduct of experimental and quasi-experimental studies of the effectiveness of CATTS, training materials in prompting skills and other interventions implemented during the program.

We have also documented, as fully as possible, all the procedures, training material and techniques used in the development and conduct of the program. Copies of instructional materials used by the trainees in the program may be found in the appendices. Many of these materials also have mediated components, and these are on file at the Center for Innovation in Teaching the Handicapped. The emphasis upon documentation is to facilitate replication of the program, as we believe that the validity of a training program can best be demonstrated by repeated implementation in a variety of training environments.

Selection of Reading as the Focus of Trainee Skill Development

The ability of a teacher to develop and sustain a successful program of reading instruction is crucial to the education and habilitation of mildly handicapped pupils in special or mainstreamed settings. A number of studies have shown that educable mentally retarded (EMR) pupils generally read below the grade level that would be predicted from their M.A. (Dunn, 1953; Grolle, 1961; Shotick, 1960). In a review of the research on this question, Dunn (1953) found that EMR performance was below expectancy in 11 out of 14 studies. There is also evidence that pupil placement does not change the pattern of underachievement in reading found in studies of EMR pupils in special classes, and that the findings are the same for mildly handicapped pupils in a variety of class placements (e.g., mainstreamed, resource room settings) (Goldstein, Moss & Jordan, 1965).

Since the relationship between teacher performance and EMR pupils' reading competence has not yet been established, the discrepancies between EMR pupils' performance and expectancy cannot be attributed to either pupil characteristics or teacher performance. However, teacher preparation programs afford a good opportunity for the study of these relationships, so that we may better understand the effects of training and teacher performance upon pupil outcomes.

Another important reason for focusing on skills of teaching reading is that several surveys of inservice special education teachers have shown that practicing teachers regard reading as the area of instruction where they need the most assistance (Lilly & Kelleher, 1971; Meyen & Carr, 1970; Windell, 1975). Needs expressed by practitioners often relate to availability of adequate materials (Lilly & Kelleher, 1971; Meyen & Carr, 1970), as well as better implementation skills (Meyen & Carr, 1970; Windell, 1974). However, there is some evidence of a great disparity between implementation techniques employed by teachers and the objectives of extant child-use materials (e.g., Gallagher, 1970). It may well be that the often-expressed need for more child-use materials is a manifestation of the teacher's inability to effectively use available reading materials. A well-trained teacher should have the specific interactive skills which complement the planning and evaluative skills necessary for effective reading instruction.

Interactive skill development should begin early in the teacher preparation program, and the specific interactive skills associated with the teaching of reading to mildly handicapped pupils is an area of highest priority.

Selection of Skills in Prompting Pupil Miscues during Oral Reading

The ability to teach reading to mildly handicapped, slow-learning pupils is a composite of many critical instructional skills. Trainees need a sound base of knowledge of the psychology of teaching reading, of individual differences, curriculum, language, and language development. Background knowledge about teaching reading should be acquired prior to or concurrent with the acquisition of interactive skills of teaching. However, recent research has shown that teachers have both inadequate skills for prompting oral reading and inadequate understanding of the influence of instruction on the child's acquisition of reading proficiency (Lynch & Epstein, 1975).

Teacher prompting behaviors and strategies are areas of interactive skill that bear directly on how children learn to process words during reading. During oral reading in the classroom, the teacher may intervene directly with the pupil, in the form of prompting, to influence the way the pupil learns to process written text. Such interference may be negative, in that it does not encourage effective reading strategies, or it may be positive. Field research (Brady, 1976) has shown that most teacher prompting in EMR classes is negative; it encourages inappropriate decoding strategies. While comprehension is the ultimate goal of reading, decoding strategies can enhance or reduce comprehension.

The prompting skills developed in this training program were based upon previous research into teacher behavior and decision-making during oral reading (Lynch & Epstein, 1975; Brady, 1976), and on development and field testing of an instructional module on Prompting Oral Reading (Brady, 1975).

These earlier CITH research and development efforts were in turn based upon the theory that learning to read is primarily a linguistic process and assumes that the processes involved in reading are similar to those involved in decoding and encoding spoken language (Ryan & Semmel, 1969; Gibson & Levin, 1975; Smith & Goodman, 1970). The teacher's behavior during reading instruction is seen as instrumental in the pupil's perception of reading as another form of language communication and is also crucial in shaping the child's set to attend to relevant features of the text. Thus, how the teacher responds to pupil miscues in oral reading has great influence on how children learn to process written text.

The CATTS Training Model

The Computer-Assisted Teacher Training System (CATTS) was used to implement a model of teacher training (Semmel, 1975) in which the trainee is required to generate appropriate teaching behaviors. The model views teaching as:

> "...a performance skill which is best learned by practice in training settings, with accurate and rapid feedback of performance being essential to efficient acquisition of goal behaviors. Efficient acquisition of teaching skills is dependent upon (a) the specification of target behaviors, (b) reliable and valid feedback of performance information during or immediately following acquisition trials, and (c) access to data from previous training trials." (Semmel, 1975, p. 249)

The model stipulates that trainees must be able to discriminate relevant teaching behaviors through the mastery of an observation system which defines a domain of interest. Trainees are then able to derive objectives for desired teaching behaviors in terms of categories of the observation system. This is the "discrimination" phase of the model. In the "generation" phase, trainees teach, are observed by trained coders, and observation data is fed back to the trainee for purposes of reinforcement of desired behaviors and/or evaluation of performance in terms of performance objectives. The CATTS system, which has the capacity to feed back information to the trainee in real-time, or to summarize data and provide print-out observation system data on one or more lessons, is used in the generation phase.

In the present study CATTS was used for both real-time feedback of information on trainees' use of prompts, and for provision of summary data on each lesson. For the purposes of determining the effectiveness of CATTS in aiding trainees to acquire desired prompting behaviors, a study of CATTS feedback compared with trainee self-evaluation of audiotaped lessons was conducted.

Research on Teacher Behavior and the Evaluation of Training Interventions

The conduct of teacher behavior research and program evaluation studies were integral to the design of the teacher education project. Four separate studies of teacher behavior were conducted, each addressing a different facet of teacher training or behavior. In addition, performance and attitudinal outcomes of pupils' participation in the tutorial program were reported. The empirical studies conducted in conjunction with the CATTS-OROS demonstration program are summarized as follows:

The Effects of the Prompting Module on Teacher Behavior. A study conducted during the first semester of the program examined the effectiveness of an instructional module on trainee use of prompts and trainee decision rules for prompting. Use of a criterion-referenced instructional package was in keeping with the CBTE orientation toward standardization of training treatments through the use of trainee-tested instructional modules (cf. Thiagarajan, Semmel & Semmel, 1974). It was predicted that trainees who completed the prompting module would demonstrate changes in their prompting behaviors in the directions specified in the module.

The Effects of CATTS and Audio Tape Feedback on Teacher Behavior. In accord with the CATTS teacher training model (Semmel, 1975), trainees completed a discrimination training sequence designed to enable them to identify relevant prompting behaviors. Trainees also completed instructional modules on the Oral Reading Observation System (OROS) whose categories were related to the Prompting Module which the trainees had completed the previous semester. After a period of discrimination training, the generation phase of the training program began. Trainees were aided in their efforts to generate appropriate prompting behaviors through CATTS or audio tape feedback of their prompting behavior. A study was conducted which compared the effectiveness of the two types of feedback in modifying the prompting behaviors of trainees, and the relative effectiveness of each mode of feedback when compared with trainee prompting during a baseline (no feedback) period of teaching.

The Effects of Training on Teacher Decision-making. Interest in trainee decision-making was an outcome of the recognition that trainees' ability to generate desired teaching behaviors is insufficient for effective teaching unless those behaviors are appropriately applied in varied contexts. That is, the behavior must be guided by an underlying rationale which forms the basis for the trainees' selection of particular behaviors from a set of known alternatives. Trainee decision-making in the present project was inferred from trainee reasons for prompting which they gave after listening to an audio tape replay of a lesson they had conducted. Trainee responses to the "stimulated recall" interview were used to determine what information was considered by trainees in making a decision to prompt in a given manner. Also measured was the relative amount of conscious decision-making that took place prior to generating a prompt. Observation data was analyzed for behavioral corroboration of decision-making data obtained from the stimulated recall interview.

Pupil Outcomes. Changes in pupils' reading achievement from the time of entry into the program to the end of the project, some 34 lessons later, were measured through an individual standardized reading test. Also studied on a pre-post basis were the pupils' attitudes toward reading and the pupils' reports of how they approached the decoding of unknown words during oral reading of connected discourse.

Organization of the Practicum

The major features of the training program are shown in Figure 1. While this organizational overview shows all the important aspects of the program, it does not indicate the relatively different amount of effort, detail, and time expended on each aspect. For example, while trainee and pupil selection was a one-time procedure, coder training extended over several weeks, with testing and retraining of coders continuous over the entire duration of the project.

The Laboratory Classroom

The central physical setting of the project was the laboratory classroom, upon which each of the other program elements impinged to some extent. The classroom was approximately 30 feet by 20 feet and was equipped with a one-way vision window. The one-way window covered the entire width of one wall, and thus permitted observation of the entire classroom. For the purpose of the study, two portable folding divider screens were placed against the extreme left and right sides of the one-way observation windows, to create two small isolated areas within the classroom which were used for oral reading and the collection of oral reading observation data. The reduction of noise and other common classroom distractions in the booths, created by placement of the screens, provided a relatively homogeneous, controlled environment in which oral reading lessons were conducted and observation data was collected. The booths also functioned as training stations. During the second semester, video monitors, on which trainees received real-time feedback about his/her prompting behavior, were placed in the booths. Figure 2 is an artist's rendering of the oral reading booth as viewed by the coder in the observation room.

The classroom was large enough to accommodate up to six trainees and six pupils simultaneously. The number of trainee and pupil pairs assumed a one-to-one trainee-pupil tutorial relationship. The same setting could accommodate small

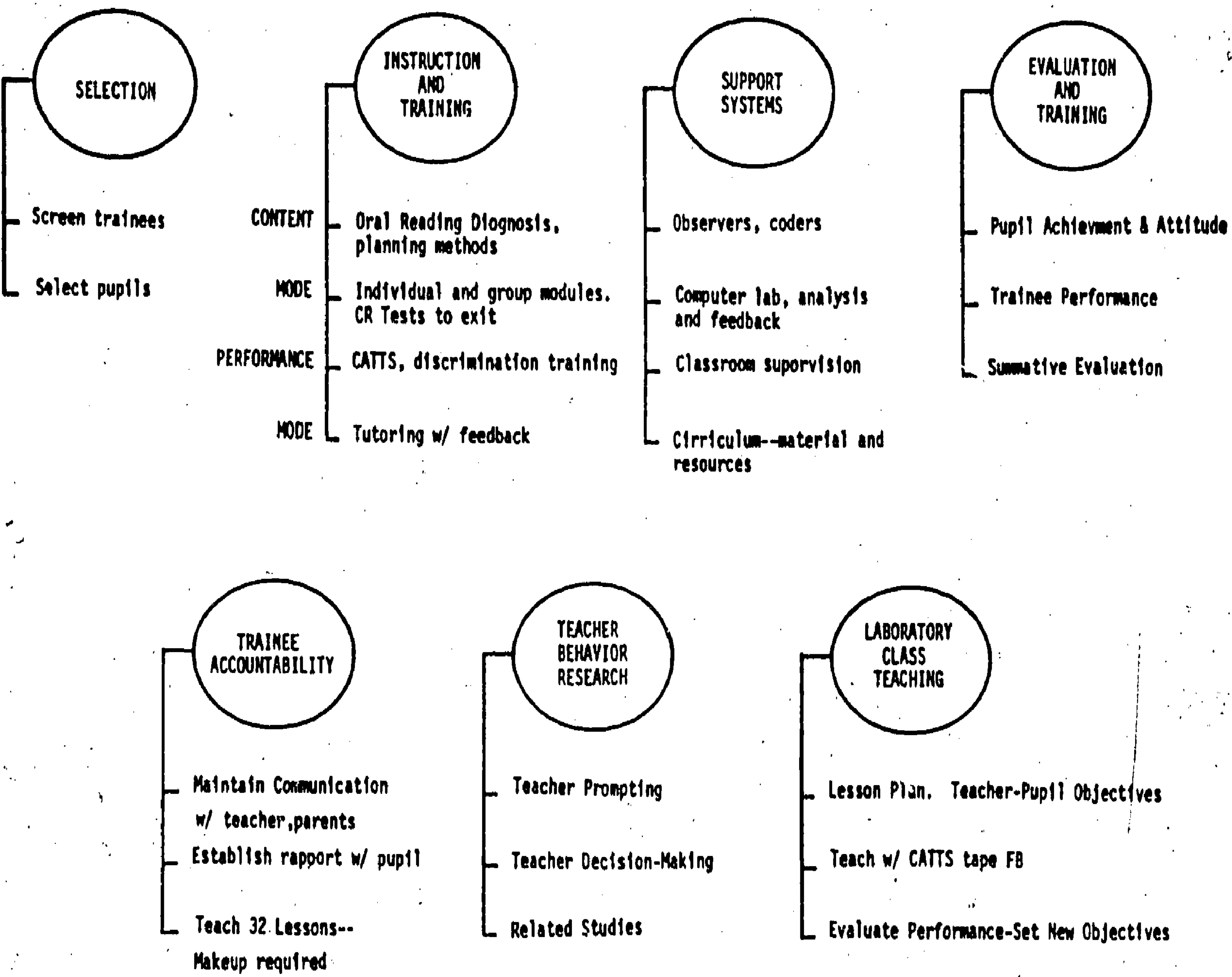


Figure 1. Features of the CATTS-CBTE program for pre-service teachers of the mildly handicapped.

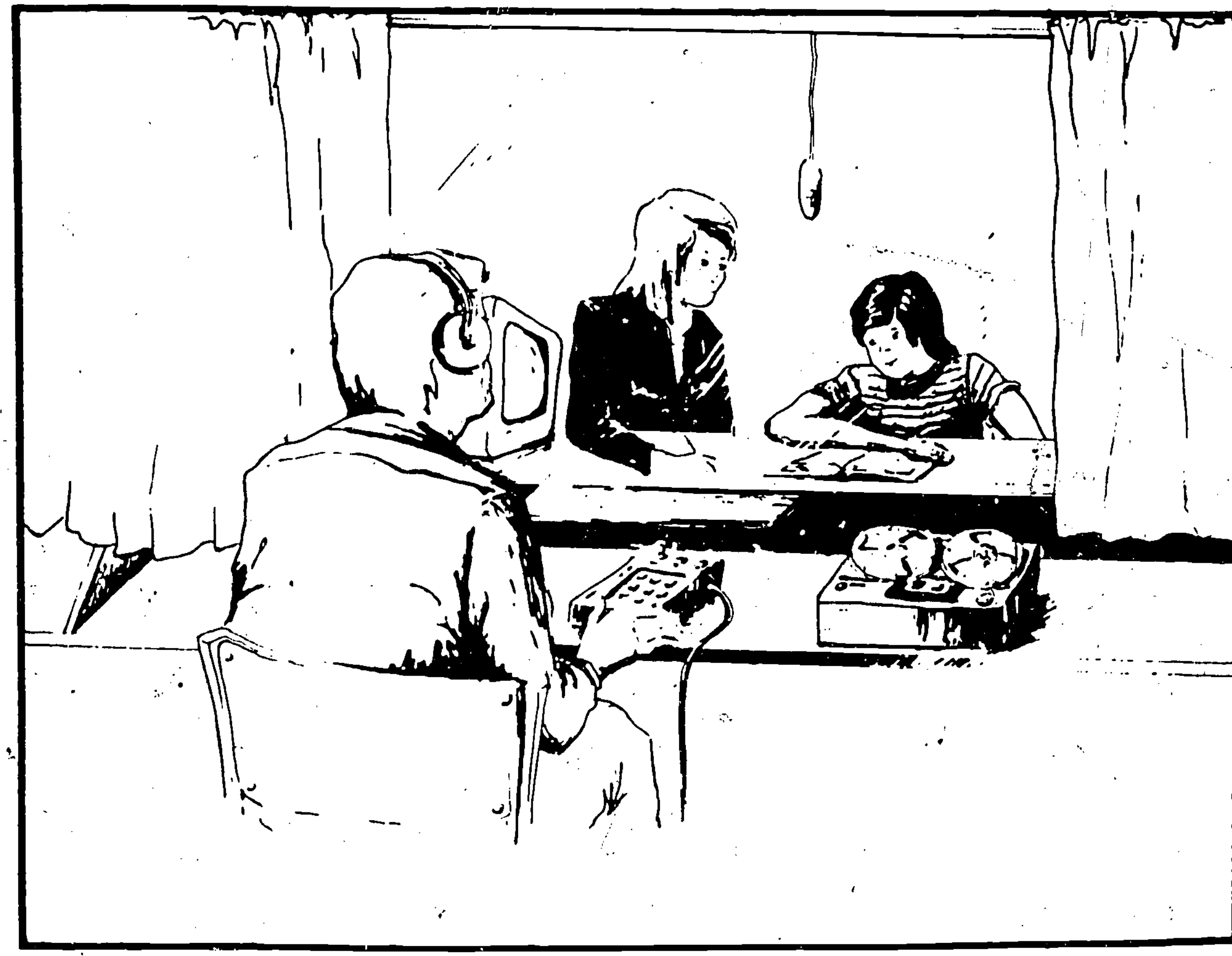


Figure 2. The oral reading booth as viewed from the observation coding room. Window provides one-way viewing.

group instruction as well. (The number of trainees and pupils that could be accommodated in the lab at any one time depends mainly upon cost factors and other resources available in the program.)

The classroom was run on an informal open plan, with sections of the room devoted to different activities that took place during the bi-weekly, hour-long tutorial session. Included in the physical layout of the carpeted room was a reading corner for recreational reading, quiet games, and other individual informal activities. The "quiet corner" had large floor pillows which provided an informal and comfortable physical setting. The room was also equipped with movable tables and chairs which were frequently and easily rearranged to suit individual needs. Other equipment more typical of classrooms included blackboards, supervisor's desk, stationary study carrels, file cabinets for records and instructional materials, and bookcases. Figure 3 shows the major elements of the physical arrangement of the lab class which contained controlled environment areas within an open class arrangement.

Trainee Selection

There were twenty pre-service, special education trainees in the program, each responsible for conducting two semesters of pupil tutoring. The trainees were in their junior year and had been admitted to the special education program during the previous year. Each trainee was screened into the program following criteria established by the Indiana University Department of Special Education. The department admits only 40 students per year, and the academic and background requirements are quite stringent. Assignment to the CATTS-OROS practicum was based primarily upon whether the trainee was free to tutor during the afternoon hours. A parallel practicum was offered in the morning hours (Semmel & Sitko, 1976). Thus, all junior-year special education trainees participated in one or another CATTS practicum. All trainees were concurrently enrolled in courses on language

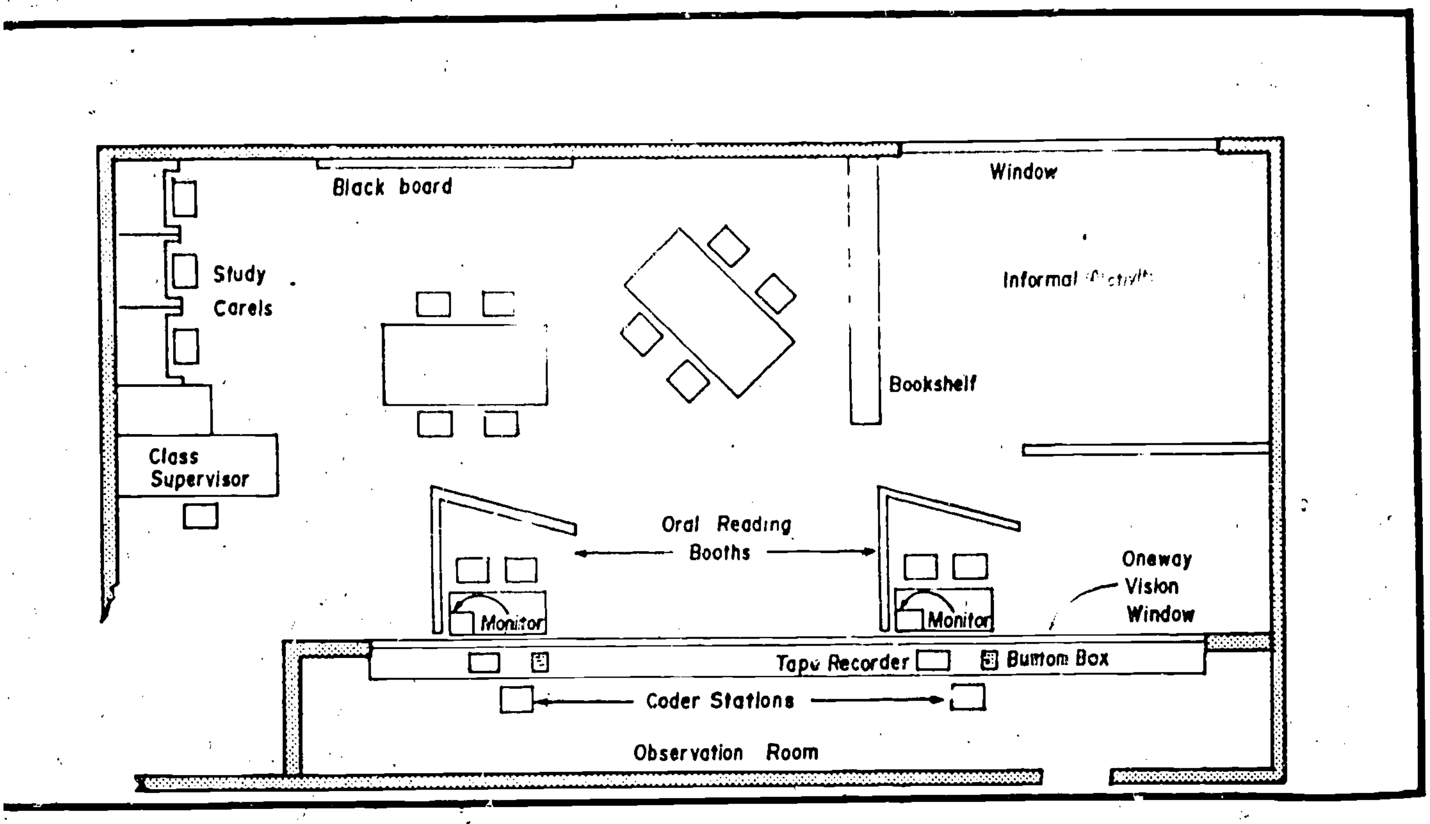


Figure 3. Layout of laboratory classroom.

and reading, reading methods, music and art methods and methods of teaching the mildly handicapped.

Pupil Selection

Early in the school year announcements were sent to the principals of 10 elementary and one parochial school in Monroe County, Indiana, concerning the after-school reading tutoring program. The schools contacted were those in closest geographical proximity to the CITH Teacher Education Laboratory. Members of the Monroe County Community Schools administration were also contacted for approval. Assurances of cooperation were received from the Superintendent of Schools, the Director of Special Education and the Coordinator of Reading Services. Letters describing the program were in turn distributed to the teachers by the school principal. The letter described which children were eligible for the tutoring service, the time, place, and nature of the program, tutors, and other pertinent information. Teachers then returned referral forms to CITH, through the principal. Letters were then sent to parents of the children referred, informing them of the availability of the program. There were several other sources of referral, including an announcement in the local newspaper. The need for tutorial services by children whose parents had responded to the newspaper story was then verified by the child's classroom teacher. Another source of referral was direct communication with the parents of children who had attended a remedial program for pupils for specific learning disabilities that had been conducted at CITH the previous semester. Only those children whose learning disability was in the area of reading were accepted into the present program.

Copies of letters sent to parents, teachers, principals, and administrators may be found in the Appendix.

Eligibility for Tutoring

Criteria for admission to the tutorial program were as follows: second- and third-grade pupils reading at least one year below grade level; 4th-, 5th-, and 6th-grade pupils at least two years behind grade level in reading. Both regular and special class pupils were accepted. Pupils were referred by teachers as having difficulty in oral reading, word recognition and word analysis skills.

Initially 20 pupils were admitted to the program, with six pupils on a waiting list.

First Semester Trainee Preparation: Methods and Materials

Trainees spent the first three weeks of the first semester following a course of study designed to provide them with requisite skills and knowledge involved in the teaching of reading, prior to the initiation of the tutoring program. All trainees also completed a series of mediated instructional modules, attended lectures and completed exercises on various aspects of reading and reading diagnosis. The topical sequence of trainee pre-tutoring preparation was as follows:

1. Completion of module: A Decision-Making Model for Teaching the Handicapped (Gillespie, 1975). This module is part of the "Tips for Teachers" (Semmel & Thiagarajan, 1975) series and was designed as a guide for planning instruction. The model attempts to show teachers how to go beyond the use of standardized tests and use other sources of information about specific strengths and weaknesses of individual children. A diagnostic/prescriptive approach is described, aimed at assisting teachers to become systematic in collection, evaluation and use of pupil assessment data.

2. Completion of module: Informal Reading Inventory (Windell, 1974). This module is also part of the "Tips for Teachers" (Semmel & Thiagarajan, 1975) series. The objective of this mediated instructional package is to provide the trainee with skills and knowledge necessary to construct, administer and interpret an Informal Reading Inventory.

3. Lecture series: All trainees were required to attend a series of lectures

on methods of teaching reading, diagnostic testing, identification of reading disabilities and lesson planning. Trainees were also required to complete exercises on the administration and scoring of both standardized and informal reading tests and to submit model lesson plans. Topics covered in the lectures given by one of the investigators included: overview of diagnostic testing concepts, test terminology, identification of reading disabilities, and discussion of specific diagnostic instruments.

The procedures for training and tutoring are shown schematically in Figure [illegible]. Lectures and discussion sessions were devoted to lesson planning, general methods of teaching, the diagnostic/prescriptive approach, teaching of word recognition and comprehension, appropriate selection and use of instructional materials, basal readers and related activities and games. Selection of reading material for pupils was based upon skill objectives found in Criterion Reading (Hackett, 19[illegible]).

Accountability. There were several levels of accountability required of trainees participating in the program. Each trainee was required to submit lesson plans specifying the instructional objectives for oral reading strategy lessons and other major areas of reading instruction (e.g., sight word, analytic skills, comprehension) needed by the individual pupil. Trainees submitted lesson plans at least four days prior to teaching their next two lessons. These were evaluated by the classroom supervisor according to a criterion checklist (see Appendix). Trainees resubmitted the plans if they were found to be inadequate.

Trainees were also required to establish rapport with the pupil, parents and teachers. Trainees communicated with both parents and teachers regarding the pupils' motivations, interventions, specific reading difficulty, remediation plans and pupil progress.

Periodic individual conferences were held by classroom supervisors and trainees,

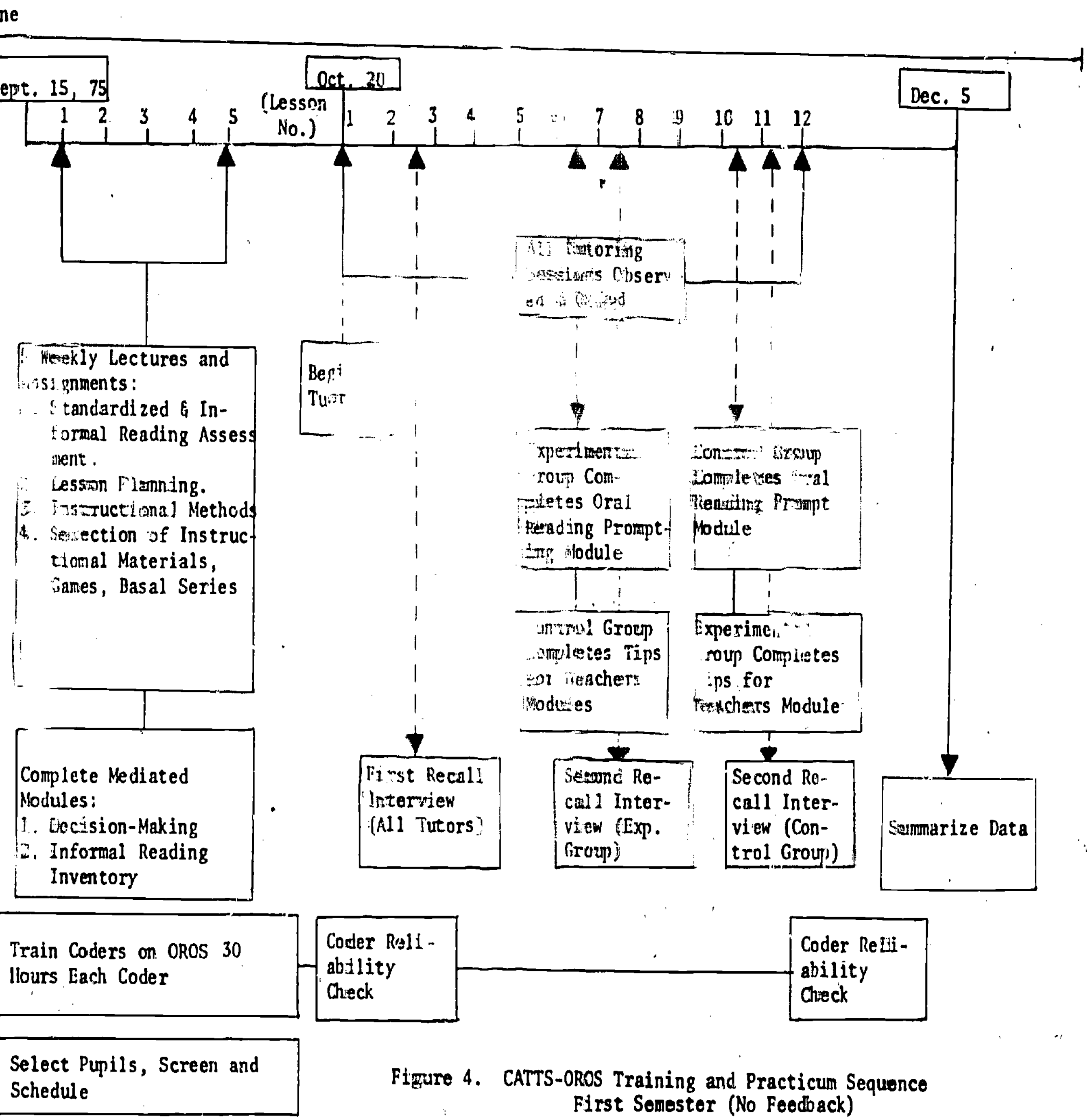


Figure 4. CATTS-OROS Training and Practicum Sequence
First Semester (No Feedback)

in which all aspects of teaching, except for oral reading prompting, were discussed. Oral reading prompting was not discussed so that no confounding of experimental treatments would occur. Trainees were under continual direct observation by a classroom supervisor who circulated about the laboratory classroom every session.

Trainees were also required to maintain a cumulative file of diagnostic information, lesson plans, and materials used in teaching. These were kept in a file cabinet in the classroom and used for reference in developing new lesson plans and for evaluation of both pupil and tutor.

Diagnostic tests. A number of standardized and informal diagnostic instruments were administered to each pupil at the beginning of the program in October and again at the end of the program in April. The Woodcock Reading Mastery Tests (Woodcock, 1973) was used to measure pupil entry levels and achievement on five aspects of reading: letter identification, word identification, word attack, word comprehension and passage comprehension. The five subtests were individually administered, and two alternate forms were used to offset pre-post practice effects.

Pupil Perceptions of Reading Interview (Andrews, 1975) was an orally administered, informal diagnostic instrument used to determine pupils' attitudes toward reading. The pupils' responses to a series of open-ended questions were used as a rough indication of his/her feelings about reading and perceptions of decoding strategies. A scoring system was devised for the instrument since there was none accompanying the instrument.

The Informal Reading Inventory (I.R.I.) is a method for determining the pupil's instructional reading level (Windell, 1974). This is the level at which the pupil can read from 95 to 98% of the words in a passage correctly and comprehend at least 75% of the material. For purposes of this project, materials for I.R.I.'s were drawn from graded passages of the New Open Highways series. Complete I.R.I.'s were developed for levels P (pre-primer) through 5 and duplicated for administration.

Each I.R.I. consisted of three parts: the word list, the oral reading passage and comprehension questions. The word list was comprised of 20 words randomly chosen from a list of all words appearing in a particular book. Its purpose was to determine the level of the oral reading passage to be used for testing. Passages of about 100 words were used for levels P through 2, and four comprehension questions accompanied each passage. The passages selected for the remaining levels were about 200 words long, and eight comprehension questions were written for each. Approximately half of the comprehension questions were of the factual type, and the remaining questions were evaluative or inferential and required the child to make some decision, draw a conclusion or formulate an opinion concerning a particular point.

The scores from the oral reading passage and from the comprehension questions were used together to determine the instructional reading level. Children who read more than 99% of a passage without error and comprehend more than 90% of it are reading at an independent level. Children who read between 95% and 98% without error and comprehend better than 75% of the material are reading at an instructional level. Those who read with more than 10% error and less than 75% comprehension are at a frustration level.

Once the instructional level was determined, each pupil was placed in the Basal reader that corresponded to that level. However, for the purpose of the oral reading lessons only, children were placed at one level above their instructional level in order for sufficient miscues to occur.

In addition to the test materials, Criterion Reading (Hackett, 1971) was used for the ongoing diagnosis and assessment of various specific reading skills, including phonology, structural analysis and comprehension. Tutors used a manual of hierarchically ordered objectives (Criterion Reading Objectives) and accompanying assessment procedures for determining pupil proficiency in each skill area and appropriate instructional tasks. Tutors were also encouraged to develop their own tests or activities designed to evaluate a child's progress and mastery in specific skill areas.

Child use materials. A variety of materials were used with the pupils for oral reading and instruction in reading skills. The New Open Highways Reading Series (Johnson, 1973) and the Lippincott Basic Reading (McCracken, 1970) were used mainly for oral reading purposes. Also available were the Monster Books (Blance & Cook, 1973), Holt Satellite Books, levels 9-12 (Hunt, 1974), and various Dell paperback books (see Appendix for complete list). The program also subscribed to two monthly children's magazines: Ranger Rick's Nature Magazine and the National Geographic World. In addition to the reading material available in the classroom, there were commercially packaged reading and skill games for the pupil's use. The tutors were encouraged to construct their own original games and instructional materials for use with their pupils as well.

To assist the tutors in both preparation and implementation of their lessons, several source books were available: Energizers (Thompson, 1973), Reading Activities for Child Involvement, 2nd Edition (Spache, 1976), and Center Stuff for Nooks, Crannies, and Corners (Forte, 1973). These references contain ideas, instructions, games, and various activities that provide teachers with creative and motivating techniques for developing children's reading skills. In addition, a booklet of reading activities was compiled to be used jointly with the comprehension sections of the Criterion Reading Series: Reading Activities and Games to Accompany Criterion Reading Objectives in Comprehension for Levels 2 and 3 (Brady, unpublished paper). Each of the main and process objectives of Levels 2 and 3 of the comprehension sections were stated, with at least one corresponding activity designed and/or selected to assist in the teaching of that particular skill.

Lesson plans. Each tutor was responsible for writing a weekly lesson plan describing the activities to be conducted in the two one-hour sessions. The tutors were provided with labeled lesson plan forms to fill out as well as a checklist which specified the items to be included in each section of the plan. Completed forms were submitted by noon on the Friday prior to the week the lessons were to be taught.

Two successive lessons were prepared in advance, with each lesson divided into two parts: oral reading and specific skill. Information required for each of these sections included the objectives, the materials, a description of the activity and the evaluation procedures.

The tutors were required to prepare a 15-minute oral reading lesson for each session. The level and exact length of the selection varied depending on the individual pupil, and the tutors were responsible for providing the pupils with reading material at a level at which there would be an error rate of approximately ten percent, in order for a sufficient number of miscues to occur. In addition to oral reading, the tutors were required to instruct the children in other reading and decoding skills. The number and type of activities conducted each day varied, depending on the child's capabilities and needs. Criterion Reading was used to determine specific skill areas the child was weak in, although the tutors were also allowed to write their own behavioral objectives. This provided the basis for instruction in the skill areas. All activities that were conducted were related to the stated objectives. The descriptions of the activity in Criterion Reading are highly specific, and evaluation of the child's progress was always in relation to the stated objectives. The purpose of evaluation was to determine whether or not the child could perform a certain skill after instruction in a particular area.

After the lesson plans and checklists were submitted they were evaluated on the basis of completeness, appropriateness and quality. All of the items stated on the checklist had to be present on the plans. The objectives, activities and materials all had to relate appropriately to one another as well as to the child involved. A subjective judgment of quality was made by the classroom supervisor, based on originality and effectiveness of the plan. If the lesson plan did not meet all of these criteria satisfactorily, it was returned to the tutor to be revised and/or completed prior to the teaching of the lessons.

First Semester Practicum Procedures

Tutoring of pupils began during the week of October 20, 1975. Each tutor met his/her pupil on a fixed bi-weekly schedule, one hour each session. Trainees met their pupils on a Monday-Wednesday or Tuesday-Thursday basis. Also, there were no more than seven tutor-pupil pairs in the laboratory class at any one hour.

Trainees worked with their pupil, in accordance with a lesson plan which had been submitted and evaluated in advance of the tutorial. A typical one-hour session included a short period of time for informal discussions or other planned activity geared toward improving rapport with pupil, about 15 minutes in silent reading, comprehension, and/or language development, and approximately 15 minutes of oral reading strategy lessons.

Trainees and pupils moved freely about the classroom, working at whatever areas they pleased (often sitting on the carpeted floor). The only exception was during oral reading, which was always conducted at the tables and chairs in the observation booth. The classroom supervisor moved about the room, observing the tutorials, troubleshooting and coordinating oral reading schedules with the coders in the observation room. An informal, relaxed atmosphere was maintained during the operation of the classroom.

Oral reading prompting module. After the first six tutorials were conducted, trainees were assigned to an experimental (group I) or control group (group II). Assignment to groups was random and stratified according to trainee scores on a test of the modules' content (Oral Reading Pretest Score), and the sex, grade and reading level of the pupils. Following the sixth tutorial lesson, the experimental group completed the Prompting Module in a single, two and one-half hour group administration of the mediated instructional package. During this same time, the control group worked through two mediated instructional modules selected from the Tips for Teachers Series: Concept Analysis and Instructional Games for Handicapped Children. These modules were also group-administered. After teaching their tenth lesson (which was four lessons after the experimental group completed the Prompting Module), the control group worked through the Prompting Module while the experimental group completed the Tips for Teachers modules.

The Prompting Module was administered at different intervals during the tutoring program in order to test the effectiveness of the module in changing the prompting behavior of trainees. The module administration schedule made possible the subsequent comparison of all trainees' prompting behavior during the baseline period (first five lessons) with their prompting behavior after completion of the module. It also made it possible to compare the prompting behavior of the experimental group with that of the control group (lessons 7 through 9). The results of completing the Prompting Module for each group are found in Chapter III, section 1.

Second Semester Practicum Procedure

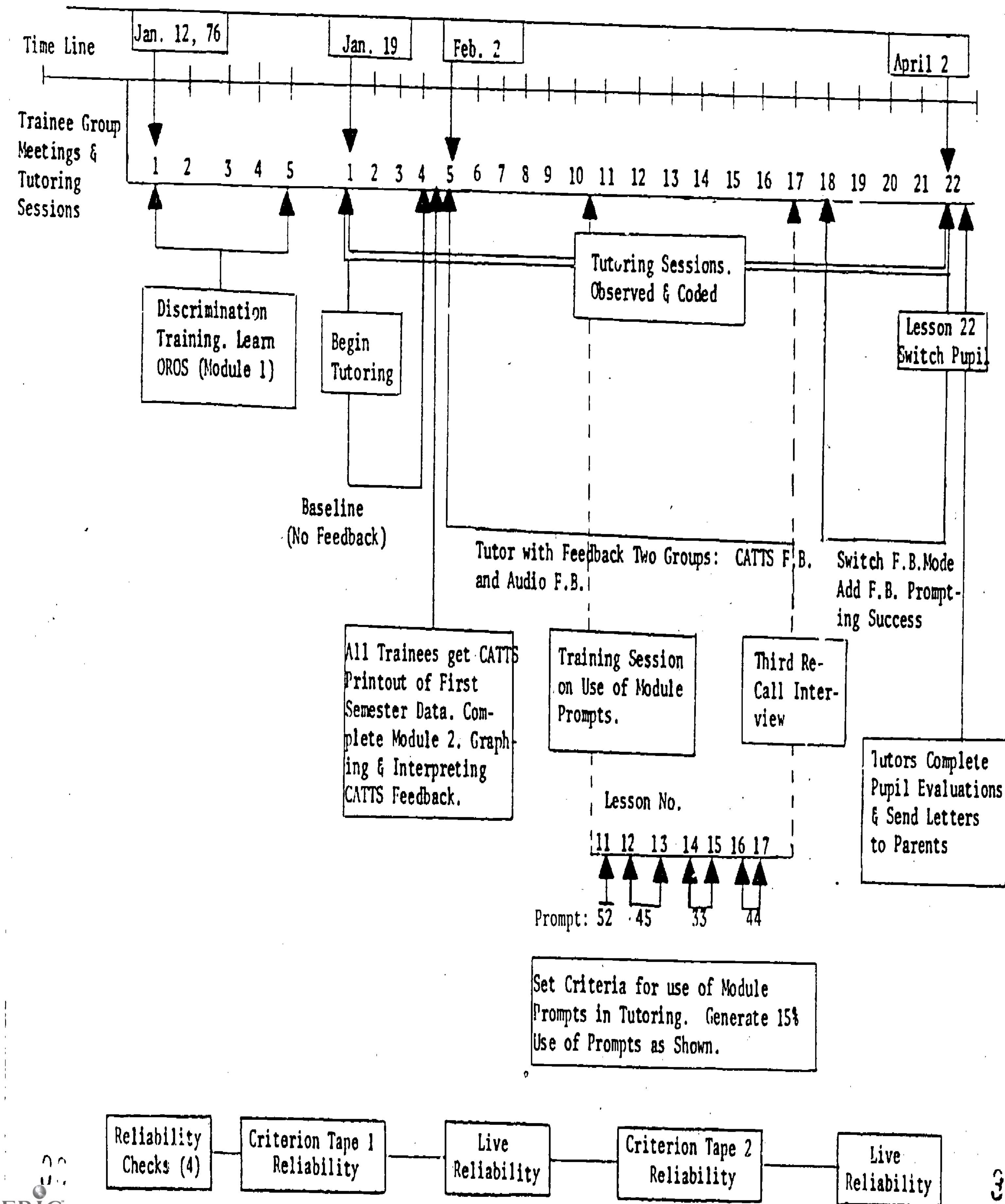
Figure 5 shows the plan of activities for the second semester training and tutoring.

After a five-week winter recess, trainees met for five bi-weekly group training sessions. The main objectives of the training sessions were as follows:

1. Develop trainee discrimination skills by learning the Oral Reading Observation System (OROS).
2. Familiarize trainees with CATTS feedback, including interpretation of computer printouts.
3. Use knowledge of OROS and CATTS to graph and interpret the results of

Figure 5.

CATTS-OROS Training and Practicum Sequence, Second Semester (CATTS & Audio Feedback)



first semester tutorials.

4. Set individual prompting behavior goals.

Materials included in these training sessions included Module I, The Computer-Assisted Teacher Training System Trainee Manual and the OROS Training Manual - Student Version. The student version of the OROS training manual was a modified form of the extended version used for the training of coders. Exercises and VTR Protocol materials used for coder training were also used with the trainees, but the criteria of proficiency were not as stringent as in coder training. The outcome of discrimination training is discussed in Chapter III, Section 2.

Following the five bi-weekly discrimination training sessions, which extended over a 2½-week period, trainees resumed tutoring. Except for a few changes, tutors worked with the same pupil they had taught during the first semester.

The first two weeks of tutoring was a baseline period, and trainees taught just as they had done during the first semester, that is, with no feedback. During the baseline period, trainees also completed Trainee Manual II - Developing Teaching Skills, which described how to interpret a computer printout of prompting behavior and how to use feedback from their own prompting behaviors to set new goals to improve prompting. In addition, trainees graphed and interpreted the printout data showing their first semester teaching performance and also developed performance objectives.

CATTS and audio feedback. The CATTS model of teacher training is predicated on the notion that trainee skills can best be developed through discriminable teacher behaviors, and through rapid and reliable feedback of relevant teaching behaviors to the trainee. CATTS has been developed to provide both real-time and post-teaching feedback of information on observed behaviors.

In the present training program, the CATTS training model and procedures were applied with half the trainees in the practicum. An alternative form of feedback -

audiotape replay of the whole lesson - was given to the other half of the trainee group. The purpose of providing two forms of feedback to trainees was to test the relative effectiveness of CATTS feedback in shaping desired trainee behaviors, compared with audiotape self-evaluation (i.e., trainees coded their own behavior). This later feedback mode is more typically available in training programs - the comparative effectiveness of each feedback mode is therefore an important question. All tutors received the same preparation program, including discrimination training, decision rules for prompting oral reading, miscue interpretation, and performance objectives. Only the mode of feedback varied for the two groups. Later in the second semester, feedback groups were exchanged, so that all trainees in the program experienced both feedback modes.

Feedback groups. Trainees were assigned to two feedback groups during the second week of baseline tutoring. Assignment to groups was random and stratified according to their pupils' average percentage of 21 (meaning change) miscues obtained during the first semester. Thus, pupils were rank-ordered according to percent of 21 miscues (adjusted for self-corrections) and then the pupil-tutor pairs were randomly assigned to CATTS feedback or audio feedback groups. Percent of 21 miscues was regarded as a measure of the difficulty that the pupil was having in oral reading.

After teaching the four baseline lessons, two simultaneous group sessions were held for the training of tutors on the use of feedback. Tutors assigned to CATTS were shown the real-time feedback display of prompting category frequencies and also instructed on the procedures for obtaining and interpreting post-teaching CATTS printouts. The tutors assigned to the audiotape feedback group received instructions on obtaining a tape of their lesson and on procedures for analyzing it for prompting behaviors.

Procedures for tutoring with feedback. In keeping with the thrust of the prompting module, all trainees were instructed to meet the following behavioral goals:

1. Prompt only meaning change (21*) miscues.
2. Do not prompt any no meaning change (22*) miscues.
3. Increase use of so-called "module prompts" which were as follows:

   33* structural prompt - teacher asks or tells pupil to identify syllables in target word.

   34* attention prompt - teacher focuses the child's visual attention on word.

   44* pattern prompt - teacher asks pupil for or gives a rhyme or word family cue to target word.

   45* phonics prompt - teacher asks for or tells a rule concerning a letter/sound relationship in a word.

   52* context prompt - teacher uses information in the sentence or story to cue pupil about the word.

4. Do not continue to prompt same word if prompts are still unsuccessful after two tries. Tell the pupil the word and go on.
5. Decrease or eliminate all other categories of prompts. The OROS system classifies all possible teacher prompting behaviors; five of these behaviors, referred to as the module prompts (above), are desirable, functional prompts that the teacher should be able to generate. Other possible prompts that teachers use are regarded as dysfunctional and trainees should work to eliminate them from his/her repertoire of prompting behaviors.

To aid in mastery of these behavioral goals, trainees received some form of feedback on their prompting behaviors during each oral reading lesson. The CATTS feedback group of trainees had a TV monitor in the oral reading booth and received information in the form of moving bar graphs indicating the relative frequency of

* OROS code numbers.

use of each of the five module prompts, "other prompts" and "telling." After each lesson, CATTS feedback tutors also received a printout summary of their oral reading behavior (see sample printout, Appendix).

The audio feedback group received cassette tape recordings following each oral reading lesson. To aid the audio feedback tutors in self-evaluation, a tally sheet for calculating the frequency of occurrence of OROS behaviors was provided. Trainees were required to turn these in (along with a Feedback Evaluation Sheet) prior to teaching their next lesson (see Appendix).

Both groups of tutors completed the Feedback Evaluation Sheet and were required to turn it in prior to teaching their next lesson. The purpose of this was to assure that the trainees would focus on the use of prompts, by continuous examination of their own prompting behavior and its status relative to behavioral goals. The CATTS feedback group used the printout summary as the basis for completing the Feedback Evaluation Sheet. Once feedback was instituted, the evaluation procedure was required for every lesson thereafter.

A group training session was held after the sixth lesson for the purpose of reiterating and reinforcing the use of the five module prompts. Written exercises and examples were provided, and trainees were also given cirterion levels for use of prompts in the subsequent lessons. Trainees were told to try to achieve 75% use of five module prompts as their main behavioral goal. They were also instructed to concentrate on generating 15% (52's) and "pattern prompts" (44's) following in two-week successive intervals. The fifth module prompt, "attention" (34's), was not targeted as a trainee goal, as first semester data had shown that this particular teacher behavior did not require any training effort and that teachers could generate it with ease.

At this point in the program (after the seventh lesson), all trainees were required to construct and maintain a graph showing their use of five module prompts.

This, too, was used to heighten trainees' awareness of the behavioral goals and of their own performance in relation to the stipulated criteria.

Mode of feedback was switched after the 17th lesson, and trainees who had received CATTS feedback now received audiotapes and vice versa. In an effort to study the interaction of trainee prompting behaviors with pupil differences, trainees exchanged pupils at the 22nd lesson. We were interested in determining if prompting patterns established with one child transferred to interactions with another child, or whether variations in child behavior have greater influence on the teachers' prompting patterns.

Trainee lesson planning and lesson plan evaluation procedures, instituted during the first semester, were continued throughout the second semester of tutoring, as was the practice of conducting periodic, individual supervisory meetings. These tutor-supervisory conferences covered all aspects of tutoring except oral reading prompting behavior. Trainees also wrote pupil progress reports at the conclusion of the program, and these were sent to the pupils' classroom teacher and parents.

Summary

The procedures outlined in this section described the organizational aspects of the teacher training program. Included were descriptions of the physical setting of the program, criteria for trainee and pupil selection, the course of study required of trainees, diagnostic tests and child use materials, the nature of discrimination training in the area of prompting pupil miscues in oral reading, the CATTS and audiotape feedback provided to assist trainees in generating appropriate prompting behaviors, and accountability and assessment techniques.

It should be noted that trainees were assigned to different Experimental (E) and Control (C) groups each semester because assignment to groups was based on different criteria each semester. In the first semester when the effects of the Prompting Module on trainee prompting behaviors were studied, assignment to E and C groups was random and stratified according to trainee pretest score on a test of knowledge of appropriate prompting behavior, and with adjustment for pupils' sex, reading grade and class level. In the second semester, when the major focus was on the study of the effectiveness of CATTS feedback and the trainees' ability to generate appropriate prompts, the assignment to E and C groups was random and stratified according to the rate of pupils' meaning change ("21") miscues obtained during the first semester.

The next section of this report describes the development of and rationale for the Oral Reading Observation System (OROS), the methods used to train observers, and the reliability of coders who observed the lessons conducted by trainees in the program. In the section that follows the description of OROS, four teacher behavior studies are reported. Since all studies were conducted within the context of the CATTS tutoring program, with the same pupils, trainees and overlapping time-lines, there is some redundancy in the description of each study, even though each addresses a distinct and separate aspect of teacher behavior or the teacher training program.

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CHAPTER II.

THE ORAL READING OBSERVATION SYSTEM (OROS)[1]

Introduction

The Oral Reading Observation System (OROS) is a research and evaluation tool that enables a trained observer to code teacher and child verbal behaviors during an oral reading activity. OROS classifies at a detailed level the kinds of miscues or oral reading errors made by a pupil, the techniques or prompts the teacher uses in helping the pupil decode words, pupil answers to prompts, and teacher feedback and management. OROS was developed at the Center for Innovation in Teaching the Handicapped (CITH) by Mary Ella Brady and William W. Lynch as part of the Center's project on "Cognitive Demand Skills of Teachers," a research and development program whose overall goal is to find ways to enhance the cognitively oriented, interactive skills of teachers of the handicapped.

A User's Manual has been written to give guidance to potential users of the system. Development of the manual and the accompanying Observer's Training Manual (Brady, Lynch and Cohen, 1976) was partially based on "A Guide for Developers and Users of Observation Systems and Manuals" (Herbert and Attridge, 1975), in which a set of criteria for observation systems was detailed. The User's Manual was designed to give a detailed rationale for the development of OROS and the specific categories, procedures for data analysis, information on the validity and reliability of the instrument, and specific suggestions for coder training procedures using the Observer's Training Manual. The Observer's Training Manual is a self-instructional, detailed manual that contains definitions and examples of all categories and exercises. It has been used in training coders to high degrees of accuracy. Both of

[1] Parts of this chapter have been adapted from Brady, M.E. & Lynch, W.W., Observing reading teachers: A critique of systems and the development of an instrument specific to teaching word recognition. Paper presented at the American Educational Research Association Convention, San Francisco, April, 1976.

these manuals may be obtained from the Center for Innovation in Teaching the Handicapped.

Rationale for the Development of OROS

In view of the high degree of importance attached to the teaching of reading by both the general public and professional educators, and the large financial investment in research and development in reading, it is paradoxical that we know so little about how teachers behave during reading instruction and what behaviors are related to pupil reading achievement. One of the reasons for this situation is the generic nature of the observation instruments that have been used to observe teacher processes during reading instruction. Instruments that include generic teaching skills, such as control, praise, criticism, and enthusiasm, have no categories specific to the subject matter of reading. While process variables such as these have been found by some investigators to be significantly related to student achievement in reading, the fact remains that, for example, an indirect, well-organized, and enthusiastic teacher may be teaching skills in reading that are not related to reading achievement or may be teaching them in dysfunctional ways. To ascertain just what is occurring in the teaching of reading requires observation systems that are sensitive to the functional aspects of reading instruction. While the authors agree with Herbert and Attridge (1975) that one needs good reasons for developing new observation instruments, we could find no low-inference category system specific to the behaviors we wished to investigate, namely, teacher-pupil verbal interactions during word recognition in oral reading.

Research in the methodology of teaching reading has, for the most part, revealed nothing about effective teacher skills in reading because teacher process variables were either ignored or measured with poorly designed rating systems. The most well-known of these studies were the First Grade studies. The teacher experience and efficiency ratings used in these projects were only slightly related to pupil success. But two results - that treatment differences did not operate in the same fashion across projects, and that project differences persisted after controlling for initial reading level - point to the possibility of teacher effects. Bond and Dykstra (1967), in a summary report on these projects, suggested that future research should focus on teacher and learner characteristics, and that "To improve reading instruction, it is necessary to train better teachers of reading rather than to expect a panacea in the form of materials" (1967, p. 123). These studies, and others, have revealed differential implementation by teachers of the same instructional materials. While research such as Barr's (1975) and Cohen's (1975) have demonstrated that instructional materials do influence pupils' reading strategies, the identification of effective approaches to the teaching of reading must be derived from three sources of information - teacher behavior, instructional materials, and learner characteristics.

Farr and Weintraub pointed out in the preface to the 1974 Annual Summary in the Reading Research Quarterly (1974) that research in teacher behavior/characteristics in the reading literature has been declining since 1967. However, in the literature related to teacher behavior, researchers have continued to investigate the relationship between reading achievement and teacher behaviors or to sample teacher behaviors during reading. Almost none of these studies produce information that is translatable into training procedures for teachers of reading because the instruments used do not contain reading specific categories. Though there is a wide body of literature from which teacher skills in reading can be hypothesized (e.g., Gibson and Levin, 1975; Davis, 1968; and Singer and Ruddell, 1970), researchers in teacher behavior and reading have not utilized this literature.

Studies that have looked at reading classroom behavior with generic instruments such as Flanders Interaction Analysis (Frizzi, 1972) or related systems (Soar, 1966) reveal nothing about effective teacher skills for reading. The variables deriving from such systems have no functional relationship to either comprehension or word recognition variables which have been shown to be important in reading. The fact that indirect control and a warm emotional climate were found to be related to pupil growth in vocabulary (Soar, 1966) helps very little when we wish to identify teacher skills specific to teaching vocabulary. Dale, O'Rourke, and Bamman (1971) suggest techniques to be used in the teaching of vocabulary, an example of which is "...maximize the transfer of present knowledge of words, roots, prefixes, and suffixes" (p. 4). The teacher behaviors investigated by Soar relate neither to this technique nor to any of the others suggested by Dale et al. (1971). Frizzi (1972) found that Flanders' revised I/D ratio was significantly related to the percentage of students mastering the word recognition skill of phoneme-grapheme correspondence for the letter p. Reading specific issues, such as whether to teach p in isolation or within words, were not addressed.

The series of studies conducted in the Texas Teacher Effectiveness project have used reading achievement as one product measure, with the Brophy-Good Dyadic Interaction System (1969) being utilized to collect observational data. The vast majority of categories in this system are classroom control variables. One reading specific variable derived from this system, a ratio of divergent to convergent questions, was found not to be related at all to student learning gains in reading (Brophy, 1975). A recent study by Weinstein (1976) used the Brophy-Good system and found no evidence of teacher bias in verbal interaction towards the high-achieving readers. However, Weinstein also found that group membership accounted for an additional 25% of the variance in achievement after controlling for readiness scores. This result suggests that differences in teacher behavior towards the two groups were present, but the instrument used was not sensitive to these behaviors.

Generic instruments classifying the cognitive level of questions are often used to observe reading comprehension activities (Guszak, 1967; Bartolome, 1969;

Wolf, King, and Huck, 1968). The categories used in the various systems overlap and are directly relatable to levels of reading comprehension. Selected results are that the greatest proportion of questions asked by teachers are of the literal type (Guszak, 1967; Bartolome, 1969) and that, if teachers receive specific training in asking critical questions, pupils will perform significantly better on a test of critical reading abilities (Wolf et al., 1968). These results suggest that one teacher skill in reading is the ability to generate questions for all levels of comprehension. Such observation systems, however, though relevant to reading comprehension, do not include knowledge of word meanings, the skill that Davis (1968) found to have the largest contribution in variance to comprehension. Taking into account psychometric research on factors of comprehension could lead to observation systems for observing teacher questioning behavior that incorporate only those kinds of comprehension questions related to identifiable comprehension subskills in readers.

There are observation instruments specifically developed to observe reading instruction. One by Quirk, Nalin, and Weinberg (1973) has four categories specific to reading: comprehension, pronunciation and word recognition, language structure, and reading silently. From this instrument one can tell how much time is spent in an area of reading, but not how the teacher approaches it. Quirk et al. (1973) reported that the largest amount of instructional time in reading is spent in pronunciation and word recognition (26%), but no information about specific teacher behaviors in pronunciation and word recognition can be determined from the observation instrument used. A second instrument, the OScAR-R (Observational Scale and Rating-Reading) was devised by Medley for use in the CRAFT project (Harris & Serwer, 1966) to provide a record of the degree to which teachers implemented the method variables of the basal treatment assigned to them. However, most categories in this system are not reading specific, which may explain the result of no significant correlations between OScAR-R process variables and student reading achievement with 30 correlations performed. Chall and Feldman (1966) gathered information about teacher behavior in reading using ratings of behavior, as well as a questionnaire and interview. Two factors, excellence in teaching and a sound-symbol emphasis, were significantly related to reading achievement. Only the instruments of Chall and Feldman (1966) seem to warrant further use, but their observation instrument was not a low-inference category system, but a high-inference rating system.

If reading instruction is to be improved, more continuity between the fields of reading and teacher behavior must be established. We know that teachers spend by far the majority of their reading instructional time on word recognition skills (Quirk et al., 1973) and that word recognition is often taught in oral reading situations (Lynch & Epstein, 1974). Two studies suggest the effect of teacher word recognition behaviors on pupil reading strategies and achievement. Clark (1975) used a modification of Quirk's system (1973), and found that more oral reading occurred in low than in high-achieving schools. Piestrup (1973), in an investigation of teacher styles in responding to dialect speaking first-graders, found that teacher responses to such errors affect reading achievement. In this study, pupils in classrooms where teachers demanded Standard English pronunciations had significantly lower reading achievement than those who accepted the child's speech. However, a more detailed categorization of teacher behaviors during word recognition in oral reading is needed if we are to relate teaching strategies to pupil reading strategies.

How a pupil approaches reading and the stages of reading he/she goes through have been shown to be influenced both by developmental and instructional factors (Barr, 1975; Biemiller, 1970; Cohen, 1975; Weber, 1970). However, none of these studies actually observed teacher responses to miscues. Better readers, regardless of instructional method, progress to a stage of contextually and graphically constrained miscues, though the stages differed depending on method (Biemiller, 1970; Cohen, 1975). Poorer readers, however, tend not to progress to the stage of contextually and graphically constrained miscues. They fail to self-correct when context is distorted (Levitt, 1972; Weber, 1970), have difficulty utilizing graphic cues (Barr, 1975), and once graphic cues are learned, tend to misuse graphic information (Weber, 1968). Goodman (1965) concluded that interruptions during oral reading were detrimental and argued that the focus during reading must be placed on language. Given the difficulties poor readers encounter, however, to allow oral reading with no corrections at all seems counter-productive. It is in just this situation that the teacher's behavior can encourage effective use of graphic and contextual cues in decoding continuous text.

The results of the above miscue studies and other research in reading suggest relationships between teacher behaviors during word recognition and pupil reading strategies. If a teacher demands exact word-for-word reading, as most do (Brady, 1976), the pupil will be using only one source of information to identify words - letters. When the focus is only on isolated words, pupils tend to make more errors and are less likely to self-correct because the grammar and meaning of the sentence or story are not being attended to (Goodman, 1965). Cohen's results (1975) suggest that if the teacher always tells the pupil to sound out unknown words, as in synthetic phonics approaches, nonsense word production and sounding out will be frequent error types. Spelling, as a teacher approach to word recognition, can cause pupils to spell unknown words and will have no relationship, or a negative one, to achievement in word recognition. Teaching the names of letters making up a list of words to be learned does not shorten the time to learn the list of words (Samuels, 1970). Encouraging a child to read for meaning, and showing him/her how to use grammar and the meaning of what is being read to decode words, could produce more miscues that fit in the context and more self-corrections. A detailed analysis of learner characteristics in reading and of how certain instructional materials affect reading strategies can suggest what variables to include in observation systems used to observe reading. The effectiveness of teacher behaviors specific to reading can then be investigated.

Purpose

The Oral Reading Observation System (OROS) has been developed in order to provide detailed descriptions of pupil reading strategies and teacher responses to pupil errors during oral reading situations. Oral reading, when practiced in the purposeless, "Round-Robin" sense, has been, and continues to be, discredited by reading professionals (Spache and Spache, 1973). Recent research, however, suggests that its use in this manner is still prevalent (Lynch & Epstein, 1974; Clark, 1975). An analysis of the kinds of miscues, or errors, a pupil makes while reading continuous text orally can reveal the pupil's approach to reading. For example, some readers simply omit words they don't know while others will make substitutions. Or, some readers pay too much attention to graphics, cues, or letters, and very little to syntax and semantics, or the grammar and meaning of what they're reading (cf. Barr, 1975; Biemiller, 1970; Cohen, 1975; Weber, 1970 for descriptions of pupil reading strategies). For pupils with dysfunctional reading strategies, teacher-pupil interaction during an oral reading situation can encourage the pupil to, for example, pay more attention to the meaning of what he/she is reading.

The authors advocate strategy lessons in which the teacher's responses to miscues are based upon a series of decision rules, incorporating diagnostic pupil information (i.e., specific reading skills), word and sentence/story characteristics and miscue characteristics. A self-instructional module called Prompting (Brady, 1975) has been developed to train teachers in these procedures. Not all children need such oral reading strategy lessons, but the poor readers (educable mentally retarded and remedial), who, for example, fail to self-correct an error even when it makes no sense or produces nonsense words because of sounding out (Levitt, 1972; Cohen, 1975), can profit from strategy lessons.

The primary purpose of OROS is to describe teacher-pupil verbal interactions during oral reading of continuous text. Subpurposes are to (1) describe the kinds of miscues pupils make as they read orally; (2) identify what kinds of miscues teachers respond to; and (3) identify the word recognition strategies teachers use to help pupils recognize words and the effectiveness of these strategies for the reader. OROS can also be used to evaluate the effects of teacher training in word recognition strategies on teacher behaviors, such as with the use of the Prompting module (cf. Brady, 1976). It can also be used to research the effect of specific teacher responses to miscues on pupil reading behaviors.

Selection of Categories

The first stage in developing an observation instrument that would completely and accurately record all relevant behaviors during oral reading activities consisted of gathering approximately 20 hours of audio- and video-tape recordings and field notes from about 35 elementary and special education classes in a large city school system during normal lessons. Most classes were using a standard basal reading series with an emphasis on meaning. Tapes and observation notes were then analyzed to identify the common, recurring forms of reading instruction that entailed teacher-child interaction. Oral reading by individual pupils was found in virtually every class. In many classes this took the common form of "round-robin" oral reading turns within a reading group, with comprehension questions interspersed. Oral reading was also dispersed throughout other lesson activities. Whenever oral reading occurred, regardless of the form of instruction, a nearly universal interactive pattern was found that consisted of the teacher responding to reading miscues by individual pupils. The following was the typical sequence: (1) after reading correctly from the text, a child miscued; (2) the teacher responded with a prompt (a hint or clue); (3) the child responded with a "provisional try" that was either correct or not; (4) the teacher then responded with either an evaluative remark or another prompt. This sequence usually continued until either the child correctly identified the word, or the teacher gave up and told the child the correct word.

As a result of the initial analysis of protocols, efforts were then made to categorize systematically all behaviors during oral reading. Concurrently, a survey of research and theory on decoding processes in reading was conducted to identify types of miscues and forms of teacher assistance that could conceivably occur, even though they had not turned up in the first group of protocols. For this, we drew on the studies of miscues cited previously, as well as on such studies as Samuels, Dahl, and Archwamety (1974), the literature cited by Gibson and Levin (1975), and behaviors identified in Minicourse 18 (Ward & Skailand, 1973). Nine general categories (six of these are further subdivided and will be explained subsequently) were established, as follows:

Category 1 - Target Pupil: Exact Oral Reading. The pupil who is reading aloud reads words continuously from the text exactly as they are printed.

Category 2 - Target Pupil: Miscues. The pupil who is reading orally deviates from what is printed by (1) reading something different, (2) stopping reading completely, (3) inserting a word, or (4) omitting a word.

Category 3 - Teacher: Look Prompts. The teacher's prompt focuses on all or part of the word's visual or structural features.

Category 4 - Teacher: Sound Prompts. The teacher's prompt focuses on sounds that are represented by different individual or groups of letters in a word.

Category 5 - Teacher: Meaning Prompts. The teacher's prompt focuses on the meaning of a text word or the meaning of the sentence or story in which the word appears.

Category 6 - Target Pupil: Answers to Prompts. The pupil responds to a teacher prompt by trying to decode a word or by answering the teacher.

Category 7 - Teacher Feedback and Management. The teacher gives positive or negative feedback or manages the oral reading lesson.

Category 8 - Teacher Tells. The teacher tells the pupil what a text word is.

Category 9 - Other. Teacher and/or pupil verbal interaction is not concerned with oral reading instruction.

The above categorization was created for two reasons: (1) so that conceptually similar behaviors would be under one general category for ease of memorization, and (2) so that the numbers of the general categories would increase in the temporal order in which the behaviors typically occur in the classroom.

Summary of OROS Categories

The complete version of OROS contains 41 categories as shown in Figure 1. The reader is directed to the User's Manual in the Appendix for a detailed description and definition of each category in the system. A listing of OROS categories and brief definition of each follows.

Category 1: Target Pupil: Exact Oral Reading

Category 2_ _: Target Pupil: Miscues

21_ Meaning Change
22_ No/Low Meaning Change

_ _0 No Response/Don't Know
_ _1 Sounding or Naming Letter(s)
_ _2 No/Low Similarity
_ _3 High Similarity
_ _4 Dialect Based
_ _5 Insertion/Omission

Category 3_ _: Teacher: Look Prompts

31_ Letter Name(s)
32_ Spelling
33_ Structural
34_ Attention

_ _1 Direct
_ _2 Indirect

Category 4_ _: Teacher: Sound Prompts

41_ Isolated Sounds
42_ Sound Out Word
43_ Unnatural Stress
44_ Pattern
45_ Sounds Within Words/Phonics Rules

_ _1 Direct
_ _2 Indirect

Category 5_ _: Teacher: [illegible]ng Pr[illegible]

51_ Word Meaning
52_ Context

_ _1 Direct
_ _2 Indirect

Category 6_ : Pupil: Answers to Prompts

61 Incorrect Answer/Word
62 Correct Answer
63 Self-Correction
64 Exact Word/Meaningful Miscue
65 Non-target Pupil Prompts/Answers

Category 7: Teacher: Feedback and Management

71 Positive Feedback
72 Negative Feedback
73 Management
74 Turns to Another Pupil

Category 8: Teacher: Telling

Category 9: Non-Oral Reading/Other

Figure 1.

The Oral Reading Observation System Categories: Full Version

Oral Reading Observation System

Definitions of Categories

Code	Category	Definition
1	Exact Oral Reading:	The pupil reads with no miscues.
2	Pupil Miscue:	The pupil deviates from the text in some manner.
21	Meaning-Change Miscue:	The miscue changes the meaning of the sentence.
	Meaning-Change Miscue Subcategories:	
210	No Response Miscue:	The pupil does not attempt the word at all.
211	Letter/Syllable Miscue:	The pupil makes an isolated sound for one or more letters of the word.
212	No Graphic Similarity/ Low Graphic Similarity Miscue:	The pupil substitutes a word that has fewer than half the letters the same as letters in the text word.
213	High Graphic Similarity Miscue:	The pupil substitutes a word that has at least half of its letters the same as letters in text word.
215	Insertion/Omission:	The pupil omits a word which is in the text or inserts a word into the text.
22	No Meaning-Change Miscue:	The miscue does not substantially change the meaning of the sentence.
	No Meaning-Change Miscue Subcategories:	
222	No Graphic Similarity	The word the pupil substitutes is very different than text word (no more than 2 letters the same), but the new word does not change the meaning of the sentence.

223	High Graphic Similarity:	The word that pupil substitutes is very much like the text word (3 or more letters the same); the substitution does not change the meaning of the sentence.
224	Dialect-Based Miscue:	The pupil's miscue occurs because he is translating text grammar or words into his own language.
225	Insertion/Omission:	The pupil omits a word which is in the text or inserts a word into the text that does not change the meaning of the sentence.

	Teacher Prompts (3, 4, 5)	
3	Graphic (Visual) Prompts:	Teacher prompts on the graphic features (letter, syllable, structure) of the word.
	Subcategories:	
31	Letter Name:	Teacher names or asks for letter(s) within the word.
32	Spelling:	Teacher spells or asks the child to spell the word.
33	Structural:	Teacher tells pupil, or asks pupil to identify structural components of the word (syllables, inflected ending, type of word)
34	Attention:	Teacher focuses the child's visual attention on word. ("Look at it!")

4	Phonemic (Sound) Prompts:	Teacher prompts on the sound features (consonants, stress patterns, phonic role) of word.
	Subcategories:	
41	Isolated Sound:	Teacher gives or asks pupil to make the sound for letter(s) in the text word.
42	Sound Out:	Teacher sounds out the word letter by letter or asks the pupil to do so.

43	Unnatural Stress:	Teacher gives unnatural stress to the initial consonant and then says the rest of the word in a natural manner.
44	Pattern:	Teacher asks pupil for or gives pupil a rhyme or word family clue to text word.
45	Sounds within Words and Phonics Rules:	Teacher asks for or tells what sound(s) the letters in the word make by saying another word that contains the same sound or by telling or asking about a phonics rule.
5	Word Prompts:	Teacher uses semantic or syntactic features of word or sentence to aid in identification of word.
51	Word Meaning:	Teacher gives or asks pupil for meaning/definition/association of word.
52	Context:	Teacher uses information in the sentence or story to cue pupil about the text word.
6	Pupil Response	
61	Incorrect Answer/Word:	Pupil incorrectly answers the teacher's prompt, or fails to give an answer.
62	Correct Answer:	Pupil responds correctly to prompt but still does not get the text word.
63	Self-Correct:	Pupil rereads and corrects own miscue without any help or prompting.
64	Exact Word/No Meaning Change:	Pupil gives exact text word after teacher prompt, or responds with a word that does not change meaning of the sentence.
65	Other Pupil Answers:	In group instruction, a non-target pupil responds to teacher prompt.
7	Teacher Feedback	
71	Positive Feedback/ Encouragement:	Teacher praises the pupil and encourages attempts to respond.

72	Negative Feedback:	Teacher tells pupil that miscue or answer is incorrect.
73	Management:	Teacher gives pupil general directions about reading, e.g., read slowly, start again, repeat, use expression, read carefully, etc.
74	Other Pupil:	In group instruction, teacher calls on non-target pupil for answer to prompt.

	Other Categories	
8	Teacher Telling:	Teacher tells the pupil the text word, using natural pronunciation.

9	Non-Oral Reading:	Teacher, pupil(s) are not talking about oral reading or word recognition (e.g., change to comprehension discussion during oral reading).

Coder Training Procedures and Reliability

Training

During the academic year 1975-1976, coders were trained on OROS and had periodic maintenance checks throughout the year. These coders were used to code observational data from several concurrent projects at CITH. This section describes the training procedures used and the results of all observer agreement checks.

Five students, none of whom had any previous experience with observational coding, were hired as coders. Two of the coders were masters' students in reading education who had nine hours completed towards their master's degree. The other three were undergraduates working toward degrees in fields other than education. One of the masters' students consistently had the highest or second highest agreement to criterion, while the other was usually fourth or fifth. Therefore, it does not seem necessary to hire as coders, people who have had experience in reading. Our indications were that training was only slightly faster for the reading masters' students.

At the first training session all coders were given a draft copy of the <u>Observer's Training Manual</u> (Brady, Lynch, and Cohen, 1976). Several changes were made in this manual as problems arose with some coding rules during the first semester. Thus, the final copy was not printed until April, 1976. All coders were given an overview of the full version of OROS, which has 41 categories. The remaining meetings, which took a total of approximately 25 hours, were devoted to coding simulated and live tapes of oral reading lessons.

All coder training was done with DITRMA, a computer system that provided instant feedback on the agreement between coders. Each coder was provided with a copy of the text the child in the training tape was reading. (This is necessary for accurate coding of miscues.) As each coder listened to the verbal behaviors in the lesson, he/she would enter the appropriate numerical codes sequentially, as each occurred, into a DATAMYTE box which then fed the codes into a computer. If all the codes were in agreement, the tape would continue. If there was a disagreement, DITRMA stopped the tape, and the codes each observer had entered would appear on the screen. The coders could then discuss why they were not in agreement and which code was, in fact, the correct one. This consensus code would then be entered on the master box and the process continued. Initially, coder errors on DITRMA were due to incorrect labeling of behaviors. As training progressed, a higher proportion of errors were due to one coder dropping a code, such as a 1. The last five or six hours of training were not done with DITRMA in order to give coders practice in non-stop coding of a continuous tape.

Simulated video tapes were developed for the training. (Audio tapes of these training tapes, as well as transcripts of each tape, are available for a reproduction charge only from CITH.) Tape 1 introduces all codes, with at least two examples of each code. Tape 2 focuses on category 2 codes, i.e., all miscue codes; tape 3, category 3; tape 4, category 4; tape 5, category 5; and tape 6, all OROS codes. (Two criterion tapes were also developed, each with at least six instances of each OROS code.)

For the first two training sessions, coders studied the introduction to each category in the Observer's Training Manual at home and practiced coding tape 1 during the sessions. Two to three sessions of about two hours each were devoted to each of the remaining tapes. Before coming to each training session, coders read and worked all exercises in the corresponding section of the Observer's Training Manual. (For example, section 2 of the manual on miscue codes was completed and studied before the sessions on coding miscues were held.) As the training progressed, coders practiced coding the new behavior being learned as well as the previously learned codes. Because they were very easy to learn, categories 6, 7, 8, and 9 were taught simultaneously with the teacher prompt categories. Separate sessions were not necessary for these categories.

Agreement

Coder agreement was checked periodically throughout the year. The first check was done immediately at the end of training, on October 14, 1975. Criterion tape 1 was used. It was a simulated oral reading lesson of 35 minutes that included at least five instances of each of the 41 OROS codes. All coders had a copy of the text being read and coded the entire 35-minute tape without stopping. (This was the longest continuous coding they had done up to this point.) After the tape was coded, there was a 45-minute break in which coders were not able to study the OROS Manual or the text just coded. Then the same tape was coded a second time (without stopping) in order to get an estimate of intra-coder agreement. This procedure was followed any time intra-coder agreement was taken. One of the authors of OROS served as a criterion coder for Criterion Tape 1 and all coder agreement checks. The criterion coder always stopped the tape in order to be as accurate as possible. The coefficient computed was Flanders' modification of Scott's procedure, which gives a total agreement coefficient across all categories, corrected for chance agreement (cf. Frick and Semmel, 1974). This formula is most appropriate when single events are totaled per category in an analysis. Most data from OROS was analyzed this way. Correcting for chance agreement is important whenever category distribution is quite uneven, as most OROS data is.

Table 1 - Part A reports the criterion and intra-coder agreements for criterion tape 1, done Oct. 14, 1975. This analysis, and all subsequent checks, were done only on 35 categories of OROS, due to program limitations. Category 7 (71, 72, 73, and 74 codes) was dropped since it is only coded when a 7_ appears by itself and is, thus, infrequent. Codes 65 (Other Pupil Prompts/Answers) and 9 (Other/Non-Oral Reading) were also dropped. The mean agreement at time 1 was .76 with the range from .72 to .78. Time 2 and intra-coder agreement is slightly higher.

Coders then received approximately eight hours of practice with live coding of actual lessons before the next agreement check. Criterion Tape 2, a simulated tape of all 41 OROS categories, each appearing at least 10 times, was administered on Nov. 3, 1975. Part B of Table 1 shows the results. The mean agreement at Time 1 was .84 (an improvement of .08), with a range of .78 to .88. All coders but one improved at Time 2. The Time 2 and intra-coder agreement means are even higher, showing better agreement with the criterion at Time 2 as well as very high intra-coder agreement. After this check, all coders began to code live oral reading lessons in the practicum, as well as tapes of inservice teacher lessons.

For the third check, which occurred on December 5, 1975, four tapes were selected from the oral reading lessons of 20 pre-service teachers. Tapes were chosen that had high frequencies per category, as well as a variety of categories. Each tape was 10-15 minutes in length. The criterion codes were decided by a criterion coder listening to the tapes separately and identifying the appropriate codes for each behavior. This coder stopped the tapes while coding and replayed many segments so as to be as accurate as possible. These criterion codes were then entered into the computer. The observers, however, coded each separate tape continuously.

The results from this third check are presented in Part C of Table 1. Only Tape 3A was done a second time to obtain intra-coder agreement. Based upon criterion code data, three categories with 0, 1, or 2 frequencies were dropped, giving a total of 32 categories. This was done so that the coefficients would not be low due to disagreements on infrequently occurring categories. Most coefficients are in the .70's, sufficiently high, given the nature of the data.

On December 16, 1975, a fourth check was conducted. Three tapes were selected from actual lessons conducted by 35 inservice teachers. As for the previous live tapes, these were chosen for the number and variety of categories exhibited. The tapes were between 10 and 20 minutes in length. Any category with a 0 or 1 frequency was automatically dropped, making the total number of categories 35. Intra-coder reliability was done only on Tape 4A.

The fifth check was conducted February 13, 1976, using the first criterion tape. (No coder had seen this tape since October or had any opportunity to study it.) The coders coded continuously. This data is summarized in Part E of Table 1. All coefficients show that coders were maintaining high agreement with the criterion.

For the sixth check, March 12, 1976, three tapes were selected from actual oral reading lessons of 20 pre-service teachers. Again, tapes representative of OROS categories were selected. The coders coded each separate tape continuously. The reliability was again computed, first by dropping the usual six categories and second by dropping any category with a 0 or 1 frequency. Intra-observer coefficients of agreement between first and second codings were done only for tape 6A. The results are shown in Part F of Table 1. The mean agreement for Tape 6A, Time 1 is .65, showing a slight loss from the previous check done on similar pre-service data.

The seventh and final check was conducted March 12, 1976, using the second criterion tape. (Coders had not seen this tape since Nov., 1975.) The observers coded the tape continuously. The coding box used by observer three malfunctioned and did not register all codes entered during the first coding of the tape. A new box was used for the second run of the tape, and the observer obtained a reliability coefficient of .79. The intra-observer score for coder three was also affected by the malfunction in Time 1. Maintenance of training over the whole year was shown by the mean reliability coefficient of Time 2 on April, 1976, of .83, and a range of .79 to .89.

As explained in Frick and Semmel (1974), coder agreement is influenced by the number of categories in a system as well as the frequency in each category. The naturalistic lessons had an uneven distribution of codes and often low frequencies.

Coefficients are, therefore, lower than on artificially constructed data. A sample of percentage agreement checks done by hand on the categories occurring more than eight times in the actual lessons always showed agreement over 80%. Users of OROS are cautioned to study agreement coefficient data before making a final decision on a coder. Achieving high agreements (over .80) across categories that only occur 1, 2, or 3 times, for example, is very difficult.

Table 1

Scotts' Coefficients (Flanders' Modification) for Coder Agreement

. . Simulation Tape 1 (10/14/75)

Coder	Time 1	Time 2	Intra
1	.78	.84	.83
2	.78	.80	.86
3	.74	.83	.82
4	.72	.70	.77
5	.78	.80	.82

B. Simulation Tape 2 (11/3/75)

Coder	Time 1	Time 2	Intra
1	.85	.89	.92
2	.88	.91	.91
3	.85	.86	.90
4	.78	.82	.84
5	.82	.76	.89

C. Protocol Tapes from Pre-service Lessons (12/5/75)

Coder	Time 1 Tape 3A	Time 2 3A	Intra	Tape 3B	Tape 3C	Tape 3D
1	.68	.74	.88	.70	.67	.62
2	.73	.73	.84	.70	.74	.74
3	.75	.73	.83	.75	.84	.73
4	.65	.60	.81	.60	.75	.69
5	.64	.69	.71	.71	.77	.52

D. Protocol Tapes from Inservice Lessons (12/16/75)

Coder	Time 1 Tape 4A	Time 2 4A	Intra
1	.53	.54	.86
2	.78	.38	.45
3	...Did Not Participate...		
4	.41	.41	NA
5	.64	.54	.93

(Table 1 - Cont'd)

E. Simulation Tape 1 (2/13/76)

Coder	Time 1	Time 2	Intra
1	.83	.82	.91
2	.90	.91	.93
3	.84	.88	.91
4	.89	.87	.90
5	.80	.87	.87

F. Protocol Tapes from Pre-Service Lessons (3/12/76)

Coder	Time 1 Tape 6A	Time 2 6A	Intra	Tape 6B	Tape 6C
1	.68	.64	.85	.76	.66
2	.56	.64	.78	.69	.65
3	.65	.53	.80	.68	.64
4	.67	.63	.87	.72	.67
5	.68	.58	.74	.65	.67

G. Simulation Tape 2 (4/9/76)

Coder	Time 1	Time 2	Intra
1	.82	.84	*
2	.81	.84	.87
3	*	.79	*
4	.83	.89	.87
5	.75	.80	.85

*Not reported

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CHAPTER III.

RESEARCH ON TEACHER BEHAVIOR AND EVALUATION OF TRAINING

Studies of teacher behavior conducted in conjunction with CATTS-OROS teacher preparation practicum are presented in this chapter. There are five related studies, each written as separate reports covering empirical investigations of different aspects of teacher behavior. The express purpose in treating each study as independent of the other, even though they were conducted within the framework of the same teacher training program, was to facilitate subsequent publication of the individual studies. It is for this reason that the reader will find some redundancy in each of the reports. Information such as subjects, procedures, background of the study and training interventions was reiterated in each report, along with the specific treatment or empirical questions addressed.

The first study presented concerns the effectiveness of the Prompting module on changing trainee prompting behaviors, as measured by CATTS-OROS observation data on trainee interaction with pupils. The second study examines the effectiveness of two methods of feedback - CATTS and Audiotape - on trainee prompting behaviors.

The next study concerns trainee decision-making, as measured by both stimulated recall interview and trainee performance data. The fourth study examines the transfer of trainee prompting behaviors acquired during the training program, to trainee prompting behavior with a pupil other than the one tutored during the practicum. The final study presents a descriptive analysis of pupil achievements in reading and pupil attitudes obtained over the duration of the practicum.

1. Effects of the Prompting Module on Teacher Behavior

Problem Statement

The problem investigated was the effectiveness of the Prompting Module (Brady, 1975) in changing the repertoire of behaviors used by pre-service teacher trainees in responding to pupil miscues during oral reading instruction. The Prompting module is a criterion-referenced instructional package designed to provide the trainee with a set of guidelines for using certain prompts in response to different types of pupil oral reading miscues. It outlines the desired types of teacher prompts and provides rules for appropriate usage. There are audio tape and paper-and-pencil exercises for identification of pupil miscues and appropriate teacher prompts. A decision-model is included in the module, to guide trainees in their application of the various available prompts. It was predicted that trainees who successfully completed the prompting module would demonstrate their knowledge of the decision rules for prompting by changes in their prompting behavior. The specific questions studied in the assessment of the effects of the prompting module were as follows: (1) Will trainee behaviors, both cognitive and performance, change significantly over time in predicted directions after completing the module? (2) Will the performance behaviors of those trainees who receive the module prior to trial 2 differ significantly from those trainees who receive the module prior to trial 3?

There were two independent variables in the study: trials (1, 2, and 3) and groups (experimental and control). Trial one was made up of the first six tutorial reading lessons and constituted the baseline observation period for all trainees. Experimental (E) group trainees received the module after the last baseline lesson. Trial two consisted of the four lessons (lessons 7, 8, 9 and 10) which followed the E groups' completion of the module. After the last lesson in trial 2 (lesson 10), the control group trainees completed the module. The two remaining lessons in the semester which followed the control group's completion of the module were trial three (lessons 11 and 12).

The dependent measures were: (1) total raw score on the Oral Reading Scale, a test of cognitive knowledge of prompting techniques, (2) percent meaning change miscues prompted, (3) percent no meaning change miscues prompted, (4) the percent of structural, attention, pattern, phonics, context, and other prompts used, (5) the total percent of the five module prompts used, (6) the success rates of the structural, attention, pattern, phonics, and context prompts, (7) the total success rate of the five module prompts, (8) the total success rate for all prompts used, and (9) the length of prompt sequences. The predicted directions of behavior change were to increase dependent variables 1, 2, 4, 5, 6, 7, and 8 and to decrease dependent variables 3 and 9, and a variable measuring the percent of all non-module prompts.

Design

The design used to test for trainee behavior change was a repeated measures design, as shown below:

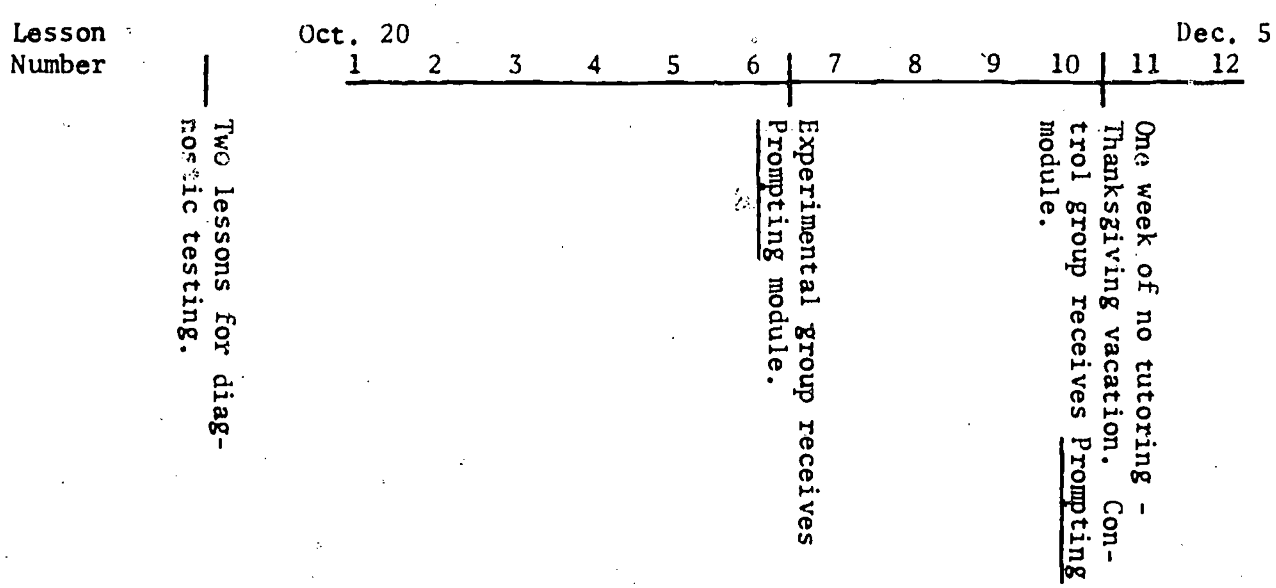
	T_1	T_2	T_3
(Exp.) G_1	$R_1 - R_{10}$	$R_1 - R_{10}$	$R_1 - R_{10}$
(Cont.) G_2	$R_{11} - R_{20}$	$R_{11} - R_{20}$	$R_{11} - R_{20}$

Since trainees were only tested twice with the Oral Reading Scale, the design for that dependent measure only was a 2 (group) by 2 (pre-post module) repeated measures design. In the analysis, subgroups of variables were tested multivariately and/or univariately, each subgroup being tested separately. The procedures used will be explained in greater detail in the results section.

Procedures

Subjects. The subjects were 20 special education pre-service teachers who were participating in a practicum focusing on teaching reading to the mildly handicapped. All were in their junior year at Indiana University. Subjects were divided into two groups by ranking their scores on the Oral Reading Scale pretest from highest to lowest and randomly assigning every other student to one group. (Some adjustments were made on this assignment procedure so that the pupils the trainees were instructing could be matched on reading level, sex, and degree of retardation in reading.)

For each trainee, the practicum ran for seven weeks of the first semester of the 1975/76 school year, from October 13 to December 5, as follows:[1]



Each trainee tutored two hours a week, one hour each day, in all areas of reading, focusing primarily on oral reading, comprehension, and specific skill development in word recognition and comprehension. Approximately 15 minutes of each tutoring session was devoted to oral reading, using the appropriate level, as determined by informal reading inventories, of the New Open Highways Series for all pupils able

[1] The first week was devoted to diagnostic testing, so no oral reading lessons were conducted.

to read in a level of the series. Five pupils initially were unable to read in this series and read language experience stories and readiness books. All five pupils were placed in the New Open Highways series by the end of the semester. Therefore instructional material was controlled to some extent. This is important since the nature of miscues made by readers is influenced by material type (Barr, 1975; Cohen, 1975). Readability level of the materials did vary, however, due to the range of pupil reading levels. All lessons in oral reading were audiotaped. All pupils read materials approximately one grade level above their instructional level in order that a sufficient number of miscues that needed prompting would occur.

All pupils were drawn from regular and special classes in the public schools in Monroe County, Indiana. Criteria for admission to the tutoring program were as follows: second- and third-grade pupils reading at least one year below grade level and 4th-, 5th-, and 6th-grade pupils, at least two years behind. Priority was given to pupils having difficulty in word recognition, word analysis skills, and in using functional decoding strategies during oral reading of continuous text. Table 1 shows entry level pupil characteristics for all pupils individually and by groups, including actual grade placement, number of times failed, and reading grade placement as determined by informal reading inventories and the Woodcock Reading Mastery Tests (Woodcock, 1973).

The descriptive pupil information appears only for those pupils retained all of the first semester. During the first six lessons, it became readily apparent that a few pupils were not as handicapped in reading as the screening tests had indicated. Therefore, these pupils were dropped and additional pupils from a waiting list were accepted into the program. Two trainees in the experimental group received new pupils, and four trainees in the control group received new pupils.

Table 1

Background Data for All Pupils

CHILD	AGE AS OF (4-1-76)	SEX	GRADE	REPEATED GRADES	TOT. RDG. WOODCOCK SCORES (OCTOBER)	INSTRUCTIONAL READING LEVEL (as of January)	
						Book	Readability Level
1	9.9	M	3	3	3.1	3 B Open Highways	(2.5)
2	13.3	M	6	*-	3.6	4.0 O.H.	(3.2)
3	9.8	F	3	3	3.3	4.0 Lippincott Basic Rdg.	(4.0)
4	9.5	F	3	-	2.7	3 B O.H.	(2.0)
5	9.4	M	2	2	2.1	3 B O.H.	(2.5)
6	9.11	M	4	-	3.6	4.0 O.H.	(3.2)
7	9.7	M	4	-	3.0	4.0 Lipp.	(4.0)
8	9.0	M	3	-	2.7	3 B O.H.	(2.5)
9	10.4	M	3	3	2.8	3 A O.H.	(2.4)
10	8.3	M	2	-	1.7	3 A O.H.	(2.4)
11	8.7	F	2	2	1.6	1 C O.H.	(.8)
12	8.11	M	3	-	2.3	3 B O.H.	(2.5)
13	8.1	M	3	-	2.9	4.0 O.H.	(3.2)
14	3.2	F	2	-	2.1	3 A O.H.	(2.4)
15	8.5	M	2	-	1.2	1 C O.H.	(.8)
16	10.9	M	3	3	1.4	1 B O.H.	(.4)
17	9.6	M	3	-	**2.7	2 B O.H.	(2.0)
18	9.4	M	3	-	2.5	3 A O.H.	(2.4)
19	8.8	F	2	1	1.5	1 C O.H.	(.8)
20	12.6	M	6	*-	1.7	1 C O.H.	(.8)

*Grades repeated not known, if any.

**Woodcock administered January.

Instruments

1. Prompting Module. This is a self-instructional module for pre-service trainees and inservice teachers of reading whose pupils are reading from middle first- through fourth-grade levels (Brady, 1975). It contains five sections and 16 exercises. All exercises are on audio tape and are either protocols of the behaviors to be learned or exercises in which the respondent has to discriminate between, or judge the appropriateness of, certain teaching behaviors. The thesis of the module is that oral reading gives the teacher a unique opportunity to diagnose the kinds of strategies a pupil uses to read, including how he/she attempts to figure out unknown words and to modify inefficient strategies (such as sounding out, omitting, naming letters, or failing to self-correct when a miscue does not fit contextually). The module was designed primarily for teachers of mildly handicapped readers since such pupils often display dysfunctional strategies of reading (Weber, 1968; Levitt, 1972; Dunn, 1954). Completion time is approximately two hours.

The general purpose of the module is to train teachers in a set of decision rules and a repertoire of behaviors to use when responding to pupil miscues during oral reading. The repertoire of behaviors was derived from a study of teacher responses and pupil miscues in naturalistic oral reading lessons (Lynch and Epstein, 1974), from research in reading strategies of handicapped and poor readers (Biemiller, 1970; Cohen, 1975; Levitt, 1972; Weber, 1968), and from teacher behaviors suggested in Minicourse 18: Teaching Reading as Decoding (Ward and Skailand, 1973). The behaviors used in the module are listed below:

(1) Respond to pupil miscues that change the meaning of the sentence being read and do not respond to those that do not change the meaning of the sentence.

(2) Generate successful structural prompts.

(3) Generate successful attention prompts.

(4) Generate successful pattern prompts.

(5) Generate successful phonics prompts.

(6) Generate successful context prompts.

(7) Tell the pupil the word if the first two prompts are unsuccessful.

Definitions and examples of each behavior appear in the Appendix.

2. Oral Reading Scale (ORS): This is a criterion test of 29 items accompanying the module (see Appendix). It tests the respondent's understanding of the effects of certain teacher behaviors on the pupil and his/her ability to choose the appropriate response, given simulated classroom examples of pupil oral reading. The reliability (KR-20) of the measure on a separate group of 23 teachers before taking the module was .81, and the criterion reliability, a concept suggested by Brown and Pugh (1975), was high. A pretest to posttest comparison, using a dependent t-test, showed a significant increase in the mean scores ($\overline{X}$ pre = 19.652; $\overline{X}$ post = 28.043; $t = 14.76$, $df = 22$, $p < .000$) after completing the module.

3. Concept Analysis Module: This is an audio tape and filmstrip module which is part of the series: Preinstructional Competencies for Teachers of the Handicapped (Semmel & Thiagarajan, 1975). It describes a procedure for the identification of important concepts in the elementary curriculum and for analysis of each concept in terms of its critical and irrelevant attributes. The objective of the module is for trainees to be able to select fundamental concepts for instruction, to identify the critical and irrelevant attributes of the concept, and to be able to create a set of examples and non-examples for teaching and testing.

4. Instructional Games for Handicapped Children: This is also a mediated module of the Preinstructional Competencies for Teachers of the Handicapped Series (Semmel & Thiagarajan, 1974), in which general principles of modifying and adapting instructional games are illustrated. The trainee is required to modify a given game using a checklist in a response book, and to adapt another game for teaching a new topic. Completion time of both modules together is approximately two hours.

5. Oral Reading Observation System (OROS): OROS (Brady, Lynch, and Cohen, 1976) was used to code all oral reading lessons conducted. This low-inference observation system is contextually specific to reading, and thus can discriminate between patterns of pupil miscues and answers and teacher behaviors occurring during oral reading instruction. (See the Appendix for an outline and definitions of all categories.) Five coders were trained with simulated and live tapes of oral reading lessons for approximately 25 hours. On a simulated criterion tape, given on Nov. 3, 1975, the mean agreement with the criterion was .83 (range, .78 to .88) and the mean intra-coder reliability was .89 (range, .92 to .84). (Coefficients reported are Flanders' Scott's phi, corrected for chance agreement.)

Experimental Procedures

The first six lessons were baseline lessons for both groups. Trainees received no specific instruction whatsoever in how to conduct oral reading strategy lessons. They were simply told to "help the child as he/she reads, as best you can." Trainees were aware that observation data was being collected, but did not know the categories and definitions nor the desired behaviors. Trainees were instructed to place their pupil at about one level above their instructional level so that there would be a total error rate of approximately 10% and comprehension would be about 70%. Adjustments were made throughout the semester, where necessary, in order to maintain that approximate error rate.

After the sixth lesson, and prior to the seventh lesson, the experimental group received the Prompting module and the control group received two modules: Concept Analysis and Instructional Games for Handicapped Children. The total training time per group was approximately two hours. The training consisted of an introduction by one of the experimenters, individual completion of exercises, and discussion after each section of the main points of the exercise. Both groups were specifically told to implement the objectives of the modules in their tutoring. All materials were collected at the end of the training session, and trainees were told not to discuss the content of the training with other trainees, neither those in the same group nor in the other group. This was to ensure, as much as possible, no contamination of treatments. (It also meant, however, that trainees were unable to refer back to the modules for clarification as they continued teaching.)

After the tenth lesson, prior to the 11th lesson, the groups were reversed, and each received the training the other group had had earlier. Thus, the control group received the Prompting module after lesson 10. All training booklets were returned to the trainees at this point, since contamination was no longer an issue. A one-week break for Thanksgiving vacation intervened at this point. Trainees then conducted lessons 11 and 12 before Christmas vacation.

As stated earlier, observation data were collected on each trainee for lessons 1-12. Due to mechanical failures, or pupil absences that were unable to be made up, not all tutors completed 12 lessons. Data was collapsed and analyzed by time period: Trial 1, Baseline (6 lessons), Trial 2 (4 lessons) and Trial 3 (2 lessons). The mean number of analyzed lessons for each group at each trial appears in Table 2. There is little difference in the two groups.

All trainees received daily supervision of their teaching and had three individual conferences throughout the semester with one of two supervisors. This supervision and feedback related to all areas of their tutoring performance, except the oral reading lessons. Topics discussed were control of the child, management of instruction, procedures for administration and interpretation of diagnostic and evaluation tests, instructional techniques of teaching comprehension lessons and word analysis exercises, and lesson plan evaluations.

Table 2

Mean Number of Lessons for Trial 1 (Total Possible = 6), Trial 2 (Lessons 7-10, Total Possible = 4) and Trial 3 (Lessons 11 and 12, Total Possible = 2) by Groups

	Trial		
Group	1	2	3
Experimental	4	3.2	1.7
Control	4.1	2.9	1.6

Description of Pupil Behaviors

Tutor-pupil pairs were assigned to groups as a dyad, after ranking tutors by the total score obtained on the ORS pretest. Assignment to treatment condition was not random. The background data on pupils presented previously, however, revealed similarity between groups on those pupils' measures. A second important consideration, however, was pupil process behavior. For example, there would be less opportunity to prompt if a pupil has a high percent of self-corrections, in which s/he corrects his/her own miscues. Likewise, if large differences in error rate and words read exist between two pupils, the tutors for those pupils would have very different frequencies of opportunity to prompt. Requiring an approximate error rate of 10% was established to try to control for these variables.

Table 3 shows means and standard deviations on the following pupil behaviors: (1) the frequency and percent of meaning change miscues (21) not followed by a pupil self-correction, (2) the frequency and percent of no meaning change miscues (22) not followed by a pupil self-correction, (3) the frequency of words read, and (4) the error rate (in percents) by groups and trials. Recall that trainees were to prompt only 21 miscues not self-corrected. The frequency of occurrence of this measure represents trainee opportunity to prompt. Table 6 shows variations in the frequency of 21 miscues. Across all trials group 1 (experimental), had a mean of 68.17 and group 2 (control), 56.77, showing a slightly higher opportunity to prompt for group 1. There are also variations in 22 miscues, but, as trainees were not to prompt such miscues, opportunity is probably little affected. Words read are reported for information simply. There are also variations in error rates. The mean across all trials for group 1 on error rate was 7.9 and for group 2, 10.2. Therefore, group 1 pupils were reading slightly easier material than group 2 pupils. The only important difference between the two groups is that group 1 appears to have had a slightly higher opportunity to prompt. This, however, was not formally tested.

Table 3

Means and Standard Deviations on Frequencies (F) and Percents (%) for Pupil Meaning Change (21) and No Meaning Change (22) Miscues, Mean Frequency of Total Words Read, and Mean Percent Miscues (Error Rate) by Groups and Trials for First Semester

Variable		Trial 1				Trial 2				Trial 3			
		G1		G2		G1		G2		G1		G2	
		F	%	F	%	F	%	F	%	F	%	F	%
21	$\bar{X}$	76.100	83.700	61.800	83.300	71.200	82.700	77.400	86.600	57.200	86.100	31.111	84.666
	SD	(53.614)	(10.165)	(41.920)	(6.945)	(43.984)	(10.594)	(74.586)	(9.215)	(27.867)	(8.925)	(13.995)	(7.778)
22	$\bar{X}$	21.800	83.900	15.900	84.500	20.000	81.300	14.100	81.000	13.400	71.800	6.111	79.222
	SD	(16.239)	(12.395)	(11.836)	(10.564)	(16.819)	(13.199)	(7.723)	(9.067)	(15.276)	(32.621)	(4.314)	(17.654)
Total Words	$\bar{X}$	825.0	NA	949.9	NA	865.0	NA	784.2	NA	554.6	NA	463.6	NA
	SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Error Rate	$\bar{X}$	NA	7.63	NA	10.76	NA	9.192	NA	8.42	NA	6.846	NA	11.44
	SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Available or Not Valid Score

Results

All data were analyzed by trials; no single lesson analyses were done. The sequential list of observation codes for each trial was analyzed by a computer program, written especially for the project. This program constructed two matrices through special search rules of the sequential codes. (See Appendix for an example of each matrix.) The matrices give information on the frequency and percents of all OROS categories, as well as on two-stage chains; teacher behavior following a miscue, and pupil answers following a teacher prompt. The average length of all tutor-pupil interactive sequences was computed by dividing the total number of responses following all miscues by the total number of sequences. Sequences of one, in which a miscue was not prompted, were thus included in the computation.

Since there was variation in the number of opportunities to respond to miscues, and thus in the number of prompts used by each trainee, all frequency data resulting from the analysis of the oral reading lessons were transformed to percentages. The percentage of prompted "21" miscues (meaning change miscues) was determined by dividing the number of "21" miscues followed by a response, by the total number of "21" miscues that were not self-corrected. The percentage of no meaning change miscues (22) prompted was computed in a similar manner. Miscues which were self-corrected were thus eliminated from the denominator since there was no need for a teacher response to occur in these situations. The percentage of the five module prompts was computed by dividing the total frequency of each prompt by the total prompts used.* The success rate for each prompt was determined by dividing the total number of prompts in each category successfully answered by the pupil, by the total prompts given for that category. All non-module behaviors in OROS were collapsed in an "other" category, and a percent "other" was determined.

* The sum of the frequency of all module prompts and all non-module prompts were divided by total teacher behaviors to determine "percent module" and "other."

Percentage successful for all prompts was computed by first eliminating all pupil answers following an "8" (teacher telling) and then computing the percent of incorrect answers (prompts followed by a "61") and percent of correct answers (prompts followed by a "62" or "64"), based upon total answers excluding "8"'s. Success rate was, therefore, determined over all prompts as well as for module prompts. It was decided to eliminate all answers following "8," since this would inflate the success rate because of the certainty of the child responding correctly after being told the word on which he/she had miscued.

The ANOVA and MANOVA tests were run, using percentages of variables for all observational data. No transformations of the metric were done. As explained in Glass and Stanley (1970), the ANOVA test is very robust to violations of assumptions, especially when cell sizes are equal, as was the case here.

Results of information test (ORS). The first question asked was "Will knowledge of prompting, as tested in the ORS, significantly increase as a result of training with the Prompting module?" Table 4 shows the individual trainee scores on ORS, both pre- and post-module. (Since all trainees were tested immediately after receiving the module, the posttest occurred at different dates for the two groups.) Using a score of 80% (a raw score of 23) as indicating mastery, all 10 trainees in the experimental group reached mastery, and seven of 10 reached mastery in the control group. Table 5 shows means and standard deviations on ORS by groups and trials, trials, and groups. There appears to be a strong trial effect, with the pretest trial mean being 17.65 and the posttest, 24.8. This was formally tested in a repeated measures ANOVA (see Table 6) and substantiated, since trials is significant beyond the .0000 level, with no other source being significant. Therefore, the training received with the Prompting module did significantly increase trainees' cognitive knowledge of prompting.

Table 4

Individual Tutor Oral Reading Scale Scores,* Pre and Post Module

Group	Tutor	Pretest	Posttest
1	1	17	24
	3	20	25
	8	17	26
	11	21	24
	12	22	24
	13	15	24
	15	16	24
	16	14	27
	18	19	26
	19	19	28
2	2	14	24
	4	20	22
	5	20	23
	6	22	26
	7	12	27
	9	10	20
	10	16	22
	14	16	25
	17	21	29
	20	22	26

*Total possible score = 29.

Table 5

Means and Standard Deviations for Oral Reading Scale by Groups and Trials (A)

	Pretest	Posttest
Group 1	18.000 (2.625) N=10	25.200 (1.476) N=10
Group 2	17.300 (4.322) N=10	24.400 2.716 N=10

Means for Oral Reading Scale by Trials (B)

Pretest	17.650
Posttest	24.800

Means for Oral Reading Scale by Groups (C)

Group 1	21.600
Group 2	20.850

Table 6

Repeated Measures ANOVA (Groups by Trials, Pre or Post) on Oral Reading Scale Scores

Source	df	MS	F	P
Between subjects	19	10.6039		
Groups	1	5.6250	.517	.5123
SWG	18	10.8806		
Within subjects	20	31.5750		
Trials	1	511.2250	76.524	.0000
GT	1	.0250	.004	.9506
Error	18	6.6806		

Results for Trainee Behaviors

All descriptive information on trainee behaviors are reported in Tables 7, 8, and 9. Table 7 shows means and standard deviations on frequencies; Table 8, percents; and Table 9, success rates. (All numbers shown represent coding in the observation system, OROS.) Table 8 shows that, with the exception of attention prompts (34), module prompts were used less than approximately 5% of the time in both groups at Trial 1. The total of all module prompts (Tot. Mod.) is 23.8% for the experimental group and 33.5% for the control group at Trial 1. Table 9 shows means and standard deviations for the percent of successful prompts for each OROS category. Approximately half or fewer of all prompts were followed by a successful pupil response. Before receiving any training, therefore, there was little use of module prompts, and many teacher behaviors were not followed by a successful child response.

Trainee response to pupil miscues. The first observational variables formally tested were the percent of 21 and 22 miscues prompted by trainees. Table 10 shows the results of a 2-way repeated measures multivariate analysis of variance for both these variables. No source of variance was significant. Therefore, it can be concluded that the module was not effective in changing the kinds of miscues trainees responded to, for either group. Trainees initially responded to a high percent of 21 miscues and, thus, did not need to increase this behavior. Trainees, however, also responded to a high percent of 22, no meaning change miscues, at Trial 1. This behavior was expected to decrease after the module but did not, indicating that the module was not effective in changing this behavior.

Trainee use of prompts. The next set of observational variables of interest were the kinds of prompts trainees used. It was hypothesized that trainees would increase their use of module prompts, i.e., structural (33), attention (34), pattern (44), phonics (45), and context (52). The total of all module prompts (Tot. Mod.)

Table 7
Means and Standard Deviations on Frequencies of all Teacher Prompting Behaviors by Group and Trial for Collapsed Lessons, First Semester

Dependent Variables		Trial 1 G1	Trial 1 G2	Trial 2 G1	Trial 2 G2	Trial 3 G1	Trial 3 G2
* PR 21	x̄	76.100	61.800	71.200	77.400	57.200	31.111
	SD	(53.614)	(41.920)	(43.984)	(74.586)	(27.867)	(13.995)
* PR 22		21.800	15.900	20.000	14.100	13.400	6.111
		(16.239)	(11.836)	(16.819)	(7.723)	(15.276)	(4.314)
31		3.000	6.700	4.000	5.500	1.600	3.333
		(1.885)	(5.982)	(5.033)	(4.972)	(2.756)	(4.272)
32		.200	.600	.600	.300	1.600	.111
		(.421)	(1.075)	(1.264)	(1.828)	(3.657)	(.333)
33		5.500	8.300	12.400	11.300	7.200	6.888
		(5.930)	(8.573)	(12.402)	(10.853)	(10.507)	(5.904)
34		11.100	15.500	14.200	1[illegible].600	12.200	6.111
		(7.109)	(9.288)	(12.007)	(16.439)	(11.640)	(3.179)
41		6.400	6.400	6.500	6.300	3.700	1.666
		(7.961)	(6.131)	(8.631)	(8.056)	(3.945)	(1.936)
42		7.400	8.300	1.500	4.900	.200	1.000
		(6.552)	(8.069)	(2.677)	(5.237)	(.421)	(1.224)
43		.400	1.700	0.0	2.400	0.0	.222
		(.690)	(4.715)	0.0	(6.2[illegible])	0.0	.441
44		1.500	1.300	5.000	1.300	3.500	1.555
		(3.135)	(1.567)	(5.477)	(1.[illegible]8)	(3.504)	(2.403)
45		1.900	4.300	2.200	7.200	2.900	4.000
		(3.314)	(5.165)	(2.201)	(8.107)	(5.043)	(5.744)
51		5.600	5.300	5.900	5.500	6.800	3.888
		(7.574)	(4.644)	(3.573)	(6.670)	(9.773)	(3.333)
52		4.000	2.600	5.400	2.600	3.200	1.000
		(3.055)	(2.913)	(4.623)	(1.776)	(3.259)	(1.000)
71		9.200	7.100	6.400	6.500	3.700	3.000
		(6.828)	(7.57[illegible])	(5.103)	(4.994)	(2.907)	(3.840)
72		1.100	2.600	1.300	1.700	.900	2.444
		(1.286)	(2.366)	(1.636)	(1.337)	(2.233)	(4.362)
73		10.300	4.400	3.200	5.500	1.500	2.000
		(12.356)	(3.204)	(2.044)	(4.576)	(1.269)	(1.732)
8		37.800	22.300	27.400	30.400	22.100	7.333
		(36.949)	(24.458)	(22.775)	(52.504)	(16.999)	(4.795)
Tot. Mod		24.000	32.500	39.200	40.000	29.000	19.555
		(13.182)	(21.889)	(27.796)	(34.260)	(25.655)	(14.371)
All Other		58.400	36.400	38.4[illegible]	4[illegible].100	28.200	14.777
		(40.008)	(26.650)	(25.491)	(55.189)	(19.118)	(7.965)

* Miscues prompted.

Table 8
Means (and Standard Deviations) for Percents of all Teacher Prompting Behaviors and Length by Group and Trial for Collapsed Lessons, First Semester

Dependent Variables		Trial 1 G1	Trial 1 G2	Trial 2 G1	Trial 2 G2	Trial 3 G1	Trial 3 G2
* PR 21	$\bar{X}$	83.7	83.3	82.7	86.6	81.1	84.6
	SD	(10.16)	(6.94)	(10.59)	(9.21)	(8.92)	(7.77)
* PR 22		83.9	84.6	81.3	81.0	71.8	79.22
		(12.39)	(10.56)	(13.19)	(9.06)	(32.6)	(17.65)
31		3.4	5.[illegible]	4.3	5.1	1.8	6.8
		(4.16)	(4.11)	(4.69)	(4.43)	(3.96)	(6.52)
32		.200	.300	.600	1.5	2.5	.777
		(.632)	(.674)	(1.34)	(2.2)	(5.68)	(2.33)
33		5.1	7.8	14.0	9.9	8.5	13.44
		(5.19)	(7.31)	(12.64)	(7.62)	(7.18)	(8.29)
34		11.0	15.9	13.6	15.7	15.0	15.1
		(6.11)	(6.08)	(10.85)	(7.30)	(10.97)	(8.32)
41		5.5	8.1	5.9	4.9	6.8	3.0
		(7.32)	(9.59)	(5.80)	(6.31)	(8.92)	(3.74)
42		7.0	6.8	1.00	4.3	.100	2.55
		(5.92)	(5.65)	(1.49)	(3.19)	(.316)	(3.60)
43		.300	.900	0	.800	0	.444
		(.483)	(2.23)	(0)	(1.54)	(0)	(1.01)
44		.800	1.6	4.9	.900	6.8	3.22
		(1.61)	(2.54)	(5.5)	(.994)	(8.33)	(5.35)
45		1.50	4.40	2.10	5.40	5.0	5.77
		(2.67)	(6.89)	(2.37)	(4.74)	(11.22)	(6.83)
51		4.10	5.70	6.20	4.60	7.20	8.22
		(3.63)	(4.96)	(3.85)	(5.03)	(10.31)	(6.62)
52		4.5	1.9	5.5	3.00	5.4	2.33
		(4.52)	(1.91)	(3.56)	(2.10)	(8.05)	(3.00)
71		7.8	8.1	6.7	6.1	4.9	5.22
		(5.55)	(7.4[illegible])	(5.75)	(3.78)	(2.80)	(6.86)
72		.800	2.3	1.7	1.5	1.2	4.44
		(1.03)	(2.26)	(2.71)	(2.06)	(3.15)	(8.35)
73		9.7	4.4	2.9	7.9	2.0	5.44
		(11.33)	(4.35)	(2.28)	(8.62)	(1.76)	(5.96)
8		33.0	19.[illegible]	25.6	21.60	28.1	19.0
		(23.78)	(15.83)	(15.35)	(16.19)	(15.47)	(15.14)
Tot. Mod		23.80	33.5	41.70	36.7	42.10	41.2
		(11.83)	(14.92)	(17.57)	(12.02)	(17.34)	(12.55)
All ther		52.5	36.3	38.0	38.5	37.1	34.55
		(20.41)	(17.05)	(14.33)	(18.29)	(14.97)	(14.01)
Length		3.45	3.50	3.28	3.45	3.16	3.28
		(1.14)	(.761)	(.769)	(.878)	(.936)	(.6139)

* Miscues prompted.

Table 9
Means (and Standard Deviations) for Percents of Prompts Successful for all Teacher Behaviors by Group and Trial for Collapsed Lessons, First Semester

Dependent Variable		Trial 1 G1	Trial 1 G2	Trial 2 G1	Trial 2 G2	Trial 3 G1	Trial 3 G2
31	$\overline{X}$	45.2	42.2	45.5	58.1	41.0	56.4
	SD	(42.11)	(27.21)	(37.23)	(37.10)	(43.52)	(40.37)
32		10.0	0	15.0	14.0	11.2	11.11
		(31.62)	0	(33.74)	(32.72)	(24.78)	(33.33)
33		54.7	40.6	60.2	61.5	53.8	57.5
		(36.48)	(27.39)	(25.12)	(29.81)	(35.22)	(30.75)
34		54.5	58.2	43.9	59.5	54.6	61.4
		(27.27)	(15.47)	(26.64)	(22.34)	(33.70)	28.68
41		47.2	48.0	36.9	34.1	42.3	19.44
		(38.85)	(32.5)	(39.40)	(34.45)	(41.13)	(30.04)
42		42.5	23.5	18.80	55.6	10.0	25.77
		(29.63)	(22.11)	(34.72)	(41.72)	(31.62)	(39.89)
43		15.0	20.0	0	(39.5)	0	22.22
		(33.74)	(42.16)	(0)	(51.01)	(0)	(44.09)
44		11.0	49.9	39.4	29.9	46.2	13.33
		(23.30)	(52.6)	(42.26)	(42.11)	(38.79)	(21.38)
45		10.40	34.7	26.6	37.1	27.5	15.44
		(22.42)	(35.68)	(28.82)	(33.55)	(37.67)	(23.32)
51		48.9	28.0	41.6	49.5	39.3	31.33
		(32.67)	(28.303)	(40.37)	(38.22)	(36.86)	(38.82)
52		51.9	37.1	54.3	49.8	54.5	27.7
		(38.19)	(42.77)	(37.24)	(42.94)	(43.87)	(44.09)
71		28.8	35.9	40.5	39.0	53.0	32.44
		(26.30)	(34.50)	(30.49)	(39.81)	(43.92)	(42.99)
72		37.5	47.4	25.0	37.5	17.1	17.44
		(48.94)	(37.93)	(40.82)	48.94	(36.69)	(26.61)
73		40.3	48.3	45.0	75.1	30.0	42.55
		(37.28)	(47.44)	(44.93)	(33.63)	(48.30)	(39.19)
8		99.3	96.8	99.3	99.3	98.5	100.00
		(2.51)	(5.3)	(1.63)	(1.636)	(3.807)	(0)
Tot. Mod.		58.1	54.2	50.7	52.8	54.9	53.66
		(21.89)	(14.55)	(14.79)	(18.17)	(16.47)	(17.83)
All Other		73.8	59.6	74.3	68.4	79.3	75.22
		(15.56)	(68.40)	(10.73)	(15.84)	(8.57)	(12.17)
Tot. - 8		55.1	48.5	55.6	52.8	56.1	56.88
		(16.39)	(9.53)	(7.26)	(14.26)	(13.59)	(13.56)
Tot. All		70.30	58.3	67.0	63.2	70.80	66.55
		(15.37)	(13.70)	(10.21)	(15.20)	(7.72)	(8.58)

Table 0

Repeated Measures MANOVA for PR21 and PP22 for

Collapsed Lessons, First Semester (First Roots Only Are Reported)

Source	F	df_{hyp}	df_{error}	p<	R (Canonical)
Groups	.202	2	17	.819	.152
Trials	.800	4	68	.529	.294
GT	1.047	4	68	.390	.317

was also predicted to increase. A decrease was predicted for trainee use of all non-module prompts (other).

The first question tested was "Did trainees significantly increase percent total module?" Part A of Table 11 reports the results of a repeated measures ANOVA on this variable. Trials is significant ($p < .001$), while groups-by-trial approaches significance ($p < .092$). Means and standard deviations for Total Module are shown in Part B of Table 11. Tukey tests on all possible pairs of means (Glass and Stanley, 1970, p. 383) revealed that Trial 2 was significantly higher than Trial 1 ($p < .05$) and that Trial 3 was significantly higher than Trial 1 ($p < .05$). Trials 2 and 3 were not significantly different. The cell means are diagrammed in Figure 1. The experimental group increased their use of module prompts dramatically from Trial 1 to Trial 2 and then maintained their level of use at Trial 3. There is little change in the control group over trials. For all trainees taken together, the training received with the module did significantly increase total module prompts. The training was more effective with the experimental group, however. This group received the module between Trial 1 and Trial 2 and significantly increased their use of module prompts in Trial 2. The control group increased their use of module prompts very slightly (37% to 41%) after receiving the module. Controls, however, had only two lessons subsequent to training as compared to 4 lessons for experimentals, and were using more module prompts at Trial 1, baseline, than experimentals.

Next, six dependent variables were tested in a repeated measures MANOVA: the 5 module prompts and other. As shown in Table 12, no source of variance is significant, although trials approaches significance ($p < .105$). Based on this analysis, which takes intercorrelations of dependent variables into account, the training was not effective in changing the kinds of prompts trainees used.

Since Total Module was significant for Trials and since Trials approached significance for the MANOVA analysis, a series of univariate analyses were performed

Table 11

PART A: Repeated Measures ANOVA for Total Module for Collapsed Lessons First Semester

Source	SS	df	MS	F	P<
Between Subjects					
Groups	25.387	1	25.387	.062	.806
SWG	7362.801	18	409.044		
Within Subjects					
Trials	1894.998	2	947.499	8.430	.001
GT	573.713	2	286.857	2.552	.092
Error	3933.637	35	112.390		

PART B: Total Module Trial Means

	$\bar{X}$	S.D.
Trial 1	28.650	(14.019)
Trial 2	39.200	(14.880)
Trial 3	41.684	(14.858)

Figure 1. Total Module Cell Means Diagrammed

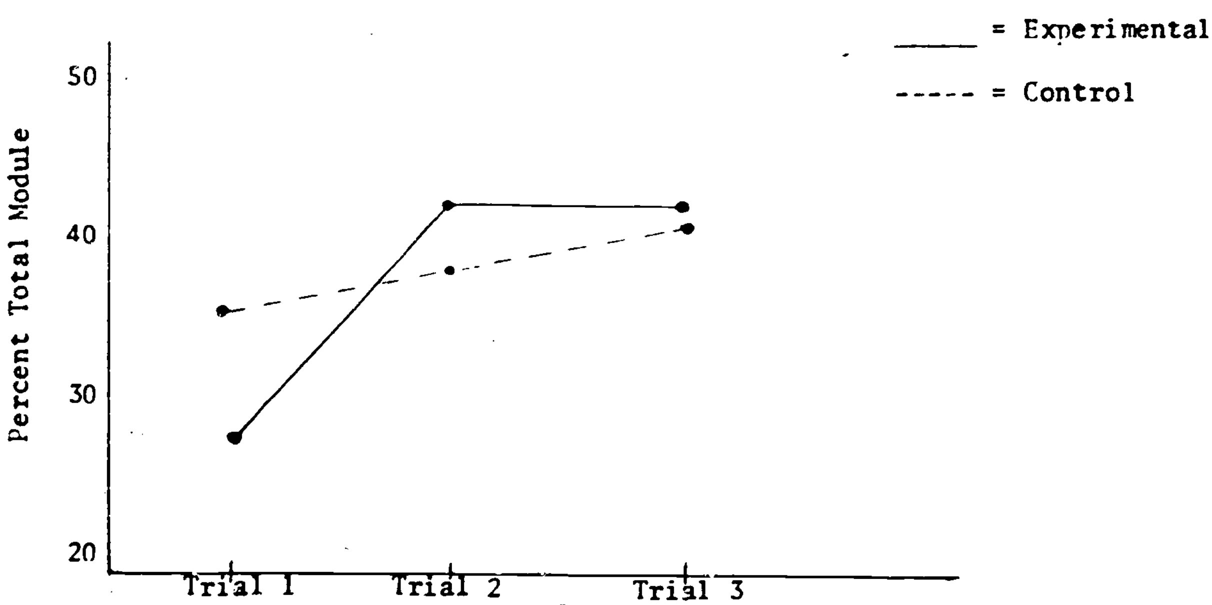


Table 12

Repeated Measures MANOVA for 33, 34, 44, 45, 52, and Other

for Collapsed Lessons First Semester (First Roots Only are Reported)

Source	F	df_{hyp}	df_{error}	p<	R (Canonical)
Groups	2.050	6	13	.131	.697
Trials	1 638	12	60	.105	.584
GT	1.371	12	60	.205	.530

in order to determine the effect of the module on each behavior when considered singly. Summary results are shown in Table 13. For groups, no source of variance is significant, although context (52) approaches significance ($p < .065$). For Trials, three of the six variables are significant - structural (33), pattern (44) and "Other." For the interaction, no source of variance is significant, although "Other" approaches significance ($p < .098$).

In Table 14 means for the previous variables are displayed. In Part A of Table 14 are group means for context (52) prompts. The experimental group G1, used approximately twice as many 52 prompts as the control group, G2. In Table 8, 52 prompts for G1 was 4.5% at Trial 1, 5.5% at Trial 2, and 5.4% at Trial 3, while for G2 the means are approximately 2% at each trial. No changes in use of 52 prompts occurred as a result of training, therefore.

In Part B of Table 14 are the Trial means for 33, 44, and other. All possible pairs of means for each variable were tested with Tukey tests. The only significant comparison for structural (33) prompts was between Trials 1 and 2, with Trial 2 being significantly higher than Trial 1 ($p < .05$). Trainees as a whole, therefore, doubled their use of 33 prompts during Trial 2 as compared to Trial 1, and then maintained the same level of use. This result also reflects the effectiveness of the module in changing experimental trainee behaviors, since those trainees received the module prior to Trial 2.

For phonics (44) prompts, the Tukey tests revealed that Trial 3 was significantly higher than Trial 1 ($p < .05$), with no other comparisons being significant. This prompt was used very infrequently at Trial 1 (1.2%) and slightly more (5.1%) at Trial 3. The module was effective, therefore, in increasing use of 44 prompts.

For other prompts, Trial 3 was significantly lower than Trial 1 ($p < .05$). No other Tukey comparisons were significant. Approximately 44% of all trainee behaviors were non-module prompts at Trial 1, while only 36% were non-module at

Table 13

Summary of Results of Repeated Measures ANOVA's for Percent of 33, 34, 44, 45, 52, and Other for Collapsed Lessons First Semester

Source	F (df	MS	p<
Groups	(1,18)		
33	.163	18.298	.691
34	.506	85.644	.486
44	2.492	73.661	.132
45	1.031	81.632	.323
52	3.861	108.714	.065
Other	.062	25.387	.806
Trials	(2,35)		
33	3.475	169.232	.042
34	.636	14.515	.535
44	3.658	72.243	.036
5	1.318	31.058	.281
2	.381	5.659	.686
Other	8.459	952.532	.001
GT	(2,35)		
33	2.238	109.003	.122
34	1.239	28.257	.302
44	1.776	35.087	.184
45	.376	8.867	.689
52	.030	.442	.971
Other	2.483	279.557	.098

Table 14

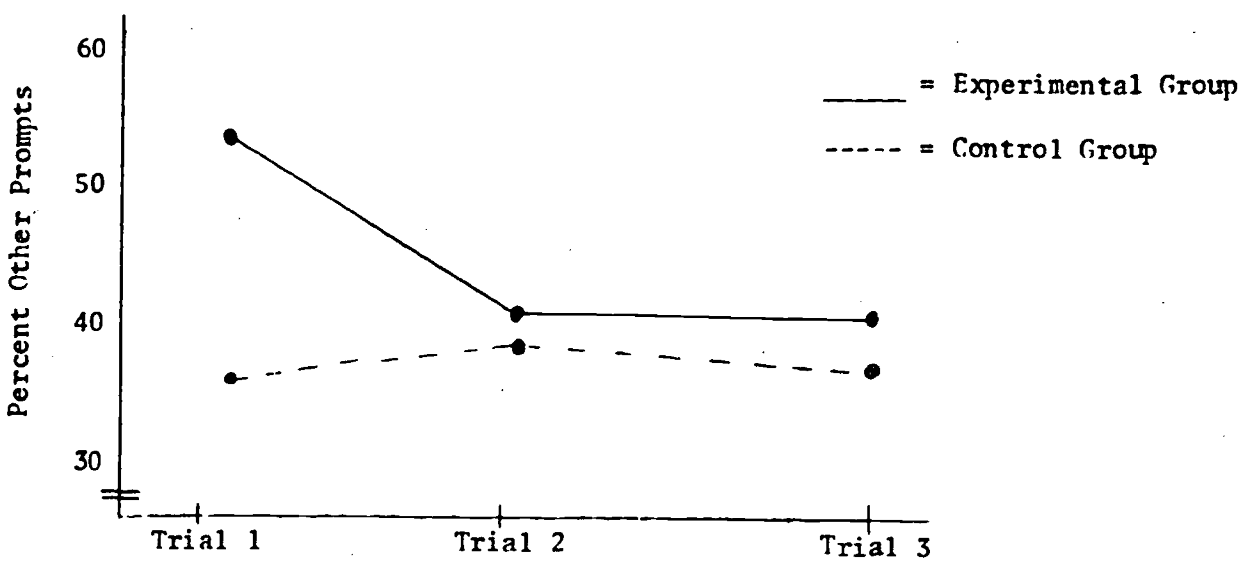
Means for Selected Variables Tested

Part A:	Context Prompt (52) Means	
Group	$\bar{X}$	S.D.
1	5.133	(5.538)
2	2.413	(2.322)

Part B: Structural (33) Phonics (44) and "Other" Prompts

	Trial 1		Trial 2		Trial 3	
Prompts	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
33	6.450	(6.328)	11.950	(10.379)	10.842	(7.925)
44	1.200	(2.117)	2.900	(4.363)	5.105	(7.132)
Other	44.400	(20.106)	38.250	(15.999)	35.894	(14.181)

Figure 2. Other Cells Means Diagrammed



Trial 3. The training, therefore, was successful in decreasing use of other prompts.

The cell means for other are diagrammed in Figure 2. In this diagram, the experimental group decreased their percent of "Other" prompts from Trial 1 to Trial 2 and maintained the level at Trial 3. Over the 3 trials, however, the control group showed very similar levels of use of "Other" prompts. As for the variable Total Module, the training appears to have been more effective with the experimental group.

In considering Tables 11 through 14, it must be concluded that the training received through the module was only partially effective in changing prompting behaviors. Significant interactions, not main effects, had been predicted since the module was administered at differential times for the two groups. This was only achieved for the variables Total Module and "Other" ($p < .10$), but not for any single prompt. Two individual prompts of five did significantly increase across trials. The results suggest that the module was more effective with the experimental trainees since Trials 2 and 3 were not significantly different for all comparisons made, as would be expected if the module had been effective with control trainees.

Success of prompts. The purpose of the module was not only to increase trainee use of module prompts but to increase the appropriateness of those prompts for pupils. The decision rules in the module encouraged trainees to focus on pupil behavior, pupil skills, and textual characteristics in order to select an appropriate prompt. A proxy for appropriateness is whether the prompt was followed by a pupil response that answered the prompt correctly or gave the text word on which the pupil had previously miscued. Success rate is the percent of prompts followed by such pupil responses. All variables discussed in the previous section were also analyzed for success rate.

The success rates analyzed were: (1) all prompts used (module and non-module minus telling), Table 15, (2) Total Module success rate, Table 16, (3) the five module prompts in a MANOVA, Table 17, and (4) the five module prompts separately in ANOVA's,

Table 15

Repeated Measures ANOVA on Total Prompt Success

Rate (Minus 8's) for Collapsed Lessons First Semester

Source	SS	df	MS	F	P<
Between Subjects					
Groups	127.008	1	127.008	.450	.511
SWG	5079.308	18	282.184		
Within Subjects					
Trials	206.106	2	103.053	.988	.382
GT	132.940	2	66.470	.637	.535
Error	3649.643	35	104.276		

Table 16

Repeated Measures ANOVA for Success Rate of

Total Module Prompts for Collapsed Lessons First Semester

Source	SS	df	MS	F	P<
Between Subjects					
Groups	136.448	1	136.448	.418	.526
SWG	5878.926	18	326.607		
Within Subjects					
Trials	38.582	2	19.291	.066	.937
GT	22.857	2	11.429	.039	.962
Error	10,280.400	35	293.726		

Table 17

Repeated Measures MANOVA for Success Rates of 33, 34, 44, 45, and 52 for Collapsed Lessons First Semester (First Roots Only are Reported)

Source	F	df_{hyp}	df_{error}	p<	R (Canonical)
Groups	.802	5	14	.566	.472
Trials	.558	10	62	.841	.378
GT	1.408	10	62	.198	.545

Table 18. In Tables 15, 16, and 17 no sources of variance are significant. From these analyses, there was no effect on success rate by the module. In Table 18, only one variable is significant, the interaction for pattern (44) prompts. In Figure 3, the diagram shows that the experimental group increased success rate of 44 prompts across trials and the control group decreased success rate. This result is probably due to instability of the behavior since the frequency of 44 prompts was extremely low, as Table 7 shows.

It must be concluded from the analyses reported in Tables 14 through 18 that the module was totally ineffective in changing success rates of trainee behaviors.

Length. A final goal of the module was to decrease the length of prompts, so that trainees would not contrive to prompt a miscue when they were not successful in selecting appropriate prompts to use. The repeated measures ANOVA reported in Table 19 have no significant source of variance. Therefore, the module was not effective in significantly decreasing the average length of prompt sequences.

Discussion

A previous study (Brady, 1976) tested the effects of the *Prompting* module on the cognitive and performance behaviors of *inservice* teachers and found more significant effects on behavior. The study reported herein serves as a replication of the previous study, with a different subject population: pre-service teachers with no teaching experience. Two procedural differences in this study were: (1) that those trainees given the *Prompting* module after lesson six were not allowed to keep the *Prompting* module booklet, and (2) that a one-week vacation intervened after the second administration of the *Prompting* module, with only two lessons occurring after the administration in which tutors could practice the behaviors taught. Both of these procedures are probable explanations for the lack of strong effect [illegible] the training on trainees' [illegible] -ting behaviors.

A second issue is [illegible] very low percent of each module prompt. [illegible]

Table 18

Summary of Results of Repeated Measures ANOVA's for
Success Rates of 33, 34, 44, 45, and 52 for Collapsed Lessons
First Semester

Source	F (df)	MS	p<
Groups	(1,18)		
SR33	.096	144.903	.761
SR34	1.290	1127.829	.271
SR44	.002	3.952	.969
SR45	.695	927.226	.415
SR52	2.299	3376.858	.147
Trials	(2,35)		
SR33	1.284	881.200	.290
SR34	.360	213.552	.700
SR44	.107	109.680	.899
SR45	.811	606.620	.453
SR52	.317	585.391	.7[illegible]0
GT	(2,35)		
SR33	.673	462.203	.516
SR34	.320	189.663	.728
SR44	6.381	6530.605	.004
SR45	2.183	1632.455	.128
SR52	.326	601.032	.724

Figure

44 Cell Means Diagrammed

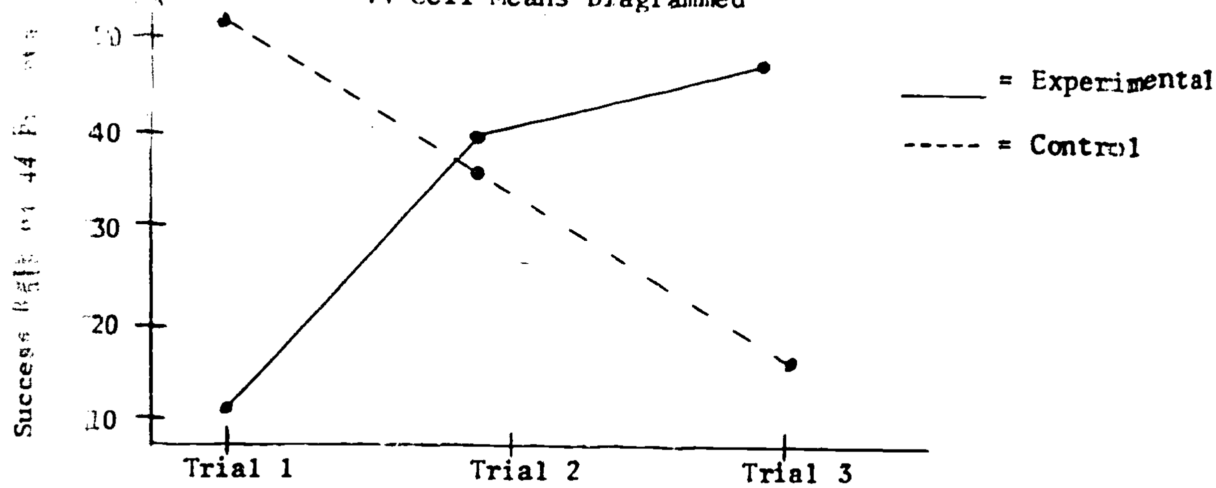


Table 19

Repeated Measures ANOVA on Mean Prompt

Length for Collapsed Lessons First Semester

Source	SS	df	MS	F	P<
Between Subjects					
Groups	.177	1	.177	.113	.741
SWG	28.219	18	[illegible]		
Within Subjects					
Trials	.639	2	.319	.934	.403
GT	.032	2	.016	.047	.954
Error	11.977	35	.342		

exception of attention prompts (34), which appeared to be a part of the trainees' natural repertoire and, therefore, remained stable and high across trials, each module prompt only occurred approximately 5% of the time. Thus, four of the module prompts, "33", "44", "45", and "52", were <u>not</u> a stable part of the trainees' existing teaching behaviors at the beginning of the study. Therefore, the trainees had to learn to emit behaviors not currently a part of their teaching repertoire. Borg (1972) stated that "it is extremely difficult to get a teacher to regularly emit specific behaviors that are not a part of his teaching practice" (p. 578). It is apparent that for pre-service teachers, criterion levels for the behaviors in the <u>Prompting</u> module cannot be accomplished simply through self-instructional techniques with no feedback due to the very low use of module behaviors in naturalistic lessons. The CATTS training program, utilizing an on-line and delayed computer-assisted feedback on trainee prompting behaviors, was therefore instituted with the same trainees in the second semester of the practicum training program, in an effort to modify prompting behaviors. This training strategy is reported in the next section of this report, Chapter III, Section 2, <u>The Effects of CATTS Feedback on Trainee Prompting Behaviors</u>.

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2. The Effects of CATTS and Audio Tape Feedback on Teacher Behaviors

The use of CATTS in teacher training rests upon the assumption that feedback on performance is critical in the development of trainee interactive skills. Underlying this assumption is a model of development of teaching skills (Semmel, 1975) which posits in sequence: 1) trainee ability to discriminate relevant target behaviors; 2) trainee ability to generate relevant behaviors (and concomitantly to extinguish irrelevant or undesirable behaviors); and 3) trainee ability to evaluate the outcomes of instructional interactions and modulate and adjust behaviors in terms of desired pupil outcomes.

The first stage in the training sequence was, therefore, to provide trainees with a program geared to development of appropriate discrimination skills. In the present program, this was accomplished through administration of instructional modules (printed manuals) on the Oral Reading Observation System (OROS) and through practice observation training sessions using simulation tapes of teacher-pupil interactions during oral reading.

In the second stage, the focus was on development of skills in generating targeted behaviors. To test the effectiveness of real-time feedback in assisting trainees to generate appropriate teacher behaviors, half of the trainees in the program were provided with CATTS feedback. The capacity of CATTS to provide data on performance to the trainee while he/she is still engaged in teaching was seen as an aid to increasing the trainees' use of the targeted behaviors. In addition, the CATTS feedback group was provided printout summaries of teacher behaviors after each lesson. Thus, the CATTS feedback consisted of provision of both real-time data and post-teaching summaries of observation (OROS) data.

The competing hypothesis - that post-teaching verbatim feedback would be as effective in trainee generation of target behaviors - was tested by providing half the trainees in the group with audio cassette tapes of their previous lesson. These trainees then prepared summaries of their own prompting behaviors by coding their own tapes. Post-teaching replay of audio tapes is probably the most widely accessible form of feedback available to trainees. The relative effectiveness of CATTS real-time coded observation data was thus tested against the effectiveness of delayed verbatim feedback provided by audio tapes.

The third stage of the study focused on the third trainee ability--modulation of behaviors in terms of desired pupil outcomes. While it was predicted that modulation, as measured by success rates of trainee behaviors, would improve as trainees improved their ability to generate relevant target behaviors, the provision of feedback specific to success rate was predicted to improve success rate further. In the last stage of the study, therefore, trainees received feedback both on generation and modulation of appropriate behaviors. Feedback conditions were also switched at this point, so that the CATTS group received audio feedback and the audio group received CATTS feedback. In this manner, all trainees were exposed to both feedback conditions, enabling the investigators to measure trainee attitudes towards each of the two feedback modes.

Problem Statement

The purpose of the study was to compare the effectiveness of two methods of feedback in changing pre-service teachers' verbal interactive behaviors during lessons in oral reading. The independent variables were time (trials) and feedback conditions (groups). There were four trials: (1) baseline, a no-feedback condition; (2) feedback on behaviors generated, first half; (3) feedback on behaviors generated, second half; (4) feedback on success rates and generation of behaviors. The two groups each received different methods of feedback; Group 1 (CATTS) was given on-line TV screen feedback during teaching as well as delayed printout feedback using the Computer-Assisted Teacher Training System, during trials 2 and 3. Group 2 (Audio) received delayed, self-constructed feedback from audio tapes of lessons taught during trials 2 and 3. The dependent measures were (1) percents of target behaviors generated, (2) success rates of target behaviors generated, (3) mean length of interactive sequences, and (4) number of trials to criterion and number of times criterion was reached. Two other measures are also reported, namely, a comparison of CATTS and Audio subjects' accuracy in completing Feedback Evaluation Sheets and trainee attitudes towards the two feedback conditions.

The general design for most analyses was a repeated measures design as follows:

	Trial 1	Trial 2	Trial 3	Trial 4
Group 1	$R_1 - R_9$	$R_1 - R_9$	$R_1 - R_9$	$R_1 - R_9$
Group 2	$R_{11} - R_{20}$	$R_{11} - R_{20}$	$R_{11} - R_{20}$	$R_{11} - R_{20}$

At the end of Trial 3, prior to Trial 4, feedback conditions were switched, with the CATTS group receiving Audio feedback at Trial 4 and the Audio group receiving CATTS feedback. (Subjects receiving CATTS feedback for Trials 2 and 3 and Audio only for Trial 4 are referred to as CATTS subjects in the remainder of this report. Those receiving Audio feedback for Trials 2 and 3 and CATTS only for Trial 4 are referred to as Audio.) The informational content of feedback was changed at Trial 4, with trainees receiving additional feedback on the success rates of the generated behaviors, as well as feedback on the specific behaviors generated. This was done in order to determine whether knowledge of success of prompting would aid trainees in generation of target behaviors which were appropriate for pupils' needs.

The general hypothesis tested was that the effects of CATTS feedback would be significantly greater than Audio feedback for all dependent measures tested. Specifically, it was predicted that subjects who received CATTS feedback at Trials 2 and 3, when compared to subjects who received Audio feedback at Trials 2 and 3, would

(1) generate a significantly greater percent of target behaviors, (2) have significantly higher success rates, (3) have significantly shorter interactive sequences, (4) reach the first criterion lesson in significantly fewer trials and have a significantly greater number of criterion lessons, (5) have more accurate Feedback Evaluation Sheets, and (6) have a more positive attitude towards feedback.

Procedures

Subjects. The subjects were 19 special education pre-service teachers who were participating in a practicum focusing on teaching reading to the mildly handicapped. All were juniors at Indiana University. The practicum ran from October 13 to April 22, for a total of 19 weeks. The present study was conducted during the second semester of the 1975-76 school year, from January 14 to April 22, for a total of 15 weeks. Throughout the year, trainees received training and supervision in diagnostic and remediation techniques for mildly handicapped readers. During the first semester, all trainees received a self-instructional module, Prompting (Brady, 1975), that contained specific techniques for responding to pupil miscues during oral reading strategy lessons. (See section 1 of this report for a description of the effects of instruction with the Prompting module.)

Trainees were assigned to feedback groups by ranking the average percentage of meaning change miscues made by their pupil during the first semester, and then assigning every other tutor-pupil pair to CATTS or Audio Groups. This was done in order to ensure, as much as possible, that trainees in each group would have equal opportunities to practice the target behaviors, by working with pupils at similar levels of reading difficulty.

All pupils were drawn from regular and special education classes in the public schools in Monroe County, Indiana. Criteria for acceptance in the tutoring program were as follows: second and third grade pupils reading at least one year below grade level, and 4th, 5th, and 6th grade pupils, at least 2 years behind. Priority was given to pupils having difficulty in word recognition, word analysis skills, and in using functional decoding strategies during oral reading of continuous text.

Each pupil was paired with a single trainee who worked only with that pupil throughout the whole practicum. Table 1 shows background information on all pupils participating in the second semester of the practicum, individually and by groups, including actual grade placement in school, number of times repeated, instructional reading level, as determined by the Woodcock Reading Mastery Tests (Woodcock, 1973), and instructional reading level as of the beginning of second semester, as determined by informal reading inventories. As can be seen in Table 1, the mean instructional reading level for Audio-group pupils is 4 months higher than CATTS group pupils, and mean readability level of materials for the Audio group pupils is 6 months higher than that for CATTS pupils. Therefore, Audio pupils appear to be somewhat less retarded in reading than CATTS pupils.

During the first three weeks of the first semester, six of the 20 selected pupils were dropped after the diagnostic testing revealed no handicaps in reading. These students were replaced with pupils from a waiting list. Four trainees in CATTS received new pupils during first semester, as did two trainees in Audio. At the end of the first semester, sufficient improvements in reading were manifested by one pupil, who was subsequently dropped and replaced. Two tutors traded children so that a severely reading disabled pupil would be better served. Thus, one CATTS trainee and two Audio trainees received new pupils at the beginning of second semester.

Target Behaviors

The behaviors on which feedback was focused were teacher methods of responding to pupil oral reading miscues, as exemplified in the Prompting module. An extensive review of the literature on reading strategies of poor and handicapped readers and teacher behavior during reading instruction, as well as observation data from EMR and remedial reading classrooms where oral reading lessons were being conducted,

Table 1.
Background Data on Pupils in Tutoring Program

Tutor No.	Pupil	Age	Sex	Grade Placement	No. of Grades Reported	Instr. Reading Level Oct, 76 (Woodcock)	Readability Level
Audio Feedback Tutors (N=10)							
1	H.B	9.8	F	3	1	3.3	4.0
2	J.J.	9.7	M	4	0	3.0	4.0
3	C.S.	10.9	M	3	1	1.4	.4
5	M.Z.	12.6	M	6	0	1.7	.8
5*	A.M.	8.3	M	2	0	1.7	2.4
7	T.A.	9.9	M	3	1	3.1	2.5
11	K.J.	8.5	M	2	0	3.0	2.0
11*	M.Z.	12.6	M	6	0	1.7	.8
13	D.S.	9.0	M	3	0	2.5	2.5
14	E.S.	8.1	M	3	0	2.9	3.2
16	M.C.	13.0	M	6	0	8.5	3.0
16*	G.M.	8.7	F	2	1	1.6	.8
17	A.C.	9.5	F	3	1	2.7	2.0
CATTS Feedback Tutors N=9							
4	A.M.	8.3	M	2	0	1.7	2.4
4*	K.S.	9.6	M	3	0	2.7	2.0
6	L.P.	8.8	F	2	1	1.5	.8
8	J.R.	8.11	M	3	0	2.3	2.5
9	J.L.	10.4	M	3	1	2.8	2.4
10	M.S.	8.2	F	2	0	2.1	2.4
12	D.B.	13.3	M	6	1	3.6	3.2
15	W.F.	9.11	M	4	0	3.6	3.2
19	M.S.	8.5	M	2	0	1.2	.8
20	T.C.	9.4	M	2	1	2.1	2.5

*2nd Semester Child for that Tutor.

was the basis for the selection of behaviors. (A review of research may be found in Chapter II.) The purpose of the oral reading strategy lessons was for trainees to modify how pupils responded to unknown words by encouraging pupil use of context, structural analysis, attention to the whole word, and sound-letter correspondences. Application of these strategies was expected to increase pupils' self-corrections, the percent of no-meaning change miscues and the percent of substitution miscues.

The behavioral goals for the trainees for second semester were as follows (numbers indicate category numbers in the observation system used, to be explained subsequently):

1. Prompt only meaning change (21) miscues.
2. Do not prompt any no-meaning change (22) miscues.
3. Increase the use of the five Prompting Module prompts:
    (a) Structural (33). Teacher asks or tells pupil to identify syllables in an unknown word.
    (b) Attention (34). Teacher focuses the pupil's visual attention on all of an unknown word.
    (c) Pattern (44). Teacher gives, or asks pupil to give, a rhyming word or word family cue to an unknown word.
    (d) Phonics (45). Teacher gives, or asks for, a phonics rule or sound-letter correspondence within an unknown word.
    (e) Context (52). Teacher asks for, or gives, information about the meaning of the sentence or story in which the unknown word appears.
4. Increase the total percent in use of all module prompts (Tot. Mod.), i.e., the sum of the five behaviors (a through e) listed above.
5. Increase the success rate for each module prompt in 3 above.
6. Increase the success rate for the total percent of all module prompts.
7. Supply the pupil with the target word, if the first two prompts for it are unsuccessful (Length).
8. Decrease or eliminate all other categories of non-module prompts (Other).

Observation [illegible]em and Procedures

The Oral Reading Observation System (OROS) by Brady, Lynch, and Cohen (1976) was used to code all oral reading strategy lessons conducted. OROS is a low-inference category system that is contextually specific to reading. It discriminates between patterns of pupil miscues and answers to prompts and teacher prompting behavior after pupil miscues. Figure 1 lists all categories in the system. (See Appendix for a definition of all categories.) The third-level codes (direct and indirect) for catego[illegible] 3, 4 and 5 were not used in th[illegible].

Five coders were t[illegible]ined at the beginning of the fir[illegible] semester with simulated and live tapes of oral reading lessons for approximately 25 hours. On a simulated criterion tape, given on November 3, 1975, the mean agreement with the criterion was .83 (range, .78 to .88) and the mean intra-coder reliability was .89 (range, .84 to .92). Coefficients are Flanders' modification of Scott's phi, corrected for chance agreement. During the second semester of the practicum, four maintenance checks were held, two with simulated criterion tapes and two using actual trainee lessons. Table 2 shows the results of these maintenance checks. Agreement on live data is lower than that for criterion tapes, as would be expected because of the low frequencies in many categories on the protocol tapes. However, the coefficients are still quite acceptable, since all but 4 of 29 coefficients were above .80, with two of the low coefficients due to equipment failure.

Within scheduling restraints, coders were randomly assigned to trainees for the duration of th[illegible] study. Coders were behind a one-way glass in an observation booth for all coding. Trainees were aware that their oral reading lessons were all being coded since they came to a special booth for all such lessons. All lessons were coded live and directly into a computer, using push-button control panels similar to touch-tone phones. All lessons were tape-recorded as a back-up system in case of mechanical failures.

Category 1: Target Pupil: Exact Oral Reading

Category 2_ _: Target Pupil: Miscues

21_	Meaning Change	_ _0	No Response/Don't Know
22_	No/Low Meaning Change	_ _1	Sounding or Naming Letter(s)
		_ _2	No/Low Similarity
		_ _3	High Similarity
		_ _4	Dialect Based
		_ _5	Insertion/Omission

Category 3_ _: Teacher: Look Prompts

31_	Letter Name(s)	_ _1	Direct
32_	Spelling	_ _2	Indirect
33_	Structural		
34_	Attention		

Category 4_ _: Teacher: Sound Prompts

41_	Isolated Sounds	_ _1	Direct
42_	Sound Out Word	_ _2	Indirect
43_	Unnatural Stress		
44_	Pattern		
45_	Sounds Within Words/Phonics Rules		

Category 5_ _: Teacher: Meaning Prompts

51_	Word Meaning	_ _1	Direct
52_	Context	_ _2	Indirect

Category 6_ : Pupil: Answers to Prompts

61 Incorrect Answer/Word
62 Correct Answer
63 Self-Correction
64 Exact Word/Meaningful Miscue
65 Non-target Pupil Prompts/Answers

Category 7: Teacher: Feedback and Management

71 Positive Feedback
72 Negative Feedback
73 Management
74 Turns to Another Pupil

Category 8: Teacher: Telling

Category 9: Non-Oral Reading/Other

Figure 1.

The Oral Reading Observation System Categories: Full Version

Table 2.

Coder Agreement: Scott's Phi Coefficients

(Flander's Modification)

A. Simulation Tape 1. ([illegible]/[illegible]3/76)

Coder	Time 1	Time 2	Intra
1	.8[illegible]	.82	.91
2	.9[illegible]	.91	.93
3	.8[illegible]	.88	.91
4	.89	.87	.90
5	.8[illegible]	.87	.87

B. Protocol Tapes from Lessons Conducted by Trainees (3/12/[illegible]

Coder	Time 1 Tape 6A	Time 2 6A	Intra	Tape 6B	Tape 6C
1	.68	.64	.85	.76	.[illegible]5
2	.56	.64	.78	.69	.65
3	.65	.53	.80	.68	.61
4	.67	.63	.87	.72	.[illegible]7
5	.68	.58	.74	.65	.[illegible]

C. Simulation Tape 2 (4/9/76)

Coder	Time 1	Time 2	Intra
1	.82	.84	*
2	.81	.84	.87
3	.58**	.79	.57**
4	.83	.89	.87
5	.75	.80	.85

*Not reported
**Broken box time 1

Tutoring Sessions

All tutoring was done between 3:30 and 5:30 after school hours. Each trainee tutored two hours a week, one hour each day, either Monday-Wednesday or Tuesday-Thursday. Trainees worked in all areas of reading, using a diagnostic-prescriptive method of instruction. Each day, two specific skill lessons, one in word analysis and one in comprehension, were taught and one oral reading strategy lesson of approximately 15 minutes was conducted. Materials used for oral reading lessons were the New Open Highways (Johnson et al., 1973) and Lippincott Series (McCracken, 19[illegible]). Six CATTS pupils read from Open Highways, as did six Audio pupils. For the oral reading strategy lessons only, each pupil was placed at a level approximately one reading grade level above his/her instructional reading level in order that a sufficient number of miscues that needed prompting would occur. Trainees were instructed to maintain a total error rate of approximately 10%. Table 3 shows means and standard deviations by group at the baseline for second semester, Trial 1, for pupil oral reading behaviors - "21" miscues, "22" miscues, self-corrections, and error rate. As can be seen, pupil behaviors are very similar in the two groups.

The pupils of CATTS tutors had a higher frequency of 21 miscues than pupils of Audio tutors. The means of the other variables are quite similar. Thus, CATTS tutors had a potentially greater opportunity to practice prompting as their pupils miscued more often. The total error rate is, however, very similar for both groups, indicating that the difficulty of the materials was about the same.

There were four performance criteria used in grading trainees during second semester. First, trainees had to conduct 25 lessons over the semester, making up all lessons missed, regardless whether it was due to pupil or trainee absence. Make-up lessons were ordered in such a way as to maintain the sequence of pupil and trainee objectives. For example, if a make-up and regular lesson were conducted in succession on the same day, the trainee completed all feedback evaluation tasks in the interval

Table 3.
Pupil Oral Reading Behaviors by Group
at Trial 1, Second Semester

Variable	Total 21 Miscues	%	Total 22 Miscues F		Tot[illegible]	[illegible]	[illegible] Rate
Group							
CATTS	86.7[illegible]	[illegible].888	17.777	15.111	12.[illegible]	[illegible]1.[illegible]22	[illegible]
AUDIO	7[illegible]	82.700	15.50	16.30	14.[illegible]	1[illegible].[illegible]00	9.024

between the make-up and regular lesson. Normally, the trainee took the feedback data home (CATTS print-out or audio tape) and completed self-evaluation procedures which were submitted for evaluation prior to the next lesson. In the case of make-up lessons, these requirements were completed between lessons. CATTS trainees missed an average of 1.5 lessons and audio trainees missed an average of 1.2 lessons. For the 21 lessons used in this study, an average of 0.5 lessons were taught by all tutors. Secondly, trainees had to complete all assignments, including turning in a week's lesson plan at the start of each week and completing and turning in an analysis of each oral reading strategy lesson, using a Feedback Evaluation sheet, before the next lesson was taught. Thirdly, trainees were required to attend all meetings and training sessions and to turn assignments in on time. Lastly, trainees were rated by a supervisor on teaching performance and lesson plan quality. Each trainee had three conferences with a supervisor during the semester. There was no discussion of oral reading lessons during these conferences, or at any other time by the supervisor. Lessons were not discussed to avoid confounding the study of the effects of controlled feedback with supervisory effects. Trainees were told that they would not be graded on the quality of the oral reading lessons but only on completion of requirements for the lessons.

Experimental Procedures

Discrimination training. Before tutoring commenced for second semester, five bi-weekly training sessions were held with all tutors. The purpose of these meetings was to introduce the trainees to the uses of feedback in teaching, and to develop trainee discrimination skills by learning the Oral Reading Observation System. Trainees received the Computer-Assisted Teacher Training System - Trainee Manual I and Developing Teaching Skills - Trainee Manual II. The first manual contained the following information: The Computer-Assisted Teacher Training System (CATTS), The Role of Feedback in Skill Development, Phases of Teacher Skill Development, Feedback as a Source for Decision-Making, and the OROS Training Manual - Student Version. The student version of the OROS training manual was a shortened version of the complete Observer's Training Manual (Brady, Lynch, & Cohen, 1976) and contained simplified definitions and examples of all categories in OROS, as well as exercises to complete. All miscue categories were initially presented, but only nine miscue categories were used for the discrimination training. The first meeting was devoted to the completion of this manual.

The remaining three meetings, approximately two hours each, were devoted to coding oral reading lessons with OROS, and using Video Tape Recorder Protocol materials. All trainees received discrimination training. Materials used for training were video protocols of oral reading lessons that had also been used to train coders. The purpose of the training was for tutors to be able to recognize and discriminate between instances of all 32 OROS categories presented. Speed was not emphasized, only accuracy of recognition.

The first criterion test was given after the 4th session. The test required tutors to code a video-taped lesson, entering codes on a specially prepared transcript which had parentheses at those points where codes would occur. Due to the speed of the taped lesson and, possibly, insufficient time for discrimination training, no coders reached mastery. Therefore, one additional training meeting was held and coders were urged to study their manuals at least two hours before taking the second criterion test.

For the second criterion test, tutors were given a typed transcript of a lesson with parentheses inserted where codes were required, and given as much time as necessary to complete the test. No video was used. Table 4 shows means and standard deviations for the second discrimination test on unadjusted scores and on scores adjusted by counting as half correct any code in which the first number of a particular category was correct, regardless of the second number. (For example, if a tutor

TABLE 4.

MEANS (AND STANDARD DEVIATIONS) FOR SCORES ON DISCRIMINATION TRAINING TESTS[1], SECOND SEMESTER, BY GROUP

Test	CTU	CTA	MODU	QMU	QMA
Group 1	169.333 (22.153)	182.556 (15.249)	16.750 (5.600)	7.625 (1.408)	11.125 (1.126)
Group 2	162.000 (17.670)	176.900 (14.395)	17.400 (4.377)	6.800 (1.317)	10.800 (1.932)

[1]CTU = Criterion Test 2, Unadjusted Score, total possible = 346.
CTA = Criterion Test 2, Adjusted Score, total possible = 346.
MODU = Module Prompts Correct, Unadjusted Score, total possible = 38.
QMU = Quiz, Unadjusted, total possible = 12
QMA = Quiz, Adjusted, total possible = 12 (repetitions accepted).

marked "33" for a Teacher Spelling Prompt, actually coded "32," no credit would be given for the unadjusted score and a half point would be given for the adjusted score, since the first level of the code is correct.) Also, a subscore of only the module prompts was developed from this test by counting the number of correct codes for the five module prompts. The scores for the two groups on CTU, CTA, and MODU are all quite similar. However, the means obtained by the groups represent a level of mastery of only approximately 50% on each test. On the test of module prompt discrimination, MODU, the mean was 17 for both groups, representing a percent score of 44. The training was, therefore, not very successful in teaching discrimination of behaviors. However, the groups are quite similar in their levels of mastery.

After about the 6th lesson of the second semester, another test was given. This quiz simply listed protocols of pupils' reading and asked the trainee to write a specific module prompt by each miscue. This quiz, therefore, was both a recall and a generation test in that trainees had to generate their own prompts to match each code. When the unadjusted quiz score was obtained, points were not given for any prompts that were exactly the same as prompts used for another miscue. The adjusted score included repetitions. Table 4 also shows these scores. The unadjusted mean of approximately 7 for both groups represents 58% of the total possible score, showing that tutors were also having a great deal of difficulty in generating novel prompts. However, the adjusted score of 11 for both groups represents 92% of the total possible score, showing that trainees could generate prompts when given an OROS code.

As a check that there was no significant difference between the CATTS and Audio subjects in the information gained from the discrimination training, analyses of variance were run on all five scores. These are shown in Table 5. There are no significant differences between the two groups. Therefore, it can be concluded that both groups were equally proficient in their ability to discriminate and generate

Table 5

Repeated Measures ANOVA's for Scores on all

Discrimination Training Tests, Second Semester, By Group

(Variable)	Source	df	SS	MS	F	p <
(CTU)	Between	1	254.737	254.737	.643	.434
	Within	17	6736.000	396.235		
	Total	18	6990.737			
(CTA)	Between	1	151.509	151.509	.691	.417
	Within	17	3725.122	219.125		
	Total	18	3876.632			
(MODU)	Between	1	1.878	1.878	.077	.785
	Within	16	391.900	24.494		
	Total	17	393.778			
(QMU)	Between	1	3.025	3.0250	1.642	.218
	Within	16	29.475	1.8422		
	Total	17	32.500			
(QMA)	Between	1	.469	.469	.177	.680
	Within	16	42.475	2.655		
	Total	17	42.944			

prompts. Because of the low proficiency level that tutors had in discriminating all OROS categories and generating novel module prompts, several changes were subsequently made in the experimental procedures.

While the discrimination training was being completed, trainees taught the first four lessons of second semester. These four lessons comprise the baseline period. No feedback or instructions as to how to prompt were given during this period. At the end of the baseline period, all tutors met as a group and received a second manual, Trainee Manual II: Developing Teaching Skills. The first section of this manual reiterated the teacher behavior goals in the Prompting module. The second section of this manual was designed to teach trainees how to interpret the computer print-outs summarizing their teaching behaviors during all of the lessons taught during first semester, a total of 12 for those who had no absences. A sample of a print-out with no information is given in the Appendix, along with a key to each item of information on the print-out, and how it was computed.

Trainees were required to graph performance data on their first semester lessons, to interpret what took place, and then to set goals for themselves for second semester. Some of this information was managerial, such as the length of time of the lessons, and the pupil error rate. Other information related to the behavioral goals of the Prompting Module and required trainees to state whether their goal for second semester should be to maintain a behavior, increase it, or decrease it. After the graphing and completion of the items requiring evaluation of behaviors, tutors were placed in two feedback groups: CATTS and Audio.

Feedback procedures. CATTS tutors received a detailed explanation of the kind of feedback they would be receiving during and after every lesson. One aspect of the feedback was a real-time feedback display of the frequencies of the prompts being used. Figure 2 shows a sample of the information that appeared on a video screen during every lesson whenever a tutor was receiving CATTS feedback. The first five numbers at the bottom of each column represent the OROS codes for the module prompts (the target behaviors); O represents Other (all non-module prompts except "8"), while "8" is teacher telling. The height of the bar graphs represents the frequency of each behavior. In the sample, the tutor has given five "33" prompts, two "34" prompts, six "44," five "45," and one "52" prompt. Telling has been used three times and Other, eight. Every time one of the codes at the bottom of the display was entered in the button box by a coder, the bar graph would increase in height by one unit. Thus, if the next prompt used by the tutor in the sample display was a "52," the bar for "52" would increase in height. CATTS tutors were told that their goal during each lesson was to generate each of the module prompts at the same frequency and to have no or few prompts in the "Other" and "8" columns.

The second aspect of the CATTS feedback was delayed print-out feedback. At the end of every tutoring session, all CATTS tutors received a summary of their lesson, as shown in the Appendix. Before teaching their next lesson, tutors were required to interpret the print-out and to complete the Feedback Evaluation Sheet, shown in Figure 3. Tutors were also required to establish their own teaching performance goals for the next lesson they would teach. These procedures were all explained to the CATTS subjects during a group meeting.

Concurrently, a meeting was held with the Audio subjects only, in order to instruct them in the nature of their feedback. At the end of each tutoring session, Audio subjects received a cassette tape of the lesson taught that day. Before the next lesson, they were required to listen to the tape and code it themselves, using the form in Figure 4, and then to complete the Feedback Evaluation sheet, the same one used by CATTS subjects. Performance goals were the same as for CATTS trainees - to increase module prompts and decrease other behaviors. These procedures were all explained to the Audio subjects during the meeting.

Feedback conditions began for all subjects with lesson 4, with all tutors

Figure 3.

Feedback Evaluation Sheet

Name ______________________ Pupil ______________ Date of Lesson ________

Type of feedback CATTS ☐ AUDIO ☐

THIS LESSON			NEXT LESSON		
			Increase	Decrease	Maintain
1. Length of lesson (minutes) ________					
2. Number of words read ________					
3. Difficulty level $\left(\frac{\text{All 2s}}{\text{No. Words}}\right)$ = ____ %					
4. No. of pupil 21 miscues ________					
5. No. of pupil 22 miscues ________					
6. No. 21's prompted ________					
7. No. 22's prompted ________					
8. Average length of prompt sequence ________					
9. Use of Strategic Prompts	frequency	percentage			
(52) Context					
(33) Structural					
(44) Pattern					
(45) Phonic					
(34) Attention					
Other prompts					
8's, Telling					

Figure 4.

Audio Tape Tally Sheet

Tutor ______________________ Pupil ____________ Date of Lesson ______

Pupil Miscues		Prompted?			
21 - Meaning Change	total	YES	total	NO	total
22 - No Meaning Change					

Prompts Used

		Frequency	%
Context 52			
Structure 33			
Pattern 44			
Phonic 45			
Attention 34			
Telling 8			
Other			
	TOTAL		100

completing Feedback Evaluation sheets showing their goals for lesson 5. Therefore, lesson 5 was considered the first feedback lesson. After the feedback conditions had continued for lessons 4 and 5, it became apparent to the experimenters that the tutors were having difficulty attempting to generate all five module prompts at once. (The results of the quiz discussed earlier corroborates this.) For that reason, several lessons at a time were devoted to generating only one module prompt, with those previously practiced being continued. Tutors were told that their goal in teaching should be to generate each module prompt approximately 15% of the time, and have at least 75% of their prompts be module prompts. These figures were established as criterion percents.

Since the prompting module states that "52" (Context) is the most important prompt, this was the first behavior practiced singly. A training session was held with all tutors (CATTS and Audio) for the purpose of defining "52" prompts, showing written examples and having the tutors generate several different "52" prompts appropriate to a sample of pupil miscues. Any questions about "52" prompts were discussed and answered. For lessons 6 through 11, tutors were to try to practice only "52" prompts (if another module prompt was more appropriate in a certain instance, then the tutor was to use it). At this time the tutors were also given a line graph showing the percent of both "52" and total module prompts that they had used in their first six lessons. They were required to continue filling in this information for each lesson, beginning with lesson 7, for the remainder of the semester so as to heighten their awareness of the target behaviors and their teaching goals. A sample graph is shown in Figure 5.

After the eleventh lesson of the second semester and prior to the twelfth lesson, a second meeting was held to discuss the remaining module prompts. Written examples were provided for categories "45" (sounds within words), "33" (structural), and "44" (word families, patterns) in that order. One prompt, "34" (attention),

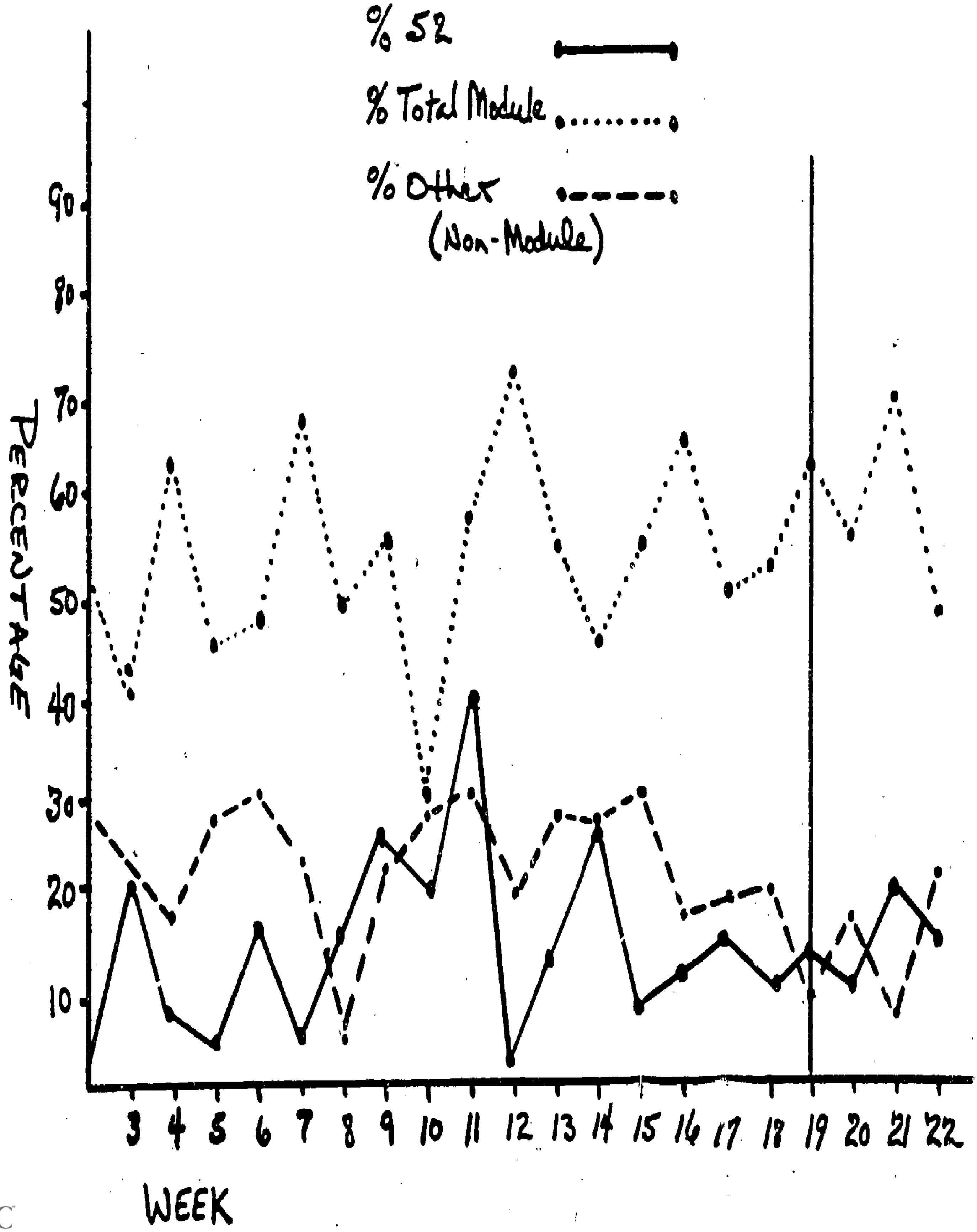

Figure 5.
Sample Line Graph

was not included because the first semester data indicated that trainees were able to generate a criterion level of "34"s by the end of first semester. Again the tutors were asked to generate several examples of each module prompt appropriate to the sample pupil miscues. In the following weeks, the tutors practiced each of these module prompts singly for two lessons (first "45"s, then "33"s, then "44"s) and maintained their generation of "52" prompts. Focus of lessons 1 through 17 is listed below:

Lesson	Focus
1-3	Overview of OROS. Discrimination training completed.
4-5	All 5 module prompts
6-11	52, context prompts
12-13	45, phonics prompts
14-15	33, structural prompts
16-17	44, pattern prompts

<u>Feedback switch</u>. After lesson 17 and prior to lesson 18, all tutors received an evaluation form designed to measure their attitude towards the feedback condition they had received to that point. (See Appendix for sample form.) Then feedback conditions were switched, with all the CATTS tutors receiving audio feedback and all the Audio tutors, CATTS, for the remaining four lessons (lessons 18 through 21). A training meeting was held with each group to explain the feedback procedures which were the same as in the meetings described previously. One addition was made in the information given in the feedback and for the teaching goals - the success rate of each module prompt was included. A successful prompt was one followed by a "62" (Correct Answer) or "64" (Exact Text Word). For the CATTS trainees, the instantaneous visual display resembled the sample in Figure 6. If all the prompts given for a

specific category were successful, the bar graph would be completely filled. If three out of five prompts were successful, the bar graph would be three-fifths filled. This information was added cumulatively to the visual display, with appropriate changes in the display occurring each time one of the module prompts occurred and was either successful or not. The Audio tally sheet and CATTS feedback sheet, revised to include success rates, are shown in Figures 7 and 8 respectively. Both groups of trainees were told to continue to generate module prompts and to choose those most likely to be followed by a successful pupil response. Before prompting, they were to consider the pupil's reading skills, the kind of miscue made, the word on which the miscue was made and the sentence (story) in which the miscue appeared. These procedures were followed for lessons 18-21.

After the last lesson of the second semester (lesson 23), the trainees again received a questionnaire on their attitudes toward feedback, similar to the first questionnaire. This evaluation, however, also asked for tutors to compare the two methods of feedback. (See Appendix for sample questionnaire.)

As indicated earlier, trainees were required to make up any absence, and almost all tutors completed 20 or 21 lessons; thus both groups had equal opportunities to practice prompting.

Summary of feedback phase of training. All trainees received feedback on all dependent measures in the study. However, due to time constraints and established priorities of the program, there was some differential emphasis between performances. Variables emphasized in the training meetings and feedback content were:

1. percent of 5 module prompts
2. total module prompts percent
3. success rates of each of 5 module prompts
4. success rate of total module prompts
5. percent "Other" prompts.

Audio Tape Tally Sheet

Tutor Ruth Damery Pupil Mark Date of Lesson 4-20-76

TALLY PUPIL MISCUES	Pupil Totals	TALLY TEACHER PROMPTS	Prompt Totals
21 - Meaning change miscues 卌 卌 卌 IIII	19	21's prompted 卌 卌 卌 卌 卌 卌 I	31
22 - Non-meaning change miscues 0	0	22's prompted 0	0
Miscue Total (21 & 22)	19		Total (21 & 22) Prompted 31

USE OF PROMPTS	TALLY & FREQUENCY		%	TALLY & FREQUENCY OF 62-64 OCCURRING AFTER PROMPT		%
Context (72)	卌 III	8	22	IIII	4	22
Structure (33)	IIII	4	11		0	0
Pattern (43)	卌 IIII	9	24	卌	5	28
Phonic (45)	III	3	8		0	0
Attention (34)	卌 I	6	16	III	3	17
Other Prompts	I	1	3		0	0
PR & Mgmt. (7's)		0	0		0	0
Telling (9)	卌 I	6	16	卌 I	6	33
TOTALS		37	100%		18	100%

Figure 7. Audio Tape Tally Sheet.

Feedback Evaluation Sheet

Name Ruth Damery Pupil Mark Date of Lesson 4-20-76

Type of Feedback CARDS ____ AUDIO X

THIS LESSON		NEXT LESSON Increase	Decrease	Maintain
1. Length of lesson (minutes)	12 min	✓		
2. Number of words read	112	✓		
3. Difficulty level (All 2s / No. words) =	17 % 19/112		✓	
4. No. of pupil 21 miscues	19			
5. No. of pupil 22 miscues	0			
6. No. 21's prompted	31		✓	
7. No. of 22's prompted	0			✓
8. Average length of prompt sequence	4 sec.		✓	

9. Use of Strategic Prompts	Frequency	Percentage	Increase	Decrease	Maintain
([illegible]) Context	8	22			✓
Successful Pupil Responses (62 or 64)	4	22	✓		
(33) Structural	4	11	✓		
Successful Pupil Responses (62 or 64)	0	0	✓		
(44) Pattern	9	24			✓
Successful Pupil Responses (62 or 64)	5	28	✓		
(45) Phonic	3	8	✓		
Successful Pupil Responses (62 or 64)	0	0	✓		
([illegible]) [illegible]ion	6	16	✓		
Successful Pupil Responses (62 or 64)	3	17	✓		
Other Prompts	1	3		✓	
8's Telling	6	16		✓	

Figure 8. Feedback Evaluation Sheet.

Less emphasis was placed on the following performances:

1. number of lessons in which the criterion percent was reached
2. length of prompt sequences
3. kinds of miscues to prompt.

The performance results obtained reflect the differential emphasis and will be discussed in the results section which follows.

Results

Performance data. Before any analyses, the observation data from each individual lesson was collapsed into four trials. Lessons 1-4 were collapsed into the baseline trial (Trial 1), lessons 5-10 into the generation-first half trial (Trial 2), lessons 11 to 17 into the generation-second half trial (Trial 3), and lessons 18 to 21 into the success rate trial (Trial 4).

Procedures used for computing percents are described in the Results section of Chapter III, part 1.

Percents of Target Behaviors Generated

Table 6 shows means and standard deviations for the frequencies of all teacher prompting behaviors by Group and Trial, and Table 7 shows the same information on percents.

As can be seen from these tables, there is little difference between the two groups at Trial 1. Two of the module prompts, "33" and "34," were already at or near criterion at Trial 1 before feedback began. Three of the module prompts were occurring at a very low percent - "44," "45," and "52." Neither group had a total module percent of over 50%, and both were using approximately 30% other prompts, fairly equally distributed across all categories. The average interaction sequence following a miscue was approximately 3.5 for each group.

In order to check that the assignment to groups procedure resulted in equivalent initial trainee behavior in each group, one-way analyses of variance (CATTS

Table 6

Means and Standard Deviations on Frequencies of Module Prompting Behaviors by Group and Trial for Collapsed Trials Second Semester

Dependent Variables			Trial 1 G1	Trial 1 G2	Trial 2 G1	Trial 2 G2	Trial 3 G1	Trial 3 G2	Trial 4 G1	Trial 4 G2
V27	PR21	$\bar{X}$	76.333	67.300	162.333	146.700	139.000	114.200	97.555	90.300
		SD	(45.191)	(36.138)	(43.243)	(56.403)	(46.548)	(30.491)	(37.340)	(37.650)
V29	PR22		16.222	12.900	26.888	30.400	30.222	26.000	16.111	16.100
			(15.896)	(6.789)	(15.078)	(13.953)	(11.882)	(12.771)	(7.975)	(11.522)
V37	31		5.444	5.500	8.777	7.700	8.000	5.200	4.444	4.600
			(2.877)	(5.482)	(5.190)	(4.644)	(5.809)	(5.287)	(2.788)	(3.777)
V39	32		5.222	1.500	5.444	2.200	1.777	1.600	.777	1.500
			(7.838)	(2.460)	(4.824)	(3.910)	(1.787)	(1.837)	(1.641)	(2.273)
V41	33		17.222	14.200	31.222	26.700	37.555	24.100	27.666	28.800
			(12.336)	(10.086)	(21.498)	(13.776)	(10.875)	(14.540)	(14.195)	(14.420)
V43	34		17.333	15.600	23.666	27.600	28.444	23.300	18.535	16.500
			(13.076)	(12.859)	(11.800)	(21.427)	(18.682)	(17.801)	(13.7214)	(8.236)
V45	41		6.666	5.800	11.000	7.600	9.777	6.600	3.666	5.600
			(4.924)	(8.904)	(10.920)	(11.471)	(8.105)	(5.168)	(3.905)	(5.037)
V47	42		.777	2.100	2.111	2.500	1.111	.300	.222	0
			(1.641)	(3.956)	(3.655)	(3.274)	(1.166)	(.483)	(.441)	0
V49	43		0	.500	.555	.400	.111	.100	0	0
			0	(1.581)	(1.130)	(.966)	(.333)	(.316)	0	0
V51	44		4.555	3.500	9.333	15.400	16.777	10.200	14.222	10.000
			(4.034)	(3.566)	(7.314)	(19.861)	(7.446)	(8.854)	(13.131)	(9.153)
V53	45		4.111	3.900	12.111	13.700	18.333	9.400	12.555	12.500
			(4.044)	(3.909)	(8.237)	(10.893)	(7.106)	(6.518)	(2.242)	(10.638)
V55	51		8.666	7.100	26.111	20.400	17.555	18.100	5.111	4.600
			(8.660)	(8.130)	(14.181)	(13.014)	(12.768)	(15.926)	(4.728)	(3.373)
V57	52		5.444	7.000	28.777	32.300	26.444	29.100	27.111	20.800
			(5.502)	(9.683)	(18.060)	(20.232)	(13.884)	(19.324)	(20.865)	(10.293)
V61	71		7.444	6.900	9.222	11.000	4.555	6.400	5.333	4.600
			(7.418)	(4.557)	(4.603)	(6.036)	(2.877)	(5.777)	(5.916)	(3.373)
V63	72		1.222	1.000	3.777	2.000	7.222	2.400	5.555	1.700
			(1.301)	(1.885)	(4.893)	(3.559)	(7.918)	(4.477)	(3.711)	(2.540)
	73		5.222	4.100	7.888	8.600	5.555	5.900	3.777	5.000
			(3.898)	(2.282)	(6.660)	(6.203)	(4.824)	(4.508)	(5.093)	(3.018)
	8		21.666	15.000	38.000	31.800	23.888	23.400	24.111	16.700
			(24.728)	(9.321)	(21.558)	(28.997)	(16.676)	(13.549)	(14.030)	(10.011)
Total Mod.			48.666	44.200	105.111	115.700	127.555	96.100	100.111	88.600
			(21.301)	(26.317)	(36.350)	(40.348)	(29.428)	(39.014)	(54.459)	(31.280)
All Other			35.555	27.000	59.000	53.400	41.222	38.100	38.778	28.000
			(30.067)	(11.737)	(23.859)	(31.805)	(18.362)	(20.920)	(21.747)	(13.621)

Trial 1 = lessons 1-4, baseline
Trial 2 = lessons 5-10, feedback
Trial 3 = lessons 11-17, feedback
Trial 4 = lessons 18-21, switch mode of feedback

G1 = CATTS feedback group
G2 = Audio feedback group

Table 7

Means and Standard Deviations for Percents of Module Prompting Behaviors and Length by Group and Trial for Collapsed Trials, Second Semester

Dependent Variables			Trial 1 G1	Trial 1 G2	Trial 2 G1	Trial 2 G2	Trial 3 G1	Trial 3 G2	Trial 4 G1	Trial 4 G2
V28	PR21	$\bar{X}$	86.777	85.600	85.888	85.000	85.444	84.600	84.666	85.000
		SD	(8.408)	(8.435)	(5.372)	(6.960)	(6.002)	(9.057)	(9.798)	(7.859)
V30	PR22		90.666	85.700	87.555	86.100	88.333	84.100	83.000	86.700
			(9.233)	(12.046)	(7.384)	(6.967)	(5.074)	(9.492)	(11.874)	(10.573)
38	31		5.222	5.300	3.888	3.600	3.555	2.300	2.777	3.200
			(4.176)	(4.217)	(2.891)	(3.306)	(3.745)	(2.162)	(1.715)	(2.859)
40	32		3.000	1.100	1.888	.700	.555	.600	.555	.800
			(3.741)	(2.469)	(1.833)	(1.337)	(.726)	(1.075)	(1.333)	(1.316)
42	33		15.777	14.200	13.000	12.800	17.777	13.800	18.111	21.100
			(7.446)	(5.028)	(6.041)	(6.356)	(3.383)	(5.138)	(7.817)	(7.922)
44	34		15.666	18.300	10.777	13.300	12.777	13.300	11.666	13.100
			(10.332)	(11.314)	(5.309)	(8.138)	(7.644)	(8.982)	(6.745)	(7.563)
46	41		5.666	4.900	4.222	2.500	4.000	3.300	2.888	3.800
			(5.522)	(6.919)	(3.929)	(3.407)	(3.122)	(2.710)	(4.196)	(3.583)
48	42		.666	1.400	.666	.600	.222	0	.111	0
			(1.322)	(2.836)	(1.322)	(1.075)	(.441)	0	(.333)	0
50	43		0	.800	.111	.100	0	0	0	0
			0	(2.529)	(.333)	(.316)	0	0	0	0
52	44		3.666	3.100	4.111	5.700	8.222	5.600	8.000	6.300
			(3.391)	(2.685)	(3.444)	(5.869)	(4.437)	(5.541)	(4.636)	(5.271)
54	45		4.111	3.900	5.222	6.300	8.444	5.700	9.000	8.800
			(4.675)	(3.875)	(3.113)	(4.900)	(2.403)	(4.785)	(3.605)	(5.633)
56	51		6.300	6.333	11.333	9.400	7.111	11.600	2.888	3.100
			(4.899)	(7.874)	(5.522)	(5.929)	(4.621)	(12.606)	(2.713)	(2.514)
58	52		4.666	6.300	12.888	15.800	12.666	16.700	15.555	14.800
			(4.031)	(7.134)	(7.928)	(10.293)	(7.158)	(11.106)	(8.353)	(7.465)
62	71		6.666	6.600	4.000	4.800	1.777	3.200	2.777	2.600
			(5.408)	(4.452)	(2.692)	(2.780)	(1.201)	(2.529)	(2.166)	(1.776)
64	72		.666	.900	1.222	.500	2.888	1.000	3.444	.700
			(1.000)	(2.183)	(1.922)	(1.080)	(3.887)	(2.000)	(2.697)	(1.251)
66	73		6.111	4.600	3.666	3.500	2.777	2.900	2.000	3.500
			(8.894)	(2.988)	(4.821)	(2.415)	(3.961)	(2.726)	(3.201)	(2.368)
70	8		15.888	16.600	16.777	13.700	10.888	13.700	15.111	12.300
			(10.469)	(8.566)	(8.348)	(7.902)	(6.641)	(6.929)	(7.928)	(6.430)
76	Total Mod.		45.555	47.700	47.888	56.000	61.666	56.900	64.333	66.000
			(8.805)	(10.770)	(9.879)	(10.604)	(5.147)	(16.569)	(11.726)	(7.571)
80	All Other		30.555	29.800	27.111	24.100	19.555	21.900	24.444	20.400
			(12.258)	(8.297)	(9.829)	(6.919)	(8.156)	(8.089)	(11.237)	(7.183)
112	Length		3.441	3.703	3.344	3.453	3.528	3.434	3.638	3.547
			(.490)	(1.455)	(.518)	(.727)	(.571)	(.819)	(.914)	(.661)

vs. Audio) were run using baseline trial data on the percent of each module prompt and the total module percent. Table 8 shows the results of these ANOVA's. No sources of variance are significant; therefore, groups were not significantly different on these variables at Trial 1.

Miscues prompted. The first variable tested was the percent of "21" miscues prompted and the percent of "22" miscues prompted. Trainees were to respond to "21" miscues and not to respond to "22" miscues. Table 9 shows the results of the multivariate analysis of variance on these two variables. No sources of variance were significant. Table 7 shows that trainees in both groups continued to prompt both "21" and "22" miscues at a high percent across the four trials. Therefore, the feedback conditions were not effective in decreasing the percent of "22" miscues prompted. It must be added that only the delayed feedback for each group contained information about these variables and that performance on these two variables were emphasized very little in comparison to the emphasis on generating module prompts.

Total Module Prompts

The second variable analyzed formally was the total percent of module prompts used. Table 10 shows the results of this analysis, in which only "Trials" is significant ($p < .001$). Therefore, trainees significantly increased their use of module prompts across the semester, regardless of the feedback condition they received. The two feedback treatments, therefore, were equally effective in increasing this behavior. Trial means and standard deviations are shown for this variable in Part B of Table 10. Tukey tests between all possible pairs (Glass and Stanley, 1971) revealed that the comparisons between Trials 1 and 3, 1 and 4, and 2 and 4 were significantly different ($p < .05$), while those between Trials 1 and 2, 2 and 3, and 3 and 4 were not. Therefore, trainees needed at least two trials to significantly increase their total percents of module prompts used. These results also indicate that trainees were able to maintain their behavior even under a different

Table 8

Summary of One Way ANOVA'S for Trial, Collapsed Baseline, Lessons 1 Through 4)
for Second Semester for "33", "34", "44", "45", "52", and Total Module

Variable	Source	SS	df	MS	F	P<
33	Between	12.800	1	12.800	.343	.565
	Within	671.200	18	37.289		
34	Between	33.800	1	33.800	.303	.589
	Within	2006.200	18	111.456		
44	Between	1.800	1	1.800	.206	.655
	Within	157.000	18	8.722		
45	Between	.200	1	.200	.012	.915
	Within	309.800	18	17.211		
52	Between	12.800	1	12.800	.392	.539
	Within	58.820	18	32.678		
Tot. Mod.	Between	16.200	1	16.200	.174	.681
	Within	1675.000	18	93.056		

Table 9

Repeated Measures MANOVA for PR21 and PR22

for Collapsed Trials, Second Semester (First Roots Only Repeated)

Source	F	df_{hyp}	df_{error}	p	R (Canonical)
Groups	.017	2	16	.983	.046
Trials	1.187	6	100	.319	.354
GT	.702	6	100	.648	.243

Table 10

Repeated Measures ANOVA for Total Module

for Collapsed Trials, Second Semester (A)

Source	SS	df	MS	F	p
Between Subjects					
Groups	60.634	1	60.634	.278	.605
SWG	3704.156	17	217.892		
Within Subjects					
Trials	3727.724	3	1242.575	15.640	.001
GT	393.571	3	131.190	1.651	.189
Error	4051.956	51	79.450		

Trial Means (And Standard Deviations)

Trial	1	2	3	4
	46.7	52.2	59.2	65.2
	(9.7)	(10.8)	(12.5)	(9.5)

mode of feedback, as occurred at Trial 4. If this had not been the case, a group by trial interaction would have occurred in which CATTS trainees would have decreased their percent total module at Trial 4, during which lessons they received audio feedback, and audio trainees would have decreased their percent total module at Trial 4, when they received CATTS feedback.

The mean for total module at Trial 4 is 65%, 10 percentage points under the criterion of 75% set by the experimenters. This could be due to the method of computing the percentages. The total frequency of all teacher behaviors was used as the denominator, therefore, including category seven codes in OROS, which are management and feedback codes, as well as 8, teacher telling. Some of these teaching behaviors are obviously necessary during any type of lesson. As measured in this study, however, trainees as a whole did not reach criterion for this variable.

MANOVAs. A multivariate analysis on the five module prompts and "Other" was also run. The results are in Table 11. Again, only the trials source of variance is significant ($p < .001$). Therefore, when intercorrelations among the dependent variables are taken into account, both feedback conditions were equally effective in increasing the percents of module prompts used and decreasing percent Other. The interaction term is not significant; thus, the change in feedback conditions did not affect trainee behavior.

In order to consider the effects of feedback on individual behaviors, univariate ANOVA's were computed on these 6 variables - 5 module prompts and Other. Summary results are shown in Table 12. For all variables, neither groups nor the interaction term are significant, showing equal effectiveness of feedback condition and no effect for switching feedback. Of the six variables tested for trials, one, "34" (Attention), was not significant, though it approached significance ($p < .08$).

In Part B of Table 12, trial means and standard deviations are reported for all six dependent variables. Attention prompts, "34," decreased almost 5% across trials,

Table 11

Repeated Measures MANOVA for "33", "34", "44", "45", "52", and "Other" Prompts for Collapsed Trials, Second Semester (First Roots Only Repeated)

Source	F	df_{hyp}	df_{error}	p	R (Canonical)
Groups	.546	6	12	.764	.463
Trials	4.746	18	130.593	.001	.819
GT	.737	18	130.593	.768	.395

Table 12

Summary of Repeated Measures ANOVA'S for "33", "34", "44", "45", "52", and "Other" Prompts for Collapsed Trials, Second Semester (B)

Source	Variable	F	(df)	MS	P<
Group	33	.223	(1,17)	9.064	.643
	34	.370		59.883	.551
	44	.245		12.896	.627
	45	.131		5.112	.722
	52	.409		72.458	.531
	Other	.295		64.458	.594
Trial	33	3.885	(3,51)	153.697	.014
	34	2.377		100.263	.081
	44	5.683		58.329	.002
	45	7.063		80.526	.001
	52	12.965		409.298	.001
	Other	15.864		1242.399	.001
GT	33	1.013	(3,51)	40.061	.395
	34	.112		4.707	.953
	44	1.521		15.615	.220
	45	1.066		12.156	.372
	52	.634		20.028	.596
	Other	1.676		131.292	.184

Means (and Standard Deviations) (B)

Variable	Trial 1	2	3	4
33	14.9(6.2)	12.9(6.0)	15.7(4.7)	19.7(7.8)
34	17.1(10.6)	12.1(6.9)	13.1(8.1)	12.4(7.0)
44	3.4(3.0)	4.9(4.8)	6.8(5.1)	7.1(4.9)
45	4.0(4.2)	5.8(4.1)	7.0(4.0)	8.9(4.7)
52	5.5(5.8)	14.4(9.1)	14.8(9.4)	15.2(7.7)
Other	52.4(9.7)	46.8(10.8)	39.8(12.5)	33.8(9.4)

as they should have, given the high percentage of "34" prompts used during the baseline period. A decrease in this trainee behavior was necessary if an increase in other behaviors was to occur.

The remaining 5 variables were all quite significant across trials. Tukey tests were, therefore, computed on all possible pairs of trial means for each variable. For structural, "33" prompts, only the comparison between Trials 2 and 4 was significant ($p < .05$), a difference of 7%. Thus, trainees significantly increased their percent "33" prompts from 12.9% at Trial 2 to 19.7% at Trial 4, regardless of feedback condition. Since the mean percent of "33" prompts across all trainees was already at criterion (15%) during the baseline period, the finding of only one significant comparison is not surprising.

For pattern, "44" prompts, the comparisons between Trials 1 and 3, 1 and 4, and 2 and 3 were significant. Since the two lessons emphasizing "44" prompts did not occur until Trial 3, this result was to be expected. At Trial 4, the mean for "44" was 7.1%, approximately half of the established criterion of 15%. Trainees, thus, had difficulty in generating "44" prompts.

For phonics, "45" prompts, the comparisons between Trials 1 and 3, 1 and 4, and 2 and 4 were significant ($p < .05$). At Trials 1 and 2 trainees generated approximately 4.5% "45" prompts and significantly increased this percent to approximately 7% at Trials 3 and 4. Again, "45" prompts were not emphasized until Trial 3; thus, this result could be anticipated.

For "52," context prompts, the comparisons between Trials 1 and 2, 1 and 3, and 1 and 4 were significant. Trainees increased their use of "52" prompts from 5.5% at Trial 1 to 14.4% at Trial 2 and maintained this level across Trials 3 and 4. Most lessons during Trial 2 were practice lessons for "52" prompts; thus, the significant increase in trainee behavior from Trial 1 to 2 shows the effects of the focus on "52."

The significant comparisons for "Other" prompts were between Trials 1 and 3, 1 and 4, and 2 and 4. Across Trials 1 and 2 trainees generated approximately 50% "Other" and decreased their use of "Other" prompts to approximately 35% across Trials 3 and 4.

Only one prompt significantly increased after baseline Trial 1, "52" prompts (from 5.5% to 14.4%). Then, a near criterion mean was maintained across Trials 3 and 4. Trainees were told to concentrate on generating "52" prompts only for most Trial 2 lessons. Thus, this significant increase shows that the goal of only focusing on "52" did change performance. Most other significant increases occurred at Trial 3, the trial that included lessons emphasizing "45," "33," and "44." No significant comparisons between Trials 3 and 4 were found. Therefore, performance was maintained at Trial 4, even though the mode of feedback was switched (CATTS to Audio feedback and vice versa).

Length. The mean length of the miscue-teacher prompt-pupil answer interaction sequences was also tested. The results are shown in Table 13. No sources of variance were significant. Therefore, subjects did not decrease length over the semester, nor was there any difference across the two groups. Again, as for the two variables, "21" and "22" miscues, length was not a goal that was emphasized as much as generating the five module prompts.

Success Rates of Target Behaviors Generated

The third set of variables of interest were the success rates of the target behaviors. Success rate was computed separately for each prompt category by dividing the frequency of the prompts followed by the pupil giving a correct answer or the exact text word by the total prompts for the category. Table 14 shows the means and standard deviations for the success rate of all OROS prompt categories. Success rate was tested across all four trials, even though feedback information on it was given during each lesson only during the Trial 4 lessons. Tutors received

Table 13

Repeated Measures ANOVA on Mean Prompt Length

for Collapsed Trials, Second Semester

Source	SS	df	MS	F	P<
Between Subjects					
Groups	.040	1	.040	.024	.879
SWG	28.346	17	1.667		
Within Subjects					
Trials	.455	3	.152	.410	.746
GT	.423	3	.141	.382	.767
Error	18.851	51	.370		

Table 14

Means and Standard Deviations for Success Rate of Teacher Prompts for Second Semester by Group and Trials

Dependent Variables	Trial 1 G1	Trial 1 G2	Trial 2 G1	Trial 2 G2	Trial 3 G1	Trial 3 G2	Trial 4 G1	Trial 4 G2
31 $\bar{X}$	44.111	39.300	48.666	42.500	53.111	54.300	27.444	26.100
SD	(25.687)	(23.847)	(23.048)	(29.937)	(23.449)	(34.548)	(33.234)	(24.950)
32	47.666	29.500	34.222	43.900	33.333	22.000	22.222	17.000
	(38.587)	(42.466)	(36.293)	(44.861)	(35.355)	(34.254)	(44.095)	(29.051)
33	54.111	50.000	43.388	43.000	50.666	55.100	58.000	54.600
	(13.251)	(28.543)	(18.496)	(16.431)	(7.193)	(17.239)	(12.165)	(18.608)
34	47.111	56.300	52.555	48.400	51.444	49.200	43.444	48.100
	(26.241)	(26.499)	(14.009)	(12.946)	(13.830)	(21.384)	(14.213)	(17.220)
41	44.555	30.600	47.888	38.500	44.888	43.700	34.444	43.500
	(30.216)	(33.470)	(31.230)	(28.551)	(25.154)	(30.298)	(33.941)	(28.402)
42	2.777	17.700	9.666	51.100	37.000	10.000	11.111	0
	(8.333)	(33.493)	(19.887)	(43.164)	(48.435)	(31.622)	(33.333)	0
43	0	10.000	14.777	20.000	11.111	10.000	0	0
	0	(31.622)	(33.770)	(42.163)	(33.333)	(31.622)	0	0
44	43.111	16.100	63.444	59.500	52.888	64.900	66.888	54.200
	(36.957)	(19.547)	(23.590)	(30.030)	(26.050)	(26.459)	(20.220)	(32.737)
45	47.888	36.800	40.666	49.600	37.777	39.300	48.888	38.100
	(32.884)	(32.220)	(20.451)	(31.945)	(11.766)	(30.703)	(9.033)	(13.186)
51	28.222	34.300	49.111	44.800	49.333	43.900	52.888	35.800
	(23.610)	(33.944)	(16.389)	(24.371)	(19.384)	(20.452)	(36.060)	(34.784)
52	38.888	23.400	45.333	46.700	53.777	47.500	48.888	46.400
	(31.880)	(22.623)	(15.668)	(20.055)	(11.616)	(19.580)	(14.615)	(11.852)
71	39.333	53.200	43.666	35.300	31.111	32.100	26.333	40.100
	(33.064)	(45.716)	(26.405)	(21.587)	(34.440)	(37.696)	(42.614)	(38.587)
72	38.777	15.000	32.777	7.700	29.222	9.100	37.777	30.700
	(42.443)	(33.747)	(34.520)	(16.438)	(29.894)	(19.301)	(30.605)	(42.588)
73	31.111	39.000	73.888	56.600	53.555	79.200	40.666	34.100
	(39.431)	(45.813)	(35.190)	(35.103)	(43.872)	(31.332)	(47.265)	(45.157)
8	98.555	95.500	98.777	99.700	96.888	96.700	94.666	95.500
	(2.697)	(7.663)	(1.563)	(.948)	(5.134)	(4.083)	(7.483)	(5.562)
Tot. Mod.	50.222	44.900	50.111	49.800	50.666	52.900	52.777	50.200
	(13.581)	(14.448)	(9.816)	(12.787)	(6.8[illegible]3)	(7.651)	(9.601)	(11.242)
All Other	63.555	68.700	66.333	66.200	65.555	66.800	66.777	68.200
	(9.015)	(15.670)	(8.170)	(8.599)	(11.587)	(9.065)	(11.008)	(12.899)
Total-8	49.555	48.400	49.888	49.300	50.222	52.300	50.222	49.800
	(10.736)	(14.206)	(7.540)	(10.842)	(7.774)	(7.181)	(10.756)	(9.126)
Total All	58.444	57.000	58.111	57.100	56.000	58.400	57.222	55.900
	(6.385)	(12.445)	(7.440)	(8.359)	(5.979(	(7.089)	(9.510)	(6.871)

feedback on success rates during each lesson at Trial 4. This procedure allowed the analyses to determine if improvements in generating prompts would result in increases in success rates when Trials 1, 2, and 3 only were considered. Comparisons between Trials 3 and 4 would reveal the effect of feedback including this information on trainee performance.

Only the success rates of the total module percent and the five module prompts were tested formally. Success rates at Trial 1 were approximately 40-50% for these variables for both groups, with the exception of the Audio trainees' success rates for "44" and "52" - 16% and 23%, respectively. Approximately half or fewer of the prompts for each category, therefore, were successful at Trial 1.

Table 15 shows the results of the ANOVA on the success rate of the total percent of the module prompts. No sources of variance are significant. Therefore, the feedback conditions were ineffective in increasing the total module success rate over trials.

The success rates of the five separate module prompts were analyzed multivariately. Table 16 shows the results, in which only the Trials source of variance is significant. Thus, when a multivariate analysis is performed on the success rates of the 5 module prompts, there is no effect for feedback condition, or the feedback by trials interaction.

Univariate analyses were then run for all five variables. The results are in Table 17. Again, only "Trials" was significant, though not for all variables. Therefore, trainees significantly increased success rate across trials for 3 variables, with no differences in effect occurring due to feedback condition. Tukey tests between all possible pairs were run for the significant variables, "33," "44," and "52." For "33" prompts, the only significant comparison was between Trials 2 and 4 ($p < .05$), an increase of 43% to 56%. For "44," comparisons between 1 and 2, 1 and 3, and 1 and 4 were significant ($p < .05$). The success rate of "44" prompts

Table 15

Repeated Measures ANOVA for Success Rate of Total Module Prompts for Collapsed Trials, Second Semester

Source	SS	df	MS	F	P<
Between Subjects					
Groups	42.316	1	42.316	.135	.718
SWG	5334.789	17	313.811		
Within Subjects					
Trials	227.368	3	75.789	1.271	.294
GT	147.420	3	49.140	.824	.487
Error	3042.211	51	59.651		

Table 16

Repeated Measures MANOVA for Success Rates of

33, 34, 44, 45, and 52 for Collapsed Trials, Second Semester

(First Roots Only Are Reported)

Source	F	df_{hyp}	df_{error}	p	R (Canonical)
Groups	.735	5	13	.610	.469
Trials	3.078	15	130.148	.001	.678
GT	.803	15	130.148	.673	.409

Table 17

Summary of Repeated Measures ANOVA'S for Success Rates of "33", "34", "44", "45", and "52" for Collapsed Trials, Second Semester (A)

Source	Variable	F (df)	MS	P<
Group	33	.029 (1,17)	18.633	.867
	34	.093	65.629	.764
	44	.985	1185.001	.335
	45	.154	154.501	.700
	52	2.144	620.409	.161
Trial	33	2.809 (3,51)	566.224	.049
	34	.509	128.364	.678
	44	7.683	4688.667	.001
	45	.309	152.961	.819
	52	3.623	1485.211	.019
GT	33	.352 (3,51)	71.009	.788
	34	.717	180.886	.546
	44	2.070	1263.579	.116
	45	.922	456.108	.437
	52	.602	246.952	.616

Trial Means (and Standard Deviations)

33	51.9(22.1)	43.4(16.9)	53.0(13.3)	56.2(15.6)
44	28.9(31.5)	61.4(26.5)	59.2(26.3)	60.2(27.6)
52	30.7(27.8)	46.1(17.6)	50.5(16.2)	47.6(12.9)

increased from 29% at Trial 1 to 61% at Trial 2, and was then maintained. For "52" prompts, only the comparison between Trials 1 and 3 was significant, an increase from 31% to 51%. The success rates for "34," approximately 50%, and that for "45," approximately 40%, did not significantly change over trials.

Increasing success rate was, therefore, a more difficult task than increasing the percent of each prompt generated, since there are fewer significant comparisons across trials for success rate. Success rates were not included on the Feedback Evaluation sheets until after Lesson 17; neither were they included on the instantaneous and delayed feedback for the CATTS group until after Lesson 17. Therefore, only during Trial 4 lessons did tutors receive feedback on success rates, while feedback on prompts generated was given for two trials, Trials 2 and 3. For the three dependent variables on which multiple comparisons were computed, the comparison between Trials 3 and 4 was not significant for any of the variables. This suggests that the increase in trainee ability to generate the targeted behaviors contributed to the increase in success rate, since trainees didn't significantly increase their success rates when this information was included in the content of the feedback. Alternatively, this could be due to a practice effect, since only 4 lessons were devoted to feedback on success rate, while 13 lessons were devoted to feedback on behaviors generated.

The success rate of all prompts used was also analyzed. Category "8," or telling, was not included since telling generally results in a success rate of 100%. The results are reported in Table 18. Nothing is significant; therefore, trainees did not increase their total success rate (minus 8's) across trials, nor was there any difference between the two feedback conditions.

Number of Lessons to First Criterion Lesson and Number of Lessons at Criterion

As stated earlier, trainees were told that the criterion level of performance was at least 15% for each module prompt and a total of approximately 75% for all

Table 18

Repeated Measures ANOVA on Total Prompt Success Rate (Minus "8's") for Collapsed Trials, Second Semester

Source	SS	df	MS	F	P<
Between Subjects					
Group	.009	1	.009	.000	.995
SWG	4502.622	17	264.860		
Within Subjects					
Trials	57.197	3	19.066	.410	.747
GT	29.253	3	9.751	.210	.889
Error	2371.800	51	46.506		

module prompts. These levels were established by the experimenters for several reasons. First, equal proficiency in all prompts was desired. Secondly, it was not considered desirable for trainees to extinguish all behaviors other than module prompts, since certain behaviors in category 7, such as praise and management, and in 8, telling, should naturally occur during teaching, especially with handicapped readers as those in the tutoring practicum.

The number of lessons to the first criterion lesson for each prompt was obtained by counting the number of lessons after Lesson 4 in which the criterion level was reached, since feedback began at Lesson 5. For example, if Lesson 5 was a criterion lesson, the tutor's score was 1, and if Lesson 7 was a criterion lesson, the score was 3. Only Lessons 5-17 were included, because feedback conditions were the same across these lessons. Only subjects who reached a criterion lesson between these lessons were included. Table 19 shows means and standard deviations on the raw data for the six variables. Due to the nature of the metric, a square root transformation ($\sqrt{Y + .5}$) (Kirk, 1968) was used to normalize the data. Table 20 shows means and standard deviations for the transformed data. One-way ANOVA's (CATTS vs. Audio) on the transformed data are reported in Table 21. Only the "Total Module" variable is significant. CATTS trainees took significantly longer, almost five lessons longer, to reach the first criterion trial of 75% for Total Module prompts. Therefore, Audio feedback was more effective in getting trainees to a first criterion trial in the shortest time. It must be pointed out that the criterion of Total Module could be obtained by a tutor having, say, 55% "34" prompts and 5% for the other 4 module prompts, an undesirable behavior. More important is the number of lessons needed to achieve criterion for the module prompts.) For those 5 ANOVA's there was no difference between the two groups in number of lessons to criterion. Therefore, the two feedback conditions were equally effective in assisting trainees to reach criterion for the 5 module prompts.

Table 19

Means (And Standard Deviations) for Number of Lessons

to First Criterion Lesson for 33, 34, 44, 45, 52, and Total

Module Prompts for Lessons 5 Through 17, Second Semester, on Raw Data by Group*

Variable	Group 1 (Audio) n=10	Group 2 (CATTS) n=9
33	2.40 (1.96) (N = 10)	3.33 (2.55) N = 9)
34	3.0[illegible] (3.42) (N = 8)	4.00 (4.18) (N = 9)
44	3.17 (2.14) (N = 6)	6.40 (4.39) (N = 5)
45	4.43 (4.65) (N = 7)	7.67 (3.83) (N = 6)
52	2.50 (1.96) (N = 10)	4.13 (3.98) (N = 8)
Tot. Mod.	4.13 (4.19) (N = 8)	8.86 (2.04) (N = 7)

*Tutors who did not reach criterion were not involved in calculation of mean number of lessons to first criterion.

Table 20

Means (And Standard Deviations) for Number of Lessons to First Criterion Lesson for 33, 34, 44, 45, 52, and Total Module Prompts for Lessons 5 Through 17, Second Semester, on Transformed Data by Group

Variable	Group 1 (Audio)	Group 2 (CATTS)
33	1.62 (.54) (N = 10)	1.87 (.61) (N = 9)
34	1.73 (.75) (N = 8)	1.95 (.88) (N = 9)
44	1.85 (.52) (N = 6)	2.50 (.89) (N = 5)
45	1.99 (1.04) (N = 7)	2.78 (.70) (N = 6)
52	1.66 (.52) (N = 10)	2.02 (.78) (N = 8)
Tot. Mod.	1.97 (.93) (N = 8)	3.05 (.31) (N = 7)

[1]Transformation used was $X^1 = \sqrt{X + .5}$.

Table 21

One Way ANOVA'S for Number of Lessons to First Criterion Lesson for 33, 34, 44, 45, 52, and Total Module Prompts for Lessons 5 Through 17, Second Semester, on Transformed Data

Variable	Source	df	SS	MS	F	P
33	Between	1	.2892	.2892	.870	.364
	Within	17	5.6489	.3323		
	Total	18	5.9380			
34	Between	1	.2010	.2010	.295	.595
	Within	15	10.2264	.6818		
	Total	16	10.4273			
44	Between	1	1.1550	1.1550	2.282	.165
	Within	9	4.5559	.5062		
	Total	10	5.7109			
45	Between	1	1.9978	1.9978	2.438	.147
	Within	11	9.0139	.8194		
	Total	12	11.0117			
52	Between	1	.5839	.5839	1.407	.253
	Within	16	6.6414	.4151		
	Total	17	7.2252			
Tot. Mod.	Between	1	4.3280	4.3280	8.524	.012
	Within	13	6.6008	.5078		
	Total	14	10.9288			

The number of lessons in which the criterion performance level was reached was also determined. For this, any tutor who never reached criterion was assigned a zero score; therefore, all subjects were included in this analysis. The means and standard deviations are reported on raw data in Table 22 and transformed data in Table 23. Table 24 reports the results of the one-way ANOVA's. Significance was not reached for any of the six variables. Therefore, there was no difference in the two feedback conditions in the total number of lessons during which criterion was reached.

Year Performance Data

In order to determine whether or not any differences existed between the effectiveness of the two feedback conditions across the whole year of the practicum, analyses were also run on selected target behaviors across the year. Five trials were formed by collapsing the 33 lessons (12 lessons conducted during first semester with no feedback and 21 during second semester with 17 having feedback) into five trials. Trial 1 was lessons 1-6, first semester; Trial 2, lessons 7-12, first semester; Trial 3, lessons 1-4, second semester (baseline); Trial 4, lessons 5-10, lessons on generating prompts (first half); Trial 5, lessons 11-17, lessons on generating prompts (second half). Thus, the lessons in which success rate feedback was presented and feedback conditons were switched were not in the 5 trials. Assignment of subjects to groups was done twice, once at the start of the first semester study, and a second time at the start of second semester. The composition of the groups, therefore, changed at the beginning of the present study. For the year analyses, first semester group assignments were ignored and group members were assigned to subjects on the basis of the treatment received during Lessons 5-17 of second semester, with CATTS designated Group 1, and Audio, Group 2.

Means and standard deviations for the variables analyzed for the year data are reported in Table 25. The mean percents of the five module prompts generated and total module prompts increased across trials for both groups, while the total of "Other"

Table 22

Means (And Standard Deviations) for Number of Lessons Criterion was Reached Between Lessons 5 and 17, Second Semester, for 33, 34, 44, 45, 52, and Total Module Prompts on Raw Data by Group

Variable	Group 1 (Audio)[1]	Group 2 (CATTS)[2]
33	5.50 (2.32)	5.22 (1.86)
34	5.30 (3.83)	4.67 (3.12)
44	1.70 (2.36)	1.78 (1.99)
45	1.50 (1.90)	1.56 (1.13)
52	5.80 (4.10)	5.22 (3.56)
Tot. Mod.	2.80 (2.86)	1.33 (1.00)

[1]N = 10.

[2]N = 9.

Table 23

Means (And Standard Deviations) for Number of Lessons Criterion was Reached Between Lessons 5 and 17, Second Semester, for "33", "34", "44", "45", "52", and Total Module Prompts on Transformed Data[1] by Group

Variable	Group 1 (Audio)[2]	Group 2 (CATTS)[3]
33	2.41 (.45)	2.37 (.38)
34	2.25 (.92)	2.16 (.74)
44	1.31 (.74)	1.36 (.69)
45	1.27 (.66)	1.37 (.44)
52	2.34 (.86)	2.24 (.88)
Tot. Mod.	1.66 (.79)	1.30 (.40)

[2] N = 10.

[3] N = 9.

[1] Transformation used was $X^1 = \sqrt{X + .5}$

Table 24

One Way ANOVA'S for Number of Lessons Criterion was Reached Between Lessons 5 and 17, Second Semester, for "33", "34", "44", "45", "52", and "Total Module" Prompts on Transformed Data

Variable	Source	df	SS	MF	F	p
33	Between	1	.0104	.0104	.060	.809
	Within	17	2.9528	.1737		
	Total	18	2.9633			
34	Between	1	.0332	.0332	.047	.831
	Within	17	11.9887	.7052		
	Total	18	12.0219			
44	Between	1	.0144	.0144	.028	.869
	Within	17	8.7073	.5122		
	Total	18	8.7217			
45	Between	1	.0514	.0514	.160	.695
	Within	17	5.4813	.3224		
	Total	18	5.5327			
52	Between	1	.0795	.0795	.106	.749
	Within	17	12.7678	.7510		
	Total	18	12.8473			
Tot. Mod.	Between	1	.5976	.5976	1.477	.241
	Within	17	6.8765	.4045		
	Total	18	7.4741			

Table 25

Means and Standard Deviations for Variables
Analyzed for Year Data by Group and Trial
(Reported in Percents)

Variable	Trial 1		Trial 2		Trial 3		Trial 4		Trial 5	
	G1	G2	G1	G2	G1	G2	G1	G2	G1	G2
33% $\bar{x}$	5.100	8.000	9.900	12.600	15.778	14.200	13.000	12.800	17.778	13.800
SD	(3.929)	(7.930)	(9.098)	(9.098)	(7.446)	(5.029)	(6.042)	(6.356)	(3.383)	(5.138)
34	15.300	11.600	16.400	13.400	15.667	18.300	10.778	13.300	12.778	13.300
	(7.499)	(4.881)	(8.984)	(8.540)	(10.332)	(11.314)	(5.310)	(8.138)	(7.645)	(8.982)
44	.400	2.000	3.000	4.100	3.667	3.100	4.111	5.700	8.222	5.600
	(.516)	(2.789)	(3.621)	(5.131)	(3.391)	(2.685)	(3.444)	(5.870)	(4.438)	(5.542)
45	2.900	3.000	2.000	6.400	4.111	3.900	5.222	6.300	8.444	5.700
	(6.757)	(3.712)	(4.295)	(4.551)	(4.676)	(3.872)	(3.114)	(4.900)	(2.404)	(4.785)
52	4.400	2.300	4.100	3.600	4.667	6.300	12.889	15.800	12.667	16.700
	(4.575)	(2.163)	(3.542)	(2.459)	(4.031)	(7.134)	(7.928)	(10.294)	(7.158)	(11.106)
Tot Mod	29.500	27.800	36.600	42.000	45.500	47.700	47.888	50.600	61.666	56.900
	(14.370)	(14.382)	(12.267)	(14.267)	(8.805)	(10.770)	(9.879)	(18.869)	(5.147)	(16.569)
Other	66.400	71.300	61.600	57.100	53.555	51.300	51.111	43.000	37.444	42.100
	(18.264)	(14.407)	(16.500)	(14.387)	(8.748)	(10.770)	(9.879)	(10.604)	(5.077)	(16.569)
SR 33	48.400	46.900	61.100	54.300	54.111	50.000	43.888	43.000	50.333	55.100
	(38.728)	(34.407)	(28.621)	(12.693)	(13.251)	(28.534)	(18.496)	(16.431)	(7.141)	(17.239)
SR 34	50.400	62.300	52.500	52.600	47.111	56.300	52.555	48.400	64.777	49.[illegible]
	(22.711)	(19.916)	(23.945)	(14.796)	(26.241)	(26.499)	(14.009)	(12.946)	(90.597)	(2[illegible])
SR 44	30.000	30.900	34.000	40.000	43.111	16.100	63.444	59.500	52.888	64.900
	(48.304)	(42.626)	(32.300)	(38.663)	(36.157)	(19.547)	(23.590)	(30.030)	(26.050)	(26.459)
SR 45	23.600	21.500	19.100	47.200	47.888	36.800	40.666	49.600	37.777	39.300
	(36.034)	(28.344)	(34.210)	(12.585)	(32.884)	(32.220)	(20.451)	(31.945)	(11.766)	(30.703)
SR 52	43.100	40.900	66.900	48.300	38.888	23.400	45.333	46.700	53.777	47.500
	(39.413)	(38.751)	(27.408)	(31.906)	(31.880)	(22.623)	(15.668)	(20.055)	(11.616)	(19.580)
SR Tot Mod	50.000	62.900	56.500	50.400	50.222	44.900	50.111	54.800	50.666	52.900
	(16.726)	(17.514)	(12.536)	(9.594)	(13.581)	(14.488)	(9.816)	(13.910)	(6.873)	(7.651)
SR All-8	48.100	55.300	56.900	53.400	49.555	48.400	49.888	49.300	50.222	52.300
	(12.096)	(14.476)	(12.160)	(6.736)	(10.736)	(14.206)	(7.540)	(10.842)	(7.774)	(7.181)

Trial 1 = First Semester baseline
Trial 2 = First Semester post module
SR = success rate
Trial 3 = Second Semester baseline
Trial 4 = Second Semester, lessons 5-10
Trial 5 = Second Semester, lessons 11-18

prompts generated decreased. Table 26 shows the results of a repeated measures ANOVA on the total module prompts percent. Only trials are significant. Across the 33 lessons of the practicum analyzed in the year data file, there is a very significant ($p < .001$) effect of training and feedback on the Total Module prompts generated but no difference in the effectiveness of the two feedback conditions.

Trial means for Total Module are shown in Part B of Table 26. Tukey tests on all possible pairwise comparisons resulted in significant differences ($p < .05$) between the following trials - Trials 1 and 3, 1 and 4, 1 and 5, 2 and 5, and 3 and 5. Thus, the baseline trial for first semester, Trial 1, is significantly lower than all 3 second semester trials. Trial 2, first semester, is significantly lower than Trial 5 only. For the second semester trials, only Trial 3 is significantly lower than Trial 5. Across the whole year, trainees more than doubled their use of Total Module prompts, from 28.7% to 59.2%. Increases across the year were significant only between trials two trials apart, showing the necessity of continued practice before changes in performance occur.

A multivariate analysis of variance was computed on 6 dependent variables - the five separate module prompts and "Other." The results are shown in Table 27. Only "Trials" is significant. Therefore, treatments were equally effective in influencing trainee generation of the five separate module prompts and "Other."

Univariate analysis summaries for these six variables are shown in Table 28. Groups is not significant for any variable. Again, the two feedback conditions were equally effective. For the interaction term, one variable, the percentage of "45" prompts, is almost significant ($p < .058$). For the interaction term, no other variables approach significance. A look at the cell means for "45" prompts in Table 25 reveals similar percents for "45" for the two feedback groups at Trials 1, 3, and 4. However, at Trial 2, the Audio group generated more "45" prompts than the CATTS group, 6.4 as compared to 2.0%. At Trial 5, the CATTS group generated more "45" prompts

Table 26

Repeated Measures ANOVA on Total Module Prompts

for Five Collapsed Trials, Year Data (A)

	Source	SS	df	MS	F	p <
	Between Subjects					
	Group	4.087	1	4.087	.001	.919
(error)	SWG	6876.718	18	382.040		
	Within Subjects					
	Trials	9182.085	4	2295.521	14.025	.001
	GT	585.616	4	146.404	.894	.472
(residual)	Error	11293.791	69	163.678		

Means (and Standard Deviations) (B)

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
$\bar{x}$	28.650	39.300	46.684	49.315	59.157
SD	(14.019)	(13.243)	(9.678)	(14.944)	(12.451)

Table 27

Repeated Measures MANOVA on "33", "34", "44", "45", "52", and "Other" Prompts for Five Collapsed Trials, Year Data (First Roots Only Reported)

Source	F	df_{hyp}	df_{error}	$p <$	R (Canonical)
Groups	.222	6	13	.962	.305
Trials	4.906	24	224.479	.001	.821
GT	1.300	24	224.479	.165	.494

Table 28

Summary of Repeated Measures ANOVA's or "33", "34", "44", "45", "52" and "Other" Prompts for Five Collapsed Trials, Year Data (A)

Source	Variable	F (df)	MS	p <
Group		(1,18)		
	33	.000	.022	.985
	34	.009	1.802	.925
	44	.040	1.448	.843
	45	.169	7.646	.686
	52	.280	31.536	.603
	Other	.071	25.924	.793
Trial		(4,69)		
	33	7.150	259.757	.001
	34	1.913	70.821	.118
	44	7.469	84.444	.001
	45	3.623	49.194	.010
	52	22.434	633.012	.001
	Other	19.311	2437.406	.001
GT		(4,69)		
	33	1.138	41.352	.346
	34	1.188	43.980	.324
	44	1.403	15.863	.242
	45	2.404	32.649	.058
	52	1.077	30.400	.374
	Other	1.255	158.445	.296

Means (and Standard Deviations) (B)

Variable	First Semester		Second Semester		
	Trial 1 (No FB)	Trial 2 (No FB)	Trial 3 (No FB)	Trial 4 (FB)	Trial 5 (FB)
33	6.55	11.250	14.947	12.894	15.684
	(6.27)	(8.018)	(6.159)	(6.036)	(4.738)
44	1.200	3.550	3.368	4.947	6.842
	(2.117)	(4.358)	(2.966)	(4.812)	(5.091)
45	2.950	4.200	4.000	5.789	7.000
	(5.306)	(4.862)	(4.150)	(4.076)	(4.000)
52	3.350	3.850	5.526	14.421	14.789
	(3.645)	(2.978)	(5.777)	(9.118)	(9.419)
Other	68.850	59.350	52.368	46.842	39.894
	(16.206)	(15.242)	(9.662)	(10.812)	(12.427)

than the Audio group, 8.4 as compared to 5.7%. This result suggests that CATTS feedback was more effective in assisting trainees to generate "45" prompts.

For the Trials source of variance all dependent variables, except for variable "34," are significant. Tukey tests were run on all possible pairwise comparisons of trials. The following comparisons were significant ($p < .05$) for variable "33": Trials 1 and 3, 1 and 4, and 1 and 5. Therefore, subjects significantly increased the percent of "33" prompts from 7% at Trial 1 to 15% at Trial 3, and maintained this level. Since feedback occurred during Trials 4 and 5, there appears to have been no effect of feedback for the year data analysis on "33" prompts generated.

For "44," comparisons between Trials 1 and 4, 1 and 5, 2 and 5, and 3 and 5 were significant ($p < .05$). Comparisons between Trials 1, 2, and 3 were not significantly different. In most cases, the two feedback trials, Trials 4 and 5, are significantly higher than the no feedback trials, showing the effectiveness of feedback in increasing this behavior, with no difference between the 2 conditions of feedback. However, the mean percent of "44" prompts used (7%) is still far below criterion (15%) at Trial 5.

For "45" prompts, only the comparison between Trials 1 and 5 was significant ($p < .05$). This represented an increase from 3% to 7%, showing that trainees had the most difficulty in generating "45" prompts.

For "52" prompts, the comparisons between Trials 1 and 4, 1 and 5, 2 and 4, 2 and 5, 3 and 4, and 3 and 5 were significant. This prompt shows the most number of significant increases across trials (from 3% at Trial 1 to 15% at Trial 5), showing that the emphasis on generating "52" prompts in the training was successful in changing trainee behavior.

For "Other" prompts, the comparisons between Trials 1 and 3, 1 and 4, 1 and 5, 2 and 4, and 2 and 5 were significant. "Other" prompts therefore, as intended, consistently decreased across trials, with the first semester trials (1 and 2) being significantly higher than the second semester trials of 3, 4, and 5. "Other" decreased from 69% at Trial 1 to 40% at Trial 5.

In terms of trainee ability to generate the targeted behaviors, the 5 module prompts, the above results taken as a whole, suggest equivalent effectiveness of the two feedback conditions, and of the first semester training. Only for one variable, "45," did a group by trial interaction appear. For this behavior, CATTS appeared to be more effective in changing trainee behavior.

The next set of performances of interest were trainee ability to modulate the targeted behaviors and select ones most appropriate in the given context such that the following pupil answer would be correct. The success rates of the prompts was the measure of appropriateness of modulation. The means and standard deviations on the success rates for the separate module prompts, total module, and total of all prompts (minus "8"s) are shown also in Table 25. For each separate variable, there appears to be very little change across trials and, also, little difference between groups. For total module success rate, however, differences do appear. Table 29 shows the results of a repeated measures ANOVA on the success rate of the total module prompts. Neither groups nor trials is significant, but the interaction term is significant. Trainees as a whole, therefore, did not improve their total module success rate over time, nor was there any difference between the two feedback conditions as a main effect.

At Trial 1, the Audio subjects were about 13% higher than CATTS, 7% lower at Trial 2, 5% lower at Trial 3, 5% higher at Trial 4, and 2% higher at Trial 5. Large fluctuations occurred across Trials 1, 2, and 3 in total module success rate for both groups, with a decrease in success rate occurring as the trainees began to attempt to generate all 5 module prompts, at Trial 3. It appears that, as trainees increased their repertoire of prompting behaviors, they were initially not successful in choosing appropriate prompts. For Trials 4 and 5, the feedback on generation of prompts trials, there is almost no change at all in the success rate of CATTS trainees for total module.

Table 29

Repeated Measures ANOVA on Success Rate of Total Module Prompts for Five Collapsed Trials, Year Data

Source	SS	df	MS	F	p<
Between Subjects					
Group	71.407	1	71.407	.215	.649
SWG	5989.230	18	332.735		
Within Subjects					
Trials	836.587	4	209.147	1.737	.152
GT	1208.638	4	302.159	2.509	.050
Error	8308.614	69	120.415		

However, Audio trainees increased their success rate from 44.9% at Trial 3, to 54.8% at Trial 4, and maintained approximately this level at Trial 5. In summary, for this dependent variable, Audio feedback appears to be more effective.

A repeated measures MANOVA on the success rate of the five separate module prompts is shown in Table 30. "Trials" is significant ($p < .002$), showing that success rates of individual prompts did significantly improve across trials, regardless of feedback conditions. In Table 31, a summary of the repeated measures ANOVA's on the five module prompts is shown. Again, "Trial" is significant, but for only three of the prompts - "44," "45," and "52." Part B of Table 31 shows trial means and standard deviations for these three variables. Tukey tests on all possible pairwise comparisons between trials were computed. For "44," the following comparisons were significant ($p < .05$) - Trials 1 and 4, 3 and 4, and 3 and 5. Once treatment was administered (at Trials 4 and 5) subjects almost doubled the "44" success rate from the levels at Trials 1, 2, and 3 (30% to 60% approximately), showing a large training effect. For "45" prompts, the comparisons between Trials 1 and 3 and 1 and 4 were significant ($p < .05$). Success rate almost doubled across these trials. For "52" prompts, the following comparison was significant - Trial 2 versus Trial 3. At Trial 3, the baseline trial for second semester (which was preceded by a six-week vacatio. from tutoring) the success rate of "52" is significantly lower than the other trials. After feedback began, subjects increased the "52" success rate to the level for Trials 1 and 2. The practicum as a whole, therefore, did have an effect on trainee ability to modulate behavior but the two feedback conditions were equal in their effectiveness.

The success rate of all prompts, minus "8"s or <u>telling</u>, was also analyzed. This is shown in Table 32. No source of variance is significant; therefore, subjects maintained the same success rate level over all prompts throughout the year.

Table 30

Repeated Measures MANOVA on Success Rates of "33", "34", "44", "45", and "52" for Five Collapsed Trials, Year Data (First Roots Only Reported)

Source	F	df_{hyp}	df_{error}	$p <$	R (Canonical)
Groups	.531	5	14	.749	.399
Trials	2.254	20	216.530	.002	.525
GT	.961	20	216.530	.422	.511

Table 31

Summary of Repeated Measures ANOVA's or Success Rates of "33", "34", "44", "45", and "52" for Five Collapsed Trials, Year Data

Source	Variable	F(df)	MS	p<
Group		(1,18)		
	33	.085	74.976	.774
	34	.303	296.211	.589
	44	.120	126.024	.733
	45	.441	666.198	.515
	52	1.919	1662.625	.183
Trial		(4,69)		
	33	1.324	570.493	.270
	34	.635	762.847	.639
	44	4.116	4772.936	.005
	45	2.459	1543.346	.053
	52	2.623	1928.654	.042
GT		(4.69)		
	33	.208	89.725	.933
	34	1.434	1722.360	.232
	44	.921	1067.774	.457
	45	1.703	1068.839	.159
	52	.484	355.825	.747

Means (and Standard Deviations) (B)

Variable	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
44	30.450	37.000	28.894	61.368	59.210
	(44.341)	(34.810)	(31.465)	(26.502)	(26.260)
45	22.550	33.150	42.052	45.368	38.578
	(31.571)	(28.934)	(32.125)	(26.779)	(23.097)
52	42.000	57.605	30.736	46.052	50.473
	(38.058)	(30.481)	(27.762)	(17.627)	(16.187)

Table 32

Repeated Measures ANOVA on Success Rate of All Prompts (Minus 8's) for Five Collapsed Trials, Year Data

Source	SS	df	MS	F	p <
Between Subjects					
Group	16.652	1	16.652	.066	.800
SWG	4529.507	18	251.639		
Within Subjects					
Trial	463.838	4	115.960	1.425	.235
GT	332.215	4	83.054	1.021	.403
Error	5614.747	69	81.373		

Accuracy of Completing Feedback Evaluation Sheets

All trainees, regardless of the feedback received, completed Feedback Evaluation Sheets (FES) on every lesson after Lesson 4 for the duration of the study. (See Figure 3 for a copy of FES used for Lessons 5 to 17.) It was predicted that subjects receiving CATTS feedback would be in 100% agreement when the data on their FES's was compared to the data on the printout sheets from the computer, since CATTS trainees were simply to copy information from these printouts onto the FES. It was predicted that Audio subjects, who had to code their own tapes and then complete the FES from their codings, would not be as accurate, but would improve as the study progressed.

Difference scores were computed on eight variables from OROS that appeared on the FES's - "21" miscues prompted, "22" miscues prompted, "33," "34," "44," "45," "52," "total module," and "Other" (the non-module prompts in OROS categories 3, 4, and 5). The tutor's computed percentage for each variable was then subtracted from the percentage on the computer printout, resulting in a negative score if the tutor's estimate was <u>higher</u> than the computer sheet and a positive score if it was <u>lower</u>. Individual difference scores are shown in Table 33 for Lessons 5 and 15, the first lesson of feedback and tenth lesson of feedback, respectively. It is obvious that CATTS tutors were highly accurate, with the exception of a few minor clerical errors, since almost all difference scores are zero at both lessons. Audio tutors are very consistently inaccurate, with improvements being shown for Lesson 15 for some tutors. For the percent total module, in considering the absolute difference scores of the 8 trainees with data available at both lessons, three Audio tutors lowered their difference scores, four increased them, and one remained within one point. (Tutors 10 and 19 are omitted from this tally.) Less than half of the Audio tutors, therefore, increased their accuracy of coding their own tapes.

For the eight audio tutors with completed FES's for Lessons 5, 10, and 15, an

Table 33

Individual Difference Scores (Computer-Tutor) on Feedback Evaluation Sheet for Lessons 5 and 15

Tutor	Group	Lesson 5									Lesson 15								
		21	22	33	34	44	45	52	Total	Other	21	22	33	34	44	45	52	Total	Other
1	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	C	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
4	C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	C	+5	+1	0	0	0	0	0	0	-9	-1	0	0	0	0	0	0	0	0
6	C	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	C	-1	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	-7
8	C	-1	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	C	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
10	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	A	-30	+28	+27	-16	0	0	+2	+13	-22	-3	+25	-5	-19	0	0	0	-24	-3
12	A	+17	+40	+15	-17	-16	-4	-31	-52	+ 3	0	+20	-12	+ 8	+8	+18	-14	+ 3	+5
13	A	-17	-34	-18	- 6	0	+15	-10	-19	- 2	+20	+59	- 4	+ 5	-10	-10	-19	-38	+20
14	A	-25	0	- 9	-25	+10	- 1	- 2	-27	+ 3	-15	0	- 6	+10	- 4	- 4	-14	+64	+10
15	A	-14	-20	+15	- 8	- 2	- 3	0	+ 8	-11	-27	+28	+15	- 1	- 5	0	-11	- 2	+11
16	A	+23	+33	+ 5	- 2	0	+ 1	- 2	+ 2	+ 7	- 9	+20	+ 1	+ 1	+ 2	+10	-16	- 3	+ 4
17	A	-47	- 8	0	-10	- 7	+ 4	+ 3	-10	- 3	0	+100	+ 9	+ 9	+19	+ 1	-14	+24	0
18	A	0	-67	0	+ 7	0	+ 2	+16	+25	+ 2	-59	-15	+10	+10	-16	0	-25	-21	- 2
19	A	-19	+40	- 1	+ 1	- 9	0	-18	+ 9	-17	NA	NA	NA	NA	NA	NA	NA	NA	NA

average difference score (ignoring the sign) over the nine variables was taken at each trial and then averaged across the eight tutors. These mean difference scores were 12, 13, and 13 for Lessons 5, 10, and 15, respectively, showing no improvement in completing FES's for Audio tutors.

It can be concluded that CATTS tutors were more accurate in completing FES's. It is hard to explain the lack of improvement for Audio tutors, given the fact that both groups increased equally (in generating prompts) over trials during the study. If the Audio tutors had not known the OROS codes, they would not have been able to increase their generation of module prompts and decrease "Other," as the performance data shows. The FES's were completed by subjects as a homework assignment; therefore, the time involved in completing them by tutors and tutor concentration were not controlled. Another possibility is that low frequencies per individual category on an individual lesson caused the percentage to be quite different if only one code was missed. Total module prompts, though, had a frequency of approximately 20 for each tutor at Lesson 15, so this explanation is not very likely.

Attitude Towards Feedback

All tutors received an evaluation sheet asking about their attitude towards feedback after Lesson 17 and at the end of the study. (See Appendix for a copy of the forms used.) Since all trainees received both feedback conditions, comparisons can be made between the tutors' attitude toward the two kinds of feedback. It must be noted that those tutors receiving CATTS feedback between Lessons 5-17, received CATTS for only four lessons. The comparisons, therefore, are not based on equivalent length of experience with the feedback types. The results discussed below are from the evaluation sheets completed by all 19 tutors at the <u>end</u> of the practicum.

Question 1 asked the trainees if they were satisfied with their <u>present</u> feedback. Nine tutors who received CATTS during Lessons 18-21 said yes and one said no. For tutors receiving Audio feedback for Lessons 18-21, four said no and five said yes.

CATTS tutors tended to question the coders' accuracy in recognizing OROS behaviors, while Audio tutors questioned their <u>own</u> accuracy of coding. 90% of the tutors who received Audio and then CATTS for Lessons 18-21 were satisfied with the CATTS feedback, while only 56% of those who received CATTS and then Audio, were satisfied with the Audio feedback. Accuracy of coding was a concern of both groups. As measured by this question, tutors had a much more positive attitude to CATTS feedback.

Question 2 asked tutors to describe the characteristics of their current feedback that were the most helpful for them in increasing their ability to prompt, and prompt successfully. Tutors receiving CATTS for Lessons 18-21 mentioned the following - percentages of prompts and success rates, and the actual specification of interaction sequences (5 tutors); the visual display giving instantaneous feedback (3). One tutor receiving CATTS did not name any characteristic of CATTS as being most helpful, but said she believed Audio was more helpful because what was actually said during the lesson could be heard as the coding of the tape was completed. Tutors receiving Audio feedback mentioned the following characteristics as most helpful - actual behaviors could be heard (6 tutors); one simply said Audio was best and didn't specify any characteristic; and one tutor's comment was uninterpretable. The characteristics of CATTS considered to be most helpful by tutors were the detailed codes for behavior, and immediacy of information. The most helpful characteristic of Audio was the ability of tutors to actually hear the interactions during the lessons.

Question 3 asked tutors to describe the advantages and disadvantages of their current feedback. Tutors receiving CATTS feedback for Lessons 18-21 stated the following as advantages - quick and easy (3 tutors); immediacy of feedback (2 tutors) - and stated the following as disadvantages - CATTS encouraged just looking at numbers and transposing them (1); "the video display didn't always show what prompts I gave" (2); and "I couldn't listen to what actually happened in the lesson" (3). Tutors receiving Audio feedback for Lessons 18-21 said the following were advantages - "it helps me to know (listen) to what the pupil and I are actually doing so that I can figure out prompts" (6) - and said the following were disadvantages - the length of time involved (4); and the lack of accuracy and immediacy of audio feedback (2). One tutor receiving CATTS for Lessons 18-21 said it was not as helpful as Audio, and one receiving Audio for Lessons 18-21 said she had found CATTS to be of little help. The quickness of CATTS, therefore, was seen as an advantage, while not being able to listen to the lesson was considered a disadvantage, causing tutors to feel, as one expressed it, "like a Xerox" copying numbers.

The fourth question asked tutors which feedback they preferred and why (two tutors did not answer this question). Six tutors, 35%, said they liked CATTS best because of its immediacy, ease, and exactness; four tutors, 23%, said they liked Audio best because they could listen to themselves and see exactly what was happening; and seven tutors, 42%, said that both should be a part of feedback, with an audio tape accompanying, say, every third lesson. More tutors, therefore, preferred to have both Audio and CATTS feedback.

The attitudinal data, taken as a whole, suggests that tutors would have been more satisfied with the feedback if they had received feedback that consisted of a combination of both CATTS and Audio. Such a "combination" feedback would combine the ease, immediacy, and coding details of CATTS with the opportunity to listen to the actual behaviors of the lessons; characteristics seen as most helpful for CATTS and Audio characteristics, respectively. While a slightly higher percent of tutors preferred CATTS over Audio feedback than those preferring Audio over CATTS, CATTS feedback did not produce a more positive attitude toward feedback, as predicted; a combination feedback was preferred by the highest percent of tutors.

Discussion

The purpose of the study was to compare feedback using a Computer-Assisted

Teacher Training System (CATTS) with the most similar feedback that a teacher training institution (pre-service or inservice) without computer support could implement. The comparison feedback (Audio) involved subjects coding their own lessons while listening to an Audio tape. The general conclusion, based upon the study herein, is that CATTS and Audio feedback are equally effective in training pre-service subjects to generate and modulate their behavior during oral reading strategy lessons. Tutors' analyses of their own behaviors, as completed on the Feedback Evaluation sheets, are more accurate for CATTS feedback. The results of the attitude measures revealed that tutors would prefer to have both kinds of feedback (CATTS combined with Audio) instead of the single feedback condition.

Because this study contrasting CATTS and Audio feedback was part of a training practicum and not just an experimental research program, highly controlled procedures could not always be maintained. Much effort was expended by the experimenters to train the practicum participants in all phases of teaching reading to the mildly handicapped. (No outcome measures, however, were collected in other areas.) In addition, there was wide variance in pupil achievement, with pupils ranging at the start of the practicum from non-readers to a reading level of 3.6, although the mean reading levels for the pupils assigned to tutors in the two experimental groups was approximately equal.

Since a major goal of the program was to train tutors in the generation and modulation of module prompts, several changes were made in the procedures as initially planned. The initial plan for the second semester was for trainees to receive feedback on generating all 5 module prompts for Lessons 5-17 and then to receive feedback on success rate for Lessons 18-21. It quickly became clear to the experimenters, however, that, even with the first semester training and the discrimination training of second semester, trainees were having a great deal of difficulty in generating all 5 prompts. For that reason, procedures were changed so that each lesson had a single prompt as a focus. After the focus changed to another prompt, trainees were to continue practicing previously focused prompts. The total possible lessons in which each prompt was practiced were - 12 lessons for "52" prompts, 6 for "45," 4 for "33," and 2 for "44." While trainees were permitted to use other than the focus prompt if a pupil miscue called for it, the results of the analyses reflect this differential emphasis on prompts. The prompt that was practiced the least, "44," had the lowest percent (7%) at Trial 4. However, "33" prompts were practiced only 4 lessons but had the highest mean percent at Trial 4, 20%. "45" prompts, practiced 6 times, had a mean percent of 9%. The prompt practiced the most, "52," had a mean of 15%. Some prompts appear much more difficult to learn than others, or, possibly, are too restricted in terms of the text characteristics for which they are appropriate.

A related issue is the unequal number of lessons per trial. The changes above necessitated that lessons be collapsed into trials such that Trial 1 had 4 lessons; Trial 2, 6; Trial 3, 7; and Trial 4, 4. There is probably little effect of the baseline trial being unequal. But the number of lessons in which success rate feedback occurred was probably too short to test the relative effectiveness of CATTS and Audio feedback in increasing success rate.

The performance data suggests that training and feedback is more potent when the targeted behaviors are already part of the subject's repertoire. Borg (1972) had difficulty in training teachers to emit behaviors not already a part of their repertoire. Three targeted behaviors, "44," "45," and "52," were not a part of trainees' repertoire at all at the start of the practicum. With the exception of "52," which was practiced a great many lessons, these prompts had the lowest mean percent at the end of the study.

Performance data also suggests that it is much easier to train subjects to <u>generate</u> behaviors than to train them to modulate these behaviors, i.e., to generate contextually appropriate behaviors. For each target behavior (module prompts), four increased in percent generated across trials while one ("34") decreased. The percent of total module prompts also significantly increased across trials. The success rate of each behavior was a proxy for its contextual appropriateness. Only three of the prompts significantly increased in success rate across trials - "33," "44," and "52" - while the total module success rate did not increase significantly. The success rates were also lower than anticipated at the end of training, with only approximately half of the prompts in each category being successful. Increasing the subjects' ability to generate the target behaviors had some transfer to their ability to generate successful behaviors, but absolute levels of success rate remained low. It is possible that increasing the length of time in which feedback on success rate occurred, would have increased the success rate. This would probably result only if specific training in the use of appropriate contextual information was given.

One of the problems of the study was the amount of content covered in the discrimination training. Tutors were trained in 31 categories of OROS, instead of in just the 5 targeted module prompts. The amount of information appears to have been too great, resulting in tutors not attaining a mastery level in those codes on which feedback focused. For the five target prompting behaviors, the mean discrimination score was 44%, the mean generation score for novel prompts was 58%, and for all prompts, 92%. These results show the difficulty tutors were having at the start of the feedback conditions in both discriminating and generating novel prompts, even at the end of the discrimination training. This difficulty manifested itself during the first few lessons of feedback. For that reason, two group meetings were held to discuss definitions of the target behaviors, present examples, and have tutors practice generating them. Since all tutors attended these meetings, all received this discrimination and generation training. This training may have been the most potent treatment factor, since Wagner (1973) found that, given motivation to change, discrimination training was sufficient for behavioral changes to occur.

A characteristic of both feedback conditions was specificity, or focus. Feedback that is focused, i.e., that enables the subject to determine his/her departure from desired performance, is more likely to produce behavioral change (Fuller, 1973; Salomon & McDonald, 1970). The performance objectives for both groups were quite specific, and feedback related directly to those objectives. Focused feedback, therefore, regardless of the method used (CATTS or Audio), appears to be effective in producing behavioral changes.

Audio subjects received only an audio tape and were able to listen to the actual teacher-pupil interactions occurring in their lessons. Simply playing an audio tape of a lesson with no specific focus would be very unlikely to produce performance changes. However, in combination with extensive discrimination and generation training, as occurred here, taped feedback appears to be as potent as coded numbers on a display or printout. Given the results of the attitude survey, it is quite possible that a combination of CATTS and Audio feedback would be more effective than either one alone. This would be an important research issue for future CATTS research projects to explore.

Previous research using CATTS has shown that CATTS feedback is significantly more effective than no feedback or supervisory feedback (Schmitt, 1969; Van Every, 1971), and that a combination of CATTS delayed and instantaneous feedback is more effective than delayed alone (Semmel et al. & Sitko, 1976). The results of the present study, while not definitive, suggest that CATTS is as effective as Audio feedback and that the computer technology of CATTS, while having the advantages of speed and accuracy of feedback, is equivalent in effectiveness with Audio feedback. Before final conclusions are drawn, however, replications in other subject areas with, for example, inservice teachers of the mildly handicapped, are needed.

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3. The Effects of Training on Teacher Decision-Making

The improvement of teacher education, and by extension, the improvement of teaching, is said to rest upon ". . . an understanding of how teachers cognitively construct the reality of teaching and learning . . ." (Gage, 1975). In this view of teacher education, the emphasis is upon how teachers apprehend a given instructional situation and how they apply decision rules as a precursor of action. The current interest in decision-making represents a shift from concern with observed teacher behavior to an emphasis upon determinants of that behavior. This path of inquiry in teacher education, in many ways parallels the study of cognition in the psychology of learning. As such, it is subject to the same criticisms frequently leveled at cognitive psychology; i.e., motivations, attributions, and other internal states of the organism must be inferred from observed behavior or inferred from introspective reports of the subject. Validation of these inferred states must therefore, ultimately rest upon observable behaviors.

The present study utilized the stimulated recall technique to obtain data on trainees' reasons for a given teaching behavior. Levels of decision-making and/or rational processes underlying teaching were thereby inferred from these self-reports. The internal validity of self-reports depends upon the accuracy of the trainees' recall, while the external validity of the inferred states rests upon observed behavior. Since the present study of trainee decision-making was part of a larger teacher training, teacher behavior research project (Semmel, Brady, Semmel, 1976), teacher performance data was available for validation of the recall interviews.

Interactive decision-making. The behavior of teachers in the interactive instructional exchange with pupils presumably involves a complex level of information processing. At a minimum, the teacher must attend to multiple sources of stimuli (e.g., pupil behaviors), discriminate among the various stimulus signals and then consider the response alternatives to the stimulus selected for response. To a large extent, the sources of stimuli in a classroom and the teachers' responses, are observable phenomena. However, the processes assumed to intervene between these S-R units (i.e., signal detection, discrimination, stimulus selection, review of response alternatives, decision-making) can only be inferred.

The processes involved in teacher decision-making have been the subject of much recent attention in the field of teacher education (Gage, 1975; Shavelson, 1976; Shulman & Elstein, 1975; Semmel, 1975; Morrissey & Semmel, 1975). Good teachers are said to apply decision rules both proactively (planning of instruction) and interactively (Shulman & Elstein, 1975; Morine, 1975; Intili, 1976). Salomon (1972) and Morine (1975) have suggested that teacher education programs incorporate training in decision-making, rather than treat decision-making as an outcome of teaching. It is apparent that teacher decision-making may be treated as either an independent or criterion variable.

The diagnostic-prescriptive method of instruction is based upon a decision-making model, but it is addressed primarily to the proactive phase of teaching. The application of the model in interactive teaching however, involves the integration and application of the diagnostic-prescriptive decision elements in real-time. While decision making is said to be a rational, reflective process (Shulman & Elstein, 1975), teacher behavior based upon decision processes must take place without the benefit of much time to reflect upon and consider alternatives. This raises the question: Can systematic mediation in the form of decision making really take place during the interactive phase of instruction?

If the behavior of teachers in the interactive mode involves complex goal directed internal processing, it is important to define the limits of such processing. Can such decision-making be measured? Can we assume that inexperienced teachers, preservice trainees and "poor" teachers process at a minimal level with only rudimentary decision rules applied to a limited subset of the available alternatives? Can training interventions be expected to affect the processing which we assume occurs between the stimulus situation and the teacher's response? Several of these questions were addressed within the framework of a competency-based computer assisted teacher training (CATTS) program, set in a controlled laboratory classroom. The behaviors studied were limited to those teacher/pupil interactions that occur during oral reading. The laboratory setting and the limitation of the observed teacher/pupil behaviors to oral reading, provided a high degree of control over conditions which normally vary in classroom research.

<u>Teacher training and decision-making</u>. The teacher behaviors of interest-prompting behaviors, were the subject of a program of teacher training and feedback, designed to provide teachers with decision rules and skills in the use of prompts in oral reading. Thus, both stimulated recall interview data and observational data on trainee prompting behavior were obtained over a two semester period.

The data were collected at specific time intervals which paralleled the termination of a given phase of the teacher training program. Interview and performance data were initially collected during the period when trainees first began tutoring but had not yet received specific instructions on prompting pupils' oral reading, nor ha. hey received any feedback about their teaching per. rmance. The second interviews were obtained after trainees completed an instructional module on strategies for prompting pupils oral reading muscues, but were not receiving any feedback on their teaching performance. The third set of interviews and performance data were obtained during the second semester of tutoring. By this time, trainees had completed discrimination training on the Oral Reading Observation System, (Brady & Lynch, 1976) and had also been receiving either Computer Assisted Teacher Training Service (CATTS) or audio tape feedback on their teaching performance.

Subjects. The subjects of the study were twenty junior year preservice trainees from the Indiana University Special Education teac... education program. They were participants in a tutorial teacher training practic. . designed to develop trainee knowledge of and skills in prompting oral reading. Trainee interactive prompting skills were developed through several successive teacher training interventions including instructional module, discrimination training, CATTS (video display) feedback during teaching, post-teaching CATTS feedback (computer printout summary) and audio tape replay of lessons.

Each trainee was assigned to tutor a pupil who had been referred for reading tutoring because of severe reading deficit. The pupils were from both regular and special education classes. Six of the twenty pupils in the program were replaced during the end of the first semester or at the beginning of the second semest. ..ause subsequent evaluation showed that their reading deficits were not as great as that indicated by the data accompanying the original referral. The rest of the pupils remained with the same tutor throughout the project.

Feedback groups. As a test of the effectiveness of CATTS real time feedback in assisting trainees to generate appropriate oral reading prompting behaviors, half of the trainees were assigned to a CATTS feedback group (n=9) and half the trainees were assigned to an audio tape feedback group (n=10), during the second semester. There was no feedback provided to the trainees during the first semester of the program. The unequal n's in the two groups was due to the loss of one trainee during the second semester.

The Stimulated Recall Interview. The procedure for collecting information about trainees' decision making was through a stimulated recall interview in which an audiotape of the trainees' previous oral reading lesson was played back to the trainee. The interviewer stopped the tape after each pupil miscue was heard and asked the trainee if he/she remembered the response (if any) given to the miscue. The trainee was then asked, "What was your reason/purpose in responding to the miscue?" Interviewers also probed the initial response with "Any other reason?"

Classification of trainee statements. Two trained coders listened to the taped recall interviews and, through a consensus procedure, classified the trainees responses to the interviewer's probes. A response classification system was used for this purpose and where possible, six miscue-probe sequences were classified. (A sequence was initiated by a pupil miscue on the replay tape. An interviewer probe and trainee recall about his/her behavior in dealing with the miscue, constituted a sequence.) For the purposes of analysis, four of the six miscue/probe sequences were used. The four probes per interview that had the highest number of statements were selected for final scoring. The purpose for selecting only four probes for each interview was to reduce the variability that occurred within each interview. The protocols of trainee responses to stimulated recall interviews were codified by means of a Recall Interview Classification System. Three main categories of trainee responses in the classification system were: 1) Trainee focus on learner characteristics; 2) Trainee focus on instruction and text characteristics; and 3) Trainee restatements of behavior. Each of these three main statement classifications were in turn made up of related subcategories.

The trainee focus on learner characteristics category was made up of statements that fell into the following four subcategories: 1) Statements on pupil cognitive or developmental state, including mention of pupil intellectual functioning, readiness, test data or generic reading skills. 2) Motivational-affective statements including views on the pupil's attitude, anxiety, cooperation, resistance, etc. 3) State of pupils' knowledge or information, as a basis for prompting. 4) The attentional state of the learner at the time a prompting decision was made.

The second major category of trainee responses to the stimulated recall interviews concerned statements about instruction, instructional goals or text characteristics. Subcategories of this classification were: 5) Statements about the use of context as a basis for prompting. 6) Graphic cues, i.e., commonalities or differences in written representation. 7) Phonemic cues; relevant auditory cues to decoding. 8) Generalized statements about instructional goals and other text features such as pictoral cues.

The third main category of the classification system, restatements of behavior, accounted for trainees retrospective statements which were a virtual reiteration of the actual behavioral interaction which had stimulated the recall response. While these statements showed no evidence that decision-making had taken place, the prevalence of such statements in response to interviewer probes led to the conclusion that in some instances trainees were unable to interpret or explain their behavior even though they were given the opportunity to reconstruct the interactional sequence of events.

Data collection. Recall interviews were conducted three times over the course of the two-semester oral reading tutoring project. The first interview was conducted during the second week of the tutoring program. Trainees were thus at the beginning of their practicum and generally inexperienced. The second interview took place during the last week of November, 1975. Prior to being interviewed in November, all of the trainees had completed an Oral Reading Prompting Module, (Brady, 1975) which was an instructional unit on decision-making for prompting oral reading miscues and which provided guidelines for appropriate prompting behaviors. The trainees had been assigned to experimental and control groups in order to test the effectiveness of the Prompting Module. The experimental group completed the module a week to 10 days prior to the November interview, while the control group was interviewed within one to five days of completion of the prompting module.

The final interview was conducted near the end of the second semester of the practicum. By this time, all trainees had at least 32 hours of tutoring experience and had been receiving CATTS or Audiotape Feedback on prompting behavior for about 12 lessons prior to the last interview.

Design and Data Analysis. The study was conducted in an effort to determine whether the stimulated recall interview provided a reasonable indicator of the parameters of trainee decision-making and whether the nature of trainee decision-making can be reliably inferred from trainee performance. Thus, in the first phase of the study, a descriptive analysis of the results of the recall interview was conducted to determine the nature of trainee responses to the interview. In the second phase, data on trainees prompting performance, obtained from the Oral Reading Observation System (OROS), were analyzed by application of information and uncertainty statistics (Coombs, Dawes and Tversky, 1970), in order to measure changes in trainees' response uncertainty in the use of prompts at various stages of their training program. In the third phase, recall interview data were correlated with several indices of trainee behavior and with the response uncertainty coefficients, in order to determine the validity of the interview.

Results of Stimulated Recall Interview. In order to obtain a representation of the decision variables reported by trainees to be the basis for their teaching behaviors, the frequency of trainee response to each decision category was converted to a percentage of all responses to the Stimulated Recall Interview for each trainee. The percentages for all trainees (n=20) were reported for each trial as mean and standard deviation for each decision element. The mean and standard deviation of frequencies of response to each Recall Interview main class, and subcategory (i.e., decision elements) for all trainees, are shown in Table 1. As can be seen from examination of class I totals, 60% of all responses to the first interview focused on some aspect of the state of the learner and about 19% of the responses focused on some aspect of text characteristics and/or instruction (sum for class II). The most frequently reported aspect of learner state reported by the trainees was "pupil previous knowledge of target word or pupil comprehension of text" (24%). The percentage for this subcategory remains at the same level during the second interview, but the total percentage for class I drops off somewhat to 52%, and the class II total percent (28%) increases in the second interview. The increase over the first interview in the class II t [illegible] attributed to increase [illegible] categories: "focus on

Table 1

Mean Percentage Distribution of Decision Elements for Each Successive Recall Interview Showing Trainees' Reasons for Prompting

	Recall Interview					
	First		Second		Third	
	X	SD	X	SD	X	SD
Class I; Trainee Focus on State of Pupil						
Category 1. Cognitive-generic state	13.45	(12.33)	12.99	(15.64)	9.99	(14.35)
Category 2. Motivational state	12.46	(11.95)	5.20	(7.31)	3.10	(5.79)
Category 3. Previous knowledge	24.04	(13.17)	24.42	(13.19)	20.25	(12.75)
Category 4. Attention-set	9.62	(8.87)	9.44	(9.52)	6.20	(12.56)
Total for Focus on Pupil	59.56	(16.79)	52.05	(16.66)	39.52	(24.05)
Class II; Trainee Focus on Instruction and/or Text						
Category 5. Comprehension-context	7.15	(8.48)	13.10	(13.05)	35.88	(23.55)
Category 6. Graphic cues	2.74	(4.93)	7.34	(12.56)	4.13	(8.06)
Category 7. Phonic cues	5.29	(6.89)	2.86	(5.79)	2.55	(5.90)
Category 8. Other instructional	4.04	([illegible].46)	4.87	(12.56)	1.22	(3.36)
Total for Focus on Instruction	19.21	(10.34)	28.17	(25.21)	43.78	(29.38)
Class III; Trainee Restatement of Behavior						
Category 9. Memory-recall	5.73	(9.25)	6.08	(9.40)	3.20	(5.76)
Category 10. Visual-auditory	12.22	(11.37)	10.73	(9.39)	7.85	(12.83)
Category 11. Linguistic	1.54	(3.98)	2.98	(5.97)	4.75	(8.66)
Category 12. Pictoral-other	1.74	(4.76)	.00	(.00)	.89	(3.57)
Total for Restatement of Behavior	21.23	(13.41)	19.78	(14.61)	16.70	(22.80)

context" and "focus on graphic cues."

The third interview was conducted near the end of the second semester of tutoring, and the tutors shift from focus on the pupil to focus on text and instruction, seen in the second interview, continued (see figures 1-3). The percent of class III responses--restatement of behavior or methods employed--remain fairly consistent over the three interviews.

<u>Performance as an Indicator of Trainee Decision-Making</u>

Trainee prompting behaviors were observed and coded for all lessons conducted over the two semester practicum. The OROS observation system was used to classify all pupil oral reading miscues that occurred during an observation period and to classify the type of response (or non-response) given by the teacher. The pupil miscue/teacher response dyads were analyzed with information statistics (Attneave, 1959; Coombs, Dawes & Tversky, 1970; Frick, 1976) in order to ascertain the response uncertainty of trainee prompting behavior.

Response uncertainty (information) statistics have been used as a measure of judgment or decision-making in a number of psychological studies and in previous studies of teacher decision-making (Salomon, 1970; 1968; Salomon & Sieber, 1970). Shavelson (1975) has suggested that information statistics may be a useful measure of teacher decision-making.

The notion of response uncertainty and its relation to judgment or decision-making stems from the probabalistic nature of choices (or responses) in a set of alternatives. When the choices in a set of mutually exclusive categories exhaustive of a given class of behavior (such as teacher prompting behavior) are equally probable then the uncertainty of response (or cho[illegible]avioral category) is said to [illegible] maximal. In other words, if there were a total of five response alternatives available and the frequency of choice of each alternative

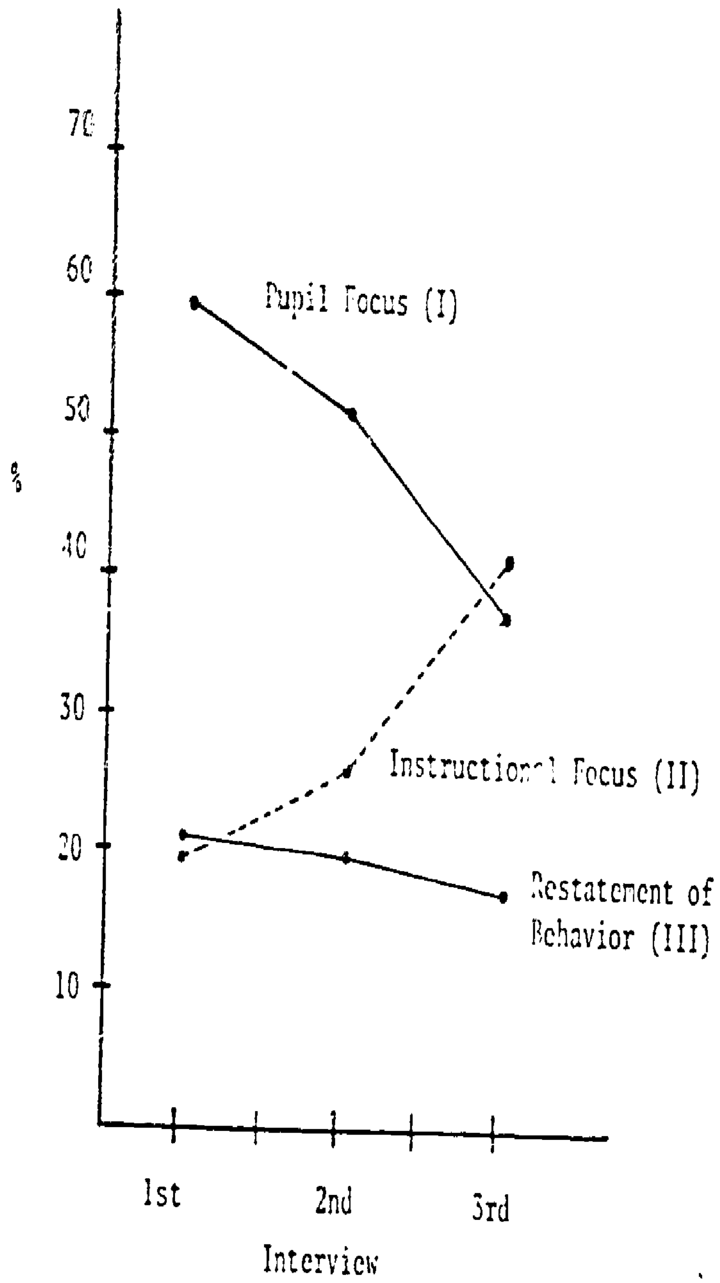

Figure 1. Trainees' reasons for prompting given in recall interviews.

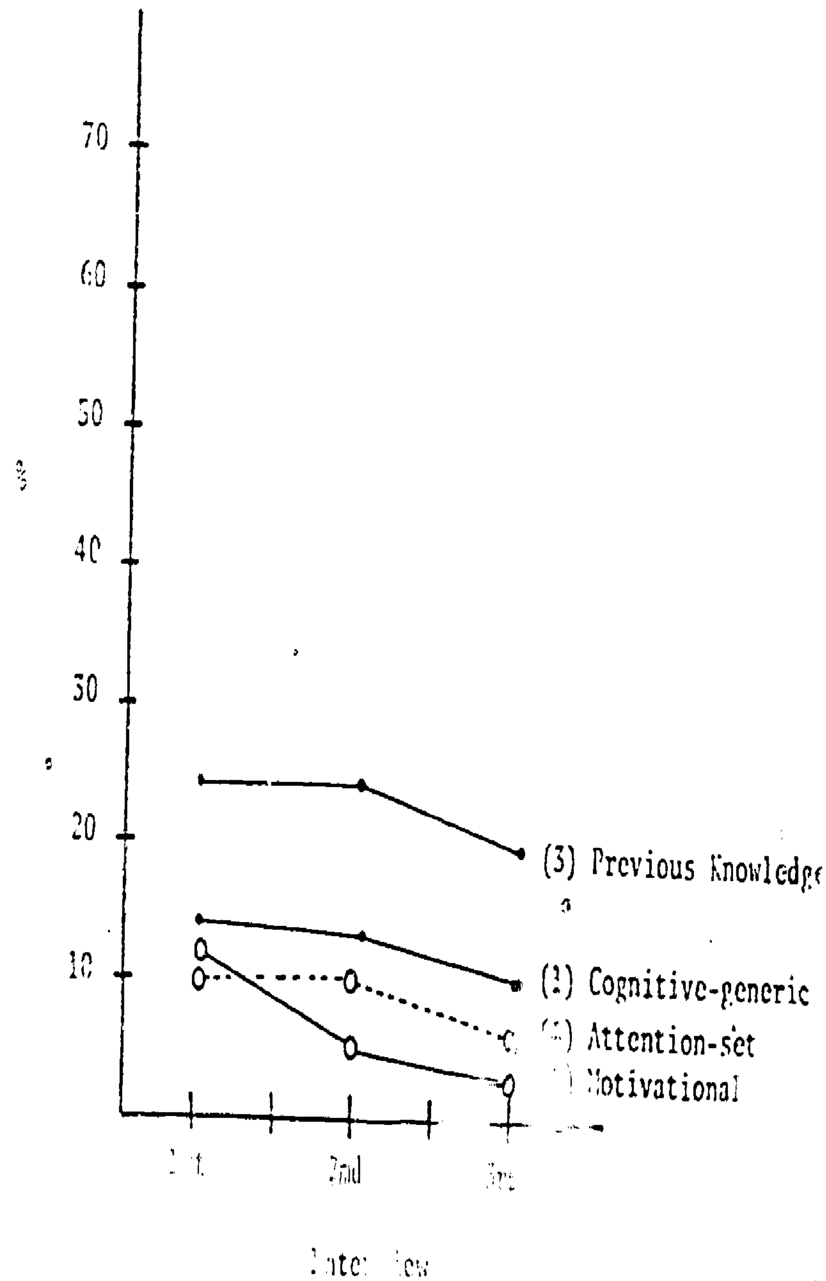

Figure 2. Trainees' reasons for prompting: Subcategories of the pupil focus classification.

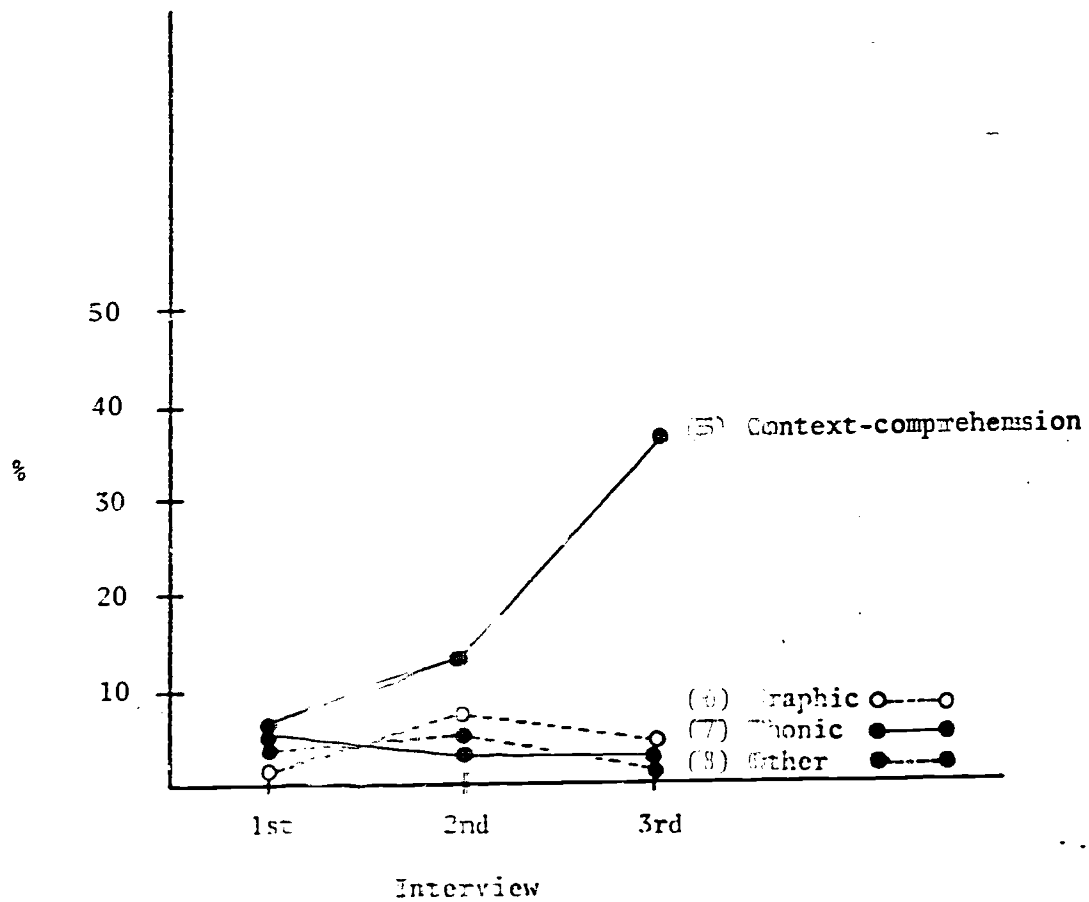

Figure 3. Trainees' reasons for prompting: Subcategories of Instructional/Text focus.

was the same for each alternative, the uncertainty would be at a maximum (or equiprobable).

The basic information statistic H is used to describe the average uncertainty of occurrences of categories in a classification (Frick, 1976). When H is zero, there is no uncertainty or in other words, total certainty. As H increases therefore, uncertainty increases.

One limitation of H as a measure of decision-making is that it does not indicate which category in a class of responses accounts for the reduction of uncertainty in an array of response alternatives. However, once uncertainty coefficients are obtained, descriptive analysis of subcategory means and SDs may be applied to aid interpretation of the decision-making measures obtained.

The main argument for the use of information statistics as a measure of decision-making is that they can provide an indicator of whether trainee behavior--in relation to a specific class of behaviors--is occurring at or near random (high uncertainty), or whether it is occurring with a high degree of predictability (low uncertainty). Thus, trainees whose prompting behavior bears no predictable relationship (highly uncertain) to the type of pupil miscue, are probably not applying any decision rules in their prompting behavior. (Unless, or course, a random walk model is adopted consciously as a teaching strategy.)

The analysis of response uncertainty* There were two measures of uncertainty used in the present study: The first measure was the relative reduction

*All data were analyzed using a computer program for information statistics written by Ted Frick. T. Frick also served as a consultant on this phase of the study and gave invaluable guidance in computation and interpretation.

of uncertainty for the joint classification of pupil miscue and teacher response categories. The statistic used in this case was T, which indicates the constraint between the uncertainty of pupil behavior (i.e., meaning change (21) or no meaning change (22) miscues) upon the uncertainty of teacher prompting behaviors (i.e., no response, functional prompt, dysfunctional prompt, feedback and telling). The form of this analysis can be visualized as a two class matrix, with the pupil miscue class made up of two mutually exclusive subcategories and the teacher response class made up of five mutually exclusive subcategories. The frequency of occurrence of each dyad for a given observation period is placed in the appropriate cell and converted to probabilities based upon marginal totals.

T is calculated by:

$$T(PM,TR) = H(PM) + H(TR) - H(PM,TR)$$

where PM = antecedent pupil miscue, and TR = subsequent teacher response.

Where T is zero, there is no relation or constraint between the uncertainty of pupil miscues and the teachers' response. T is used to calculate the relative percent reduction of uncertainty (rT). rT provides an estimate of the relationship of the predictability of pupil behavior to subsequent teacher behavior. rT is defined as follows:

$$rT(PM,TR) = \frac{T(PM,TR)}{H(PM)}$$

The greater rT, the less uncertainty there is or conversely, the higher the rT the more certain the relationship between pupil miscues and teacher prompting behaviors.

The second statistic used in the analysis was rH. This statistic was used to measure the percent reduction in uncertainty from maximum uncertainty for a single classification. The "H" statistic--which is the basic statistic for all information uncertainty measures--was first computed to determine the trainees' response uncertainty in the use of the five functional (module)* prompts.

The formula for determining H is as follows:

$$H(MP) = -\sum_{i=1}^{n} p\,(mp_i)\ \log_2 p(mp_i)$$

where MP is the class "Module Prompts", "mp" is a category of MP and p= probability of each category in the class.

Where trainees use all five module prompts with about equal frequency the uncertainty of their behavior is high. Use of all five module prompts at about equal frequency was in fact the behavioral goal of the trainees during the second semester of the program. The program was partially based on a skill development model of teacher behavior in which trainees ability to generate given behaviors was seen as a necessary precursor of the ability to modulate these behaviors. In order to aid trainees in attaining skill in generating the module prompts, several forms of feedback were provided; real time CATTS feedback; delayed CATTS printout (post teaching) feedback; or audio tape (post teaching).

Thus, in order to see if trainees provided with alternative forms of feedback on their prompting behaviors were able to successfully achieve the behavioral goal of using all five module prompts, the relationship of the obtained H to maximum H was calculated. The formula for H max is:

$$H_{max} = \log_2 n$$

*The five "module" prompts were the focus of the teacher training program. Trainees worked on achieving facility in generating these prompts in response to pupil miscues. The prompts (or cues) were: 1) attention, 2) word in context (meaning cue), 3) structural (syllable cues), 4) pattern (word family), 5) phonic rule.

where n = number of categories in the classification.

The formula for rH is:

$$rH = \frac{H_{max} - H}{H_{max}} \times 100$$

Results

Relative response uncertainty. Table 2 shows the group means and standard deviations of rT coefficients obtained for all trainees in the study. rT was calculated for each trainee for three observation periods at different time intervals over two semesters of the program. Trial 1 was made up of observed frequencies of teacher-pupil behavior during the first six lessons taught by trainees. Trial 2 was made up of two different observation periods for each of two groups that the trainees were placed in for the purpose of assessment of the effectiveness of the Prompting Module. Trial 2 for the experimental (E) group consisted of observation data from lessons 7 through 10. Trainees in the E group completed the Prompting Module after lesson 6 and thus the four lessons in trial 2 for the E group were taught with the knowledge of prompting behavior and decision-making that they obtained from the Module. Trial 2 for the control group consisted of two post-module lessons and were the 11 and 12th lessons taught the first semester. The third trial was made up of observation data from the 17th and 18th lesson taught by all tutors near the end of the second semester of the program. By this time, trainees had undergone discrimination training on the OROS and had been receiving CATTS or audio feedback on their prompting behaviors. As can be seen in Table 2, the mean rT for all trainees prior to training on the use of prompts (trial 1) was about 22%. For the second trial, rT increased to 25.70% (SD 15.85) and showed a negligible increase in the third trial.

Table 2. Reduction of relative response uncertainty (rT)*, mean percentage and SD for all trainees.

Observation Periods	lessons	rT $\bar{x}$%	SD	n
Trial 1. Baseline	1-6	22.25	(9.14)	20
Trial 2. Post-instructional module	7-12	25.70	(15.85)	20
Trial 3. Post-feedback (second semester)	17-18	26.37	(15.76)	19

The small number of subjects in each group and the large SD obtained make any extended discussion of group differences in rT untenable. A repeated measures ANOVA performed for all trainees over three trials was found to be non-significant.

From the perspective of rT as an indicator of trainee decision-making, the data did not show any significant changes in trainee decision-making over time or as a consequence of the treatment interventions (i.e., instructional module or feedback). This finding was obtained even though examination of the behavioral data did show significant changes in trainee responses to pupil behavior over time. This is shown in Tables 3 and 4. The pupil behaviors of interest were two mutually exclusive behavioral categories; meaning change miscues (21's) and no meaning change miscues (22's). The range of teacher responses to pupil miscues as obtained from the OROS was combined into five mutually exclusive teacher behavior categories. As shown in these tables, four out of five classes of teacher behaviors in response to 21 miscues changed significantly between the beginning and termination of the project, and one out of five classes of teacher behavior in response to 22 miscues showed significant change over the span of the program.

Table 3

Percent Frequency (Means and SD) of Teacher Responses to Pupil Meaning Change (21) Miscues; Trial 1 (1st Semester) and Trial 3 (2nd Semester).

	Teacher Behavior				
Trial	No Response	Module Prompt*	Non Module Prompt*	Feedback*	Telling*
1	24.05 (15.60)	25.49 (15.99)	16.63 (11.33)	15.48 (9.16)	18.36 (17.15)
3	28.38 (12.51)	47.61 (14.29)	7.50 (6.79)	10.08 (7.59)	6.44 (7.59)
		$p < .001$	$p < .004$	$p < .05$	$p < .01$

Table 4

Percent Frequency (Mean and SD) of Teacher Responses to Pupil No-Meaning Change (22) Miscues; Trial 1 (1st Semester) and Trial 3 (2nd Semester).

	Teacher Behavior				
Trial	No Response	Module Prompt	Non Module Prompt	Feedback	Telling*
1	64.00 (20.12)	11.98 (11.94)	3.05 (4.76)	12.03 (13.23)	8.95 (9.60)
3	76.51 (26.85)	9.41 (15.51)	.81 (2.43)	6.17 (10.07)	1.83 (4.59)
					$p < .006$

*Significance obtained from matched pairs T test 18df.

Thus, while the behavioral data showed changes in percent frequency in trainees' use of the prompting alternatives, these changes were not reflected in the mean percent reduction of response uncertainty (rT) for trainees at the three observation periods examined.

<u>Response uncertainty in the use of five module (functional) prompts.</u>

The mean rH was obtained from individual rH coefficients for all trainees in the study for each of the observation periods (trials) described above. In this instance, the hypothesis regarding the uncertainty of trainee behavior was the reverse of what had been predicted for trainee behavior contingent upon pupil behavior. Since the goal set for the trainees by the training program was for them to use about 15% of each of the five functional (module) prompts, it was expected that if trainees approached this behavioral criterion it would be reflected in a lower percent reduction from maximum uncertainty.

This is what appears to have occurred (Table 5). During the first trial there was a mean 42.93% reduction of uncertainty (from maximum uncertainty) for all trainees, a smaller reduction at the second trial, and a substantially smaller reduction of uncertainty at the third trial (20.22%). In this case, the smaller the percentage reduction of uncertainty, the more uncertain the behavior, and in terms of the training objectives (use of module prompts) great uncertainty is what would be predicted if the training were effective. Trial 1 differences between the two trainee groups appear negligible. Trial 2 differences were not tested becuase the groups received non-comparable treatments in this observation period. However, the difference between the CATTS and Audio Feedback groups mean rH coefficients was considerable. A one-way analysis of variance showed group significance (F=7.39, D.F. 1/17, P<.01).

Table 5. Percent reduction of uncertainty in trainees' use of five functional prompting alternatives (rH)*

	First Semester Observation Periods				
Group	Trial 1 (Baseline)			Trial 2 (Post Instructional Module)	
	n	$\overline{X}$	S.D.	$\overline{X}$	S.D.
All trainees	[illegible]	42.93	24.14	39.20	[illegible]1.47
E(6 lesson baseline)	10	39.77	24.92	26.2[illegible]	22.17
C(10 lesson baseline)	10	46.10	24.24	42.[illegible]	21.50

	Second Semester Observation		
	Trial 3 (Post-feedback)		
	n	$\overline{X}$	S.D.
All trainees[a]	19	20.22	11.44
CATTS FB	9	13.76	8.89
Audio FB	10	26.03	10.52

*The smaller the percent reduction of uncertainty, the more uncertain the behavior. Thus, where uncertainty is great, Ss may be said to be generating all categories of behavior at about equal frequency (e.g., the use of each of five alternatives are equiprobable).

a. While the trainees in the program were the same for both semesters (with the loss of one trainee 2nd semester), the treatment subgroups into which they were placed were different each semester.

Since rH means were found to be significantly different for the two feedback groups there was some evidence suggesting that feedback treatments affect trainee decision making. That is, the relatively small mean percent reduction of uncertainty (rH = 13.79% SD 8.89) shown by the trainee group that received CATTS feedback indicates that the CATTS FB group generated each of the five functional (module) prompts with about equal frequency. This approximates the goal of the training program in terms of these specific behaviors. Likewise, the relatively higher mean percentage reduction shown by the Audio Feedback group (rH = 26.03%, SD 10.52) indicated a trend away from equiprobability in the generation of the 5 functional prompts.

In order to clarify interpretation of this outcome, the distribution of behavioral data for the two feedback groups was examined. Table 6 shows means and SD's for percent frequency of use of each module prompt by each feedback group during the third trial (post feedback) observation period. Both means and variances for each module prompt category were tested for differences between groups.

A one-way ANOVA of mean percent frequency for each module prompt category obtained by each feedback group revealed no significant differences between groups in the third trial. However, when the percent of variance from the mean for each group was analyzed by a one-way ANOVA, the variances were found to be significant ($F = 6.68$, d.f. 1/17, $p<.02$).

The Relationship of the Recall Interview to Decision-Making

In order to determine if there was a relationship between the Recall Interview responses and trainee decision-making behavior as indicated by rT and rH, a series of zero order correlations were obtained between the variables

Table 6

Mean Percentage Use of Module Prompts by

CATTS and AUDIO Feedback Groups, Third Trial

Module Prompt Category											
Group	N	(33) [illegible]cture		([illegible]) Attention		(44) Pattern		(45) Phonic		([illegible]) Context	
		$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
Total	19	21.64	(11.74)	30.26	(19.26)	10.00	(9.99)	9.74	(7.74)	[illegible]	(17.42)
CATTS FB	9	21.3[illegible]	(11.80)	33.44	(13.84)	9.67	(9.00)	11.33	(6.40)	[illegible]	(5.80)
AUDIO FB	10	22.0[illegible]	(12.[illegible])	27.40	(24.51)	10.30	(11.29)	8.30	([illegible])	[illegible]	(23.42)

rT, rH, success rate, and the total Recall Interview score and percent in each of the Recall Interview summary categories; i.e.. (1) pupil focus, (2) instructional focus, (3) restatement of behavior.

The method of obtaining rT and rH coefficients from frequencies of trainee and pupil behavior (as measured on the OROS) was previously described. Although there is much empirical validation of these information statistics as indices of decision-making (Coombs, Dawes and Tversky, 1968), the small number of subjects in the present study precluded formal validation of the recall interview through correlation with an external criterion. Given limitations of the number of subjects of the study, only face-validity for recall interview may be asserted and the study of the relationship between the Recall interview and rT, rH, and trainee success rate was undertaken as a means of uncovering trends in the relationships. Table 7 reports the correlation coefficients between the variables rT, rH, percentage of statements in each of the three Recall Interview classifications (pupil focus, instructional focus, restatements), a total interview score (number of discrete trainee statements), and success rates (the rate of correct pupil responses to teacher prompts).

Trial 1 correlations showed a significant negative correlation between rT and rH ($p<.005$). This would be expected since rT was low (22%) and rH was relatively high (42.93%). Both these relationships are in the expected direction in terms of trainee decision making prior to training and feedback interventions. Trial 1 rT and rH coefficients provided evidence of relatively little trainee decision making.

Table 7

Correlation Coefficients for Recall Inte[illegible]

Categories, Success Rate and [illegible]

Variables		Trial 1 r	Sig.	N	Trial 2 r	Sig.	N	Trial 3 r	Sig.	N
rT	rH	*-.5573	[illegible]	20	-.2294	[illegible]	[illegible]	.[illegible]190	(.31[illegible])	19
[illegible]	Success Rate	*-.3484	[illegible]	20	[illegible]	(.401)	[illegible]	.[illegible]441	([illegible])	19
r[illegible]	Pupil Focus	.0686	([illegible])	14	[illegible]	(.104)	17	-.[illegible]	(.1[illegible]0)	[illegible]
rT	Restatement	-.2364	(.208)	14	.03[illegible]	(.448)	17	*-.64[illegible]6	(.004)	16
rH	Restatement	-.0508	(.432)	14	-.4961	(.021)	17	.0437	(.436)	16
Success R	Total Int.	*-.5924	(.013)	14	-.52[illegible]	(.012)	18	-.1465	(.294)	16
Success R	Pupil Focus	* .4147	(.070)	14	.384[illegible]	(.054)	17	*-.4479	(.041)	16
Success	Instruct. Focus	-.1908	(.257)	14	*-.445[illegible]	(.037)	17	* .4167	(.054)	16
Success R	Restatement	*-.3724	(.095)	14	* .3299	(.[illegible]8)	17	-.0645	(.406)	[illegible]
Pupil Focus	Instr. Focus	-.6024	(.011)	14	*-.833[illegible]	(.001)	17	*-.6[illegible]	(.003)	16
Pupil Focus	Restatement	*-.7882	(.001)	14	.297[illegible]	(.1[illegible]3)	17	-.2[illegible]	(.213)	16
Instruct. F.	Restatement	-.0164	(.478)	14	*-.776[illegible]	(.0[illegible]1)	17	*-.600[illegible]	(.007)	16

The variable success rate, which was the percent of correct pupil responses to any teacher prompt except "8" (telling), correlated with a number of the Recall Interview categories. These coefficients should be interpreted with caution since the number of trainees from whom interview data was obtained was smaller than the total number of subjects in the study. Success rate correlated negatively with the total interview score -- the total score in effect measures trainee volubility -- the number of different reasons given for responding to a given miscue. Trainees were free to give as many reasons as they could think of for responding to the given miscue the way that they did. Thus the higher the score, the more reasons given.

The rT and rH coefficients showed a low (-.2204) negative correlation in the second trial and no correlation in the third trial. Again, due to the reversal in the direction of percentage reduction of uncertainty for the two measures, this is what would be expected.

In the second trial success rate and total interview score was also negatively correlated (r.=-.5272 p<.01). In the third interview, success rate and total score did not correlate.

Success rate also correlated with the pupil focus category percentage in the first trial (r = .4147 p<.07), and also in the second trial (r = .3843 p<.06). However, the correlation obtained in the third trial, while also insignificant (p<.04), showed a change in direction of the relationship to negative .4479.

Similarly, correlation coefficients obtained for success rate and the instructional focus category showed a significant negative correlation between these variables during the first and second interviews and positive correlation at the third interview. The inter-correlation of the pupil focus and instructional focus categories with trainees' tendency toward reiteration of behavior (restatement category) was negative in 5 of 6 instances.

Discussion

Recall Interviews. The purpose of the Stimulated Recall Interviews was to obtain information from trainees on the reasons for their own prompting behaviors. Based upon this introspective technique of data collection, we found that the inexperienced trainees initially emphasized pupil variables as the basis for their prompting behavior. At the first interview, which took place during the initial week of teaching, trainees explanations of their prompting behavior involved pupil variables three to one over explanations relating to instructional variables. The pupil focus variables reported to be of importance by the trainees were: 1) pupils' previous knowledge (24%), 2) cognitive level of pupil (13%), 3) motivational status of pupil (12%), and 4) current attentional state of pupil (10%). The trends in pupil-related variables as explanations of teacher behavior obtained in the second and third interviews are shown in Figures 1 and 2. A decline in all pupil variables can be seen in these figures, but the largest proportionate decline is seen in the pupil motivational state variable. It is possible to attribute these results to a reduction of the trainees' initial anxiety over acceptance by the pupil or a concomitant growth in confidence about rapport with the pupil over the extended time period of the tutorial program. In either case, pupil motivation was seen as less important a factor in trainee behavior near the end of the program than it was at the outset.

The most dramatic shift in trainees' explanation of their own behaviors comes in the concern over instructional variables (Figure 3). While explanations centering on text characteristics and other instructional tactics (categories 6, 7, 8) remained at a consistent low level, trainees markedly increased the percentage of explanations focusing on comprehension and context cues during the second and third interviews. This finding reflects the emphasis placed upon these variables in the teacher training program. The influence of participation in the training program is seen in the increasing attention to context and comprehension as the underlying rationale for trainee behavior. This effect was noted by the interviewers who found that in two separate instances, trainees offered word context as an explanation for their prompting behavior when the sample of teaching used as the basis for recall could not be objectively classified as an instance of contextual prompting. In other words, even where the trainees had not adequately developed appropriate discrimination skills that permitted them to distinguish an instance of a context prompt, the primacy of context prompts as the rational basis for decision making was already established.

The finding that trainees responded to some interviewer probes by restating the prompting behavior may reflect the automatic nature of some teacher responses to pupil behavior. Such responses may be interpreted as evidence of an absence of a rational or decision-making basis of the teacher behavior. On the other hand, reiterative responses may be due to the interview method, in which all trainee statements were accepted without comment and a given interview sequence terminated after two probes. No trainee statements including restatements of the behavior were rejected, nor were such statements treated any differently than substantive answers to probes. This was because we felt that the risk of post hoc rationalization was probably quite high, and "forcing" answers from trainees would only inflate the tendency toward such rationalization.

It is probably the case that a good proportion of teacher-pupil interaction takes place with little conscious mediation and some of this may be reflected in the trainees reiteration of behavior in response to the interview. The small decline in the rate of reiterative responses from 21% in the first interview to 17% in the last one (see Figure 1), may be due to trainee familiarization with the interview situation.

Response uncertainty. The argument was raised elsewhere in this paper concerning the reduction of response uncertainty as an indicator of teacher decision-making. Briefly the reasoning was that if teacher behavior in relation to a specific class of behaviors occurs at or near random (high uncertainty) or with a high degree of predictability (low uncertainty), then teachers' use of decision rules to guide behavior may be assumed.

A teacher training intervention can be viewed as a method of reducing trainee response uncertainty. Within a limited domain, the effect of training on teacher behavior should be predictable in terms of increases or decreases in response uncertainty. In the CATTS-OROS training program, trainees were taught to use a series of decision-rules to determine which prompts to give in response to pupils' oral reading miscues. The decision paradigm was as follows:

1. Determine whether the pupil miscue changes the meaning of the word or sentence.
2. If the miscue does not change the meaning--do not prompt.
3. If the miscue changes the meaning of word or sentence--use an appropriate prompt.

There were a series of additional decision rules provided to the trainees which were designed to aid them in selecting the most appropriate prompt to use if prompting was indicated. There were five different prompts stipulated by the training program as potentially appropriate or functional. These five prompts were by no means exhaustive of all possible prompting responses and a major goal of the training program was to assist trainees in using the five functional prompts and to eliminate the use of the so-called dysfunctional prompts from their response repertoire.

Given the decision making model which served as the basis for the CATTS-OROS teacher training program, the prediction that trainee prompting would be initially uncertain is warranted. That is, in the absence of explicit decision rules, consistent or rule governed prompting behavior would not be expected. Rather, a greater initial tendency toward trial and error prompting would be predicted. And the logical outcome of the hypothesized early trial and error prompting behavior would be the subsequent shaping of teacher behavior through reinforcement in the form of pupil responses (e.g., success rate, tension reduction, etc.). Thus, the outcome of teacher-pupil interaction over time alone would be in the direction of lowered response uncertainty - the same prediction proposed as the outcome of a teacher training intervention. But while the direction of teacher behavior changes in both instances would be toward reduction of response uncertainty, only in the case of a training intervention could the categorical nature of the behavior change be predicted.

The trend in the reduction of relative response uncertainty (Table 2) was in the direction predicted but the magnitude of the reduction was nonsignificant for the trainees as a total group. Thus, changes in trainee decision making behavior as measured by the reduction of relative response uncertainty was not borne out. However, evidence for change in trainee behavior as a function of participation in the training program was obtained and this reflected the tenets of the program in a number of ways. Tables 3 and 4 show trainee behavior changes between the beginning and end of the program, an interval of some six months. Significant increases in trainees' use of functional (module) prompts in response to 21 (meaning change) miscues as well as a decrease in the use of dysfunctional (non-module) prompts to 21 miscues were obtained.

There were no significant changes in trainees' non-responses to either meaning change (21) or no meaning change (22) miscues between the beginning and end of the program. But trainee non-responses to the two types of pupil miscues were at an appropriate relationship from the outset; there were nearly 2 1/2 times as many non-responses to no meaning change (22) miscues as to meaning change (21) miscues. While the centrality of the decision to prompt or not to prompt contingent upon whether the pupil miscue was 21 or 22 would lead us to expect an increase in nonresponses to 22's and a decrease of nonresponses to 21's, this did not occur. It is possible that some trainee non-responses reflect a failure to process the pupil behavior rather than a conscious decision not to prompt.

The significance of the change in trainees use of feedback in response to pupils' 21 miscues cannot be easily interpreted as the training program was neutral on this behavior. The change in the "telling" category was also difficult to interpret as trainees were instructed <u>not</u> to use telling as a response to 21 miscues but to give the correct word only when the pupil failed to do so after being prompted twice. We cannot tell from the data as organized for this analysis whether the telling prompt occurred as an initial prompt or as a termination of a set of unseccessful prompts.

<u>Response uncertainty and teacher training</u>. The trainees' use of the five functional prompts may be regarded as trainee decision-making in the sense

that the task of generating all five prompts required conscious selection among a fixed set of alternatives. However, these choices were conditioned by a behavioral goal requiring approximately equal use of all five prompts. This was a direct test of the effect of training and feedback upon trainee decision making. A small percentage reduction of response uncertainty would indicate the success of trainees in achieving the behavioral criterion of using all five functional prompts at the rate of about 15% each. That is, the stipulated behavioral criterion was equal use of the five prompts and re-stated probabilistically, achievement of the criterion behavior would be indicated by maximally uncertain behavior.

Table 5 shows that for the trainees as a whole, reduction of uncertainty decreased over time (trials), indicating greater uncertainty in the use of the five functional prompts after participation in the training program.

During the second semester of the program, CATTS real time feedback was provided for half of the trainees in the group to aid them in generating the five functional prompts during teaching. The other half of the trainee group received a post-teaching audio tape of their lesson, a contrasting feedback mode, designed as a test of the relative effectiveness of the two types of feedback in shaping trainee prompting behavior. As a result, improvement in the use of all five prompts was obtained by all trainees, with CATTS feedback group showing a significantly smaller percentage reduction of rH (table 5).

The behavior of trainees during the third trial (teaching with feedback) was of interest from the point of view of the effectiveness of feedback on trainee behavior. We have already seen that in this simple, noncontingent situation, trainees decision making was demonstrated over trials by changes occurring in the direction predicted. Trainee behavior after imposition of feedback (during the third trial) showed that there were no significant differences between the two feedback groups in the mean percentage use of each functional prompt. However, differences between the two feedback groups in the variance of the use of each prompt were significant. For example, while the CATTS feedback group showed a mean of 24.22% use of context prompts compared to 31.60% use of context by the audio FB group, the CATTS group standard deviation was 5.80% while the audio group SD was 23.42%. Overall, the variances for the CATTS FB group were significantly lower than for the audio FB group (Table 6). Thus, training effects can be seen not only in the direction of the behavior change but in the homogeneity of trainee behavior under real time (CATTS) feedback conditions.

<u>The relationship of Recall Interview categories to trainee behavior.</u>

Correlations of Recall Interview categories with rT and rH coefficients and trainee prompting success rates were run in an effort to validate the Stimulated Recall Interview scale. However, the small number of subjects in the study made this anticipated procedure an inconclusive one and the results could not be used to establish the validity of the scale. Nevertheless, the intrinsic logic of the changes in the Recall Interview data over trials, lends credence to the interview as a viable measure of trainee recall of decision-making.

The data obtained from the correlations of the three Recall Interview categories (pupil focus, instructional focus, restatements), a total interview score, the rT and rH coefficients, and success rate, are shown in Table 7. Of interest here is the indication that the more contingent decision making (as evidenced by rT), the less likely was the trainee to supply restatements of behavior in lieu of an explanation of that behavior. The variable rT (percent reduction of relative response uncertainty), which was found to show a small nonsignificant increase over trials (Table 2), also showed a significant negative correlation to trainees' restatement of behavior as a response to probes aimed at uncovering the rationale for behavior, during the first and third trials. Iterative responses also showed a significant negative correlation with the variable rH during the second trial.

At each trial, success rate showed a negative correlation with the total interview score, indicating that the greater the success in prompting, the fewer different statements the trainee made in response to the interview. This finding could indicate a weakness in the interview technique or it may possibly mean that trainees who generate a great number of reasons for their prompting behavior are less effective in prompting.

In the third trial, trainee success in prompting showed a negative correlation with statements focusing on pupil variables, whereas a positive correlation between success and instructional focus was obtained in the same period. Assuming the scale is valid, this would indicate that by the end of the practicum, the more successful trainees reported basing their prompting decisions on instructional considerations than on pupil related variables.

Conclusions. The study of teacher decision making has great relevance for improvement of teacher education programs. The depth of the teacher's knowledge of relevant pupil and instructional factors, together with the range of decision alternatives employed in the interactive teaching situation must be accounted for if the qualitative aspects of teacher behavior are to become amenable to training intervention. Teacher behavior research has in the past placed heavy emphasis upon the quantitative dimensions of teacher behavior. The limitations of the quantitative approach in the improvement of teacher training has probably been of significance in the more recent interest in teacher decision making behavior (c.f. Gage, 1975). The present study indicated that trainee decision making is susceptible to training intervention and thus provides a useful measure of the training programs' effectiveness. The reasonable next step in this line of study would be to establish the validity of the teacher training program through examination of trainee decision making and its relationship to pupil outcomes.

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4. The Effect of Pupil-Tutor Exchange on Teaching Performance

Problem Statement

Teacher effectiveness research has recently shifted away from research on the effectiveness of generic teaching skills, such as praise and management, to an emphasis on the effectiveness of certain specific behaviors within varying contexts. One teacher behavior does not have the same effect on all students, as Good and Power (1975) point out. "Recent work ...have applied final documentation to the view that teachers' behavior does not have generally salubrious effects upon all students" (p. 2-3). For example, Brophy and Evertson (1974), in an investigation of process-product relationships in schools with high student socio-economic status (SES) and schools with low student SES status, found distinct differences in the kinds of teaching behaviors that were effective with the two types of students. Student characteristic variables, such as achievement potential, actual achievement level, and achievement motivation, cannot be ignored in teacher effectiveness research.

A second important contextual variable is instructional content. Joyce (1975) argues persuasively for the control of content in teacher effectiveness research. He points out that studies that have controlled content find much more consistency in teaching effectiveness than those not controlling this variable. The previously cited work by Brophy and Evertson (1974) used product measures in two subject areas — reading and math. There were many cases where the process variables correlated significantly with pupil achievement in one subject area but not in the other. Even student achievement in different skill areas within the same subject area, such as vocabulary and comprehension in reading, can be significantly related to different teaching behaviors, as Soar (1966) demonstrated.

With the development of competency-based teacher education (CBTE) programs, teacher training has focused more on specific teaching skills within subject areas. However, a strong decision-making component, in which contextual characteristics are weighed before teaching, has yet to be included in CBTE. According to Shavelson (1973), teacher decision-making and planning are <u>the</u> basic teaching skills. His model assumes that two sources of information must be taken into account simultaneously: information about the state of the learner (e.g., skills and motivation), and information about the possible effectiveness of different instructional moves with the particular learner. Clark and Joyce (1975) suggest that neither more accurate perception of student characteristics nor a trained repertoire of skills are likely by themselves to be associated with pupil outcomes, but that the two areas must be coordinated.

Teacher training in skills, therefore, can be of two basic types: 1) generation of a specific repertoire of behaviors, and 2) modulation of these behaviors through decision-making in order to select behaviors appropriate to the context in which teaching is occurring. It can be hypothesized that training teachers to generate a specific repertoire of behaviors does not necessarily mean that they will be able to modulate these behaviors appropriately when placed in a new context. The present study sought to test this hypothesis.

The purpose of the study was to examine the effects on teaching performance when teacher trainees (each of whom had tutored the same pupil for 30 hours) were each given a new pupil to instruct. It was assumed that trainees' knowledge of learner characteristics would be much higher and more veridical for those pupils with whom they had worked for 30 hours in a reading practicum. Thus, one independent variable was Trials - Trial 1, original pupil; and Trial 2, new pupil. The second independent variable was pupil reading level. Because pupils at the same reading level have fairly similar skills, teachers may still be able to modulate behavior successfully when given an unknown pupil at the same reading level as the known pupil. With a new pupil at a very different level, however, performance could be more or less successful, depending on the reading levels of the two pupils. In the present study, there were three categories of the reading level factor: (1) trainees given new pupils at a much lower reading level than their original pupils, (2) trainees given new pupils at approximately the same level, and (3) trainees given new pupils at a much higher level. The design was a 2 (trial) by 3 (groups) design, with subjects nested in groups. The dependent variables were of two types - (1) generation, or a measure of what teacher behaviors were used, and (2) modulation, a measure of the appropriateness of the teacher behavior for the pupil.

METHOD

Subjects

The subjects were 19 pre-service trainees who had participated in a reading practicum during the school year, 1975-1976. All were juniors and special education majors at Indiana University. None had any prior teaching experience.

The pupils with whom the trainees worked were from regular (grades 2 through 6) and special education classes in the Monroe County Schools. All were at least one year or more behind in their reading achievement when compared to grade placement. At the end of the practicum, the average reading level of the 19 pupils was 3.0, and the range was 1.4 to 4.9.

Table 1
Background Data on Pupils in Tutoring Program

Tutor No.	Pupil	Age	Sex	Grade Placement	No. of Grades Reported	Instr. Reading Level Oct, 76 (Woodcock)	Readability Level
Audio Feedback Tutors (N=10)							
1	H.B	9.8	F	3	1	3.3	4.0
2	J.J.	9.7	M	4	0	3.0	4.0
3	C.S.	10.9	M	3	1	1.4	.4
5	M.Z.	12.6	M	6	0	1.7	.8
5*	A.M.	8.3	M	2	0	1.7	2.4
7	T.A.	9.9	M	3	1	3.1	2.5
11	K.J.	8.5	M	2	0	3.0	2.0
11*	M.Z.	12.6	M	6	0	1.7	.8
13	D.S.	9.0	M	3	0	2.5	2.5
14	E.S.	8.1	M	3	0	2.9	3.2
16	M.C.	13.0	M	6	0	8.5	3.0
16*	G.M.	8.7	F	2	1	1.6	.8
17	A.C.	9.5	F	3	1	2.7	2.0
CATTS Feedback Tutors (N=9)							
4	A.M.	8.3	M	2	0	1.7	2.4
4*	K.S.	9.6	M	3	0	2.7	2.0
6	L.P.	8.8	F	2	1	1.5	.8
8	J.R.	8.11	M	3	0	2.3	2.5
9	J.L.	10.4	M	3	1	2.8	2.4
10	M.S.	8.2	F	2	0	2.1	2.4
12	D.B.	13.3	M	6	1	3.6	3.2
15	W.F.	9.11	M	4	0	3.6	3.2
19	M.S.	8.5	M	2	0	1.2	.8
20	T.C.	9.4	M	2	1	2.1	2.5

*2nd Semester Child for that Tutor.

(Scores are grade equivalents from the Woodcock Reading Mastery Tests (Woodcock, 1973) and are the total instructional reading level as determined by the posttesting for the practicum.)

Pupils were initially paired with trainees for the practicum in a random manner, after working around scheduling problems. In the first two weeks of the practicum in October, several pupils with no handicaps in reading were dropped and replaced with handicapped readers. After this point, however, 16 tutor-pupil dyads remained together from October to April. Due to significant improvements in reading level of some of the students, changes occurred at the end of the first semester. Three tutors, one in each group, received a new pupil at the beginning of second semester. Thus, 16 tutors had 30 hours of experience with their pupils and three had 21 hours.

An Overview of the Practicum

The practicum began on October 13, 1975, and continued to April 22, 1976, for a total of 37 lessons. Each trainee taught two hours a week, one hour each lesson. Tutoring was done after school hours from 3:30 to 5:30 in the afternoon.

One purpose of the practicum was to instruct trainees in diagnostic and remediation techniques for handicapped readers. The practicum followed a diagnostic-prescriptive approach, with trainees required to pretest in order to establish skill needs, to set objectives, to construct/select materials, to teach; and then to posttest in order to determine whether or not mastery had been reached. The skills focused on were comprehension and decoding (phonics, structural analysis, and context). All trainees were supervised during teaching, and each received six conferences with a supervisor during the year.

A second purpose of the practicum was to conduct research in teacher training. This research focused on trainee behavior during oral reading strategy lessons. The strategy lessons were designed to develop, in pupils, functional decoding strategies; that is, to effect a decrease in omissions, sounding out, and letter naming, and to effect an increase in real word substitutions, miscues which fit semantically, and self-corrections. All trainees received instruction with a module designed to increase specific teacher behaviors during the strategy lessons. The Prompting Module (Brady, 1975) and the CATTS-OROS teacher training program had the following teacher performance objectives:

1. Prompt only meaning change (21)[1] miscues.
2. Do not prompt any no-meaning change (22) miscues.
3. Increase the use of the five Prompting Module prompts:
   (a) Structural (33). Teacher asks or tells pupil to identify syllables in an unknown word.

   (b) Attention (34). Teacher focuses the pupil's visual attention on all of an unknown word.

   (c) Pattern (44). Teacher gives, or asks pupil to give, a rhyming word or word family cue to an unknown word.

   (d) Phonics (45). Teacher gives, or asks for, a phonics rule or sound-letter correspondence within an unknown word.

   (e) Context (52). Teacher asks for, or gives, information about the meaning of the sentence or story in which the unknown word appears.
4. Increase the total percent in use of all module prompts (Tot. Mod.), i.e., the sum of the five behaviors (a through e) listed above.
5. Increase the success rate for each module prompt in 3 above.
6. Increase the success rate for the total percent of all module prompts.
7. Supply the pupil with the target word, if the first two prompts for it

[1] Numbers represent category numbers in the observation system, to be explained subsequently.

are unsuccessful.

8. Decrease or eliminate all other categories of non-module prompts (Other).

A set of decision rules as to when to use each kind of prompt in order to achieve the goal of pupil independent decoding was also included. These rules related to consideration of pupil characteristics (reading skills, and previous behavior in strategy lessons), kind of miscue made, and textual characteristics (the nature of the word in which the miscue appeared and the sentence/story being read). The teacher behaviors were derived from studies of reading strategies of poor and mentally retarded readers (cf. Levitt, 1972; Biemiller, 1970; Cohen, 1975), field observations (Lynch and Epstein, 1974), and behaviors in Minicourse 18: Teaching Reading as Decoding (Ward and Skailand, 1973).

Throughout the practicum, each trainee taught a 15-minute oral reading strategy lesson during each tutoring session. Pupils read at a level approximately one level above their instructional level in order that a sufficient number of miscues would be made. Pupils read passages from the New Open Highways series or the Lippincott series. In the first semester, all trainees received the Prompting module. This module, in its self-instructional format, did not significantly increase the percent of each of the five module prompts.

During the second semester, all trainees received discrimination training using an observation system, paying particular attention to the five module prompts. Then, for Lessons 5 through 17 in second semester, all trainees received one of two feedback conditions, either on-line and delayed feedback through a computer-assisted teacher training system (CATTS) (Semmel, 1975), or delayed audio feedback in which trainees coded their own behavior. The information given in each feedback condition contained the frequency and percent of each of the five module prompts. Trainees were told that each separate module prompt should occur at least 15% of the time, with the total of the five (Total Module) occurring 75% of the time. No direct supervision of lessons was given by supervisors, since the purpose of the research second semester was to test the effectiveness of the two feedback conditions given above. After Lesson 17, feedback conditions were switched and additional information was added - the success rate of each prompt. Lesson 23 was the last lesson for most tutors.

Analysis of the trainee performance for Trials 1 through 21 revealed significant increases across trials in behaviors generated and in success rates, but no differences between the two groups.

Observation Procedures

All lessons were tape-recorded and also coded live by five trained coders on the Oral Reading Observation System (OROS) (Brady, Lynch, and Cohen, 1976). This system classifies pupil miscues, teacher prompts, pupil answers to prompts, and teacher feedback and management, into 25 categories. Coders were randomly assigned to tutors, within scheduling constraints. Since special booths were used in which to conduct oral reading lessons, tutors were always aware that they were being coded. During the second semester, the purpose of the coding was also known.

All coders were trained at the beginning of the practicum with the OROS Observer's Training Manual (Brady et al., 1976), and all had periodic maintenance checks throughout the year. On a simulation tape used for a maintenance check approximately two weeks prior to the date of the study, the mean agreement with the criterion was .86 (range, .80 to .91) and the mean intra-coder agreement was .92 (range, .87 to .93). Coefficients reported are a corrected version of Flanders' modification of Scott's procedure (Frick and Semmel, 1974).

Dependent Variables

Five categories from OROS - "33", "34", "44", "45", and "52" - and a collapsed category for the total of these module prompts, were the six generation dependent variables. For each tutor, the total frequency of all prompts following miscues was found and then the frequency for each separate category was divided by the total prompts in order to get a percent for each category.

The remaining six dependent variables were modulation variables. Teacher ability to modulate behavior, or to select the most appropriate behavior based on pupil characteristics, was measured by the success rates of the prompts. A prompt was considered successful if it was attempting to decode. For each of the categories in the paragraph above, the total frequency of successful prompts within the category was divided by the total frequency of prompts in that category in order to get a success rate.

Procedures

There were 19 tutor-pupil dyads in the practicum. An additional pupil who had two tutors during the second semester was included as a switch pupil, but the tutors were not. Reciprocal switches between dyads were made; i.e., if Tutors 1 and 2 were paired, Tutor 1 taught Tutor 2's pupil for the switch lesson and Tutor 2 taught Tutor 1's pupil for the switch lesson. During each one-hour time period, there were from four to six tutors. Tutors per time period were listed alphabetically and paired from the top; i.e., 1 with 2, 3 with 4, etc.

Tutors knew in advance that a switch would be made. They were told that it would only occur for the 15 minutes of the oral reading lesson. Tutors were not informed of the purpose of the switch. They were told to continue doing everything with the new pupil that they had been doing with their original pupil. Thus, their goal was to use the five module prompts, each about 15% of the time, and to have successful prompts. Each pupil read material from the book they were currently reading with their original tutor. In most cases, a different section of the same story was used.

The switch lesson occurred at Lesson 22 for 15 of 19 tutors, and at Lesson 23 for 4 tutors. Tutors continued to receive their same feedback condition during the switch lesson. To control for order effects, 10 tutors were compared to a lesson with their original pupil that occurred one lesson before the switch, and nine tutors were compared to a lesson with their original pupil that occurred one lesson after the switch. Trial 1 was always the original pupil lesson, but for half the tutors in each group, this original lesson occurred one lesson before the switch lesson, and for the remaining tutors, one lesson after.

The total scores of pupils on the Woodcock Tests were used to assign pupils to groups. All tutors who received a new pupil at least one year or more lower in reading level than their original pupil were assigned to Group 1, high to low. Those whose new pupil's score was the same or within .4 months of the original pupil's score were assigned to Group 2, same. Tutors who received new pupils reading at least 1 or more years higher than their original pupils were assigned to Group 3, low to high.

RESULTS

Table 2 shows means and standard deviations for all dependent variables by groups and trials. The Woodcock scores (used to block by groups) reveal that for Group 1 (high to low group), there is a mean decrease of 1.6 in pupil reading level. For Group 2 (same), the mean reading level is identical. For Group 3 (low to high), there is an increase of 1.6 in pupil reading

Table 2

Means (and Standard Deviations) for all

Dependent Variables by Groups and Trials

	G1 (N=7)		G2 (N=6)		G3 (N=6)	
Variable	T1	T2	T1	T2	T1	T2
Woodcock	3.814	2.243	3.117	3.117	2.000	3.633
	(.495)	(.808)	(.325)	(.325)	(.537)	(.137)
%33	25.286	11.714	16.333	25.000	20.500	20.667
	(15.261)	(11.116)	(14.334)	(12.649)	(13.620)	(11.237)
%34	11.571	8.571	15.500	7.333	9.667	15.500
	(7.807)	(8.753)	(7.918)	(4.033)	(12.356)	(14.068)
%44	3.286	9.429	9.167	9.333	15.833	5.000
	(4.348)	(7.591)	(7.705)	(10.093)	(11.771)	(5.727)
%45	11.571	9.429	7.833	12.000	1.667	5.333
	(7.480)	(9.589)	(6.178)	(10.040)	(1.862)	(4.179)
%52	13.714	20.143	14.333	10.833	21.833	17.333
	(9.552)	(24.327)	(10.801)	(7.653)	(8.110)	(14.706)
Tot. Mod. %	65.429	59.286	63.167	64.500	69.500	63.833
	(13.649)	(16.276)	(9.131)	(9.460)	(9.418)	(18.368)
*SR 33	45.143	42.143	48.500	65.667	44.667	46.333
	(26.686)	(31.222)	(35.999)	(29.214)	(29.555)	(32.904)
SR 34	50.714	52.429	23.667	47.167	35.500	61.333
	(40.905)	(40.975)	(27.897)	(41.330)	(42.208)	(38.479)
SR 44	25.714	39.857	55.333	58.333	71.333	36.833
	(44.293)	(3[illegible].998)	(45.478)	(49.160)	(38.344)	(40.598)
SR 45	24.857	[illegible]429	26.833	48.500	25.000	45.833
	(25.47	(37.977)	(26.687)	(37.389)	(41.833)	(51.031)
SR 52	49.28	30.714	44.333	52.667	35.833	43.333
	(33.925)	(20.670)	(23.972)	(32.290)	(9.304)	(23.517)
SR Tot. Mod.	52.286	48.857	51.167	64.000	52.000	54.500
	(17.192)	(16.537)	(12.254)	(16.038)	(14.778)	(9.915)

*Success Rate

level. Thus, assignment to groups was as intended.

Table 2 also shows little difference across trials for each group, for the two composite variables, total module (Tot. Mod.) and success rate of total module (SR Tot. Mod.). The repeated measures of ANOVA's on these variables in Tables 3 and 4 show no significant sources of variance. Therefore, trainees were able to maintain a high rate of generation (approximately 65%) and a moderate success rate (approximately 50%) when given a new pupil with whom they had had no previous experience or knowledge, regardless of the reading level of the new pupil.

A multivariate analysis of variance was run on the percents of the five module prompts. Only the interaction term was significant ($F = 2.379$, $df_{hyp} = 10$, $df_{error} = 24$, $p < .040$). Therefore, reading level in combination with pupil familiarity does appear to influence the tutor's ability to generate prompts. Univariate analysis of these 5 measures were then run in order to look at the effects of each separately. Table 5 shows a summary of these repeated measures ANOVA's for the interaction term only. Univariately, only "44" is significant. In Figure 1, cell means are diagrammed for "44" prompts. Group 1, High to Low readers, increased use of "44" prompts when given an unknown pupil; group 2, Same level, generated the same percent of "44" prompts; and group 3, Low to High, decreased use of "44" prompts. Thus, when considered multivariately, reading level does interact with knowledge of pupil in affecting teacher performance. Univariately, this interaction is significant only for "44" prompts. Neither knowledge of pupil nor reading level alone appeared to affect performance. Figure 1 also shows cell means for the other four module prompts.

The success rates of each module prompt were also analyzed multivariately. Table 6 shows the results of this analysis. No sources of variance

Table 3

Repeated Measures ANOVA on Total Percent Module Prompts

Source	SS	df	MS	F	p<
Between Subjects					
Groups	122.163	2	61.081	.309	.739
SWG	3164.048	16	197.753		
Within Subjects					
Trials	125.289	1	125.289	.790	.387
GT	108.449	2	54.224	.342	.716
Residual	2537.762	16	158.610		

Table 4

Repeated Measures ANOVA on Success Rate

of Total Percent Module Prompts

Source	SS	df	MS	F	
Between Subjects					
Groups	320.247	2	160.123	1.171	.335
SWG	2187.595	16	136.725		
Within Subjects					
Trials	121.684	1	121.684	.402	.535
GT	432.292	2	216.146	.713	.505
Residual	4847.024	16	302.939		

Table 5

Summary of Repeated Measures ANOVA's on the

Percent of Each Module Prompt for the Interaction Term Only

Source	Variable	F(df)	MS	p<
GT		(2,16)		
	%33	1.508	411.819	.251
	%34	1.579	150.715	.237
	%44	5.806	236.316	.013
	%45	1.237	40.770	.317
	%52	.762	120.953	.483

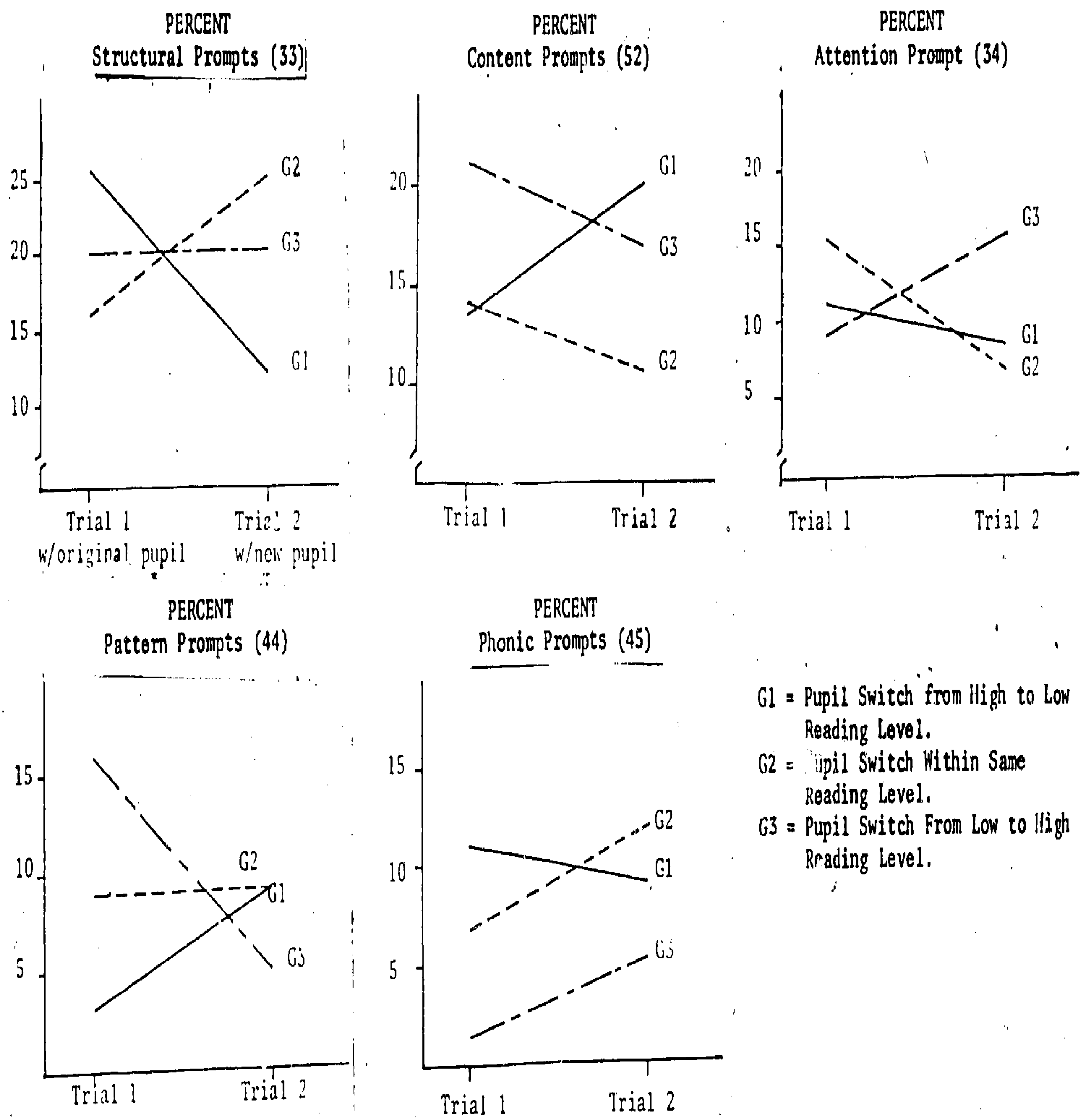
Table 6

Repeated Measures MANOVA on the Success Rate of Each

Module Prompt ("33", "34", "44", "45", "52") (First Roots Only Reported)

Source	F	df_{hyp}	df_{err}	p<	R(Canonical)
Group	.412	10	24	.927	.467
Trial	.971	5	12	.473	.537
GT	1.107	10	24	.397	.705

Figure 1. Mean percentage use of each module prompt with original (trial 1) pupil and new (trial 2) pupil.



G1 = Pupil Switch from High to Low Reading Level.
G2 = Pupil Switch Within Same Reading Level.
G3 = Pupil Switch From Low to High Reading Level.

are significant. Tutors, therefore, maintained ability to modulate and select appropriate prompts regardless of pupil reading level or prior experience with the pupil. Univariate ANOVA's were also run on success rates, and one was significant, trials for SE "45" ($F = 4.47$, $df = 1, 16$, $p < .05$). A look at Table 2 reveals that the success rate for "45" approximately doubled across trials for each group, thus <u>increasing</u> when tutors worked with an unknown pupil. In general, however, success rates of the module prompts did not significantly change when tutors worked with a new pupil, regardless of pupil reading level.

DISCUSSION

Given a group of subjects trained to criterion after 19 lessons of feedback, it appears that, as a total group, subjects can maintain both generation and modulation of behaviors when given a new pupil. For the two composite variables, total module percent and success rate of total module, there was very little difference across trials.

The results of the multivariate and univariate analyses on the percents of the separate variables verify this, with the exception of "44" prompts. Other variables approached significance for the interaction term, but suggest inconsistencies in maintenance of behavior when the cell means are studied. It is quite possible that this inconsistency is due to the nature of the behaviors, responses to pupil miscues, and not to trainee inconsistency. Only three of the prompts can be used with any word, "34", "45", and "52". Two of these, "34" and "45", show the smallest change across trials for each group. Variable "52" shows the largest increase across trials for Group 1, high to low. Since these trainees were working with new pupils much lower in reading level than their original pupils, their uncertainty as to what specific skills the new pupil had may have led them to give more general "52" prompts, e.g., "Does that sentence make sense?" Two of the prompts, "33" (structural) and "44" (pattern), can only be used when a miscue occurs on a certain kind of word, multisyllabic and word family, respectively. Group 1, high to low, shows a decrease across trials for "33", possible due to the lower frequency of multisyllabic words at beginning reading levels. Group 1 shows an increase in "44", pattern, across trials, as would be expected due to the high proportion of one-syllable words that fit in word families at low reading levels. If this is correct, then Group 3, low to high, should have performed exactly the opposite of Group 1 for these two variables. However, Group 3 showed no change across trials for "33", but these subjects did decrease sharply in their percent of "44" prompts across trials. Group 2, tutors who did not change reading level, showed no change across trials for "44", but a slight increase for "33".

The above discussion suggests that the characteristics of the instructional materials used may have been a stronger influence on teacher behaviors than pupil reading levels. It is apparent that studies investigating teacher word recognition strategies during oral reading lessons must have tight control over textual characteristics. Group 2, in which textual characteristics were most similar, showed the smallest changes over trials. Control of text may not be sufficient, however, since the teacher behavior being investigated only occurs after the pupil has made a miscue. Weinstein (1976) found that comparisons among reading groups on a similar variable, teacher treatment of wrong answers, was dubious because of the varying proportions of errors in the reading group, since with a low or zero error rate, no teacher behavior was required. Error rate can easily be controlled in studies such as this, but control over the exact words upon which pupils make miscues is extremely difficult. Word characteristics, however, do exert some control over the possible subsequent teacher response.

In general, the trainees maintained the same levels of behaviors when given a new pupil. Therefore, once pre-service teachers are specifically trained on a repertoire of behaviors, they are able to generalize to the new context of a pupil with whom they have never worked. The success rates of the generated behaviors are fairly moderate, even after training. This may be due to the fact that only four lessons were devoted to feedback on success rate. Further investigations of the effects of training in decision-making during interactive teaching (with the hoped result of increasing success rate to 75% or so) are necessary in order to determine how relevant knowledge of pupil characteristics is to high success rates of teacher behavior.

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5. Outcomes for Pupils Participating in the CATTS OROS Reading Tutorial Program

The purpose of this section is to present pupil outcome data collected during the CATTS-OROS practicum for pre-service teachers of the mildly handicapped. Although the focus of the teacher training program was on the development of trainee prompting skills, evaluation procedures were instituted to determine the effects of these trainee prompting skills on pupil behaviors, including the following: 1) pupils' verbalized and actual decoding strategies, 2) pupils' attitudes toward reading, 3) the general effect of practicum procedures on pupil achievement, 4) the types of miscues made by pupils during oral reading.

METHOD

Subjects

Pupils. There were 20 pupils from regular and special education classes who had moderate to severe reading deficits and were referred to the tutoring program by their teachers. Priority for acceptance into the after-school program was given to children referred by their teachers for difficulties in oral reading, word recognition and word analysis skills.

Criteria for admission into the tutoring program included a reading level at least one year behind actual grade level for second and third grade pupils, and at least a two-year deficit for pupils in the 4th, 5th, and 6th grades. Pupil selection procedures are described in Chapter I of this report. Each pupil was assigned to a tutor and, except for a few changes between semesters, each pupil remained with the same tutor for the two-semester program. Pupils received one hour of tutoring in a laboratory classroom at CITH, twice a week. Most pupils received a total of 10 to 12 hours of tutoring during the first semester and between twenty and twenty-two hours during the second semester.

Initially, 20 pupils were admitted to the program, with about six pupils on a waiting list. Several pupils were dropped from the program because they did not meet the criteria for reading deficit even though they were initially referred because of reading problems. Table 1 shows the relevant background data on pupils in the practicum. The table indicates the age, sex, grade placement, number of grades repeated, instructional reading level, and readability level of their basal reader during October, 1976. Data for pupils who were new in the program second semester were based upon January, 1977 test scores. There were 15 boys and 4 girls in the program. Mean age was 9.7 years with a range from 8.1 to 13.3 years. Pupils were drawn from grades 2 to 6, and 9 of 19 pupils had been retained in grade for a year.

Tutors. There were 20 pre-service teacher trainees who participated in the CATTS-OROS practicum. They were all majors in Special Education and had completed 12 hours of course work on teaching the mildly handicapped. All were concurrently enrolled in courses on theory and methods of reading and teaching the mildly handicapped. As part of the CATTS-OROS practicum, the trainees were required to assume responsibility for tutoring a pupil in need of remedial instruction. Practicum requirements are described in greater detail in Chapter I of this report.

Tutors received specific training designed to develop their skills in prompting pupils' oral reading miscues. CATTS and audio tape feedback were provided to the trainees to aid in development of specific prompting skills. Sections 1 and 2 of Chapter III of this report discuss the results of these training and feedback methods.

It was anticipated that trainee ability to generate appropriate prompting strategies would produce concomitant changes in pupil decoding strategies. Pupil

Table 1
Background Data on Pupils in Tutoring Program

Tutor No.	Pupil	Age	Sex	Grade Placement	No. of Grades Reported	Instr. Reading Level Oct, 76 (Woodcock)	Readabili Level
Audio Feedback Tutors (N=10)							
1	H.B	9.8	F	3	1	3.3	4.0
2	J.J.	9.7	M	4	0	3.0	4.0
3	C.S.	10.9	M	3	1	1.4	.4
5	M.Z.	12.6	M	6	0	1.7	.8
5*	A.M.	8.3	M	2	0	1.7	2.4
7	T.A.	9.9	M	3	1	3.1	2.5
11	K.J.	8.5	M	2	0	3.0	2.0
11*	M.Z.	12.6	M	6	0	1.7	.8
13	D.S.	9.0	M	3	0	2.5	2.5
14	E.S.	8.1	M	3	0	2.9	3.2
16	M.C.	13.0	M	6	0	8.5	3.0
16*	G.M.	8.7	F	2	1	1.6	.8
17	A.C.	9.5	F	3	1	2.7	2.0
CATTS Feedback Tutors (N=9)							
4	A.M.	8.3	M	2	0	1.7	2.4
4*	K.S.	9.6	M	3	0	2.7	2.0
6	L.P.	8.8	F	2	1	1.5	.8
8	J.R.	8.11	M	3	0	2.3	2.5
9	J.L.	10.4	M	3	1	2.8	2.4
10	M.S.	8.2	F	2	0	2.1	2.4
12	D.B.	13.3	M	6	1	3.6	3.2
15	W.F.	9.11	M	4	0	3.6	3.2
19	M.S.	8.5	M	2	0	1.2	.8
20	T.C.	9.4	M	2	1	2.1	2.5

*2nd Semester Child for that Tutor

decoding strategies were ascertained through analysis of pupil behaviors following a miscue made while reading from continuous text. Since all oral reading lessons were coded with the OROS system, data on the sequence of pupil behaviors were available for miscue analysis.

The intention of each of the prompting strategies (behaviors) that trainees were taught was to encourage the pupil to apply decoding strategies independently. The specific teacher strategies taught in this program are summarized as follows:

1. Prompt only meaning-change miscues.
2. Do not prompt any no-meaning-change miscues.
3. Increase the use of the five strategic module prompts which are:
   - (a) Structural. Teacher asks or tells pupil to identify syllables in an unknown word.
   - (b) Attention. Teacher focuses the pupil's visual attention on all of an unknown word.
   - (c) Pattern. Teacher gives, or asks pupil to give, a rhyming word or word family cue to an unknown word.
   - (d) Phonics. Teacher gives, or asks for, a phonics rule or sound-letter correspondence within an unknown word.
   - (e) Context. Teacher asks for, or gives, information about the meaning of the sentence or story in which the unknown word appears.

Assessment and Diagnosis

Upon entry into the tutoring program, pupils were assessed on attitudes, achievement, verbalized decoding strategies and on actual decoding strategies.

When the program was initiated in October, data for all pupils were obtained from the following sources:

1. Woodcock Reading Mastery Tests
2. Informal Reading Inventory (IRI)
3. Pupil Perceptions of Reading Interview
4. Miscue analysis using OROS observation system

When the program was concluded in April, all instruments except the IRI were re-administered. OROS data were collected at each lesson. A description of each of these instruments follows:

Woodcock Reading Mastery Tests. The Woodcock Reading Mastery Tests (Woodcock, 1973) are composed of five individually administered subtests: Letter Identification, Word Identification, Word Attack, Word Comprehension, and Passage Comprehension. These tests are suitable for grades K to 12. The results of the Woodcock were used by the tutors as a source of practical instructional and diagnostic information about their pupils.

Informal Reading Inventory. A second diagnostic measure used to obtain information on the pupils was an Informal Reading Inventory (IRI) (Windell, 1975). The IRI was used to determine the instructional reading level of the pupils. This is the level at which the pupil can read approximately 90 to 99% of a passage correctly and correctly answer about 75% of the comprehension questions.

In determining whether a child could read a passage within the 10% error rate, only words that significantly changed the intended meaning of the sentence were labeled as errors. Miscues, such as repetitions or synonym substitutions, were not considered errors. IRI's for the tutors to administer at the start of the project were developed by drawing on graded passages and word lists form the New Open Highways Reading Series (for sample IRI's see Appendix). The IRI's given to the pupils consisted of three parts--a word list, an oral reading passage and comprehension questions.

The scores from the oral reading passage and from the comprehension questions were used jointly to determine the reading placement level, as shown below:

Reading Placement Level

Independent level	95% accuracy	90% comprehension
Instructional level	90-95% accuracy	75% comprehension
Frustration level	90% accuracy	75% comprehension

For the purpose of the oral reading strategy lessons only, pupils were placed one level above their instructional level in order for sufficient miscues (that require prompting) to occur. All other instruction was conducted at the instructional reading level.

Pupil Perceptions of Reading. The third instrument used to collect information about the pupils was an attitude survey. The Pupil Perceptions of Reading Interview (Andrews, 1974), developed by a doctoral student at Indiana University, consisted of seven open-ended questions about reading, such as "What is the best (worst) thing about reading?" (See complete questionnaire in Appendix.)

The Andrews questionnaire was used to evaluate children's attitudes toward reading and to collect information on pupils' verbalized decoding strategies. The open-ended interview elicited some interesting responses from the children (protocols of children's statements about reading may be found in Appendix), but it was apparent that a scoring system to organize the data collected would enhance its usefulness. Since none was provided, the staff of the project devised a three-way classification system (positive, neutral or negative) to rank the children's responses to the first four attitude questions.

Pupil verbalized knowlege of decoding strategies. Questions 5, 6 and 7 of the interview dealt with the children's knowlege and awarness of how to apply word recognition strategies. Children were given the opportunity to provide up to three answers to questions about what they do when confronted with a word that they do not know. The pupil responses were classified into nine decoding strategy categories (Table 8). The responses were also ranked according to the amount of pupil independence in decoding indicated by the answer. Changes in pupil responses were measured by comparing data obtained in October at the outset of the program with data from interviews held at the end of the program in April.

Miscue Analysis. The data on changes in pupil strategies in decoding were indicated by the types of miscues made during oral reading and were collected from observation system data of tutor-pupil interaction occuring during oral reading lessons. The Oral Reading Observation System (OROS) was used to obtain the interactive data. Pupil miscue categories of the OROS are as follows:

MEANING-CHANGE MISCUE (21)* The miscue changes the meaning of the sentence.

MEANING-CHANGE MISCUE SUBCATEGORIES:

No Response Miscue (210)
The pupil does not attempt the word at all.

Letter/Syllable Miscue (24)
The pupil makes an isolated sound for one or more letters of the word.

No Graphic Similarity/Low Graphic Similarity Miscue (212)
The pupil substitutes a word that has fewer than half the letters as letters in the text word.

High Graphic Similarity Miscue (213)
The pupil substitutes a word that has at least half the letters the same as letters in the text word.

Insertion/Omission (215)
The pupil omits a word which is in the text or inserts a word into the text.

NO-MEANING-CHANGE MISCUE (22) The miscue does not substantially change the meaning of the sentence.

NO-MEANING-CHANGE MISCUE SUBCATEGORIES:

No Graphic Similarity (222)
The word the pupil substitutes is very different than text word (no more than 2 letters the same), but the new word does not change the meaning of the sentence.

High Graphic Similarity (223)
The word that pupil substitutes is very much like the text word (3 or more letters the same), but the substitution does not change the meaning of the sentence.

Dialect-Based Miscue (224)
The pupils miscue occurs because he is translating text grammar or words into his own language.

Insertion/Omission (225)
The pupil omits a word which is in the text or inserts a word into the text that does not change the meaning of the sentence.

*All numbers in parenthesis are OROS code numbers.

Results

Reading Achievement. The teacher training program in which trainees learned and applied specific oral reading prompting techniques did co-occur with positive changes in the general reading performance of children who had previously had trouble learning to read. As seen in Table 2, the Woodcock Reading Mastery Test scores increased for the children on each of the five subtests as well as on the total reading score. The group mean grade level score in October was 2.4 (sd = .73), while in April the group mean reading grade-level achievement score had increased to 3.05 (sd = .88). The mean increase in reading skill for the children was, thus, greater than 6½ months during the six months the tutoring program was in operation. A correlated t-test showed this increase in reading achievement scores between October and April, as measured by the Woodcock Reading Mastery Test to be significant, $t(19\ df) = 4.54$, $p < .005$.

A corroborating measurement of increased reading achievement can be found in Table 3 which shows the grade equivalent readability levels (as computed by the Harris and Jacobson readability formula (Harris & Sipay, 1975) of the books the individual children were reading in April compared to October. The group mean reading level in October was 1.74 (sd = 1.02). In April, the group mean reading level was 3.03, (sd = 1.17) resulting in a mean gain of 1.35 grades, (sd = .68). A correlated t-test showed this to be a significant increase in reading level, $t(19\ df) = 7.9$, $p < .001$.

Attitudes towards reading. A comparison of the answers to the attitude questionnaire before and after the reading tutoring program showed that the number of pupils with negative or neutral attitudes toward reading both decreased, while the number of pupils with positive attitudes increased

Table 2

Woodcock Reading Mastery Test Pre (October) and Post (April) Scores and Gain for all Subjects

	Letter Identification			Word Identification			Word Attack			Word Comprehension			Passage Comprehension			Total Reading		
Pupil	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain
T. A.	3.8	3.5	-.3	2.8	3.9	+.8	3.0	3.8	+.8	2.9	2.6	-.3	2.9	4.1	+.2	3.1	3.6	+.5
D. B.	12.9	6.2	-6.7	3.1	2.8	-.3	2.8	2.9	+.1	3.1	5.1	+2.0	3.7	3.2	-.5	3.6	3.5	-.1
H. B.	3.8	6.2	+2.4	3.1	3.4	+.3	3.5	3.2	-.3	2.7	2.7	0	3.9	4.0	+.1	3.3	3.6	+.3
A. C.	3.5	6.2	+2.7	2.3	3.0	+.7	2.2	3.5	+1.3	2.9	2.4	-.5	2.7	3.8	+1.1	2.7	3.4	+.7
T. C.	2.1	4.3	+2.2	2.1	2.6	+.5	2.1	6.7	+4.6	1.7	3.1	+.4	2.3	3.6	+1.3	2.1	3.4	+1.3
W. F.	4.3	6.2	+1.9	3.3	2.8	-.5	3.0	3.7	+.7	3.6	3.4	-.2	3.4	3.1	-.3	3.6	3.4	-.2
J. J.	3.5	12.9	+9.4	2.6	3.9	+1.3	5.1	12.9	+7.8	2.0	2.5	+.5	2.9	4.0	+1.1	3.0	4.9	+1.9
S. K.	3.3	3.8	+.5	2.4	2.8	+.4	3.3	3.7	+.4	2.3	3.3	+1.0	2.5	---	---	2.3	3.7	+1.0
J. L.	6.2	12.9	+6.7	2.1	2.5	+.4	2.6	3.8	+1.2	3.0	5.3	+2.3	2.1	3.5	+1.4	2.8	3.6	+.8
A. M.	1.9	3.5	+1.6	1.8	3.3	+1.5	2.0	8.1	+6.1	1.4	3.7	+2.3	1.6	4.1	+2.5	1.7	3.9	+2.2
G. M.	2.2	3.4	+1.2	1.7	2.1	+.4	1.2	1.8	+.6	1.5	2.4	+.9	2.1	2.1	0	1.6	2.3	+.7
J. R.	3.8	6.2	+2.4	1.9	2.6	+.7	1.4	1.7	+.3	2.6	2.8	+.2	2.6	3.0	+.4	2.3	2.9	+.6
E. S.	12.9	6.2	-6.7	2.6	3.6	+1.0	2.6	3.7	+1.1	1.7	2.8	+1.1	2.7	3.1	+.4	2.9	3.6	+.7
M. S.	2.1	2.9	+.8	1.9	2.6	+.7	2.0	3.0	+1.0	2.0	2.8	+.8	2.0	2.7	+.7	2.1	2.8	+.7
M. S.	1.7	2.3	+.6	1.4	1.6	+.2	1.2	1.8	+.6	1.3	1.4	+.1	1.1	2.2	+1.1	1.2	1.7	+.5
C. S.	1.9	2.3	+.4	1.5	1.3	-.2	1.6	1.7	+.1	1.2	1.2	0	1.6	1.5	-.1	1.4	1.4	0
D. S.	3.1	3.4	+.3	2.5	3.0	+.5	2.0	3.1	+1.1	1.9	2.5	+.6	2.4	2.5	+.1	2.5	3.0	+.5
L. V.	2.2	2.8	+.6	1.5	1.9	+.4	1.4	2.2	+.8	1.4	1.5	+.1	1.6	1.9	+.3	1.5	2.0	+.5
M. Z.	2.8	2.5	-.3	1.5	1.6	+.1	1.6	1.7	+.1	1.8	1.5	-.3	1.5	1.7	-.2	1.7	1.7	0

Table 3

Readability Level of Books used for Instruction

in October and April

CHILD	LEVEL OF 1ST BOOK READ	*READABILITY LEVEL	LEVEL OF LAST BOOK READ	READABILITY LEVEL	# OF BOOKS COMPLETED	INCREASE IN EQUIVALENT GRADE LEVELS
1	2B	2.0	4.0	3.2	4	1.2
2	3B	2.5	I**	4.0	3	1.5
3	3B	2.5	J***	5.0	4	2.5
4	2A	2.4	4.0	3.2	5	1.8
5	2B	2.0	4.0	3.2	4	1.2
6	4.0	3.2	I	4.0	1	.8
7	4.0	3.2	J	5.0	1	1.8
8	3A	2.4	3.0	3.0	3	.6
9	2A	2.4	4.0	3.2	5	.8
10	1B	.4	4.0	3.2	7	2.8
11	1B	.4	2B	2.0	4	1.6
12	2B	2.0	4.0	3.2	4	1.2
13	3B	2.5	I	4.0	3	1.5
14	2A	2.4	4.0	3.2	5	.8
15	1B	.4	1.0	1.0	2	.6
16	1B	.4	.8	.8	2	.4
17	2B	2.0	4.0	4.0	4	1.2
18	1C	.8	4.0	4.0	6	2.4
19	1B	.4	2B	2.0	4	1.6
20	1B	.4	1.0	1.0	2	.6

* The Harris & Jacobson readability formulas 1 and 2 were used to determine these levels.

** Level I of the Lippincott Basic Reading Series

*** Level J of the Lippincott Basic Reading Series (see Table 4). Although the changes were not statistically significant ($t = 1.2$ $p < .051$) 7dS), the trend was toward more positive attitudes.

The Pupils Attitude scores were subsequently correlated with achievement scores in order to determine whether any relationship existed between pupils' attitudes toward reading and their reading skill. Based on the October scores of the respective tests, a Pearson Product Moment correlation yielded an r of .50 ($p > .05$). The correlation of April scores however was .23 ($p < .05$).

Pupil knowledge of decoding strategies. The pupil interview permitted us to ascertain the number of word recognition strategies the children could name. Table 5 shows the number of strategies named by each pupil during the October interview and the number named in April. The mean number of strategies named in October was 2.4 and 3.2 in April, and these changes were found to be statistically significant ($t_{17df} = 27$ ($p < .05$).

The quality of the answers given by children in response to questions concerning word recognition strategies (i.e., "When you're reading and you come to a word you don't know, what do you do--How does that help you?") were ranked according to the degree of independence of the word attack strategy indicated by the pupil's response. Table 6 shows the mean rank for 3 responses on the four-point scale. The mean rank for independence of strategy was 1.87 in October and the mean was 2.22 in April, the differences between the two interviews were not statistically significant ($t_{df17} = 1.30$, $p < .05$).

The same data is shown in Table 7, where the types responses given by the pupils in the study are listed, and the number of such responses given in the October and April interviews are shown.

Table 4

Changes in pupils' attitudes toward reading between October and April

	Attitude Index		
Subjects	October	April	Net Change
1	2	2	0
2	2	2	0
3	1	2	1
4	3	2	-1
5	2	3	1
6	1	3	2
7	3	3	0
8	3	3	0
9	3	3	0
10	2	3	1
11	1	2	1
12	2	3	1
13	2	1	-1
14	2	2	0
16	1	1	0
17	3	3	0
18	2	1	-1
20	1	1	0

	Number of Pupils		
Attitude	October	April	Net Change
Positive (3)	5	8	+3
Neutral (2)	8	6	-2
Negative (1)	5	4	-1

Table 5

Number of word recognition strategies named by pupils during interviews in October and April

	No. of Strategies	
Pupil	October	April
1	2	2
2	1	3
3	2	1
4	3	3
5	3	2
6	2	4
7	4	2
8	3	5
9	2	4
10	1	3
11	2	3
12	2	2
13	2	3
14	2	4
15	2	2
16	3	4
17	2	3
18	2	4

Table 6

Pupil Independence in Word Recognition Strategies Mean Rank

	Mean Rank		
Pupil No.	Oct.	April	
1	2.67	2.67	Pupil independence in word recognition strategies: scale:
2	1	2	
3	1.33	.67	
4	3	1.33	
5	2.67	2	
6	1.67	3	
7	3	1.67	3 = independent
8	2	3	
9	1.67	2.67	2 = dependent
10	.67	2	
11	1	3	1 = static
12	2	2	
13	1.33	2.33	0 = neutral
14	1.67	2.67	
15	2.67	1.33	
16	2.67	2	
17	1.33	2.67	
18	1.33	3	
Mean	1.87	= 2.22	

Table 7

Decoding strategies named by pupils

Decoding Strategy	Number of Responses October	April
Ask for assistance	15	14
Sound out word	12	14
Omit word	5	9
Use phonics	3	2
Spell word	1	0
Use context	1	8
Use structural analysis	1	3
Guess	0	1
Other (try it, think about, memory)	2	2

The difference in total n of the two interviews is due to the free response nature of the interview. Not all children supplied the maximum of 3 answers to the interview items; thus, difference in total n is due to this source of variability. The only pupil decoding strategy showing a positive change was the use of context cues, which was, of course, the teacher behavior emphasized in the training program.

Miscue Analysis. In order to determine if pupil strategies of decoding changed as a result of the teacher prompting behaviors, data was collected during the oral reading strategy lessons on the kinds of miscues made. The results are in Table 8. The October data is from Trial 1 of the first semester, formed by collapsing the first six lessons. The April data is Trial 4 of second semester, formed by collapsing the lessons 18-21 of the second semester.

The data was not analyzed formally since (1) changes in pupils occurred and (2) instructional materials were not controlled. There appear to be few changes in individual categories. However, a sum of all substitution miscue categories reveals that, in October, 57.9% of the miscues were substitutions and, in April, 85.1% were substitutions. This suggests one effect of the prompting behaviors used by tutors on pupil decoding strategies--an increase in pupil responding to unknown words with whole words, instead of omitting the text word, or sounding it out.

Discussion

Pupil participation in the tutoring program was accompanied by gains in reading achievement over the course of the program. The tutoring program lasted six months, and the average pupil gain in reading skill was 6½ months as measured by the Woodcock Reading Mastery scores. The readability level

Table 8

Means and Standard Deviations for Percents of all Miscue Categories by Time

Variable	October $\overline{X}$	October SD	April $\overline{X}$	April SD
Total 21	76.800	8.501	83.263	5.961
210	15.750	13.301	12.368	12.495
211	6.050	8.744	3.263	5.331
212	18.100	10.794	30.473	10.663
213	32.450	16.275	31.578	14.833
215	2.800	2.353	4.000	3.366
Total 22	22.250	8.575	15.736	5.961
222	4.200	3.488	2.894	2.622
223	5.200	2.876	5.052	3.390
224	7.850	6.698	5.842	3.905
225	3.900	3.059	.789	1.031
Total 63's	15.550	8.242	12.473	7.343

of the books mastered by the children likewise increased greatly over the course of the tutoring program.

Given the poor educational performance of these pupils in the past (all had been referred because of reading retardation, about half had repeated at least one grade and about a third were mainstreamed or special class pupils), the normal rate of gain achieved during their participation in the program would have to be seen as a substantial achievement.

The measures of children's attitudes toward reading, as elicited by the attitude interview, did not show a significant change over the course of the tutoring program. This lack of measured attitude change could be due to a number of possibilities--the fact that attitudes are difficult to change; that the 6-month period was too short a time in which to measure such a change; that the attitude interview was not able to accurately elicit the information and that the scoring system was too crude; or that there was no change in attitude.

In addition, the children were receiving reading instruction in their classes at school on a regular basis and for at least 5 hours a week, while the tutoring program accounted for only 2 hours. Furthermore, the nature of the pupils reading experiences in their own classrooms was an uncontrolled factor which may have affected their responses to the attitude interview.

The analysis of the interview questions on the pupils knowledge of word attack strategies showed that there was an increase in the number of word recognition strategies that a child could describe at the end of the tutoring program compared to the number that the child could describe at the beginning of the program. When the pupils' verbalized strategies were ranked on independence, the average rank for the pupils in the program increased over time, although the change was not statistically significant.

Pupils also showed an increase in their use of content cues as a verbalized decoding strategy for dealing with unknown words. This finding provides some evidence that pupils were incorporating a strategy into their repertoire that the tutors had been specifically trained to teach. This finding also indicates that a strategy which the tutors learned had some effect on pupil behavior at the verbal level.

At the behavioral level, there were changes in pupil miscue patterns in the use of substitutions in responding to unknown words between October and April, indicating that pupils changed in the direction of responding to unknown words with whole words, rather than omitting the word or sounding it out. This is a strategy which indicates greater self-reliance and hypothesis generation by the pupil.

The effects of the tutoring program on participating pupils may be summarized as follows: 1) increases in reading achievement as measured on a standardized diagnostic instrument; 2) increases in the difficulty level of the books the children were able to read; 3) increases in the number of word recognition strategies named by pupils in response to questions on how they approach unknown words; 4) a trend to greater independence in word attack strategies named by pupils in response to interview questions; 5) increase in naming context cues as a decoding strategy; and 6) greater use of substitutions in dealing with unknown words during oral reading.

These effects were obtained from multiple evaluation sources; standardized tests, observation data and pupil responses to interviews. While the gains made by pupils could not be directly related to the teacher training strategies, there were positive outcomes for pupils and a number of findings which suggested a relationship between certain pupil behaviors and the teacher training interventions.

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Appendix

TABLE OF CONTENTS

Section 1.

CATTS Trainee Manual I

Introduction

The tutoring program you are participating in this year is designed to meet the following objectives;

1. To provide a laboratory classroom in which to practice and develop selected teaching skills.

2. To assist a child who is below grade level in reading to improve his/her reading skills.

3. To assist trainees in refining interactive teaching skills by providing feedback on teaching performance.

Thus far, you have completed one semester of work with a pupil; and have demonstrated some mastery over the problems of selecting appropriate instructional objectives and lesson planning. Work this semester will concentrate on refining your interactive teaching skills. Interactive teaching skills are those give and take transactions (mainly verbal) between teacher and pupil which are under the control of the teacher and geared to the accomplishment of specific instructional objectives.

As you know, the major instructional objectives in this practicum are concerned with the teaching of reading. Achievement of the instructional goals for the pupil requires first of all, careful analysis of the instructional task and then a construction of a plan of action for achieving the goals. A similar process takes place in determination and analysis of behavioral goals of teaching.

The focus this semester will shift from goal setting for the pupil to the setting of teacher behavioral goals. It is certain that your interactions with the pupil will affect the pupils' responses, and over time should affect how the pupil learns.

The Computer-Assisted Teacher Training System (CATTS)

The Teacher Education Laboratory in which you conduct the practicum is part of a unique Computer-Assisted Teacher Training System (CATTS), designed for the development and improvement of interactive teaching skills.

The CATTS system was developed at the Center for Innovation in Teaching the Handicapped (CITH), and it is designed to provide real-time (instantaneous) feedback or delayed (post-teaching) feedback of information about teacher and pupil interactions. How feedback is used for the development of teaching skill will be discussed in detail in Section 2 of this Manual.

The Role of Feedback in Skill Development

Development of teaching skill obviously requires the opportunity to practice. But as psychologists have consistently shown, practice alone is insufficient to assure the development of skills. For practice to be instrumental in changing teaching behaviors in a desired direction, clearly articulated behavioral objectives for both teacher and pupil must be present. Another crucial variable in skill development is feedback on performance. Both pupils and teachers need feedback on their performance in order to modulate their teaching behavior/learning responses in terms of the behavioral objectives. Thus, the three critical factors in skill development are: (1) clearly defined goals or behavioral objectives, (2) opportunity to practice, (3) feedback.

The feedback teachers usually receive is from supervisors who often vary greatly in their degree of objectivity or in their preferences for focusing on one aspect of teaching or another. The CATTS system provides a method of overcoming the subjectivity of supervision by providing feedback in the form of observation system data. The definitions of the categories of the observation system are public to all so that the meaning of the feedback is the same for both trainee and supervisor. In addition, the objective nature of the feedback makes self-evaluation an alternative to traditional supervision.

The application of computer technology in teacher education is based upon a teacher training model also developed at CITH. The model should help you visualize how your teaching experiences will be structured in this practicum course.

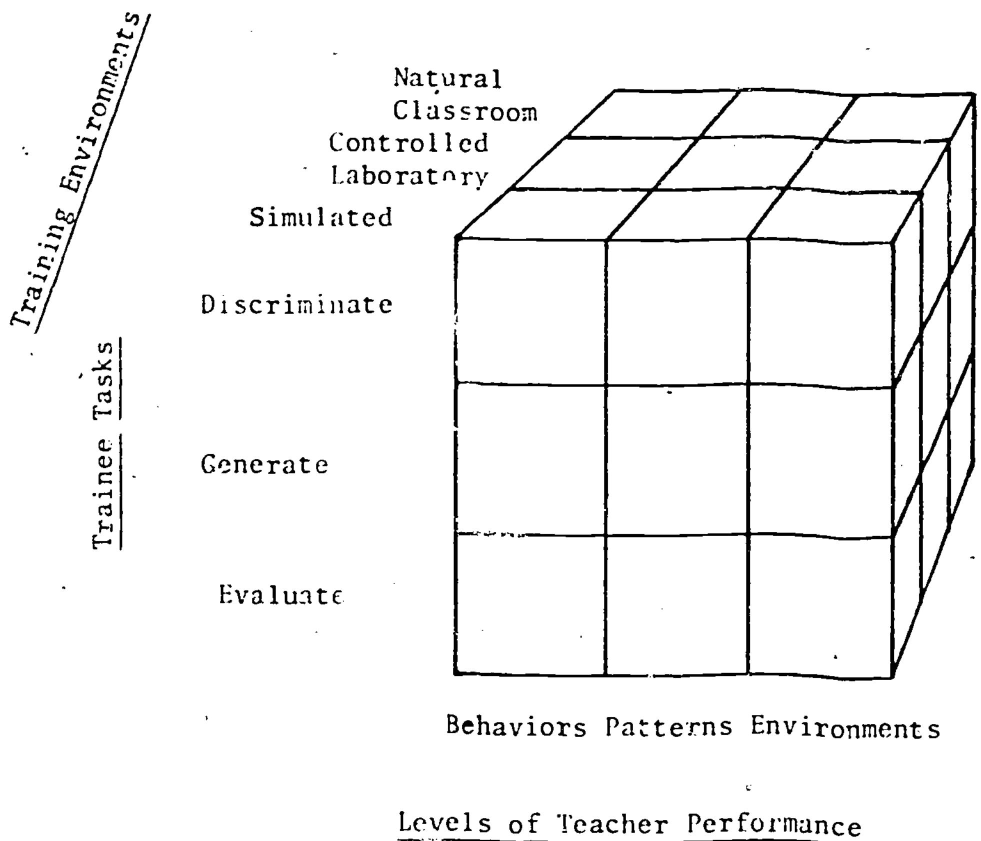

Figure 1: CITH Teacher Training Model[1]

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[1] Semmel, M. I. Application of Systematic Classroom Observation to the study of pupil-teacher interactions in Special Education, 1974.

Phases of Teacher Skill Development[2]

1. In developing teaching skills, you obviously need to know what they are - you are able to discriminate instances of these skills when you see them. One way of acquiring discrimination skills is by learning an observation system which focuses on those teaching skills.

2. The next phase is for you to try out those teaching skills, or generate them in a teaching situation. In this practicum you will have numerous opportunities to practice specific teaching skills that you chose to work on.

3. In order to know how well you have developed the given instructional skills and how to modify your performance to bring it closer to your objectives, you need feedback for evaluation of performance. Rather than having someone else evaluate your progress, you will have data upon which to evaluate yourself. You will be able to do this by using the objective observation system records that trained observers have collected during the lessons you teach.

Feedback as a Source for Decision-Making

Feedback and evaluation information can also be used for an analysis of your pupil's performance as well as your own, and you can incorporate this source of information to plan new behavioral goals and strategies for the next lesson. Thus, in addition to using feedback for developing interactive teaching skills, you can use the feedback data for instructional decision-making - e.g., lesson planning based upon pupil/teacher behaviors

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[2] This section is reprinted from CATTS Manual, 1973, Module 2. Observation system coding (Frick, T. and Hasselbring, T.).

that have actually taken place. This information and analysis can become the basis fc. deciding how you will change and structure the interactive aspects of the next lesson.

Learning an Observation System

The key to the implementation of the training model [Discriminate-Generate-Evaluate] and the development of interactive skills is knowledge of the categories of the observation system covering the domains of interest. This semester, the focus is on pupil oral reading. This is the domain of interest. You are already familiar with many of the terms and definitions involved in pupil oral reading and teacher prompting, through completion of Tips for Teacher Module II: Prompting A Skill for Helping Children in Oral Reading (Brady, 1975).

In order to interpret the feedback available through CATTS, you will need to become familiar with the terminology and definition of the Oral Reading Observation System (OROS). You will need to be able to discriminate different instances of pupil miscues and teacher prompts or other behaviors that occur during oral reading, so that you can interpret feedback and modify your own teaching behaviors.

The plan for this semester is for you to spend at least six hours during the first two weeks of the term mastering the Oral Reading Observation System. By the third week of the practicum, you will receive instruction on how to use the feedback available to you while you are teaching, and on how to analyze the feedback data in planning strategies for improvement of pupil oral reading.

The next section of this manual contains the student version of the (OROS-S) Oral Reading Observation System (Lynch, Brady, Cohen, 1975).

Read the Manual before the first training session. Memorize the definition of each category and make note of any questions you have concerning the OROS, so that they can be discussed during the training sessions.

Section 2.

OROS Training Manual: Student Version

The Oral Reading Observation System (OROS)

OROS focuses on teacher-pupil verbal interaction when pupils are reading aloud. Oral reading can be used for a variety of objectives in the classroom: (1) diagnosis, (2) practice, (3) communication of information, (4) instruction. In the first three situations, there should be little or no teacher interruptions as the pupil reads. However, when oral reading is used to meet instructional goals, the teacher assists the pupil to use his/her previous knowledge about words, word recognition rules, and context to figure out unknown words.

Children often do not read stories word for word, even when the material is easy for them. Any pupil deviation from what is printed in the story is called a miscue, whether the child substitutes one word for another, inserts a word into the text, omits a word, or stops reading entirely.

Some miscues do not change the author's intended meaning. These miscues occur because the child is reading the way he speaks, using familiar words, or they occur because the child didn't know a word and substituted a similar one based upon his knowledge of what kind of word should go where the unknown word was.

Some miscues change the author's intended meaning and/or do not make sense in the sentence. The miscues that change the meaning of the sentence are indicative of the pupil's failure to use cues or available information accurately in decoding the unknown word. It is in these instances that the pupil needs assistance.

OROS can answer the question, "What kinds of miscues do pupils make as they read orally?" One purpose of OROS is to describe the kinds of miscues pupils make as they read orally.

Many teachers require a child to read without miscues, even if the miscues do not change the meaning of what is read. Other teachers want the child to read for meaning and only help the child when his miscues change the meaning of the text being read. The first approach can be called an exactness approach because the teacher requires the child to read each word exactly as printed. The second approach is a language-based approach because the teacher believes that the child should read for meaning using what s/he knows about language and reading, even if some words are changed. The second purpose of OROS is to distinguish between these two approaches to miscues.

The third purpose of OROS is to classify how a teacher helps a child when a miscue is made. Teacher responses to miscues can focus on many different things, e.g., telling the pupil to look at all or part of the unknown word, giving sound(s) of the word or saying "That's wrong, try harder." OROS data can be used to identify the word recognition strategies a teacher is teaching her students to use.

The fourth objective of OROS is to show how helpful the teacher's prompts are for the child, i.e., how often is a particular prompt followed by a correct answer? OROS indicates how effective the teacher's strategies are for the reader.

In conclusion, the purpose of OROS is to categorize pupil miscues, teacher responses to miscues, and pupil answers during oral reading of stories. It can be used in any classroom where a teacher has pupils read materials orally, regardless of the materials being read, as long as the teacher is using oral reading instructionally. It can be used at any grade level but will probably be most useful in those classes where pupils have reading levels from approximately the beginning of first grade to the middle of the third grade, since it is at these reading levels that word recognition is the focus in reading instruction.

Prompting During Oral Reading

The end goal of prompting during oral reading instruction is no teacher prompting at all. That is, the child has learned to recognize and apply the appropriate cues to decode words or the meaning of the text and no longer needs any teacher help. The assumption is that the techniques a teacher gets children to use for oral reading are effective in decoding words and meanings. An instructional module which teaches effective oral reading strategies was developed by Brady and Lynch (1975). The module teaches the user to employ the most effective prompts during oral reading instruction and also to use decision rules as a guide to chosing the "best" prompt to use in a given situation. Refer back to the module in planning your own oral reading strategies.

For a prompt to be effective, it must account for the lexical or graphic characteristics of the word in the text, and the child's knowledge of reading. It is not enough for teachers to know what prompts to use, the teacher must also know how to decide whether or not a particular prompt is appropriate.

Coding Teacher-Pupil Oral Reading Interaction

OROS is a classroom observation system called a category system. That is, an observer records the occurrence of each category of behavior as it takes place during interactive oral reading. The observer using OROS distinguishes between discrete events (such as miscues and prompts) and tallies the occurrence of each event into one of the categories of OROS.

Some interactions take very little time, others extend over a relatively long period. Each unit coded on an OROS record represents a single event (e.g., a miscue). The system is not time based, it is behavior based. One code is made per event, regardless of how much time has elapsed. Behaviors coded on OROS, with the exception of exact oral reading, usually occur in rapid succession.

When observation is completed, OROS privides a record of the events (interactions) that have occurred during oral reading, and in the exact sequence in which they occurred. The record can then be analyzed in a variety of ways.

Learning the OROS Categories

Read, understand, and memorize the names and definitions of each category in the system. It will give you the ability to discriminate these behaviors when you see them, and will also enable you to use the coded information about your own interactions. It will also be helpful for you to learn to associate the code numbers for each category with the name of the category, since the feedback on your lessons will be printed out in coded form. However, you can always refer back to the manual and summary sheet to interpret the feedback information you will receive.

Figure 2 presents the main categories of OROS in the typical sequence of events as they occur in an oral reading activity. You can see from Figure 2 that there are eight main categories (there is a ninth category, not shown, for miscellaneous events that do not have anything to do with the oral reading itself). In the order in which they usually occur, the categories are as follows:

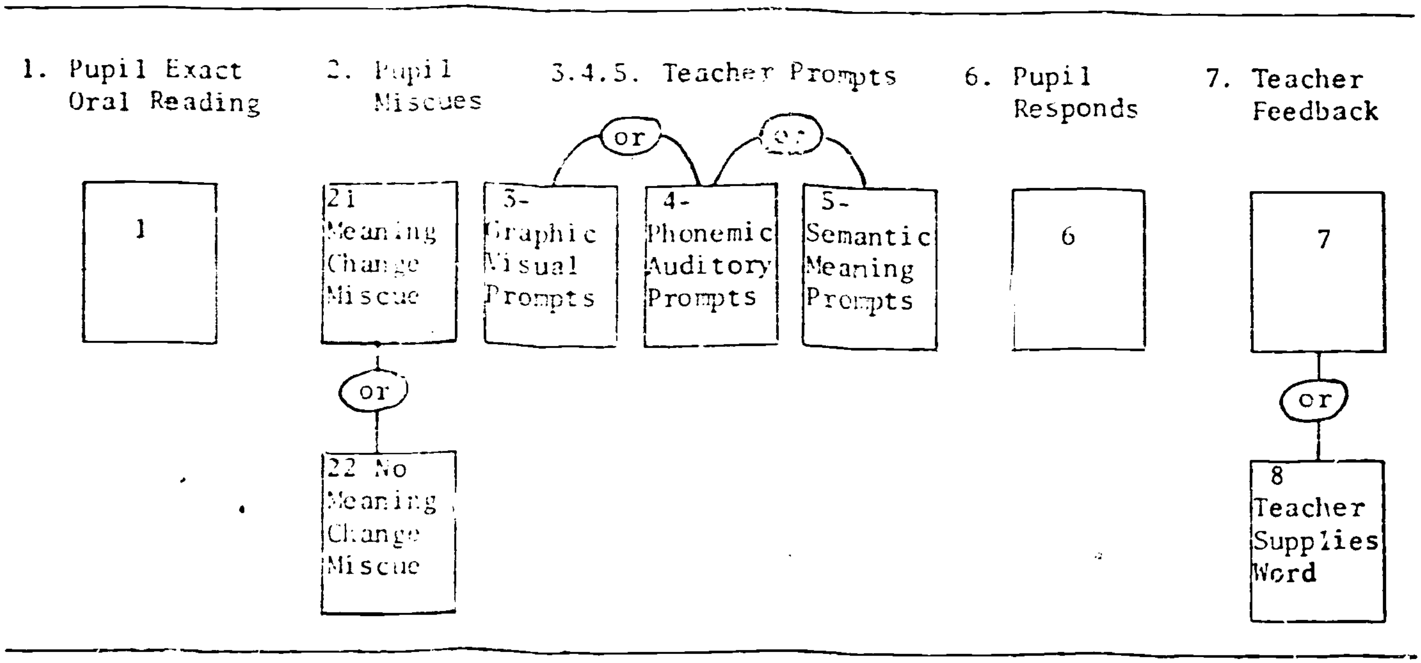


Figure 2. Main Categories of OROS

Table 1 summarizes the main categories of the OROS. Although there are nine main categories in the OROS, the two PUPIL MISCUE subcategories are as essential to the total system as any of the other main categories and so are included in the summary of main categories.

Table 1. Summary of Main OROS Categories.

Code Number	Category
1.	Pupil Exact Oral Reading.
2.	Pupil Miscue: Pupil deviates from written text. There are two types of pupil miscues:
21	Meaning change miscues.
22	No meaning change miscues.
3.	Teacher prompts on <u>Graphic</u> (written) features of word.
4.	Teacher prompts on <u>Phonemic</u> (sound) features of word.
5.	Teacher prompts on <u>Semantic</u> (meaning) features of word.
6.	Pupil responds to teacher prompt (e.g., correct, incorrect answers).
7.	Teacher gives feedback to pupil response.
8.	Teacher tells pupil the exact word.
9.	Behaviors <u>not</u> related to oral reading.

Many of the major categories in the system can be further divided into useful subcategories. The expanded OROS which includes subcategories and definitions for each category and subcategory follows:

Oral Reading Observation System-S

Definitions of Categories

1	Exact Oral Reading:	The pupil reads with no miscues.
2	Pupil Miscue:	The pupil deviates from the text in some manner.
21	Meaning Change Miscue:	The miscue changes the meaning of the sentence.
	Meaning-Change Miscue Subcategories:	
210	No Response Miscue:	The pupil does not attempt the word at all.
211	Letter/Syllable Miscue:	The pupil makes the sound for one or more letters or says one syllable of the word.
212	No Graphic Similarity/ Low Graphic Similarity Miscue:	The word that the pupil substitutes has no more than two letters that are the same as letters in the text word.
213	High Graphic Similarity Miscue:	The word that the pupil substitutes has 3 or more letters same as letters in text word.
215	Insertion/Omission	The pupil omits a word which is in the text or inserts a word into the text.

22	No Meaning Change Miscue:	The miscue does not substantially change the meaning of the sentence.
	No Meaning Change Miscue Subcategories	
222	No Graphic Similarity Miscue:	The word the pupil substitutes is very different than text word (no more than 2 letters the same),but the new word does not change the the meaning of the sentence.
223	High Graphic Similarity Miscue:	The word that pupil substitutes is very much like the text word (3 or more letters the same) the substitution does not change the meaning of the sentence.
224	Case/Tense/Pronunciation Miscue:	The miscue changes the case or tense or is a dialect pronunciation which does not change meaning of the sentence.
225	Insertion/Omission:	The pupil omits a word which is in the text or inserts a word into the text that does not change the meaning of the sentence.

	Teacher Prompts (3, 4, 5)	
3	Graphic (Visual) Prompts:	Teacher prompts on the graphic features (letter, syllable, structure) of the word.
	Subcategories	
31	Letter Name:	Teacher names or asks for a letter(s), consonant blends, digraphs, within the word.
32	Spelling:	Teacher spells or asks the child to spell the word.
33	Structural:	Teacher tells pupil, or asks pupil to identify syllables in the word.
34	Attention:	Teacher focuses the child's visual attention on word. ("Look at it"!)
4	Phonemic (Sound) Prompts:	Teacher prompts on the sound features (consonants, stress, patterns, phonic role) of word.
	Subcategories	
41	Isolated Sound:	Teacher gives or asks pupil to make the sound for letter (also digraphs and blends) in the text word.
42	Sound Out:	Teacher sounds out the word letter by letter or asks the pupil to do so.
43	Unnatural Stress:	Teacher gives unnatural stress to one consonant (or blend or digraph) and then says the rest of the word in a natural manner.
44	Pattern:	Teacher asks pupil for, or gives pupil a rhyme or word family clue to text word.
45	Phonics:	Teacher asks for or tells a rule concerning the letter/sound relationship in a word.

5	Word Prompts:	Teacher uses semantic features of word or sentence to aid in identification of word.
51	Word Meaning:	Teacher gives or asks pupil for meaning/definition/association of word.
52	Context:	Teacher uses information in the sentence or story to cue pupil about the text word.
6	Pupil Response	
61	Incorrect Answer/Word:	Pupil incorrectly answers the teacher's prompt, or fails to give an answer.
62	Correct Answer:	Pupil responds correctly to prompt but still does not get the text word.
63	Self Correct:	Pupil rereads and corrects own miscue without any help or prompting.
64	Exact Word/No Meaning Change:	Pupil gives exact text word after teacher prompt, or responds with a word that does not change meaning of the sentence.
65	Other Pupil Answers:	In group instruction, a non-target pupil responds to teacher prompt.
7	Teacher Feedback 7	
71	Positive Feedback/ Encouragement:	Teacher praises the pupil and encourages attempts to respond.
72	Negative Feedback:	Teacher tells pupil that miscue or answer is incorrect.
73	Management:	Teacher gives pupil general directions about reading, e.g., read slowly, start again, repeat, use expression, read carefully, etc.
74	Other Pupil:	In group instruction, teacher calls on non-target pupil for answer to prompt.

	Other Categories	
8	Teacher Telling:	Teacher tells the pupil the text word, using natural pronunciation.
9	Non-Oral Reading:	Teacher,pupil(s) are not talking about oral reading or word recognition (e.g., change to comprehension discussion during oral reading).

Reliability of OROS Data

A coder is a person who has learned an observation system and who can code different instances of teacher/pupil interaction with a high degree of reliability. Coder Reliability is established by testing coders against a known criterion (i.e., a video tape of interaction that has been pre-coded by an expert). Good coders must also be consistent and so are also tested twice over the same materials to determine if they code the same way when viewing the same interactions at different times.

The coders who are observing your lessons have all tested at .80 or better on both measures of reliability.

Thus, even though there is some degree of error associated with the collection of observation data, the data you will be working with is accurate enough to give you useful information for interpreting pupil and teacher behaviors.

Collecting Data and Coding OROS

1. When a pupil begins oral reading, the coder records a $\boxed{1}$. As long as the pupil continues to read without miscues there are no additional codes made.
2. As soon as there is a pupil miscue, the coder records it (e.g., 210), then records what happens next. Usually a teacher prompt (e.g., 34) follows the pupil miscue. Next the pupil responds (e.g., 64) to the teacher's prompt, and often the pupil resumes exact oral reading.
3. As soon as the pupil resumes exact oral reading after a miscue-prompt interaction, the coder records a $\boxed{1}$.

Examples of coded Oral Reading Interactions:

*(a) 100 213 340 640 100

(b) 100 222 630 100

(c) 100 210 340 610 800 640 100

Example 1. In line (a), we see the codes for a single teacher-pupil oral reading interaction. Initially, the pupil read with no miscues (100), then the pupil miscued, substituting a word that looked very much like the target word, but whose meaning was quite different (213). The teacher asked the pupil to look at the target word again (attention prompt, 340).

In this case calling the pupil's attention to the word was all that was needed, for the pupil responded with the correct word (640) and continued exact oral reading (100).

Exercise 1. Using the OROS definitions as your guide, interpret the interactions in examples b and c. Write the description of the interactions below.

b. ______________________________

c. ______________________________

*All categories will be given in 3 digit form since that is how coded information is printed out by the computer, e.g., category one reads 100, category 63 reads 630, etc.

Exercise 1. Discriminating between meaning-change (21). Miscues and no-meaning change miscues (22).

The following sentences were read by a pupil. Miscued words are underlined. What the child did with the word is shown above the miscued word. Carret ∧ indicates an insertion.

Enter the correct code, 21 or 22, in the box next to the miscue.

1. The trucks come (came) [ ] down the highway (unm....) [ ].

2. There were (was) [ ] two people for dinner (supper) [ ].

3. Many woke up happy (hungry) [ ] because it was her birthday (uhm....) [ ].

4. They came to the city from (for) [ ] the country.

5. She bought (brought) [ ] peanuts.

6. He carries (carried) [ ] the ball.

7. The trucks come (came) [ ] over the land with (which) [ ] food.

8. Milk comes from cows (crows) [ ].

9. Tom saw (was) [ ] the boy ∧ (who) [ ] run. ∧ (Away) [ ].

10. Jim walked around (round) [ ] the town [ ] square.

Check answers on page 30.

Types of pupil miscues (miscue subcategories)

As shown below, the basic pupil miscue subcategories can be further subdivided to describe the nature of the pupil miscue. Refer to the definitions on pages 7 and 8 to complete exercise 2.

Pupil Miscue Subcategories

21 Meaning Change	22 No Meaning Change
210 No response 211 Letter, syllable 212 No similarity 213 High similarity 215 Insertion/omission	222 No similarity 223 High similarity 224 Case/Tense/Pronunication 225 Insertion/omission

Exercise 2. Coding types of Pupil Miscues.
Enter the code in the space next to the word. The pupil miscue is shown above the word. Insertions are shown by a ∧, omission by

truck comes
The trucks come down the long highway.

came under road
The trucks come down the long highway

uhm...
3. The trucks .

Johnny stop
4. John stopped his horse.

bird were singing the word
5. The birds sung by a window .

birk-uh ball sailed uhm...
6. The birds sung by a window .

uhm... ....
7. Mary .

uhm.. ......
8. Mary woke up happy.

wuh, c, kuh don't know the word.
9. Mary woke [ ] up happy [ ].

s-s-omh-ch-th-th d-duh-duh kuh-kuh-ō-nuh
10. Something [ ] is dark [ ] in the corner [ ].

Check answers on page 30.

Teacher Prompts: Categories 3, 4, and 5.

Category 3. Graphic (Visual) Prompts

Category 3 consists of prompts that call the pupil's attention to the written features of the word. By doing so, the teacher requires the pupil to <u>look</u> at the word or some part of it. These prompts supply visual cues and thus depend upon the pupil's visual skill (e.g., visual discrimination, memory, recognition, sequencing).

Category	Graphic Prompt Subcategories
31	Names, letters, consonant blends, digraphs
32	Spells word
33	Identifies syllables within word
34	Attention focused on word

Exercise 3. In the following examples, the sentence read is shown in all capital letters. How the pupil read the sentence is shown following the letter "P." The teacher's prompts are preceded by the letter "T." Give pupil and teacher codes. Use the <u>one</u> codes to show exact oral reading.

1. FRED WAS A BOY WHO LOVED SEALS.

P: Fred saw ☐ a boy who loved seals.

T: Fred saw? ☐.

2. THEY COULD NOT STAY AT THE ZOO FOR THE AFTERNOON.

P: They ☐ could not stay at the zoo for the after..... ☐.

T: That's a compound word. What is the second word in it? ☐.

P: Noon.

T: Now put it together ☐.

3. BUT NO ONE CAME TO BUY A SEAL.

P: But ☐ no one came to put ☐...

T: It begins with a b ☐.

4. WHAT DID I SAY?

P: Went...want ☐ did I say.

T: What's the word before did? ☐.

5. THAT ANGEL HAD SOME BUMP!

P: That ☐ angel had some <u>dump</u> ☐.

T: Do you see a d on the beginning of the last word? ☐.

6. COME ANOTHER TIME, SHE SAID.

P: Come an.... ☐.

T: Do you see two words there? What is the first one? ☐.

7. THEY BOTH WENT ON THEIR WAY.

P: They ☐ both went on their may ☐.

T: That last word doesn't start with m. What does it start with? ☐.

8. THEY STOPPED TO LOOK.

P: They ☐ stopped to cook ☐.

T: Stopped to cook? Point to that word ☐.

9. A FRIGHTENED VOICE CALLED TO THEM.

P: A ☐ frightened ☐ voice ☐ called to them.

T: F-r on the beginning of the word ☐.

10. FRED PUT A BIGGER SIGN OUT.

P: Fred ☐ put a buh... ☐.

T: Cover the g-e-r. What's that ☐?

P: Big.

T: Right, now add the g-e-r ☐.

Check answers on page 30.

Category 4. Phonemic (Sound) Prompts.

Category 4 includes all these prompts which give sound-letter correspondences. These prompts supply auditory cues and depend heavily upon the pupil's auditory skills (e.g., discrimination, recognition, memory, etc.).

Category 4: Phonemic Prompt Subcategories

41 Isolated Sounds
42 Sound Out Word
43 Unnatural Stress
44 Pattern (Word Family)
45 Phonic Rules

Exercise 4. Fill in pupil miscues and teacher prompts in space provided. Check your answers on page

1. ...AND A BITE OF SUPPER.

P: And ☐ a bit ☐ of supper.

T: Is that i long or short? ☐

2. WHEN HE GREW UP...

P: When ☐ he uhm... ☐.

T: What is this word? (writes NEW) ☐.

P: New

T: I'm going to remove the n and write g-r. What is it now? ☐

3. THEY COULD NOT STAY AT THE ZOO.

P: They ☐ could not sit ☐

T: Not sit, listen, stuh ā. What is it? ☐

4. KATE WAS LOOKING AT JOHN.

P: Linda ☐

T: It starts with "Kuh" so it wouldn't be Linda ☐.

5. A LOT OF SNOW FELL QUICKLY.

P: A □ lot of snow fell uhm.... □.

T: The q-u says kwih. □

6. WATCH THE ROAD.

P: Watch □ the uhm.... □.

T: Rhymes with bad □.

7. THE BRIGHT SUN SHONE.

P: The brut □ sun shone.

T: Not brut, say bruh-t-tuh □.

8. THEY WENT ON TO SEVENTH STREET.

P: They □ went on to Sss.... □.

T: S-e-v-e-n-t-h. How do you sound that out? □

P: Suh-ĕ-vuh-e-nuh-thuh.

T: Now put it together □.

9. THEY GOT ON THE TRAIN.

P: They □ got on the truck □.

T: Not truck. It has the same beginning sound as truck □.

10. SHE CAME BACK JUST NOW.

P: She □ came back umh... □

T: Make the j sound □.

P: Juh

T: Juh-ust, juh-ust. Put them together □.

Check answers on page 30.

Category 5. Word Prompts.

There are two types of word prompts used by the teacher: WORD MEANING PROMPTS (51), and CONTEXT PROMPTS (52).

51 WORD MEANING:	Teacher gives or asks pupil for the definition, meaning or association (synonym and antonymn of the word).
52 CONTEXT:	Teacher uses information in the sentence or story to cue pupil about the text word.

Exercise 5.

1. KEEP YOUR EYES OPEN FOR EMPTY BOTTLES.

   P: Keep your eyes open for uhm.... □.

   T: If the bottle isn't full, then it's... □.

2. HE WAS SHOVELING SNOW.

   P: He □ was ... □.

   T: Skip that word and go on □.

   P: Snow.

   T: He was blank snow. What might it be □.

3. FRED WAS A BOY WHO LOVED SEALS.

   P: Fred □ saw □ a boy who lived □ seals.

   T: Did that make sense? □.

4. THE BOY SQUIRTED WATER AT HIM.

   P: The □ boy splashed □.

   T: That word means almost the same as splash □.

5. KEN WALKED OUT OF THE ROOM.

P: Ken ☐ wah... ☐.

T: Say blank and go on ☐.

P: Out of the room.

T: Ken blank out of the room. What word fits in? ☐.

Check answers on page 31.

Category 6. Pupil Responses.

There are five subcategories within the pupil response category. Three of these always occur in response to a teacher prompt; they are Incorrect Answer (61), Correct Answer (62), Exact Word (64). Category 63 (Self-Correct) is used when pupil corrects his own miscue with no help. Category 65 is used in coding group instruction and is used when some pupil other than the target pupil responds to the teacher prompt.

Category 6. Pupil Response Subcategories

61 Incorrect Answer or Word/Fails to Answer
62 Correct Answer
63 Self-Correct
64 Exact Word or No Meaning Change Miscue
65 Non-Target Pupil Answers

Exercise 6.

1. HIS TEACHER TAUGHT HIM MUSIC.

P: His uhm.... ☐

T: What's a word for a person who teaches? ☐

P: Uhm.... ☐

T: I am your what? ☐

P: Teacher ☐

2. HE LOOKS LIKE A WILDMAN.

P: He looks like a whu.... ☐

T: It has two little words. What's the first one? ☐

P: Wild ☐

T: You know the second word, put them together ☐

P: Wildman ☐

3. HE LOOKS LIKE A WILDMAN.

P: He looked ☐ like a woodman, ☐ wildman ☐.

Check answers on page 31.

Category 7. Teacher Feedback and Management

The behaviors in this category include general teacher feedback and management related to the oral reading task. There are four subcategories:

Category	Teacher Feedback and Management Subcategories
71	Positive Feedback/Encouragement
72	Negative Feedback
73	Management
74	Turns to Another Pupil

Examples of Category 71

1. "Very good"
2. "Say it"
3. "You almost had it"
4. "Alright, very good"
5. "That right. It's should"

Examples of Category 72

1. "No"
2. "Not should"
3. "That word's not find"
4. "You got the third word wrong"
5. "The word after school isn't party"

Examples of Category 73

1. "What are you saying?"
2. "Read that again with more expression. Read it like it's talking."
3. "Start on page two."
4. "Everyone turn to page one and we'll follow along with Susie while she reads out loud. OK, Susie."
5. "Read louder."

Examples of Category 74 (used in group instruction)

1. "Does anyone know that word?"
2. "Joe, can you help him out?"
3. "Can anyone tell me what w-h-e-n spells?"
4. "Mary, tell Jane that word."

Exercise 7.

1. "MAYBE I WOULD," SAID ALBERTA.

P: Uhm.... ☐.

T: "It's 2 words together ☐."

P: "Might ☐."

T: "No not might ☐."

P: Uhm.... ☐.

T: "We're right here now go ahead and read ☐."

P: "May be ☐ I would said Alberta."

T: "Go back and read that again but this time take the pencil out of your mouth ☐."

2. "WELL," SAID WALKER.

P: "When ☐."

T: "No, try it again. ☐'

P: "Where ☐."

T: "Not w-h, w-e ☐."

P: "Wuh-eh ☐."

T: "That's right so far, keep going ☐."

Check answers on page 31.

Category 8. Teacher Telling

In Category 8 teacher tells pupil the word using natural pronunciation. There are no subcategories to teacher telling.

Category 9. Non-Oral Reading

Teacher or pupil switches from oral reading to talk about something else. For example, pupil begins to talk about a personal experience. Teacher switches to asking comprehension questions. There are no sub-categories in this classification.

Exercise 8.

1. THE DOG IS BROWN.

P: "The ☐ dog is brown. Mrs. Jones, I h... ☐."

T: "Timmie, you're not paying attention. ...ep reading ☐"

2. THE WAVES SWEPT HIM OUT TO SEA.

P: "The ☐ waves....um ☐."

T: "That word is swept ☐."

P: "Swept ☐ him ☐ out to sea."

3. THE STORES ARE CLOSED.

P: "The ☐ ... ☐."

T: "Cover the s. What is that much ☐?"

P: "Sorry ☐."

T: "Store. ☐ Now add your s ☐."

P: "Stores ☐."

T: "Why do you think the stores are closed ☐?"

P: "It was late at night."

T: "How do you know that?"

P: "Because the streets were quiet."

T: "Right. Now continue reading [ ]."

Check answers on page 31.

Answers

Exercise 1 page 14.

b. 100, no miscues, 222, miscue, no meaning [illegible] word does not look like the target word, 630, pupil [illegible] was no teacher prompt, 100 pupil continues [illegible] correct.

c. 100, exact oral reading [illegible] pupil [illegible], 340 teacher asks pupil to look at it [illegible] pupil [illegible] with wrong answer 800, teacher tells pupil the word, [illegible]0, pupil repeats the word correctly and continues 100, exact oral reading.

Exercise 1, page 14.

1. 22, 21
2. 22, 22
3. 21, 21
4. 21
5. 51
6. 22
7. 22, 21
8. 21
9. 21, 21, 21
10. 22, 22

Exercise [illegible] page 15.

1. [illegible], [illegible]
2. [illegible], [illegible]2, [illegible]
3. [illegible]10
4. [illegible], [illegible]
5. [illegible], [illegible], 222, 212
6. [illegible], 212, 212, 210
7. [illegible]
8. 21[illegible]
9. 21[illegible], 210
10. 211, 211, 211

Exercise 3, page 17.

1. 213, 340
2. 100, 213, 330, 330
3. 100, 212, 310
4. 213, 340
5. 100, 213, 310
6. 212, 330
7. 100, 213, 310
8. 100, 213, 340
9. 100, 213, 100, 310
10. 100, 211, 330, 330

Exercise 4, page 19.

1. 100, 223, 450
2. 100, 210, 440, 440
3. 100, 212, 430
4. 212, 410
5. 100, 210, 410
6. 100, 210, 440
7. 213, 430
8. 100, 211, 420, 420
9. 100, 212, 450
10. 100, 210, 410, 430

Answers (Cont.

Exercise [illegible], page [illegible]

1. 100, [illegible], [illegible]
2. [illegible] [illegible] [illegible], 520
3. 1 [illegible], [illegible], 520
4. 1[illegible], 222, [illegible]
5. 10[illegible], 211, [illegible], 520

Exercise 6, page 24.

1. 210, 510, 610, 510, 620
2. 211, 330, 620, 330, 640
3. 224, 213, 630

Exercise 7, page 26.

1. 210, 330, 6[illegible], 720, 610, 730, 640, 73[illegible]
2. 212, [illegible], 61[illegible], 310, 610, 710

Exercise 8, page 28.

1. 100, 900, 730
2. 100, 210, 800, 640, 100
3. 100, 210, 330, 610, 800, 330, 640, 900, 730

Section 3.

Trainee Manual II: Developing Teaching Skills

Trainee Manual II

Developing Teaching Skills: Prompting

Strategies for Oral Reading Improvement

The objectives of this manual are as follows:

1. To introduce the CATTS and audio tape feedback systems (page).
2. To discuss the reasons for developing prompting skills (page).
3. To provide you with instructions on how to interpret CATTS printout (page).
4. To set individual skill development goals (page).

Also included in the manual is a key to reading the printout, found on page .

Introduction to the Computer-Assisted Teacher Training System (CATTS)

The CATTS system of teacher training is designed to provide the teacher trainee with objective information about his/her individual pattern or use of different teaching strategies during a given lesson. The system uses trained classroom observers to code lessons. The data they obtain is transmitted to the computer in "real time" (as soon as it is mechanically punched in on the button-box). The computer then transmits the information obtained from the coder into a data storage file for latter use or it analyzes the data and feeds it back to the teacher - also in "real time." (See Figure 1).

In the present use of CATTS, we shall use the computer to perform both these functions. The data that is stored will be retrieved and printed out so that each teacher can review it and have an objective picture of his/her individual use of different teaching strategies (represented by each of the categories on the Oral Reading Observation System). In addition to print-out data, teachers will have the opportunity to have some of this data fed-back into the classroom during teaching. This "instant" feedback is in the form of a moving graph displayed on a video monitor in the classroom. Additional detail on how the video feedback works and how you work with it will be presented in a handout.

CATTS and Audio Tape Feedback

Since the feedback capacity of our equipment is limited, we can provide computer feedback to only ten tutors at a time. As an alternative, we have arranged for audio tapes of the oral reading lessons to be provided for the ten tutors who do not get CATTS feedback. Audio tape playback is a good source of information on how you are teaching and teaching goals will be the

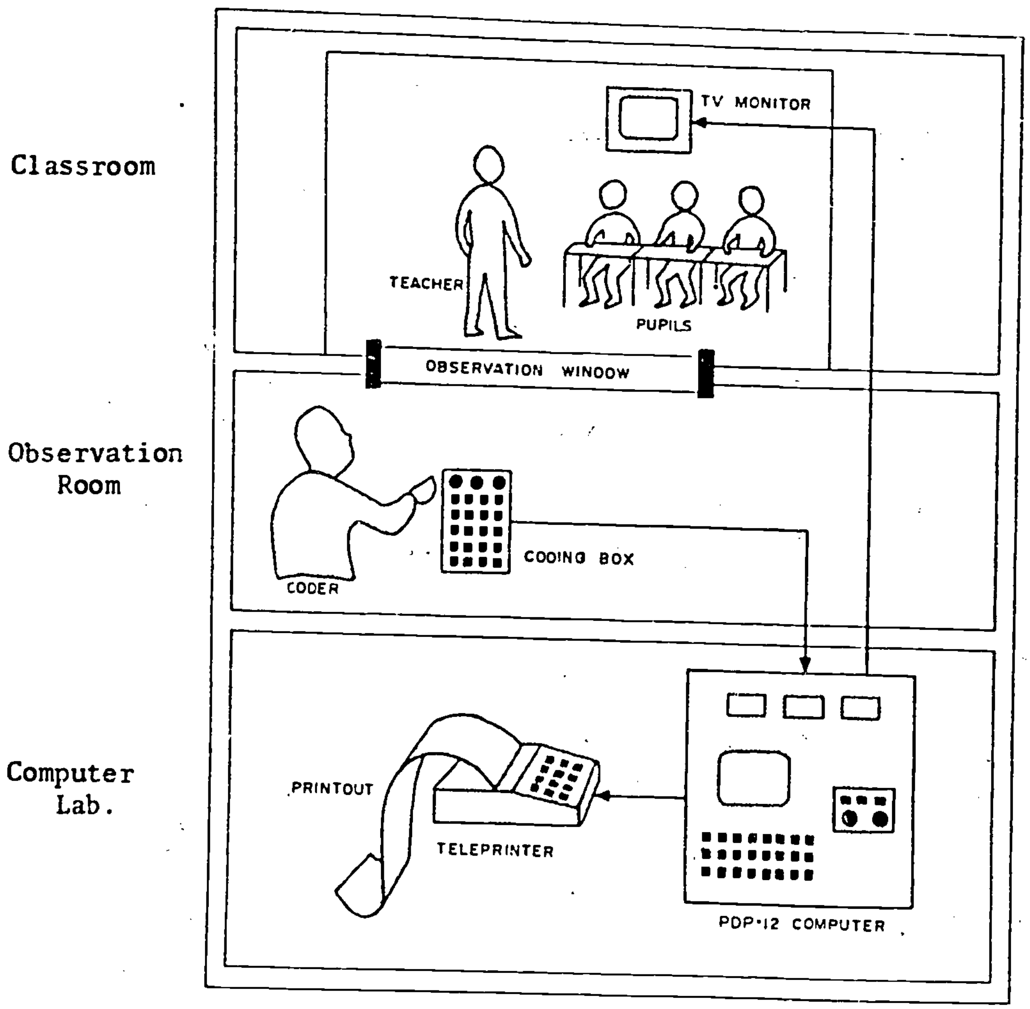


Figure 1. Arrangement of Laboratory Classroom for CATTS.

same for everyone. After three lessons, tutors getting CATTS feedback will switch to audio tape feedback, audio feedback tutors will get CATTS. We will make four such changes during the semester so everyone will have equal opportunity to get both CATTS and audio tape playback.

Why develop prompting skills? A theory-based explanation for the use of prompting strategies. The development of teaching skill depends on a number of factors; first you must know why a particular strategy is important or preferrable to an alternative way of teaching, then you must practice and become skilled at using the strategies. The CATTS system of teacher training has been developed so that you focus in on selected teaching strategies and develop the skills in using them. However, skill in using the different strategies is not enough, you need to know the principles that underlie the use of specific skills so that you can decide when to use them in different situations.

Principles underlying the use of specific teacher prompts.

As you know from learning the Oral Reading Observation System, there are many ways of prompting the various types of pupil miscues. If you refer back to the module on oral reading that you worked through last semester, you will see that not all prompts that a teacher can use should be used. That is, the module recommends use of five specific prompts, and also describes those prompts that should not be used. In addition, recommendations about when to prompt and when not to prompt are made, as well as how long any prompting sequence should last. All of these recommendations are based upon assumptions about how children learn to read, how teachers can assist pupils in acquiring good reading skills and how pupil deficiences and disfunctional reading strategies can be remediated.

The prompting strategies recommended in the module are based on the theory that a child must be able to use multiple sources of information if he/she is to learn to read. The child must first understand that reading is a written (coded) form of the spoken language in which he/she is already quite competent, and that the same implicit rules that govern the pupil's use of language for oral communication, govern the use of written communication. That is, a written sentence is always governed by the same semantic (meaning) and syntatical (grammar) constraints as is the same sentence in spoken form. The linguistic (meaning and grammatical) constraints and cues are the most important sources of information available to the pupil. In terms of teaching, these are the context prompts (52's) used by the teacher.

Pupils whose miscues indicate that they are using their understanding of language to figure out what the sentence is "saying" (i.e., miscues that do not change the meaning of the sentence) are using context as their major source of information in decoding the written text. It follows therefore, that the teacher must not discourage the pupils use of context by prompting or calling attention to miscues that do not change the intended meaning of the sentence.

It is most important that you learn to prompt only meaning-change (21) miscues, and avoid prompting no-meaning-change (22) miscues.

Given that the pupil must learn to use multiple sources of information in learning to read, what other sources (in addition to context) are important? Basically there are two other sources of information: (1) letter-sound correspondences and (2) word structure rules. Unlike context cues which depend upon the child's knowledge of language and which the child is presumed to have, the latter two skills must be taught directly (but not during oral reading!). In order for these prompts to work, the pupil must have acquired some level of knowledge of letter-sound correspondences and word structure rules.

Clues supplied by the teacher in the form of prompts (3, 4, or 5 codes) are used by the pupil to either figure out the exact word outright, or to form a tentative, mental hypothesis about what the target word is--which is then "tried out" against the context information.

In short, there are important reasons for you to prompt, and a few principles to follow that will tell you why and when to prompt.

1. By prompting only those miscues that change the meaning of the sentence, you help a child to learn that reading is a form of communication,

2. By using a variety of prompts you help a child discover that there are several kinds of information that can be used in figuring out a word.

Which Prompts to Use? If you review the Prompting Module you received last semester, you will recall that there are five prompts that are recommended:

Context prompt (52)
Structural prompt (33)
Pattern prompt (44)
Phonics prompt (45)
Attention prompt (34)

Through practice you can become skilled in using each of these "strategic" prompts. You use these prompts because they help a child learn a variety of decoding approaches and because they are more apt to lead to success in figuring out a word than other types of clues or prompts.

The next section takes you through the interpretation of the information on the prompting strategies you used last semester, and how this information can be used to set new teaching goals.

Interpreting the Printout Summary

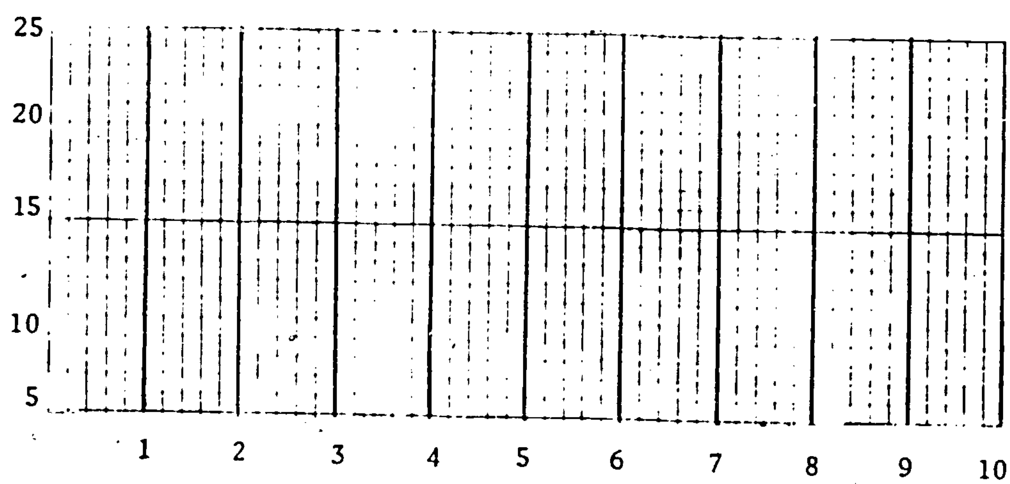
The printout summary of each oral reading lesson is filled with information for you to use in analyzing your own teaching style and your pupil's oral reading patterns. The data on your teaching can be used for self-supervision, interpretation of what took place during the lesson, and use of the information for planning new teaching strategies.

Read the description of the data available in the printout and then complete the graphs and behavioral interpretations as indicated. (Except where indicated all graphs should be line graphs).

ITEM 1. TOTAL OBSERVATION TIME:

The amount of time you and your pupil actually spent on oral reading during the observed lesson is the first item of information presented.

Construct histogram (bar graph) by entering the number of minutes spent on each lesson



1. TIME SPENT ON ORAL READING PER LESSON.

Interpreting the graph. The average lesson should be between ten and fifteen minutes long. On the average, how much time did you spend per lesson, on oral reading? Were you consistent? Were the lessons too long, too short, too variable, just about right?

Decide if any changes are desirable and what direction changes should take if they are needed, and complete the goal statements below. Take into account the attention span of your pupil in making your decision about necessary adjustments in the amount of time you spend on each oral reading lesson.

OBJECTIVES FOR TIME SPENT ON ORAL READING (check as appropriate).

--My oral reading lessons should average about ☐ minutes each.

--Amount of time spent should be maintained at the same level as first semester ☐.

--Amount of time should be increased ☐.

--Amount of time should be decreased ☐.

--Amount of time should be stabilized ☐.

ITEM 2. TOTAL WORDS READ:

During the first semester, word count records for lessons conducted are not complete. If your printout for any one lesson does not have a word count for number of words read, go back to your files and determine what was read and enter the word count for that lesson in the space provided on printout.

What information do you have about the length of the passages you have chosen for oral reading over the first 10 lessons?

Lowest number of words read ________

Highest number of words read ________

Average number of words read ________

Consistent across all lessons? yes ☐ no ☐

Complete the Goal Statement:

New goals for second semester

Increase passage to approximate ____ words per lesson. ☐

Decrease passages to approximate ____ words per lesson. ☐

Reduce varability over lessons. ☐

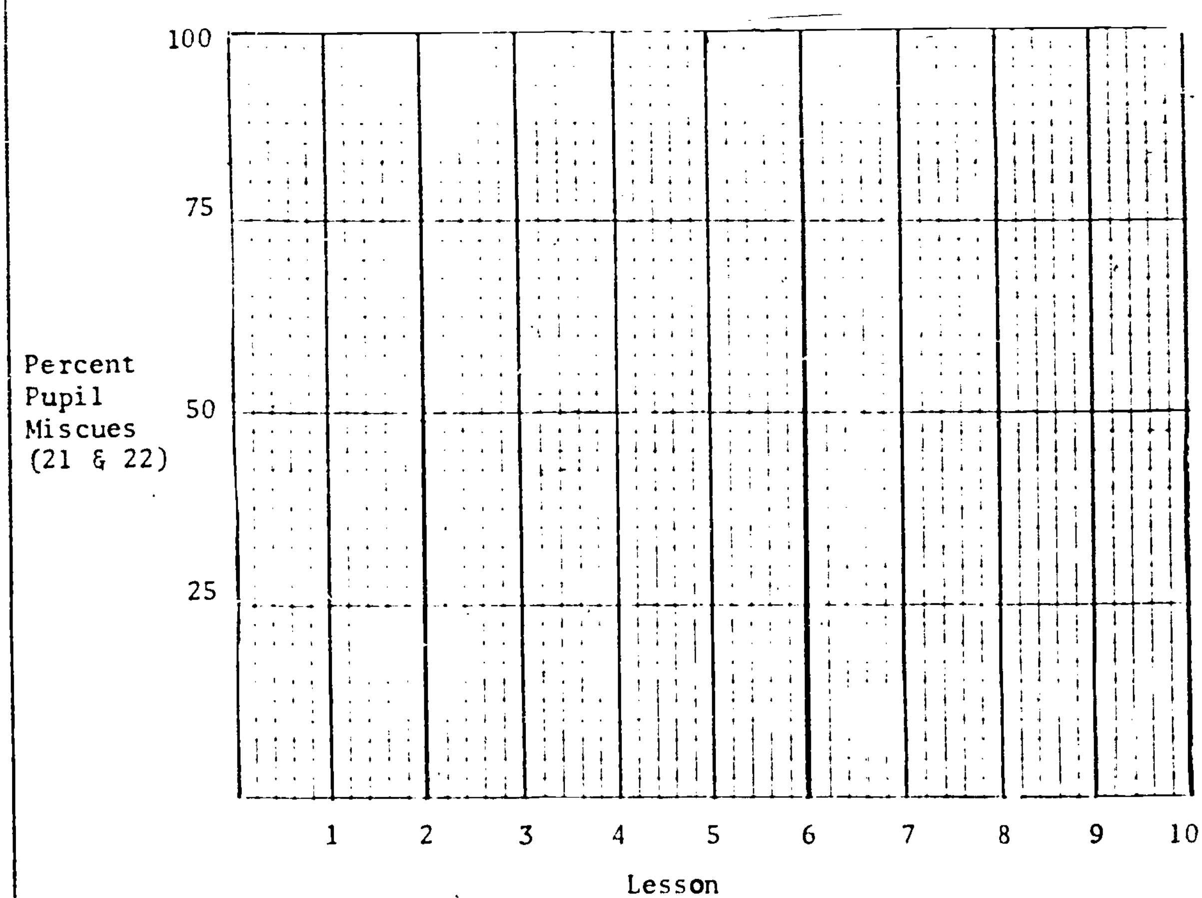
Data shows adequate, consistent pattern, no changes indicated ☐

ITEM 3. PUPIL MISCUES TOTAL

Find PERCENT MISCUES TOTAL. This figure indicates the percent of pupil miscues in relation to the total number of words read. The figure in. cates the difficulty level of the passage read.

If you have reason to believe that the difficulty level of the passages you selected for oral reading are consistent, then the trends in the pupil oral reading miscue data can be also attributed to change (improvement) in the pupil's oral reading.

GRAPH THE TOTAL PUPIL MISCUES (PERCENTAGES) OCCURRED OVER THE FIRST SEMESTER AND DEVELOP SOME TENTATIVE HYPOTHESES ABOUT WHAT THE DATA SHOWS:



2. Percent of pupil miscues each lesson.

If no clear trend emerges, or you have reason to believe that other factors are operating, then this data may not be useful for pupil evaluation. It can tell you however, about the difficulty level of the materials you choose.

Does the data suggest change in the difficulty level of the materials?

Too easy (few miscues) ____ yes ____ no (less than 10%)

Too hard ____ yes ____ no (more than 20%)

About right ____ yes ____ no (about 10%)

ITEM 4. TEACHER RESPONSE TO PUPIL MISCUES:

This tells how many (frequency column) and what percent of all pupil miscues were responded to with some type of prompt, feedback, or direct telling by the tutor. Interpretation of this data is optional

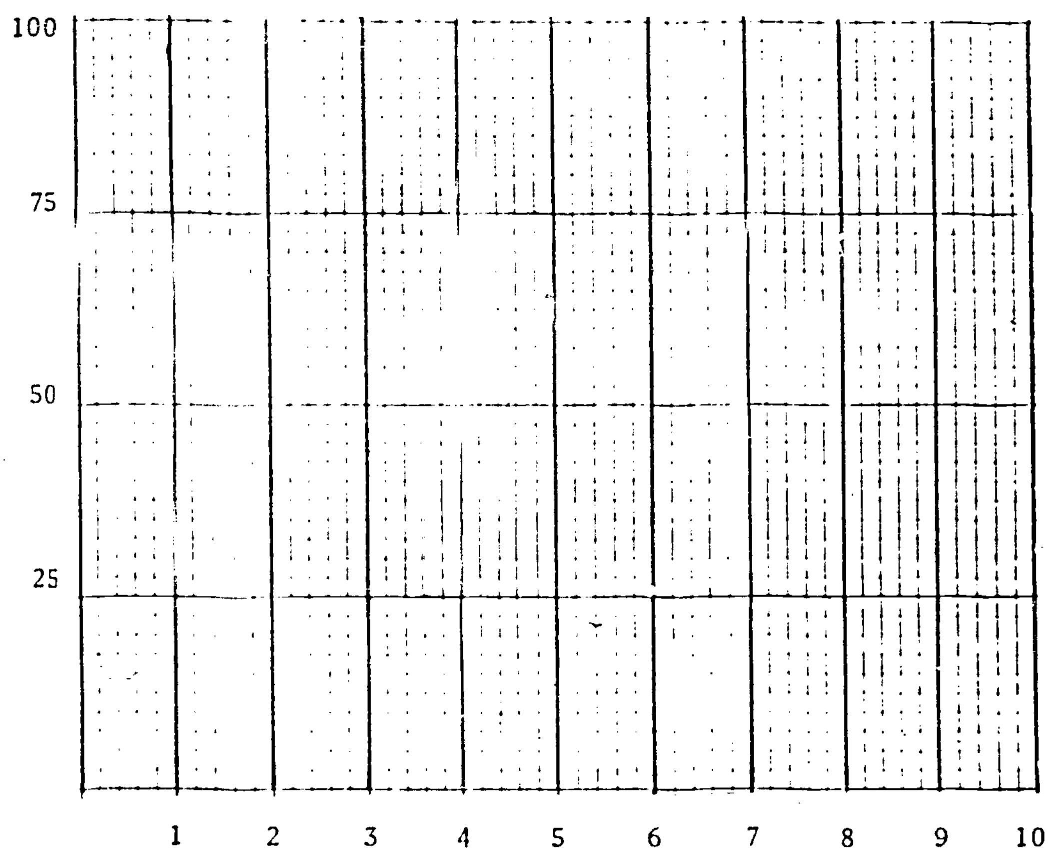
ITEM 5. MEANING CHANGE MISCUES (21's):

These are the pupil miscues that constitute real reading errors and pupils should be provided with cues and strategies for overcoming these errors if their oral reading is to improve. The percentage figure shown is the percent of meaning change in relation to <u>all</u> miscues. (Pupil miscues followed by pupil self correction (63's) are <u>not</u> counted in the miscue total).

ITEM 7. NO-MEANING CHANGE MISCUES:

These miscues show that the pupil is correctly processing the meaning of the passage even if the encoding is not precise.

Track the relationship between no-meaning change (22), and meaning change (21) miscues by entering the percentages for each category on the same graph. Overtime, an improved reader should show relatively fewer meaning change miscues than no-meaning change miscues. (ITEMS 5 and 7)



3. Relation between 21 and 22 miscues.

Information in this graph can be interpreted in a number of ways and interpretation is optional.

ITEM 6. TEACHER RESPONSE TO PUPIL MEANING CHANGE MISCUES:

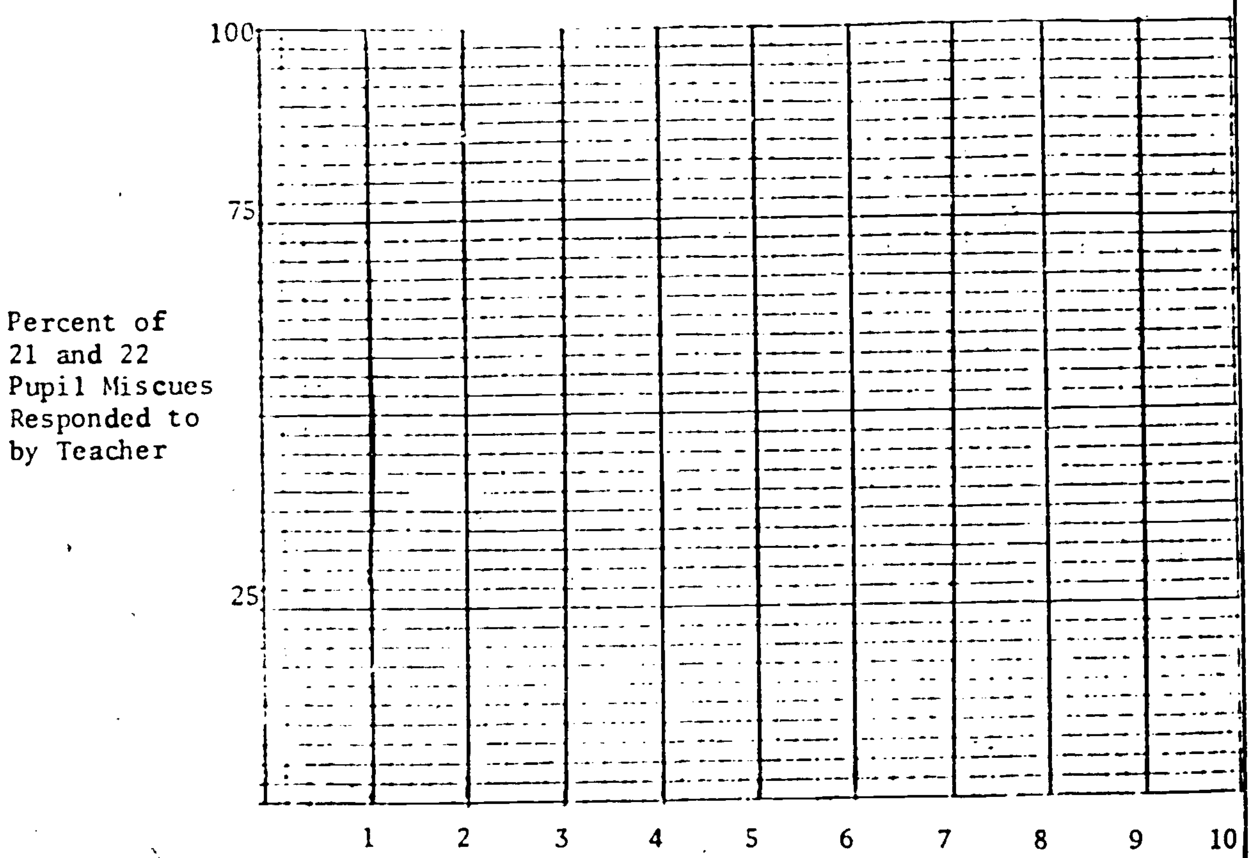
The data in this line tells how many meaning change miscues were followed by a teacher prompt or other response.

ITEM 8. TEACHER RESPONSE TO NO-MEANING CHANGE MISCUES:

As in item 6, the data here shows the number and percent of pupil 22's that the tutor responded to.

Teacher behavior should play a vital role in pupil oral reading improvement. Are no-meaning change (22's) being prompted? Linguistic processing theory of reading suggests that a good teacher should aim for the reduction of prompts of no-meaning change miscues, but that meaning change (21) miscues should be prompted.

TRACE THE PATTERN OF TEACHER PROMPTING OVER THE FIRST SEMESTER BY GRAPHING 21 AND 22's PROMPTED. INTERPRET THE BEHAVIOR SHOWN BY THE RELATIONSHIP BETWEEN THE TWO LINES AND STATE THE TEACHING BEHAVIOR GOALS (CHANGES) PATTERNS SUGGEST. (ITEMS 6 and 8)



4. Comparison of tutor prompting of 21 and 22.

INTERPRETATION:

--Is the percentage of responses to 21's much greater than to 22's?
yes ____ no ____

--Are all 21's being prompted? yes ____ no ____ (Any percentage less than 100 indicates that some 21's are not being prompted.)

--Is there great variability between lessons? yes ____ no ____

Taking all these factors into account, the most reasonable change goals are: (1) Increase Prompting of 21's ____

(2) Maintaining same Level of 21's Prompted ____

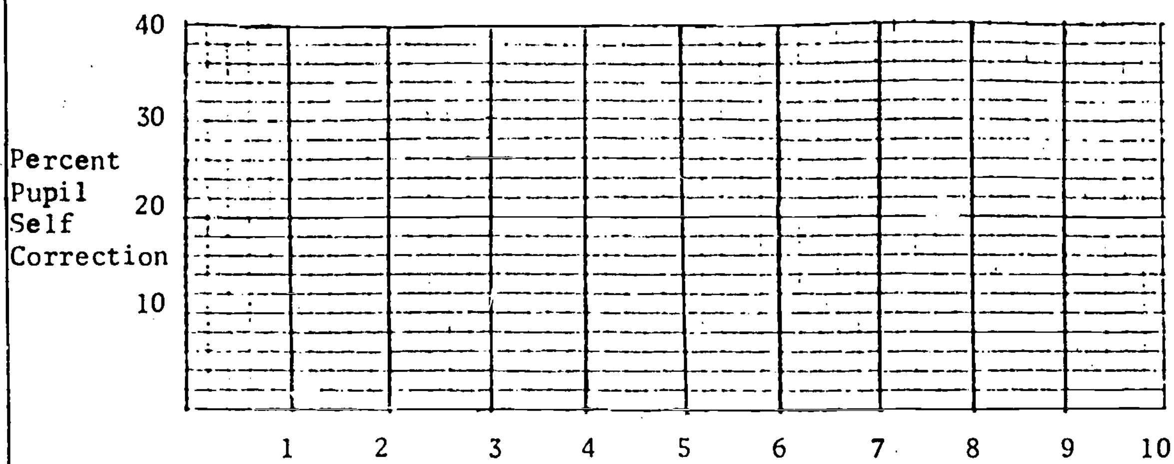
(3) Decrease Prompting of 22 ____

(4) Maintain same Level of 22's Prompted ____

ITEM 9. PUPIL SELF CORRECT:

This line shows the frequency of pupil self corrects (63) and percent of (63's) relation to all pupil miscues (21 and 22). This data can be a good indicator of pupil oral reading improvement over time. A child who has developed new and better oral reading skills should show more self correction of miscues.

Graph pupils' self-corrections of miscues and interpret.* (ITEM 9)



5. Pupil self correction of miscues.

Pupil improvement is shown by a positively accelerating curve. Is there evidence of pupil improvement as measured by the % of self corrections

yes ____ no ____

*NOTE: SELF CORRECTIONS CAN BE ENCOURAGED BY ALLOWING THE PUPIL ENOUGH TIME TO SELF-CORRECT BEFORE PROMPTING.

ITEM 10. TEACHER PROMPTS TOTAL:

This line of data tells how <u>many</u> prompts were used by the tutor. The percent figure is always 100%.

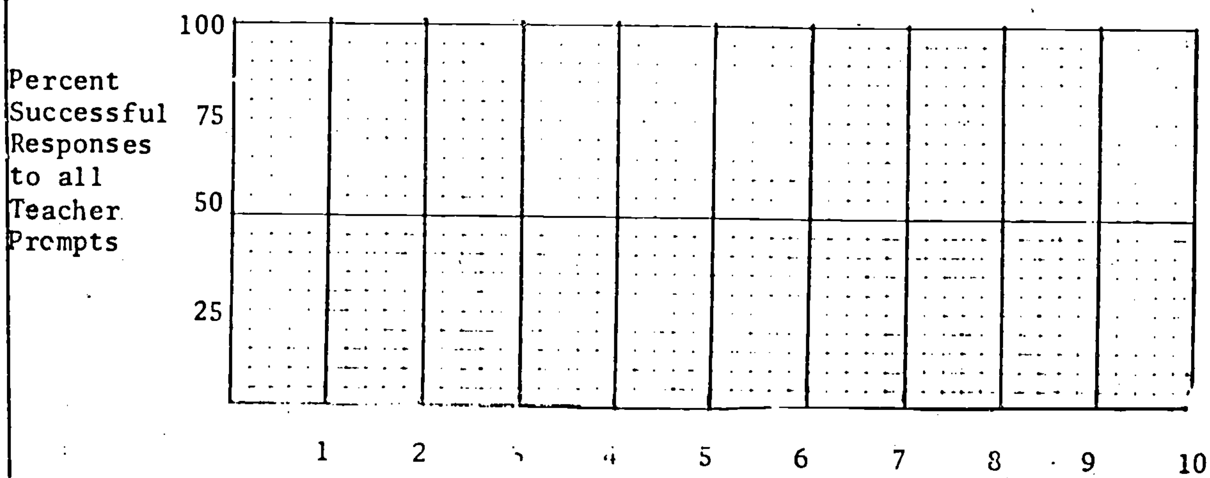
ITEM 11. PUPIL SUCCESS IN RESPONDING TO TEACHER PROMPTS:

This data tells how many and what percent of pupil responses to the teachers prompting were correct (62's) or correct exact word responses (64's).

The effectiveness of tutor prompting can be measured by the percent of pupil 62 and 64 responses to the prompting.

GRAPH THE WEEKLY PUPIL SUCCESS PERCENTAGES AND INTERPRET

(ITEM 11) Percent of successful pupil responses to prompting.



Highest Success Rate ____________.

Lowest Success Rate ____________.

Average Success Rate (Approx.)_____.

Is Pattern Consistent Across Lessons? yes ____ no ____

Is there Indication of Improvement Overtime (positively Accelerating curve)? yes ____ no ____.

Increasing the over all pupil success rate depends on many factors. Conducting a fine-grain analysis of the data that goes into making up pupil miscue patterns and teacher prompting patterns (e.g., sub-categories of OROS) will help you understand the factors that contribute to the success rate and also help you plan strategies that should improve the pupil success rate.

Summary of Goals

Independent of past performance, all tutors should aim at the following behavioral goals.

1. Increase prompting of 21 miscues.
2. Decrease prompting of 22 miscues.
3. Decrease the average length of a prompting sequence by limiting to two the number of prompts given in response to a miscue.
4. Increase the use of <u>all strategic prompts</u> (33, 34, 44, 45, 52's) as compared to other possible prompting approaches. (Or conversly, decrease use of other prompting strategies).

Based on your interpretation and summary of your first semester performance, you should be able to state which of the 5 strategic prompts need to be increased most. You should develop the skill and facility to use each of these prompts. Begin developing your skill by trying to increase the frequency of use of each of these strategies (categories 33, 34, 44, 45, 52).

Depending upon your analysis of last semesters performance, you should aim at the following behavioral goals:

1. Each lesson should be average _____ minutes. (page 7)
2. Each reading text selected should have about _____ words. (page 9)
3. The text selected for oral reading should present a difficulty level of about 10%. (page 11)

OROS DATA SUMMARY

DATE: 11/14/75

NAME:

BOX NO.: 2

LESSON NO.: 2

1) TOTAL OBSERVATION TIME: 8.8 MIN.

2) TOTAL WORDS READ: 460

	MISCUES NO.	MISCUES PC.		TEACHER RESPONSES NO.	TEACHER RESPONSES PC.
3) PUPIL MISCUES TOTAL (21 + 22)	21	4	4)	12	57
5) MEANING CHANGE (21)	14	66	6)	10	71
7) NO MEANING CHANGE (22)	5	23	8)	2	40
9) SELF-CORRECTED (63)	2	9			

	PROMPTS GIVEN NO.	PROMPTS GIVEN PC.		PUPIL SUC. (62+64) NO.	PUPIL SUC. (62+64) PC.
10) TEACHER PROMPTS TOTAL (31 TO 8)	20	100	11)	14	70
12) CONTEXT (52)	0	0	13)	0	0
14) STRUCTURAL (33)	0	0	15)	0	0
16) PATTERN (44)	0	0	17)	0	0
18) PHONIC (45)	0	0	19)	0	0
20) ATTENTION (34)	1	5	21)	0	0
22) OTHER 3, 4, 5 PROMPTS	0	0			
23) POSITIVE FEEDBACK (71)	4	20			
24) NEGATIVE FEEDBACK (72)	0	0			
25) MANAGEMENT (73)	11	55			
26) TELLING (8)	4	20			
27) OTHER (9)	0	0			

SEQUENCE LENGTHS

FREQUENCY DISTRIBUTION (MINUS 1S AND 9S)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
8	3	1	6	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

MEAN= 3.41
MEDIAN= 2.50
SD= 3.11

TOTAL DATA STRINGS= 22
TOTAL CODES(- 1 AND 9)

PRINTOUT KEY

1. Total Observation Time: Recorded automatically.

2. Total Words Read: Entered into file after lesson.

PUPIL MISCUES

3. Pupil Miscues Total: Lists total frequency of all 21 and 22 codes and percent miscues. (3/2)

4. Teacher Responses to all Miscues. Lists total frequency of all 31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8 codes following 2_ codes and percent miscues responded to. (4/3)

5. Meaning Change. Lists total frequency of 21's, excluding those followed by 63 and percent 21's. (5/3)

6. Teacher Response to Meaning Change. Lists total frequency of all 21's followed by a teacher response (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8) and percent 21's responded to. (6/5)

7. No Meaning Change. Lists total frequency of 22's, excluding those followed by 63 and percent 22's. (7/3)

8. Teacher Response to No Meaning Change. Lists total frequency of all 22's followed by a teacher response (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8) and percent 22's responded to. (8/7)

9. Self-Corrected. Lists total frequency of all 21's and 22's followed by 63 and percent 2's self-corrected. (9/3)

Check point. (1) Frequencies in 5, 7, and 9 must equal frequency in 3 and percents in 5, 7, and 9 must add up to 100%. (2) Frequencies in 6 and 8 must equal frequency in 4.

10. Teacher Prompts Total. Lists total frequency of all prompts (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8) and percent prompts. (100%)

11. Pupil Success. Lists total frequency of all 62 and 64 codes following prompts (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 73, and 8) and percent successful prompts. (11/10)

12. Context. Lists total frequency of all 52's and percent 52's. (12/10)

13. Pupil Success-Context. Lists total frequency of all 62 and 64 codes following 52's and percent success of context. (13/12)

14. Structural. Lists total frequency of all 33's and percent 33's. (14/10)

15. Pupil Success-Structural. Lists total frequency of all 62 and 64 codes following 33's and percent success of structural. (15/14)

16. Pattern. Lists total frequency of all 44's and percent 44's. (16/10)

17. Pupil Success-Pattern. Lists total frequency of all 62 and 64 codes following 44's and percent success of pattern. (17/16)

18. Phonic. Lists total frequency of all 45 prompts and percent 45's. (18/10)

19. Pupil Success-Phonic. Lists total frequency of all 62 and 64 codes follo[illegible] 45 and percent success of phonic. (19/18)

20. Attention. Lists total frequency of all 34's and percent 34's. (20/10)

21. Pupil Success-Attention. Lists total frequency of all 62 and 64 codes following 34's and percent success of attention. (21/20)

22. Other 3, 4, 5 Prompts. Lists total frequency of all 31, 32, 41, 42, 43, and 51 prompts and percent other 3, 4, 5 prompts. (22/10)

23. Positive Feedback. Lists total frequency of all 71's and percent 71's. (23/10)

24. Negative Feedback. Lists total frequency of all 72's and percent 72's. (24/10)

25. Management. Lists total frequency of all 73's and percent 73's. (25/10)

26. Telling. Lists total frequency of all 8's and percent 8's. (26/10)

27. Other. Lists total frequency of all 9's and percent 9's. (27/10)

Check point. (1) Frequencies in 12, 14, 16, 18, 20, 22, 23, 24, 25, and 26 should add up to frequency in 10 and percents should total 100%. (2) Frequencies in 13, 15, 17, 19, and 21 should add up to frequency in 11.

Section 4.

Trainee Manual III: Using Feedback for Lesson Analysis and Planning

Using Feedback

There are three kinds of feedback available to you this semester:

1. Audio tape playback.
2. CATTS "real-time" TV display.
3. CATTS printout summaries.

You will use the feedback for analyzing pupil miscues and tutor prompting strategies, and then use the analysis for setting goals for the next lesson.

Each tutor will do three lessons with either CATTS FB or AUDIO FB, and then continue with the alternate FB method every three lessons.

This manual describes how to use and interpret the audio-tape and CATTS TV display. Interpretation of CATTS Printout is found in Trainee Manual II (orange cover).

ALL TUTORS MUST ANALYZE EACH LESSON FOR WHICH THEY RECEIVE FEEDBACK; COMPLETE THE FEEDBACK EVALUATION SHEET; TURN IT IN BEFORE THE NEXT LESSON.

Audio Tape Feedback

When you are scheduled for audio feedback, be sure to pick up the cassette tape of your lesson and make arrangements to hear it played back before you teach your next lesson.

There are two cassette playback devices reserved for K495 tutors in room 160 of CITH, and you can use these at anytime of the day. You may also take the cassette home. You must however, return the cassette before your next lesson.

The analysis of your lesson will be more accurate if you tally the important pupil and tutor behaviors you hear on the tape. Use the tally sheet and fill out as shown on next page.

Audio Tape Tally Sheet

Tutor ____________________ Pupil ____________________ date of lesson __________

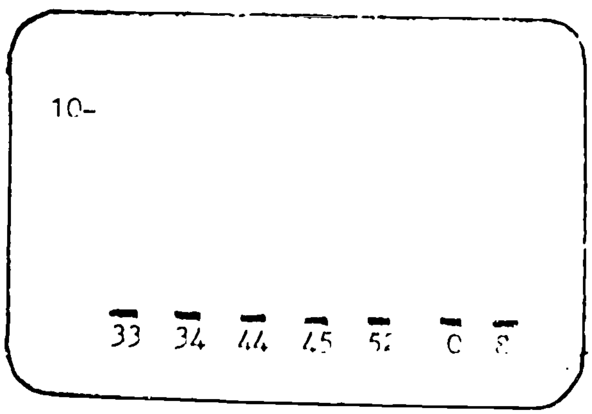
Pupil Miscues		Prompted?			
21 - Meaning change	total	YES	total	NO	total
~~////~~ /	6	////	4	//	2
22 - No meaning change ////	4	//	2	//	2

Prompts Used

		totals
Context 52	///	3
Structure 33		
Pattern 44		
Phonic 45		
Attention 34	//	2
Telling 8	/	/
Other		

CATTS TV FEEDBACK

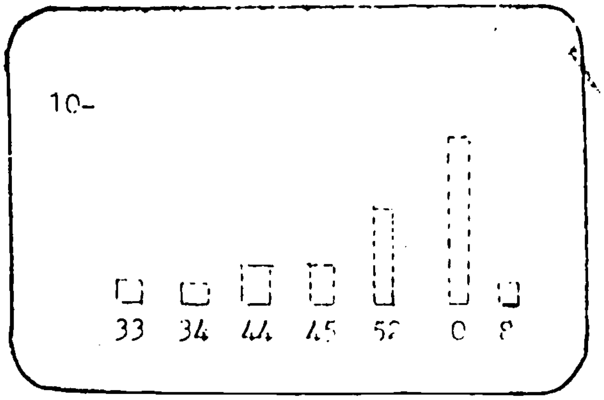
For three oral reading lessons, the video monitor in the booth will be turned on. The screen will display a moving bar graph that changes as you prompt. It will show you which prompts you have used up to that moment, and the relationship between use of the different prompts to each other.



video screen displays showing five strategic prompts, other prompts, and telling.

Example 1

How it works: As you prompt, the coder transmits the code for the prompt to the computer, which then instantly shows its occurance by moving the bar for that prompt up a notch. When you first start your lesson the bars are flat along a horizontal axis, and the number ten shown at the top of the vertical axis (not actually seen). As a prompt occurs, the bar rises a constant amount for each occurance. A bar halfway up the scale tells you there have been five prompts for the category represented by that bar.

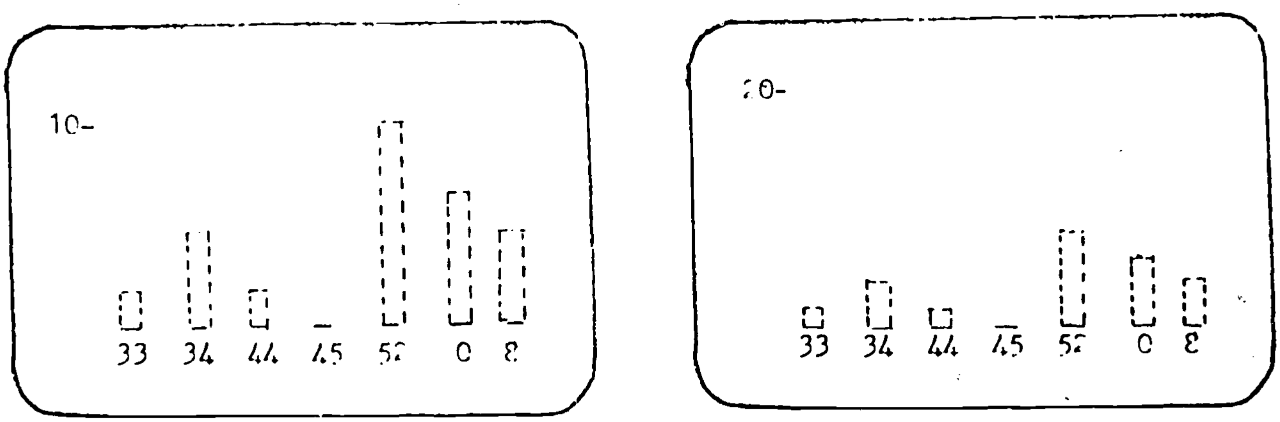


Example 2

In example 2, you can see that there have been five 52 prompts, about 7 or 8 Other prompts used and two 45 prompts used.

WHAT HAPPENS WHEN THERE ARE MORE THAN TEN PROMPTS?

As the bar for any category reaches ten, the display will cut off for a moment and then reappear scaled down by one-half! A 20 will show on the vertical axis in place of the 10 and each bar will be half as tall as it was before. See example 4.



Ten Scale for beginning of lesson.

Twenty scale used after any category reaches ten.

Example 4. Change in scale after ten prompts in any one category.

By looking at the whole display, you will be able to tell at a glance which category of the 5 strategic prompts needs to be increased in relation to the other four, which needs to be decreased in relation to the others, or it may tell you that all 5 prompts are at about the same level - no changes needed there.

The 0 column shows the frequency of use of dysfunctional prompts. If it starts getting too much taller than the other columns, try to decrease the use of these dysfunctional prompts and increase the use of the five strategic prompts. The eight column tells you how often you are "telling" in relation to use of all other prompts.

Feedback Evaluation Sheet

Name ____________________ Pupil ____________________ Date of Lesson __________

Type of feedback CATTS [ ] AUDIO [ ]

THIS LESSON			NEXT LESSON		
			Increase	Decrease	Maintain
1. Length of lesson (minutes) ______					
2. Number of words read ______					
3. Difficulty level $\left(\frac{\text{All 2s}}{\text{No. Words}}\right) =$ ____ %					
4. No. of pupil 21 miscues ______			X	X	X
5. No. of pupil 22 miscues ______			X	X	X
6. No. 21's prompted ______					
7. No. of 22's prompted ______					
8. Average length of prompt sequence ______					
9. Use of Strategic Prompts	frequency	percentage			
(52) Context					
(33) Structural					
(44) Pattern					
(45) Phonic					
(34) Attention					
Other prompts					
8's, Telling					

Section 5.

Sample Printout Form

1

OROS DATA SUMMARY

DATE: 2/16/76

NAME: J. GOTTS

BOX NO.: 6

LESSON NO 8

1) TOTAL OBSERVATION TIME: 14 4 MIN.

2) TOTAL WORDS READ: 402

	MISCUES NO.	MISCUES PC.	TEACHER RESPONSES	TEACHER RESPONSES NO.	TEACHER RESPONSES PC.
3) PUPIL MISCUES TOTAL (21 + 22)	16	3	4)	9	56
5) MEANING CHANGE (21)	11	68	6)	9	81
7) NO MEANING CHANGE (22)	4	25	8)	0	0
9) SELF-CORRECTED (63)	1	6			

	PROMPTS GIVEN NO.	PROMPTS GIVEN PC.	PUPIL SUC. (62+64)	PUPIL SUC. NO.	PUPIL SUC. PC.
10) TEACHER PROMPTS TOTAL (31 TO 8)	23	100	11)	14	60
12) CONTEXT (52)	4	17	13)	3	75
14) STRUCTURAL (33)	9	39	15)	4	44
16) PATTERN (44)	1	4	17)	1	100
18) PHONIC (45)	0	0	19)	0	0
20) ATTENTION (34)	1	4	21)	1	100
22) OTHER 3, 4, 5 PROMPTS	6	26			
23) POSITIVE FEEDBACK (71)	0	0			
24) NEGATIVE FEEDBACK (72)	0	0			
25) MANAGEMENT (73)	1	4			
26) TELLING (8)	1	4			
27) OTHER (9)	0	0			

SEQUENCE LENGTHS

FREQUENCY DISTRIBUTION (MINUS 15 AND 95)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	2
7	1	4	0	1	2	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0.	

MEAN= 3.82
MEDIAN= 2.63
SD= 4.13

TOTAL DATA STRINGS= 17
TOTAL CODES(- 1 AND 9)= 65

1

INTERACTION SEQUENCES

```
730 100
211 420 610 330 610 320 620 330 610 800 640
213 340 640 100
210 520 620 100 520 640 730
223 100
213 630 100
212 100 730 100 610 310 620 410 620 330 610 320 610 330 330 620
330 640 100
210 440 620 310 640 100
213 100 330 100 730 100
224 100
212 100 520 640 100
222 100
213 330 640
222 100
213 100
212
330 640 710 610 330 640 710
```

Section 6.

Printout Key

DATE:

NAME:

BOX NO.

LESSON NO.

1. Total Observation Time ____________

2. Total Words Read ____________

	Miscues No.	Miscues %	Teacher Responses No.	Teacher Responses %
Pupil Miscues Total (21 + 22)	3. ____	____	4. ____	____
Meaning Change (21)	5. ____	____	6. ____	____
No Meaning Change (22)	7. ____	____	8. ____	____
Self-Corrected (2_-63)	9. ____	____		

	Prompts Given No.	Prompts Given %	Pupil Success (62+64) No.	Pupil Success (62+64) %
Teacher Prompts Total (31 to 8)	10. ____	____	11. ____	____
Context (52)	12. ____	____	13. ____	____
Structural (33)	14. ____	____	15. ____	____
Pattern (44)	16. ____	____	17. ____	____
Phonic (45)	18. ____	____	19. ____	____
Attention (34)	20. ____	____	21. ____	____
Other 3, 4, 5 Prompts	22. ____	____		
Positive Feedback (71)	23. ____	____		
Negative Feedback (72)	24. ____	____		
Management (73)	25. ____	____		
Telling (8)	26. ____	____		
Other (9)	27. ____	____		

Included on first semester printouts; not included on second semester printouts until after Lesson 17

Sequence Lengths

Interaction Sequences

OROS Data Summary (Printout) for Tutor

Lessons and Printout Key

PRINTOUT KEY

1. Total Observation Time: Recorded automatically.

2. Total Words Read: Entered into file after lesson.

PUPIL MISCUES

3. Pupil Miscues Total: Lists total frequency of all 21 and 22 codes and percent miscues. (3/2)

4. Teacher Responses to all Miscues. Lists total frequency of all 31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8 codes following 2_ codes and percent miscues responded to. (4/3)

5. Meaning Change. Lists total frequency of 21's, excluding those followed by 63 and percent 21's. (5/3)

6. Teacher Response to Meaning Change. Lists total frequency of all 21's followed by a teacher response (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8) and percent 21's responded to. (6/5)

7. No Meaning Change. Lists total frequency of 22's, excluding those followed by 63 and percent 22's. (7/3)

8. Teacher Response to No Meaning Change. Lists total frequency of all 22's followed by a teacher response (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8) and percent 22's responded to. (8/7)

9. Self-Corrected. Lists total frequency of all 21's and 22's followed by 63 and percent 2's self-corrected. (9/3)

Check point. (1) Frequencies in 5, 7, and 9 must equal frequency in 3 and percents in 5, 7, and 9 must add up to 100%. (2) Frequencies in 6 and 8 must equal frequency in 4.

10. Teacher Prompts Total. Lists total frequency of all prompts (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 72, 73, and 8) and percent prompts. (100%)

11. Pupil Success. Lists total frequency of all 62 and 64 codes following prompts (31, 32, 33, 34, 41, 42, 43, 44, 45, 51, 52, 71, 73, and 8) and percent successful prompts. (11/10)

12. Context. Lists total frequency of all 52's and percent 52's. (12/10)

13. Pupil Success-Context. Lists total frequency of all 62 and 64 codes following 52's and percent success of context. (13/12)

14. Structural. Lists total frequency of all 33's and percent 33's. (14/10)

15. Pupil Success-Structural. Lists total frequency of all 62 and 64 codes following 33's and percent success of structural. (15/14)

16. Pattern. Lists total frequency of all 44's and percent 44's. (16/10)

17. Pupil Success-Pattern. Lists total frequency of all 62 and 64 codes following 44's and percent success of pattern. (17/16)

18. Phonic. Lists total frequency of all 45 prompts and percent 45's. (18/10)

19. Pupil Success-Phonic. Lists total frequency of all 62 and 64 codes following 45 and percent success of phonic. (19/18)

20. Attention. Lists total frequency of all 34's and percent 34's. (20/10)

21. Pupil Success-Attention. Lists total frequency of all 62 and 64 codes following 34's and percent success of attention. (21/20)

22. Other 3, 4, 5 Prompts. Lists total frequency of all 31, 32, 41, 42, 43, and 51 prompts and percent other 3, 4, 5 prompts. (22/10)

23. Positive Feedback. Lists total frequency of all 71's and percent 71's. (23/10)

24. Negative Feedback. Lists total frequency of all 72's and percent 72's. (24/10)

25. Management. Lists total frequency of all 73's and percent 73's. (25/10)

26. Telling. Lists total frequency of all 8's and percent 8's. (26/10)

27. Other. Lists total frequency of all 9's and percent 9's. (27/10)

Check point. (1) Frequencies in 12, 14, 16, 18, 20, 22, 23, 24, 25, and 26 should add up to frequency in 10 and percents should total 100%. (2) Frequencies in 13, 15, 17, 19, and 21 should add up to frequency in 11.

Section 7.

Printout of Matrix 1: Pupil Miscue by Teacher Prompts

ORAL READING OBSERVATION SYSTEM

DATA HEADER CARD
171103030311 147 152 51 112175000 2 102775 1033

MATRIX 14 PUPIL NO BY TEACHER PROMPTS

TEACHER PROMPTS

PUPIL NO	31-	32-	33-	34-	--1	--2	41-	42-	43-	44-	45-	--1	--2	51-	52-	--1	--2	65	71	72	73	74	8	RESP	NRS	63S
210	0	0	0	0	0	0	1	2	0	0	0	0	3	1	0	1	0	0	2	0	0	0	1	7	0	0
	0	0	0	0	0	0	14	28	0	0	0	0	100	14	0	100	0	0	28	0	0	0	14			
211	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	0	0	100	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
212	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	0	0	1	0	1	0	7	13	2	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15	100	0	0	7	0	7	0	53			
213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	5	0	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	0	59			
215	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

TOTAL 21- MOS = 26
PERCENT 21- MOS = 96
PERCENT 21- MOS AND 63S = 3

PUPIL NO	31-	32-	33-	34-	--1	--2	41-	42-	43-	44-	45-	--1	--2	51-	52-	--1	--2	65	71	72	73	74	8	RESP	NRS	63S
222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100			
223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

TOTAL 22- MOS = 1
PERCENT 22- MOS = 3
PERCENT 22- MOS AND 63S = 7

TOTAL RS = 27

Section 8.

Printout of Matrix 2: Teacher Prompts by Pupil Responses

MATRIX 2 TEACHER PROMPTS BY PUPIL RESPONSES

PUPIL RESPONSES

TCHR PRMTS	61	62	64	65	OBMT	TOTS
31-	0	0	0	0	0	0
	0	0	0	0	0	
32-	0	0	0	0	0	0
	0	0	0	0	0	
33-	0	1	0	0	0	1
	0	100	0	0	0	
34-	0	0	1	0	0	1
	0	0	100	0	0	
--1	0	0	1	0	0	1
	0	0	100	0	0	
--2	0	1	0	0	0	1
	0	100	0	0	0	
41-	1	0	0	0	0	1
	100	0	0	0	0	
42-	3	0	0	0	0	3
	100	0	0	0	0	
43-	0	0	0	0	0	0
	0	0	0	0	0	
44-	1	0	0	0	0	1
	100	0	0	0	0	
45-	0	0	0	0	0	0
	0	0	0	0	0	
--1	0	0	0	0	0	0
	0	0	0	0	0	
--2	5	0	0	0	0	5
	100	0	0	0	0	
51-	1	0	3	0	0	4
	25	0	75	0	0	
52-	1	0	1	0	0	2
	50	0	50	0	0	
--1	2	0	4	0	0	6
	33	0	66	0	0	
--2	0	0	0	0	0	0
	0	0	0	0	0	
65	0	0	0	0	0	0
	0	0	0	0	0	
71	2	0	2	0	0	4
	50	0	50	0	0	
72	0	0	0	0	0	0
	0	0	0	0	0	
73	2	0	0	0	0	2
	100	0	0	0	0	
74	0	0	0	0	0	0
	0	0	0	0	0	
8	0	0	20	0	2	22
	0	0	90	0	9	

TOTAL PUPIL RESPONSES = 54

PERCENT RATIONAL PROMPTS(33-,34-,44-,45-,52-)= 38

Section 9.

Printout of OROS Interaction Sequences

PERCENT DIRECT= 53
PERCENT INDIRECT= 46
PERCENT SUCCESSFUL PROMPTS= 62

FREQUENCY DISTRIBUTION (MINUS 1S AND 9S)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
6	2	16	2	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MEAN= 3.39
MEDIAN= 3.13
SD= 1.66

DATA LIST

730
210 422 610 800 640
212 800 640 100
212 710 610 422 610 800 640 100
210 412 610 800 640 100 710 100
212 521 610 511 640 710
212 100
212 100 100 521 640
213 730 610 800 640 100 100
213 800 640
223 100
212 100
212 511 610 800 640 100
224
210 710 640 100
213 800 640 100
212 800 640
212 730 610 800 640
212 800 800 640
224 630 100
212 800 640
213 800 640 100
222 100 800 511
210 800 640 100
210 511 640 100
210 710 640 100
213 630 100
212 800 640 100
223 100
211 332 620 442 610 800 640 100
223 100 100 630 341 640 100
212 511 640 100
212 800 640
212 800 640
213 710 610 800 640 100
210 422 610 800 640

Section 10.

Tutor Evaluation - Afternoon Session Feedback

Tutor Evaluation-Afternoon Session Feedback

Second (Present) Type of Feedback ______________________________

Date ____________________

Please take the time to fill out the last of many infamous forms. Names are not necessary. None of these will be looked at until final grades are turned in. Thank-you for all your patience and cooperation. Good luck in the future.

1. Have you been satisfied with your present feedback?

2. Which portion of your feedback was most helpful?

3. What were the advantage and/or disadvantages of your feedback.

4. Now that you've experienced both, which feedback would you prefer and why?

Tutor Evaluation - Practicum

Please read the following and rate each item on the basis of how useful you felt it was with #5 being most useful and #1 being least useful. Add any comments you feel may be helpful in revising a particular item feel free to write on the back of the page.

Discrimination Training

1. Learning codes	5	4	3	2	1
2. Filling out coding exercises	5	4	3	2	1
3. Taking Criterion Tests	5	4	3	2	1

Use of Feedback for Training Purposes

4. Analysis of feedback (Read printout or listen to tapes)	5	4	3	2	1
5. Filling out feedback sheets	5	4	3	2	1
6. Filling out graphs	5	4	3	2	1

Performance Objectives

7. Prompting of 21's only, not 22's	5	4	3	2	1
8. Give pupil time to self-correct by waiting until end of sentence to prompt	5	4	3	2	1
9. Shorten length of prompt sequence	5	4	3	2	1
10. Increase use of Module Prompts (75%)	5	4	3	2	1
11. Decrease use of Other Prompts	5	4	3	2	1

Teaching

12. Teaching 2 hrs. week (versus 1 hr.)	5	4	3	2	1
13. Diagnostic testing of your child	5	4	3	2	1

14.	Giving Criterion Reading Tests	5	4	3	2	1
15.	Filling out Lesson Plans	5	4	3	2	1
16.	Oral Reading in booth	5	4	3	2	1
17.	Computing and maintaining 10% error rate for oral reading	5	4	3	2	1
18.	Materials available to you in classroom or from Mary Ella or Darla	5	4	3	2	1
19.	Switching children for one oral reading lesson	5	4	3	2	1
20.	Conferences with Darla	5	4	3	2	1
21.	Recall Interviews	5	4	3	2	1
22.	Progress letters to parents at end of semester	5	4	3	2	1

Constructive Criticism/Suggestions for Improvement in any area of this practicum

Section 11.

Summary of Responses to Tutor Evaluation

Summary of Responses

Tutor Evaluation-Afternoon Session Feedback

1. Have you been satisfied with your present feedback?

   (7) Yes's

   Yes - I have been satisfied with the feedback. I like knowing what I've done according to someone else's opinion. By looking at the sequences I got to see what I did prompt and which prompts I used.

   Yes - It was all really helpful. At first I was rather confused, but with time I learned, became more organized myself, and understood what was going on.

   Yes - I like being able to see (approximately) what I'm doing.

   Yes - I am enjoying CATTS alot, it has helped me learn the code and the rest of this observation system.

   No - I feel it isn't as accurate as the CATTS feedback.

   No - I wish I knew whether or not the tapes I've coded are accurate. But, I enjoy listening to my tapes. I feel I've learned alot from listening to my mistakes.

   No - There is no way to accurately check my reliability, I am pleased to listen to the tapes but the feedback appears to contain a void in that it provides no definitive instructional diagnosis.

   I had been satisfied until recently. My tapes have been very difficult to hear.

   What can I say? For one, it was very time consuming and an inconvenience in that it was necessary to go to the library and locate a cassette recorder.....

   Somewhat.

   Basically I would have liked to get both types of feedback.

2. Which portion of your feedback was most helpful?

   Filling out the sheets.

   Realizing the varying context clues and structured prompts. Also the inconsistency of some prompts and the frequency.

   How about the Feedback Evaluation Sheet?

   It helped me alot to be able to listen to the entire oral reading session again. It reinforced what I had done correctly and made me realize the dumb prompts I'd made.

I enjoy examining the quality of the miscues. Variations & relationships in 21 and 22 are most informative.

I enjoy listening to my tape. I've found out some of my weak traits (Ex. being irritated when Daves messing around with Mike.) I also feel my prompts are improving. Instead of using one type of 33, I use several.

Listening to myself prompt.

Prompt sequence is the most helpful. I have learned from this portion of the feedback, how accurate I'm doing on the amounts of prompts and how to stop going so many.

Seeing the graph on the screen helped me to concentrate on increasing the appropriate prompts.

The immediate feedback on the montor helped me alot for immediate knowledge of where I was. In long run terms the graph really helped me analyse my prompting.

Two portions helped: (1) the module prompts and other prompts showing what I did or didn't do, (2) the sequences (helped me see how long it took to prompt and which miscues were and weren't prompted.)

Well If I gave a prompt and was not sure which category it fell under it was helpful in that it showed what prompt.

Knowing the frequency of prompts given. Also hearing one's voice on tape.

The portion that was most helpful, was knowing exactly what prompts I had given. Also looking at the interaction sequences and knowing what prompts helped Mark get the word he was stuck on.

Coding my miscues.

The taping and sheets to be filled out.

I feel that the instant feedback gave me an incentative or motivation but the evaluation sheet is a permanent record.

The graph is the most helpful part cause I can actually see what I've been doing. Looking at the numbers doesn't tell me much.

3. What were the advantages and/or disadvantages of your feedback? Be specific.

The advantages were that it was easy to record and it was fairly immediate. I saw no disadvantages except sometimes there were delays--but that's minor.

Advantages: Instant feedback.
Disadvantages: Cannot compare stringsfor my marked miscues because can't decide which goes where.

You can understand your progress & percentages more by figuring them yourself.

You can remember exactly what you did. I'm never sure if they are coding the same way I am. If I was sure that I coded the exact same then it would be better.

It didn't take too long to do the CATTS feedback and I could spend more time on special activities for Mark. There has been several times I thought I was giving a certain prompt (an mod. prompt) and I was giving a prompt which was not a mod. prompt. With CATTS feedback this was caught and explained to me, which has helped very much.

Advantage: Hear yourself on tape. Have written on paper what prompts you are to increase.
Disadvantage: Is not immediate as CATTS. In CATTS you know them and are reminded what prompt was given.

At first it was more of a disadvantage because it tended to distract the tutor. But is soon became advantageous as the tutor got use to it.

The advantage was being able to see as soon as the lesson was over and while it was going on what prompts I was using and didn't use.
The disadvantage was seeing that I wasn't using certain prompts that were expected of me, and trying to use them that I wasn't comfortable and sure of what I was doing.

Immediately knowing what prompts I am using. Records of past prompting.
Disadvantages: T.V. distracts John,could be some errors in coding.

I have never agreed with the feedback sheet as far as number of miscues/ or prompts given. I don't know if the coder can't hear me or Michelle or what. I usually mark miscues on my xeroxed copy and our numbers never match.

Advantages: Concentrating on one specific prompt has helped me with my feedback in increasing the particular prompt--I have learned to overall go 15% on 52's, 15% on other, and 7?% on m.p.'s. Thanks. I won't forget this for a long while.

Advantages: listen to yourself prompt.
Disadvantages: CATTS takes less time. Is it really accurate.

I like an accurate feedback such as CATTS. I know my coding is close but I wonder how close it is.

Time consuming (in relation to CATTS), lack of reliability, and lack of specific diagnostic information (more as result of the coding system, rather than the feedback itself.)

Again, I was greatly benefited by hearing the session over again. But, often the tapes are not real clear which made it difficult to hear what the child was saying.

I have already mentioned the disadvantage in it.
Advantage: Possibility to write down what child says accurately and thus being able to be fully attentive during oral reading.

Disadvantage: Not being able to see the prompts as being given--to be able to change prompts.

Because I wasn't sure if I was coding myself correctly, i.e., if I think I'm giving a 52 and I'm not I still code myself as a 52.

Section 12.

Lesson Plan Checklist

Name ______________________

Week ______________________

Lesson Plan Checklist

	Self Evaluation Day 1	Self Evaluation Day 2	Supervisor Evaluation Day 1	Supervisor Evaluation Day 2
Oral Reading (7)				
Objective stated				
Need for that skill				
Title & level of book				
Title of story				
Page numbers				
Number of words read				
Total number of errors				
Other Skill Areas (11)				
A. Objective stated				
1. Given				
2. Behavior OR				
B. CR				
1. Number				
2. Brief heading				
Materials listed				
1. Accurate & complete				
2. Correspond to activity				
Activity Discription				
1. Describe pupil behavior				
2. Describe teacher behavior				
3. Describe use of materials				
4. Give any directions necessary for understanding the activity. (Assume the reader is totally unfamiliar with anything other than C.R. pre & post tests)				
Evaluation Procedure Stated				
1. Is different from activity (instruction in skill)				
2. Is appropriate test of designated skill				
OR 3. One & two above fulfilled by a CR post test.				
*Comments Section Filled Out				
1. Are a realistic interpretation of the events that occurred.				
TOTAL				

TOTAL POINTS 20

Section 13.

Lesson Plan Form

LESSON PLAN
Teacher Education Laboratory
Tutorial Program in Reading

Tutor/Pupil ____________________

Week ____________________

		SPECIFIC OBJECTIVES	MATERIALS	ACTIVITY	EVALUATION PROCEDURES
Day 1	Oral Reading				
	Specific Skill				
		Comments			
Day 2	Oral Reading				
	Specific Skill				
		Comments			

Section 14.

Sample of Informal Reading Inventory Materials

Name ______________________________ Date ____________________

Oral Reading Passage

Seeking Adventure (Level 4)*

A True Tale

Another man and I were studying water birds in Alaska. One day I was alone, paddling up a stream. A black bear on the bank saw me. He plunged into the water and came for me. I landed. Then I grabbed my pack and climbed a tree. The bear followed.

The bear climbed up the tree after me. He bit my right boot. But when I kicked him, he let go and dropped to the ground. I tried to go higher. But I lost my grip on the tree trunk, and I slid to the ground. I threw my pack at the bear. He grabbed it and moved away. I climbed a bigger tree.

Soon the bear was back. He came up the bigger tree after me. Once he bit my left boot. I yelled. I shook the treo. I even threw by binoculars at the black bear below me. The bear did not go away until my friend came looking for me. I was not hurt, but I had been up a tree for two hours.

*This is a sample from ono level out of a set of materials for levels preprimer to fifth.

Comprehension Questions

1. Where was the man when the bear went after him?

2. What did the man do when he saw the bear?

3. Do you think he was afraid of the bear?

4. Why did the man kick the bear?

5. What did the bear do when the man kicked him?

6. Why was the bear chasing the man?

7. Do you think it was a good idea for the man to have gone out alone?

8. Why do you think the bear left when he saw the man's friend?

Level 4*
IRI

Word Recognition List

baby	much
boat	page
candle	present
cookies	sadly
doesn't	sign
fed	stamp
funny	terrible
help	turn
join	whistle
lonely	zoo

*This is a sample from one level out of a set of materials for levels preprimer to fifth.

COMPREHENSION 38-3
Inferring Main Idea

Can you read a story and then tell its main idea? Let's see.

Read the story about Helen. Under the story is a question: "What do you think is the main idea of the story?" The right answer has a circle around it. That is how you will mark your answers.

Helen went to a birthday party. She saw her good friends. She played games that were fun.

What do you think is the main idea of the story?

a. Helen had fun at the party.

b. Helen has friends.

c. Helen plays.

Now read the story in the next box. Then read the question under it. Circle the right answer. Then do the rest of the boxes.

A fire started in the house. The fire trucks came. The firemen worked very hard. But the firemen could not put out the fire.

1. What do you think is the main idea of this story?

   a. The fire started in the house.

   b. The firemen came to the fire.

   c. The firemen worked hard, but the house burned down.

   d. The firemen worked hard and saved the house.

Dale was watching T.V. He did not want to go outside. Dale hoped the show would never end because it was so good.

2. What do you think is the main idea of this story?

   a. Dale did not go outside.

   b. Dale liked the T.V. show very much.

   c. The T.V. show was very funny.

   d. Dale did not have anyone to play with.

Danny went fishing with his father. They said they would catch many fish. Danny said he would have fish for dinner. When Danny and his father came home, all they had was their fishing poles.

3. What do you think is the main idea of this story?

   a. Danny and his father did not catch any fish.

   b. Danny and his father went fishing.

   c. Danny had a fishing pole.

   d. Danny wanted fish for dinner.

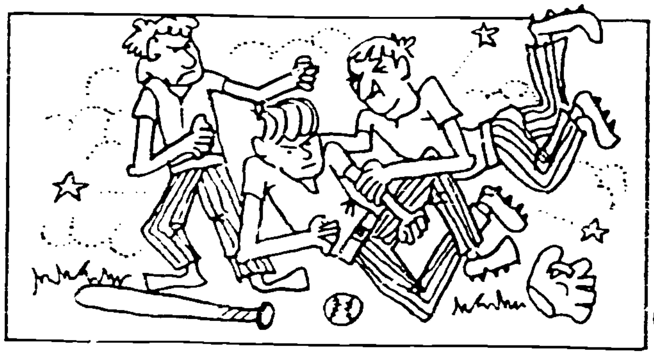
DATE____________________

COMPREHENSION 38-3.1
Identifying the Main Idea in a Picture

SAY: Read the directions on your page silently as I read them aloud.

Can you look at a picture and tell the most important thing or idea in it? Let's see.

Look at the picture of the two boys below. Beside the picture are three words. Which word tells the most important idea in the picture? It is the word *fight*. *Fight* is circled because it is the correct answer. This is how you will mark your answers.



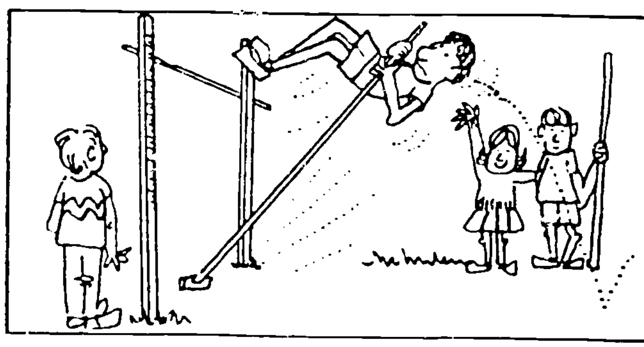
a. baseball game

b. boys

c. fight

Now look at the pictures below. Choose one of the three words beside each picture that best tells the main idea in the picture.

1.

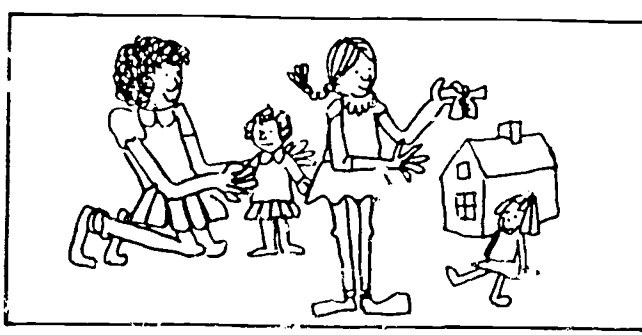


a. men

b. contest

c. looking

2.



a. girls

b. dolls

c. playing

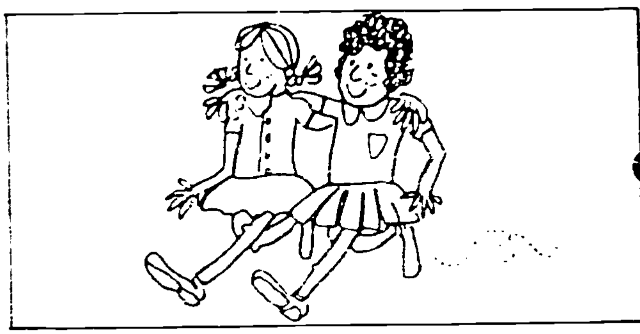
3. 

a. finding

b. working

c. watching

---

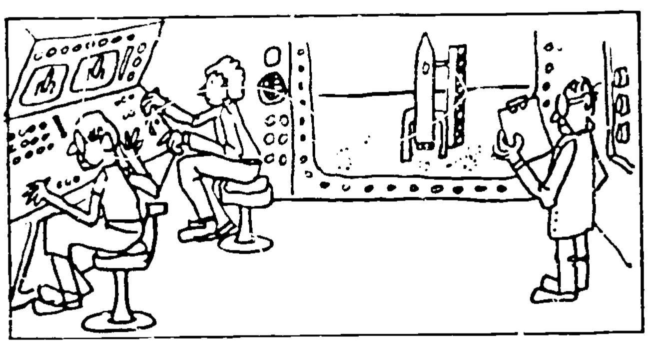
4. 

a. walk

b. friends

c. sisters

---

5. 

a. spacemen

b. spaceship

c. space age

Number correct needed to pass: 5

Let's see how well you can choose the part of a story that tells its main idea.

Read the story about Jane below. Under the story is a question: "What is the main idea of the story?" The correct answer is circled. This is how you will mark your answers.

Jane is a good reader. She reads her lessons fast. She helps the rest of us with hard words.

What is the main idea of the story?

a. Jane goes to school.

b. Jane helps us.

c. Jane is a good reader.

Now read the story in the next box. Then read the question under it. Circle the right answer. Then do the rest of the boxes.

Ronald likes to play kickball. He likes to play football, baseball, and tag. He likes to play many kinds of games.

1. What is the main idea of the story?

a. Ronald likes to play football.

b. Ronald likes to play many games.

c. Ronald does not like to play hopscotch.

d. Ronald likes to play kickball.

TURN PAGE

Tonya had short hair. Everyone liked Tonya's hair. But Tonya did not like her hair short. She wanted long hair like her sister's.

2. What is the main idea of this story?

a. Everyone liked Tonya's hair.

b. Tonya wanted long hair, not short hair.

c. Tonya liked her sister.

d. Tonya's sister liked short hair.

Tom fights with other children. He will not let anyone play with his toys. He is not very nice to anyone. Tom does not have any friends.

3. What is the main idea of the story?

a. Tom has no toys.

b. Tom is bad to his teacher.

c. Tom fights with all his friends.

d. Tom does not have any friends

DATE ______________________

PHONOLOGY: PERFORMANCE OBJECTIVES

Level 2

24-1 Given rows of pairs of upper and lower case letters, the pupil [illegible] specified letters in upper and lower case pairs with 95% accuracy.

24-1-1 Given rows of vowel letters with orally specified letter names, the pupil identifies lower case vowel letters with 95% accuracy.

24-1-2 Given rows of consonant letters with orally specified consonant names, the pupil identifies lower case consonant letters with 95% accuracy.

24-1-3 Given rows of letters with orally specified letter names, the pupil identifies upper case letters with 95% accuracy.

24-2 Given rows of consonant letters, the pupil identifies initial single consonant sounds of orally specified words with 95% accuracy.

24-2-1 Given rows of pictures, the pupil identifies initial single sounds of orally specified words (illustrated by the pictures) with 95% accuracy.

24-3 Given rows of consonant letters, the pupil identifies final single consonant sounds of orally specified words with 95% accuracy.

Level 3

34-1 Given orally specified letters, the pupil is able to write letters in upper and lower case pairs with 95% accuracy.

34-1-1 Given orally specified vowel letter names, the pupil identifies each vowel by writing its lower case form with 95% accuracy.

34-1-2 Given orally specified vowel letter names, the pupil identifies each vowel by writing its upper case form with 95% accuracy.

34-1-3 Given orally specified consonant letter names, the pupil identifies each consonant by writing its lower case form with 95% accuracy.

34-1-4 Given orally specified consonant letter names, the pupil identifies each consonant by writing its upper case form with 95% accuracy.

34-2 Given orally specified words with long vowel sounds, the pupil identifies the long vowel sound by writing the correct vowel letter with 95% accuracy.

34-2-1 Given rows of vowels with orally specified words, the pupil identifies long vowel sounds with 95% accuracy.

34-3 Given orally specified words with short vowel sounds, the pupil identifies the short vowel sound by writing the correct vowel letter with 95% accuracy.

34-3-1 Given rows of vowels with orally specified words, the pupil identifies short vowel sounds with 95% accuracy.

STRUCTURAL ANALYSIS: PERFORMANCE OBJECTIVES:

Level 2

25 1 G... of pictures and oral directions containing specified ... the pupil identifies singular possessive nouns with 95% ...

25 ... of pictures and oral directions containing ... fied words, the pupil identifies singular and plural ... with 95% accuracy.

25 2 Given ... of pictures and oral directions containing specified ... the pupil identifies comparative adjective endings er and est with ... accuracy.

25 3 Given ... by simple pictures followed by sets of three ... oral directions, the pupil identifies compound words with ... accuracy.

Level 3

35 1 G... numbered pictures and sentences containing specified ... possessives, the pupil classifies singular possessive nouns ...

... lists of nouns containing some regular and irregular ... plural forms, the pupil classifies singular and plural nouns with 95% accuracy.

35 2 ... of words containing some *er-est* suffixes, the pupil ... adjectives changed by adding *er* or *est* with 95% accuracy.

35 3 Given ... verbs, *is*, *does*, or *have*, with lists of three words, the pupil classifies important irregular verbs, present tense, with 95% accuracy.

35 ... Given lists of verbs containing some with *ing* suffix, the pupil classifies verb endings with 95% accuracy.

35 ... Given lists of words containing some contractions with forms of *to be*, *will*, and *not*, the pupil classifies contractions with 95% accuracy.

35 4 Given ... verbs, the pupil identifies irregular verbs, past tense ... accuracy.

35 4 ... Given lists of verbs containing some with endings, the pupil classifies regular verbs, past tense, with 95% accuracy.

35 5 Given ... ified words and lists of three words, the pupil classifies compound words with 95% accuracy.

Given lists of words containing some contractions with forms of *to be*, ... and *not*, the pupil classifies contractions with 95% accuracy.

35 6 ... Given lists of words ending in *s* the pupil identifies simple contractions with 95% accuracy.

26-8 Gi... ...s of pictures and orally specified words ... possession, the student identifies possessive words with 95% accuracy.

26-9 Given pictures containing several different subjects and orally specified directions to mark the one that does not belong, the student classifies by category with 95% accuracy.

26 9.1 Given rows of pictures and some orally specified category words, the student identifies countable nouns with 95% accuracy.

26 9.2 Given rows of pictures and some orally specified category words, the student identifies noncountable nouns with 95% accuracy.

Level 3

36-1 Given words for the names of nine colors and rows of colors, the student identifies words for colors with 95% accuracy.

36-2 Given the words for the cardinal numbers zero through ten and lists of numerals, the student identifies words for cardinal numbers with 95% accuracy.

36-3 Given direction sentences containing ordinal numbers and rows of boxes, the student identifies words for the ordinal numbers for one through ten with 95% accuracy.

36-4 Given names for the days of the week in random order followed by seven alternative numerals, the student puts the days of the week in order with 95% accuracy.

36-5 Given words for the names of two-dimensional and three-dimensional shapes and rows of shapes, the student identifies words for shapes with 95% accuracy.

36-6 Given specified words for the three states of matter and rows of pictures, the student identifies the three states of matter with 95% accuracy.

36-7 Given descriptive words for size properties and rows of pictures of objects, the student identifies size properties with 95% accuracy.

36-8 Given specified sentences, two incomplete sentences for each, and lists of alternative property words, the student identifies objects for different properties with 95% accuracy.

36 8.1 Given words to describe tactile properties and rows of pictures of objects, the student identifies tactile words with 95% accuracy.

36 8.2 Given words to describe taste properties and rows of pictures of objects, the student identifies taste words with 95% accuracy.

36 8.3 Given words to describe sound properties and rows of pictures, the student identifies words for sound properties with 95% accuracy.

Section 15.

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Section 16.

Andrew's Pupil Perceptions of Reading Interview

Directions: Read what is in capital letters to the child. You may modify the words, if necessary, to clarify an item since this is not a standardized test. Record exactly what the child says in response to each item. Don't go on to the next item until you have finished recording the child's answers. Where indicated, probe the child for more responses to a question. Be sure to fill in all information and complete all questions. For those questions where you get more than 1 response from the child, indicate the order of the responses given by writing one (1) by the first response given, two (2) by the second response given, and so on. After probing for an additional response where indicated, if the child isn't coming up with anything, go on to the next question.

Name ______________________________ Date ______________

DIRECTIONS: I AM GOING TO ASK YOU SOME QUESTIONS ABOUT READING. THERE ARE NO RIGHT OR WRONG ANSWERS. I'D JUST LIKE TO KNOW WHAT YOU THINK ABOUT READING. THINK ABOUT ALL THE READING YOU DO, NOT JUST READING YOU DO IN SCHOOL AS I ASK YOU THESE QUESTIONS.

1. WHAT IS THE BEST THING ABOUT READING, THAT IS, WHAT DO YOU LIKE MOST ABOUT READING? (If the child doesn't answer, probe by saying something like, "Can you tell me something really good about reading?" One response is sufficient.)

2. WHAT IS THE WORST THING ABOUT READING, THAT IS, WHAT DO YOU REALLY NOT LIKE ABOUT READING? (If the child doesn't answer, probe by saying something like, "Can you tell me something really bad about reading?" One response is sufficient.)

3. IF YOU WENT TO TALK TO THE KINDERGARTEN PUPILS ABOUT READING, WHAT WOULD YOU SAY TO THEM? (If the child doesn't answer or gives an irrelevant answer, probe by saying something like, "How would you explain reading to someone who doesn't know how to read?" A long response(s) may be obtained here. Be sure that the answers received are relevant to the question.)

4. DO YOU THINK THAT YOU'RE A GOOD READER? YES NO

If yes: A. WHY DO YOU THINK YOU'RE A GOOD READER? (Try to get 3 reasons why the child thinks he's a good reader by probing with further questions, such as, "Are there any other things you do that make you think you're a good reader?")

If no: B. WHY DO YOU THINK YOU'RE NOT A GOOD READER? (Try to get 3 reasons why the child thinks he's not a good reader by probing with further questions such as, "Are there any other things you do that make you think you're not a good reader?")

5. WHEN YOU'RE READING AND YOU COME TO A WORD YOU DON'T KNOW, WHAT DO YOU DO? (Try to get 3 things the child does by probing further with such questions as, "Is there anything else you sometimes do when you don't know a word?" For each answer, that is, each thing the child says he does when he doesn't know a word, ask the question, "HOW DOES THAT HELP YOU?"

A. I do ______________________________

____

It helps me because ______________________________

____

B. I do ______________________________

____

It helps me because ______________________________

____

C. I do ______________________________

____

It helps me because ______________________________

____

6. DO YOU THINK THAT YOUR TEACHER AT SCHOOL IS A GOOD READER? YES NO

If yes: A. WHAT MAKES HER/HIM A GOOD READER? (Try to get 3 reasons by probing if necessary, with a question, such as, "Are there any other things that you think make her/him a good reader?")

If no: B. WHAT MAKES YOU THINK THAT SHE/HE IS NOT A GOOD READER? (Try to get 3 reasons by probing, if necessary, with a question, such as, "Are there any other things that you think make him/her not a good reader?")

7. DO YOU THINK YOUR TEACHER EVER COMES TO A WORD SHE DOESN'T KNOW WHEN SHE'S READING? YES NO

If NO, stop. End of test.

If YES, ask:

WHAT DO YOU THINK SHE/HE CAN DO TO FIND OUT WHAT A WORD IS? (Try to get 3 responses by probing with a question such as, "Is there anything else you think she/he can do when she/he comes to an unknown word?")

Section 17.

Tabulation of Pupil Responses to Interview

Andrew's Tabulation

1. What is the best thing about reading, that is, what do you like most about reading?

	October Response	April Response
Child 1	You learn harder words.	Riddles.
2	It's fun and the only thing I have to do.	Little words, short stories.
3	You learn.	It's fun when you don't have anything to do.
4	You learn something, it's fun.	You learn something; when you grow up, you have to read signs and everything so it's a good thing to learn to read.
5	Stories are fun to listen to.	The stories we can read.
6	The pictures.	That they have easy words and they're fun words.
7	Being able to read the words.	You learn about something or how to make something.
8	I think reading's fun. You learn how to spell or read, then you know what it says.	Good stories; getting up into higher books, I like my old (reading) teacher better Mrs. X.
9	When you read you learn things (about) animals, people, countries, states.	When we go in the booth to read stories.
10	Like reading at school.	I like reading because I want to read to my Mom & Dad. I like it because it is fun for me.
11	It's okay...can't say	Better for you. Learn how to read and you know how to do alot of stuff.
12	Pictures.	You learn stuff.
13	You can read about dogs, cats, horses, goats, turtles, pigs and birds.	It's no fun. I don't like to read.
14	Learning how to read. It's fun.	Reading itself is not fun but the stories are fun.
15		The story.
16	Well...nothing. You like to sound them out.	Pictures. I like to look at them but that doesn't mean I like to read (about) them.

	October Response	April Response
Child 17	It's fun and it gives you something to do.	Sometimes if you don't have nothing to do you can find a book to read.
18	The deer book (short).	Nothing.
19		
22	Nothing. I don't like to read.	Nothing.

2. What is the worst thing about reading, that is, what do you really not like about reading.

	October Response	April Response
hild 1	When I stumble over words.	Hard words.
2	Long stories.	Everything.
3	Some words are hard.	Them hard words.
4	Some words and letters are hard.	There might be a long page and I don't like to read real, real long pages.
5	When I don't know how to read.	Trying to spell words.
6	The words.	That they are really really hard words.
7	Stories aren't too fun--too long. Rather not read out loud, it takes too long.	Reading in the booth (orally).
8	Reading a whole book; reading too many pages at once.	Trying to figure out hard words, I don't like people being so slow. I hardly ever get any free reading time.
9	When you have to quit reading and you're at the best part of the book.	Nothing--I like it all.
10	Tearsheets (Worksheets).	Well, I don't know some words.
11	Somebody goes too fast.	(Wouldn't answer).
12	Have to sound out the words.	I don't like to look-up the words.
13	You can't get to do anything you want when you have to do.	No good stories.
14	Reading books of certain types.	Reading pages and questions.
15		You have to read it.
16	You don't like to read. It ain't no fun when you don't know how to read.	You have to sound out word.
17	If somebody bothers me I might not want to read.	It's not that fun unless there's a good story.
18	Stay up on reading chairs too long.	Cause I get a headache every time I read. It's really hard for me to read.

	October Response	April Response
Child 19		
22	I don't know. I hate it. I like to go out and play.	Everything.

3. If you went to talk to the kindergarten pupils about reading, what would you say to them.

	October Response	April Response
Child 1	Reading is hard.	That readin' is not fun. There's hard words in readin'.
2	Ask them if they like to read and like to look at pictures.	Nothing to it! It's simple.
3	Some words are hard.	That word is "the," number 1 that word is number 10, that's all I can [illegible] them.
4	Spell out words, sound them out, you'd have a good time reading.	Sound the word out first, then read it. It might start getting harder so practice [illegible].
5	Look, we read it to them, then they look at the pages and read with me.	Ask them if they knew how to read. If they said yes, I'd tell them to read alot. If they said no, I'd ask them to try and read.
6	There's lots of things to learn about reading. You gotta listen to the teacher.	It's easy to read if you know your A.B.C's. You have to sound out sometimes if you don't know the word.
7	Show them how to sound out words. Read them a book.	Reading is easy, sound it out, the teacher helps.
8	Reading is fun. The more you know about reading, the more you know.	Reading is a little hard but it's fun. You have to figure out words. Every word has a little word in it and you cover up certain letters to find out the word.
9	Reading is the best way to learn about math, language and people.	I can't think of anything to tell them.
10	I don't like reading.	What do you like about reading? You can learn from 2nd grade through all the grades. You should learn reading.
11	I couldn't say.	Listen to the teacher and learn how to do it. Let them try to sound out words and read the sentence.
12	Pictures are good to look at. Don't look at pictures while reading.	Make sure they learned their phonics.
13	Would you like to read? Wouldn't you like to read?	Give them a book with pictures no words.
14	Nothing, I don't know.	It's fun and not fun, easy and hard. I bet you'd like it.

	October Response	April Response
Child 15		Pronounce it out.
16	When you don't know a word, sound it out. When you have a book you sit down & read it.	I hate it. It's just dull.
17	Reading is fun it's very easy to do.	Sound out words if they don't know them.
18	Nothing	Just to read, and do your work very good and the teacher will like you.
19		
22	I don't like it; a bunch of words in a sentence...Why should they be in a sentence.	That you read out of a book. Just look at the words and sound them out!

4. Do you think you're a good reader?

	October Response	April Response
Child 1	yes	yes
2	no	no
3	no	no
4	yes	no
5	no	yes (a little)
6	no (not very well)	yes
7	yes	yes
8	yes (a little)	no - then yes
9	not really	yes/no - fairly
10	yes	yes
11	no	no
12	yes	about even
13	yes	no
14	yes	no
15		no
16	no	no
17	yes	yes
18	yes	yes & no (a little)
19		
22	no	yes/no - half
TOTAL	9 yes, 1 both, 8 no ⟷	4 yes, 6 both, 8 no

4. If yes: Why do you think you're a good reader?
   If no: Why do you think you're not a good reader?

	October Response	April Response
Child 1	Yes--I can read good.	Yes--Because there's easy words.
2	No--Because I'm here.	No--Because I don't like it.
3	No--Don't know many words.	No--(Wouldn't give reasons).
4	Yes--When you come to a big word that you don't know, you sound it out and then read it and you're right.	No--Miss too many words on spelling tests, miss long and short vowels-nothing else.
5	No--I don't know words, long words, hard words, big words, words with too many letters.	Yes--I like stories and story books I like to find out things I don't know.
6	No--Because I miss alot of words.	Yes--Because I read good sometimes. Sometimes I get lots of words right.
7	Yes--I can sound out words I can read pretty fast.	Yes--'Cause I'm in a high reading book. I can get hard words alot.
8	Yes--I'm learning how to sound out words. Good enough.	Yes/No--I don't know I figure out some words I don't know. Reading words right off without having to figure them out.
9	No--Not really: Because I don't know alot of words, also I don't read that many different kinds of books.	Yes/No--I can read some books but I can't read books with real skinny lines in it.
10	Yes--I read loud.	Yes--Because I like to read to my Mom & Dad. Because I'm having a reading contest.
11	No--There are alot of reasons.	No--I'm behind everyone; I'm in a lower book; I like to try but I fail alot.
12	Yes--Sort of (no other responses).	Even Yes/No--I can't read good but I can read better than bad.
13	Yes--No reasons.	No--I don't like to read.
14	Yes--I know most of the words.	No--Everyone got A+ but I did/not. Don't figure.
15		No--I don't know why.
16	No--I don't know as much as you. I haven't been in as many grades as you.	No--They know when to stop & when to go, the periods & comma. They know words better.

	October Response	April Response
17	Yes--Cause it don't take me long to read cause I know lots of words. I'm real quick.	Yes--Cause I use to not read too much and didn't read very good. Now I do and I can read faster.
18	Yes--Read some words but don't like to learn.	Yes/No--A little. Nothing. Maybe I don't want to.
19		
22	Yes/No--I can sound the words out sometimes, I'm slow, it takes time.	Yes/No--Half! I'm not that good but I'm okay--I don't know anything else.

5. When you're reading and you come to a word you don't know, what do you do/How does that help you? (3 reasons if possible)

	October Response	April Response
Child 1	Ask the teacher: She'll tell me Use my phonics: It helps to sound it out; ask a neighbor they'll tell me.	I ask the teacher: teaches me words. I try to pronounce it: it helps me learn the words I skip it: that doesn't help me.
2	I sound it out: if you don't sound out a word you don't know--you won't get it	Ask the teacher: sometimes she tells me. guess; I try to figure it out.
3	I sound it out: it's easier to get the word. I think: I get the answer faster.	I ask the teacher: I don't know (how that helps me.)
4	I sound it out: I learn more about the word. I look at it, I spell it to myself. I ask one of my friends: they might know it.	I pronounce the word: when I pronounce it, it helps me put the word together. When I see 2 words together you know how to say the 1st word. I stare at it: I start seeing one word, then another and then you can put the 2 together.
5	I don't read them: ______ I tell the teacher: She helps me with the word. I try to sound it out: hear all the letters.	I sound it out: ______ I read the sentence: ______
6	I sound it out: then you will know the word. I ask the teacher she tells me the word.	I sound it out: I'll get the word. I ask the teacher if it's hard, she'll tell me to sound it out and if I still don't know she'll tell me. I say blank: I can read the whole thing and I might know what it is.
7	I sound it out: because I can put words together. I skip over it: I can go on & read the whole sentence & things back & figure it out.	I sound it out: it helps me get it. I ask the teacher: ______
8	I sound it out: because I can hear it better. I find the base word: I can add on to it.	I cover certain letters to see if there's smaller word's in the word: Most words have little words in them. I sound it out: I learn to say them better. I say blank & read the rest of the words: you don't say the word right away and you see if it makes sense.

	October Response	April Response
9	I ask somebody to help me find out what the word is: I remember the word after someone tells me. I sound it out: I learn the word & remember it in my vocabulary.	I skip it: it doesn't help. I pronounce it: I might come to it again & then I'd know it. I ask the teacher: she breaks it up for me.
10	I ask the teacher: she writes it down.	I ask someone--They tell me. I figure the word out--I sound it out. It helps me know the word. I don't know.
11	Try to figure it out: _______ Ask the teacher: it helps me remember.	I skip it & try to figure it out by words in the sentence: otherwise I'd wear myself out on one word. I sound it out: it helps me remember the word.
12	I skip it: if it's long I skip it. I sound it out: it helps my reading & understanding the story.	I say blank and read the rest of the sentence.
13	I ask the teacher: because you can read after you read or know the word. I ask Mom: she tells me the right word.	I ask the teacher: you can move on I ask my mother, father, brother: you can move on. I skip it: it doesn't help.
14	I ask the teacher: don't know I skip it: don't know.	I skip it: I can go back to it. I ask the teacher: I get to know it.
15		I pronounce it out, I don't know why. I ask the teacher.
16	I sound it out: ________. I skip it (no help) I ask someone what it is (no help).	I don't do anything. Ask the teacher. It helps because she puts it on the board and we stare at it.
17	I usually ask somebody: I don't know the word & I can go on reading if I know the word. I sound it out: I might know it. I think about other words & try the "e" sound so I know if it's a long vowel sound.	I sound it out: if you know all the letters you can put them together you can know them. I ask somebody to help me. I sound it out more.
18	I ask the teacher: ____________. I ask one of the kids: ________.	I ask the teacher: ______________. I sound it out: __________________. I skip it: ____________________.
19		
22	I stop & think about it. I sound it out: because I can sound out each letter.	I sound it out: helps because I can sound it out better than just saying it. I try to read it: I don't know how it helps. I don't do nothin'--maybe read on & go back. It helps because I might figure it out.

Section 18.

Sample Letters Sent to School Administrators, Teachers and Parents Concerning the Tutoring Program

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

September 11, 1975

The Teacher Education Laboratory of CITH, will offer a program of tutoring for reading improvement. It will begin mid October and continue till the close of the winter semester (end of April).

We would like to enlist your cooperation in making the availability of the after-school tutorial program known to the teachers in your school. Children eligible for the program are those in grades 2 and 3 who are one or more grade levels behind in reading, and children in the upper elementary grades who are 2 or more grade levels behind in reading. We can accept both special class and regular class pupils.

The tutors assigned to work on a one-to-one basis with pupils are juniors majoring in special education. They are participating in a program for training teachers in reading improvement.

The program has been carefully designed to include training in all aspects of teaching reading. The trainees will be closely supervised and accountable for individual pupil program planning, pupil attitude and periodic assessment. Trainees are required to demonstrate mastery in diagnosis, lesson planning, prescription, and oral reading skills prior to working with pupils. Expert consultation and reading materials and resources will be available to the tutors.

The project will also serve as a means for conducting studies on the teaching-learning process, and the parents of participating children will be informed of this.

We would appreciate your informing the teachers in your school of the availability of the tutorial program by circulating the enclosed referral sheet. If it is convenient, we will collect the referrals from your office on September 19, 1975.

Children in the program will receive two hours of tutoring per week, with tutorial sessions scheduled between 3:30 and 5:30 p.m., at the Laboratory Classroom at CITH. Initially, we will be able to provide tutorial service for up to 22 pupils.

If you have any questions about the service, I will be pleased to answer them, so feel free to call me.

Sincerely yours,

Dorothy Semmel

Dorothy Semmel
Research Associate

Enc.

DS/lp

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

September 11, 1975

To MCCSC Teachers:

The Teacher Education Laboratory of CITH, will offer an after-school tutoring program for reading improvement.

Children eligible: Second and 3rd grade pupils who are one year behind in reading, and upper elementary pupils who are 2 or more grade levels behind in reading. Both regular class and special education pupils can be accepted.

Time: Two one-hour sessions per week, to be scheduled afternoons between 3:30 and 5:30. The program will begin October 13, 1975.

Place: The Teacher Education Laboratory, Room 150, Smith Research Center (Old University High School) 2805 East 10th Street.

Staff: Tutors are I.U. education students who are being trained in Reading Instruction. They will be carefully and continuously supervised and will have both consultant assistance and extensive reading resource materials available.

Program: Emphasis is on pupil development of oral reading skills and comprehension. Other remedial goals will be established, based on individual pupil needs.

Research on the teaching-learning process will also be conducted in connection with the tutorial program, and parents of participating children will be informed of this.

Cost and Transportations: There is no cost for the tutoring service but parents will be expected to make own transportation arrangements whenever possible. (Some transportation assistance may be available from time to time.)

Referral: If you have a pupil in your class that you think will benefit from supplementary tutoring in reading, please write his/her name, home address and phone number on the next page.

We will write to each parent directly and ask them if they wish to enroll their child in the program. The letter to the parents will emphasize the voluntary nature of participation in the program, as we would avoid the implication that you expect or require it.

If you would like further information, call Dorothy Semmel, 337-5847 (336-8952, evenings).

Names of pupils who would benefit from an after-school tutoring program in reading.

Name	Home Address	Phone No.
1.		
2.		
3.		
4.		
5.		

Teachers name ____________________

Grade __________

School ____________________

Please return to principals office before September 26, 1975.

The Teacher Education Laboratory
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

September 23, 1975

Dear Parent:

We are writing to tell you about the availability of a free-after school tutoring program for reading improvement.

The program will emphasize improvement of oral reading and reading for understanding. Other remedial goals will be established based upon individual pupil needs.

Tutors are I.U. education students who are being trained in Reading Instruction. They will be carefully and continuously supervised. Reading materials and reading consultants will be available to help the tutors plan an individualized program.

Children eligible for the program are elementary school pupils, second grade or older, who are having problems with reading.

Cost and transportation: There is no cost for tutoring but parents are expected to provide transportation. Some help with transportation may be available from time to time.

Place: Tutoring will take place in the Teacher Education Laboratory, Room 150, Smith Research Center (Old University High School) 2805 East Tenth Street.

Time: There will be two, one hour tutoring sessions per week, to be scheduled afternoons between 3:30 and 5:30 p.m.

Enrollment: Because the number of children we can accept into the program is limited, it is possible that we will not be able to take everyone who applies.

If you are interested in obtaining tutoring for your child, I will be happy to talk with you and answer any questions you have. Please call me at 337-5847 for further information.

Sincerely yours,

Dorothy Semmel

DS/lp

MIS-Gp

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

September 12, 1975

Dr. Ronald Walton
Superintendent of Schools
MCCSC
North Drive
Bloomington, Indiana 47401

Dear Dr. Walton:

We wish to inform you that the Teacher Education Laboratory of CITH, will offer a program of tutoring for reading improvement, beginning mid October and continuing to the end of the school year.

We plan to make the availability of the after-school tutorial program known to about 6 elementary school principals whose schools are located nearest to the Smith Research Center in which our Teaching Lab is located. I am enclosing a copy of the letter sent to the principals, which describes the program in greater detail.

As sponsors of the program, we are cognizant of the responsibility to the children we plan to serve, and have taken care to see that the program meets the highest professional standards. By providing the tutorial service and requiring the tutors to be accountable for the pupils' reading improvement, we are attempting to meet several important goals; providing a useful community service, establishing a meaningful training setting for our students, and conducting research into the teaching-learning process. Naturally, research conducted in connection with the tutoring program will comply with all federal and local regulations concerning protection of human subjects in research.

I will be happy to answer any questions you have about the program.

Sincerely yours,

Melvyn I. Semmel
Director & Professor

Enc.

MIS/lp

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

September 17, 1975

Dr. D. Ebeling
Director of Elementary Education
MCCSC
North Drive
Bloomington, Indiana 47401

Dear Dr. Ebeling:

We wish to inform you that the Teacher Education Laboratory of CITH, will offer a program of tutoring for reading improvement, beginning mid October and continuing to the end of the school year.

We plan to make the availability of the after-school tutorial program known to about 6 elementary school principals whose schools are located nearest to the Smith Research Center in which our Teaching Lab is located. I am enclosing a copy of the letter sent to the principals, which describes the program in greater detail.

As sponsors of the program, we are cognizant of the responsibility to the children we plan to serve, and have taken care to see that the program meets the highest professional standards. By providing the tutorial service and requiring the tutors to be accountable for the pupils' reading improvement, we are attempting to meet several important goals; providing a useful community service, establishing a meaningful training setting for our students, and conducting research into the teaching-learning process. Naturally, research conducted in connection with the tutoring program will comply with all federal and local regulations concerning protection of human subjects in research.

I will be happy to answer any questions you have about the program.

Sincerely yours,

Dorothy Semmel
Research Associate

Enc.

DS/lp

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

September 17, 1975

Dr. N. Rogers
Reading Coordinator
MCCSC
North Drive
Bloomington, Indiana 47401

Dear Dr. Rogers:

We wish to inform you that the Teacher Education Laboratory of CITH, will offer a program of tutoring for reading improvement, beginning mid October and continuing to the end of the school year.

We plan to make the availability of the after-school tutorial program known to about 6 elementary school principals whose schools are located nearest to the Smith Research Center in which our Teaching Lab is located. I am enclosing a copy of the letter sent to the principals, which describes the program in greater detail.

As sponsors of the program, we are cognizant of the responsibility to the children we plan to serve, and have taken care to see that the program meets the highest professional standards. By providing the tutorial service and requiring the tutors to be accountable for the pupils' reading improvement, we are attempting to meet several important goals; providing a useful community service, establishing a meaningful training setting for our students, and conducting research into the teaching-learning process. Naturally, research conducted in connection with the tutoring program will comply with all federal and local regulations concerning protection of human subjects in research.

I will be happy to answer any questions you have about the program.

Sincerely yours,

Dorothy Semmel
Research Associate

Enc.

DS/lp

CITH

Center for Innovation in Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

October 8, 1975

I hereby give permission to the Teacher Education Laboratory of CITH, Indiana University, to observe and video/audio record tutoring sessions in which my child participates, and permission to use these records in teacher education research and for development of teacher training materials without limitation.

Date ______________ Signature ____________________

Name ____________________
(please print)

Address ____________________

____

The Teacher Education Laboratory
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

October 8, 1975

Dear

We are pleased to accept your child into the Tutorial Reading Program.

is scheduled for tutoring every at at the Smith Research Center, 2805 East 10th Street, Teacher Education Laboratory Classroom, Room 150. The first session will be held on , October

Since the tutorial service is offered in connection with a program of research on the improvement of teaching, we will be observing and recording the teaching that takes place. Would you therefore, sign the enclosed permission form and bring it along on the first day. If you have any question about this or any other aspect of the program, please call me.

Sincerely yours,

Dorothy Semmel
Research Associate

Enc.
DS/lp

CITH

Center for Innovation In Teaching the Handicapped
School of Education, Indiana University
2805 East Tenth Street, Bloomington, Indiana 47401
Phone 812/337-5847

February 3, 1976

Dear Parents:

As you know, your son or daughter is being tutored in both oral reading and any specific word attack skills he or she may need. Our tutors are undergraduate students in education currently being trained in various aspects of teaching, one of which is reading. As part of their training the tutors are participating in the Computer Assisted Teacher Training Service (CATTS). Through this service, they are observed while teaching, their behavior coded into the computer and finally are provided with specific information about their teaching and ways to improve it.

Our goal is to provide your child with a better reading teacher so as to improve his/her reading. If you have any questions, concerning either the program or your child, please contact us at 337-5847. You're welcome to visit us anytime! Thank you for your participation.

Sincerely,

Darla Cohen

Darla Cohen

DAC/jah

Movie times

PRINCESS
"Super. Vixens." 2:00. 3:50. 5:35. 7:20. 9:20.

INDIANA
"Who," 1:45. 3:42. 5:34. 7:26. 9:23.

VILLAGE
"Monty Python and the Holy Grail," 7:00, 9:15.

TOWNE CINEMA
"Jaws," 7:00, 9:30.

CINEMA I
"Other Side of the Mountain," 1:30. 3:25. 5:20. 7:30. 9:15.

CINEMA II
"King of Hearts," 1:15, 3:15, 5:15, 7:20, 9:20.

VON LEE
"And Now My Love," 7:04, 9:13.

WEST CINEMA
"Country Hooker," 7:35; "Around the World," 8:50; "Touch Me," 10:00.

STARLITE
"The McCullochs," 7:30, 10:40; "Macon County," 9:05.

...presents

Tutoral reading started

A select group of elementary school children who are behind in reading will be accepted for an after-school tutoring program for reading improvement with no charge for the service.

Second and third grade pupils who are one year behind in reading, and upper elementary pupils who are two or more grade levels behind will be eligible to participate in the special program.

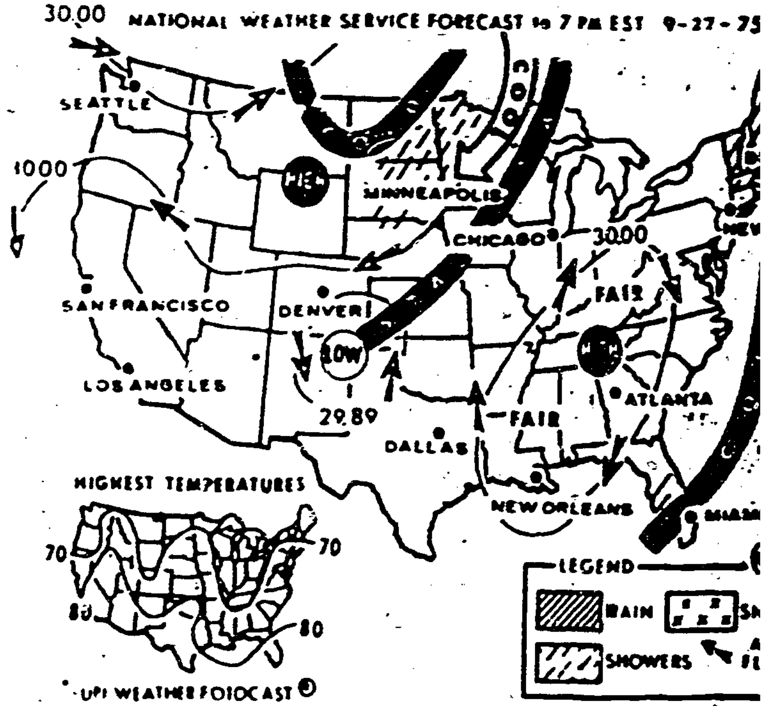
The tutorial program is being arranged by the Center for Innovation in Teaching the Handicapped. The center is part of the School of Education at Indiana University. Parents interested in enrolling their children in the tutorial program may phone research associate Dorothy Semmel, 337-5847 during the day or 336-8952 evenings.

Both regular and special education pupils can be accepted for the program, which will involve two one-hour sessions each week between 3:30 and 5:30 p.m. The sessions will be at the Teacher Education Laboratory, Room 150, Smith Research Center (Old University High School), 2805 E. 10th St.

Tutors will be IU education students, who are being trained in reading instruction. Emphasis will be on pupil development of oral reading skills and comprehension. Other remedial goals will be established, based on individual pupil needs.

Parents will be expected to provide transportation for their children, although limited assistance may be available from time to time.

Weather Vane

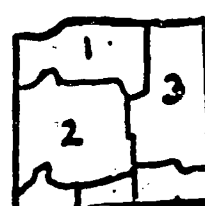


Saturday will find a few showers lingering over parts of the north Atlantic states. Shower activity is also indicated for lower Florida and the northern Plains, otherwise, generally fair weather should prevail elsewhere. Maximum temperatures include: Atlanta 69, Boston 70, Chicago 62, Da... Denver 71, Duluth 64, H... 72, Jacksonville 75, Kans... 76, Los Angeles 78, Mia... New Orleans 78, New Y... Phoenix 97, San Franci... Seattle 66, St. Louis 6... Washington 78.

High-Lows

By United Press International

City	Hi	Lo	Pcp
Albuquerque c	76	45	....
Anchorage r	53	48	.08
Asheville pc	72	50	....
Atlanta pc	61	54	.04
Birmingham pc	62	54	.01
Boston r	60	55	.83
Charleston S.C pc	81	68	07
Charlotte N.C. pc	75	57	....
Cheyenne c	69	40	....
Chicago cy	58	54	...
Cleveland r	56	52	.29
Columbus r	59	55	....
Dallas c	77	51	..
Denver c	76	39	..
Des Moines c	65	40	....
Detroit cy	65	51	.02
El Paso c	81	47	....
Hartford r	59	54	2.38
Honolulu c	88	76	...
Houston c	79	57	..
Indianapolis cy	62	49	.20
Jackson Miss. c	76	46	...
Jacksonville c	83	65	....
Kansas City c	63	39	....
Las Vegas c	95	64	....
Little Rock c	72	51	[illegible]
Los Angeles c	[illegible]	[illegible]	[illegible]
Salt Lake City c	81	49	....
San Diego c	96	69	....
San Francisco c	89	57	....
San Juan pc	87	76	1
Seattle pc	66	56	....
Spokane c	77	51	....
Tampa pc	87	72	.02
Washington r	71	64	1.20
Wichita c	64	42	....



Zone Fore...

Zones 1-2-3
Mostly cloudy with a ... light rain today ar... tonigh... the upper 50s to around ... tonight mid 40s. Friday cl... continued cool. Highs in th... Precipitation probabilitie... cent today and 20 tonight.

Zones 4-5-6
Mostly cloudy with chan... rain today. Highs upp... around 60. Mostly cloudy ... cooler tonight. Lows in th... Friday clearing and conti... Highs in the low 60s. Pr... probabilities: 30 per cent ...

Zones 7-8-9-10
Mostly cloudy today wit... of drizzle thi...

9/6/76