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ABSTRACT

This study evaluated the decoding skills acquired by low readers in an experimental project that taught low readers in regular class through the use of clinical procedures based on a synthetic phonic, multisensory approach. An evaluation instrument which permitted the tabulation of specific decoding skills was administered as a pretest and posttest measure to a random sample of 50 or more pupils in each primary grade, 1-3. The gains on decoding skills which were evidenced were statistically significant and occurred both among the fast learners and the slow learners within these low reading groups. One of the significant findings was that after less than a year of experimental instruction, all children in the sample acquired the skill of decoding simple three-letter short vowel words above the 40 percent correct level--a level that indicates the acquisition of transfer skills beyond the sight word level. (Author/WR)

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DECODING SKILLS ACQUIRED BY LOW READERS TAUGHT IN REGULAR CLASSROOMS USING CLINICAL TECHNIQUES

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The University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children has been established to concentrate on intervention strategies and materials which develop and improve language and communication skills in young handicapped children.

The long term objective of the Center is to improve the language and communication abilities of handicapped children by means of identification of linguistically and potentially linguistically handicapped children, development and evaluation of intervention strategies with young handicapped children and dissemination of findings and products of benefit to young handicapped children.

Acknowledgments

The data for this report were obtained from children participating in an experimental project, Project READ, which was conceived and carried out by the special education staff of the Bloomington Public Schools under the direction of Mr. Ellsworth Stenswick. A history and description of the project are available from Ms. M. L. Enfield, Special Learning Disabilities Coordinator for the Bloomington Public Schools. She and Ms. Victoria Greene, Project READ Director, were responsible for developing the instructional and teacher training procedures used. These project leaders and the ten resource teachers whom they trained developed many instructional materials, lesson plans and manuals which are available from them.

The authors of the present paper gathered data as part of a research effort in evaluation whose purpose was to determine the specific coding skills acquired by children in the experimental project both before and after introduction of the new instructional procedures. The research reported here is part of a continuing project assessing the value of an experimental test for measuring coding skills. The data reported here were only one aspect of the evaluation of Project READ. Official evaluation data, including results from standardized tests, are available from the Project READ Evaluator, Dr. Robert Barron, Bloomington School District.

The present study was partially supported by a grant from the Research, Development and Demonstration Center in Education of Handicapped Children.

Abstract

The present study evaluates the decoding skills acquired by low readers in an experimental project that taught low readers in regular class through the use of clinical procedures based on a synthetic phonic, multisensory approach. An evaluation instrument which permits the tabulation of specific decoding skills was administered both before and after experimental instruction to a random sample of 50 or more pupils in each primary grade, 1 - 3. The gains on decoding skills which were evidenced were both statistically and educationally significant and occurred both among the fast learners and the slow learners within these low reading groups.

Tabulation of data on specific skills mastered increased the precision of curriculum evaluation with the result that planning for the coming year could be based on knowledge of the approximate skill level attained by each subgroup. One of the significant findings was that after less than a year of experimental instruction all children in the sample, acquired the skill of decoding simple three letter short vowel words above the 40% correct level - a level that indicates the acquisition of transfer skills beyond the sight word level. In contrast, approximately 60% of low readers in previous classes had not acquired this first decoding skill after either one or two years of traditional instruction. Transfer of these increased word recognition skills on the WRAT also occurred at all levels.

Decoding Skills Acquired by Low Readers Taught in Regular Classrooms Using Clinical Techniques

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One of the critical issues in teaching handicapped children to read, particularly children with learning disabilities, is what Chall (1967) calls the "meaning vs. code emphasis" issue or what learning disability specialists often call the auditory vs. visual approach. Meaning emphasis approaches are represented by basal reading series which teach sight words first as a visual recognition process. Coding approaches, on the other hand, are usually characterized by emphasis on teaching phonics (the relations between graphic symbols and their sounds) from the beginning. Much use of auditory processes is involved in learning the sounds and in sounding out words. For this reason most coding emphasis approaches are called auditory methods and the basal approach is called a visual method. Since learning disabilities specialists are frequently concerned with problems of fitting the different patterns of auditory and visual aptitudes of the child to the auditory and visual demands of the method, the meaning versus coding emphasis issue tends to be translated into an auditory versus visual issue.

The issue has two parts. One is the question of which approach produces superior learning for low readers, and reduces the incidence of serious reading disability. The second question is whether low auditory learners learn readily from a sight word approach with emphasis on meaning but find a coding emphasis approach with intensive phonics too difficult, particularly at the beginning. These two issues will be discussed separately in two related papers. The present study reports the development of coding and word recognition skills in low readers in first, second, and third grade who were taught first from a sight-word, meaning-emphasis approach and then from a coding emphasis approach. It compares the acquisition of decoding and word recognition skills from a basal or meaning emphasis approach with their acquisition from a multi-sensory phonic-linguistic approach. The second study reports the relationship of auditory and visual aptitudes to differences in method for the first grade group (Gallistel, Boyle, Curran, and Hawthorne, in preparation).

The ability to decode words, particularly new words, is only one of the set of skills that the mature reader must possess. It is a useful tool. Both code emphasis proponents and meaning emphasis proponents agree that the eventual or real goal in reading is the ability to obtain meaning from the printed page. Mastery of the decoding process is but one of the many skills necessary to accomplish this task. However, it may be an important skill, particularly for those who have trouble learning to read. Several clinicians and researchers have concluded that children with severe reading

problems have the most difficulty with the decoding process. Vernon (1960), for example states that "the one universal characteristic of non-readers suffering from specific reading disability is their complete failure to analyze word shapes and sounds systematically and associate them together correctly " (p. 74). Chall, after a review of six clinical studies, reports that regardless of how the readers in these studies had been taught initially, they all had extreme difficulty with decoding not with comprehension. She concludes that it is the decoding problem, including spelling, that is the essential characteristic of the true reading disability pupil and that "severe disability seems to result when a child has a predisposition (a set of characteristics that make it difficult for him to associate printed symbols with their spoken counterparts) and is exposed to an initial method that ignores this predisposition" (p. 175). If children predisposed to reading failure, or children with reading disability have the most trouble with the decoding process, as these two authors suggest, should they then be taught from an approach that emphasizes this decoding process or from an approach that deemphasizes it and emphasizes reading for meaning instead? Vernon concludes that for these children "teaching methods are indicated which stress the meaningful reading of words and the writing of connected sentences; and phonetic methods are contraindicated " (p. 191). Chall, on the other hand, concluded on the basis of evidence from the clinical studies she reviewed that methods that emphasize natural or speeded reading from the beginning and

insufficient training in decoding produce more serious reading failures than those that emphasize the code. She recommended, particularly for children predisposed to reading and spelling difficulty, instructional procedures that control words on spelling regularity, teach letter sound correspondences directly, and incorporate writing, tracing, or typing as supplementary aids. No experimental evidence from studies of poor readers is available to assess the relative validity of Vernon and Chall's conflicting recommendations. That is, no evaluation studies are available which compare the reading achievement of low readers after a year or more of instruction.

Several reviews of studies comparing the achievement of the whole range of children in a classroom have indicated that "phonic emphasis" approaches tend to produce superior reading achievement, both word recognition and comprehension, particularly at the end of first, second, and third grade. (cf. Bliesmer and Yarborough, 1965; Chall, 1967; Gurren and Hughes, 1965). Chall concluded on the basis of the pattern of the results of these studies that after third grade the differences tended to disappear or equalize though few comparisons were available for intermediate grades. She reasoned that reading comprehension scores after third grade tend to be heavily weighted with a child's verbal language comprehension and reasoning skills. From that time on reading ability, as a skill that is separate from these more general skills, has less influence on the reading comprehension score. For poor readers this is probably not the case. Chall also concluded on the basis of the pattern of the results

in the studies reviewed that intensive phonics methods probably result in slower learning at the beginning. Thus, if comparisons are made in the middle of first grade they tend to favor whole word meaning emphasis approaches. Since slow learners progress more slowly, the lag in their achievement scores could be reflected as late as second grade. None of the studies measured the achievement of the lowest readers separate from the achievement of faster readers. Hence we do not know what the effects of method are for poor readers. Chall and Gurren and Hughes did attempt to review the effects of method on low IQ children, often called slow learners. Poor readers, however, are not necessarily low IQ children. Both concluded that the majority of the significant differences for low IQ children also favored phonics emphasis methods. Dykstra (1967a) found that for children finishing second grade coding emphasis methods produced higher word recognition scores but not necessarily higher comprehension scores. Among the coding emphasis approaches he studied, only those ITA methods which taught the sounds for the symbols at the beginning, and the phonic-linguistic approaches could be considered intensive phonics or phonics emphasis methods. Whole word linguistic methods do not include intensive teaching of phonics though they are considered to be coding emphasis approaches. In the two projects in Dykstra's study in which phonic linguistic approaches were compared with basal approaches the phonic linguistic procedures produced significantly

higher reading comprehension scores as well as significantly higher word recognition and spelling scores. However, the author stresses the fact that project differences exerted greater effects on achievement than method differences even after pupil readiness was controlled. Bond and Dykstra (1967) in their report of achievement of the first graders in this large study also grouped children statistically according to IQ scores. They found that in no comparison of phonics emphasis methods with basal methods did one IQ group achieve better in one method while a different IQ group achieved better in another method. Nor did grouping by high or low reading readiness scores make any difference. Whenever the phonic emphasis procedures resulted in higher achievement the effects occurred regardless of IQ or readiness groups.

Bateman (1969) also found that at the end of first grade, a phonic-linguistic approach (Lippincott) was significantly superior to a sight-word, basal approach (Scott-Foresman) regardless of whether the learner was a lower auditory or a lower visual learner. However most of the children in her study were high achievers and tended to have above average aptitude scores.

In general then studies comparing the effects of different methods have been concerned with the achievement of all readers.

When they have measured the achievement of slow learners of fast learners separately they have grouped on the basis of IQ scores. The results from Dykstra's grouping of children into quartiles based on reading readiness scores might be considered an indication of the effects on children who are apt to become poor readers although the correlations of these readiness scores with later achievement were low. Though these studies suggest that phonic emphasis methods frequently produce superior achievement, at least in second and third grade, we do not really know what the effects may be on poor readers because we have not studied the results for the lowest achieving groups. All methods have some failures. The important questions are: how many fail, how seriously do they fail, and on what specific tasks to they fail?

If we are to succeed in studying the effects of different methods on the performance of disabled readers, better evaluation procedures are essential. Better procedures for assessing coding skills are particularly necessary, since, as discussed above, difficulty with this process may be one of the major handicaps of children with specific reading disability.

Traditional group and individual reading tests employ the words used most frequently in our language. These words are limited only in the number that are introduced,

not by their structure or the phonic regularity of their spelling. When children learn to read using readers which control their vocabulary by the phonic structure of the words traditional tests do not provide an adequate picture of the learner's achievement, particularly in the early stages. Nor do such tests have a structure that makes it possible to classify and discuss the phonic generalizations necessary to decode the words. They do not measure the acquisition of generative skills which lead to the ability to recognize new words. Further, their norm referenced manner of defining a child's achievement tells only how well a child can read in comparison to others of the same age and does not define a specific skill sequence from which teachers can set behavioral objectives and by which they can ascertain which skills the learner can use effectively and which he needs to learn to use. Previous research has indicated that children with similar scores on standardized reading tests have markedly different levels of mastery of the coding skills necessary to unlock new phonically regular words, particularly in the early stages of learning (Gallistel, in press).

The Gallistel-Ellis (GE) Linguistic Reading and Spelling Test was constructed to measure word recognition and word-attack skills leading to the recognition of new words. It is made up of eight sections of phonically regular words which are classified according to their phonic structure plus one section of phonically irregular words. The instrument is designed to help a resource teacher or

classroom teacher plan and evaluate her lessons with adequate knowledge of the child's word recognition and spelling skills and needs.

The GE Test was designed primarily as an individually administered diagnostic instrument for use in learning disability resource rooms and clinical teaching situations. However, a previous pilot study suggested that the information which the test provides might be useful in evaluating group progress. At present there are no group tests which measure the ability to recognize phonically regular words through the use of phonic generalizations.

Bloomington School District, in the Minneapolis-St. Paul metro-area, was planning to initiate a large scale program to remediate and prevent reading disability by modifying the instruction received by the low readers in the regular classroom. (See note at the beginning of the report). Approximately 2000 low reading pupils in first, second, and third grade were to participate in the program. The experimental teaching procedures which were to be introduced involved the use of techniques for teaching sound-symbol relations on phonically regular words controlled according to their phonic structure. This situation provided an opportunity to ascertain the usefulness of obtaining data on specific coding skills as measured by the GE test. Therefore, the special study reported here, undertaken by the authors in cooperation with the school district, sought to determine whether administration of this criterion-referenced, individual achievement test to a small random sample of children in

each grade would furnish information that would be useful for purposes of curriculum planning. [An official evaluation based on the results of standardized tests was conducted by the district's project evaluator and is available from the School District (Barron, 1972).]

An additional purpose of the present study was to pilot evaluation procedures which might be useful in assessing the specific effect of classroom intervention strategies on the learning of handicapped children. Because of the growing interest in models for serving handicapped children within the educational mainstream (Reynolds & Davis, 1971), careful evaluation of such efforts are important both to special education and regular education. If special education funds are to be used to further the education of handicapped children within the regular class, means must be found for evaluating the effects on handicapped children of services provided to the regular class. The present study and a companion study on the learning aptitudes of first graders in the project (Callistel, Boyle, Curran, and Hawthorne, in preparation) explore techniques which might be useful in such an endeavor.

A final purpose was to measure and compare the acquisition of decoding skills under experimental phonic-linguistic instruction with the previous acquisition of decoding skills under basal instruction.

Decoding is only one aspect of the final act of reading, but one for which we have not had adequate measures (Chall, 1967). Once measurement of the decoding process has been successfully accom-

plished, further study of the relationships between decoding and connected reading, and between decoding and reading comprehension are planned. Such study should indicate whether a person's decoding skills are related to fluency in reading and comprehension and how these relationships are affected by different instructional procedures.

Method

Subjects

Subjects were low reading pupils in a large middle class suburban school district. All pupils in the low reading group in each first, second, and third grade class received the experimental instructional procedures. Low reading achievement was judged by the classroom teachers according to their regular grouping practices. This judgment was further checked by administration of the Reading subtest of the Wide Range Achievement Test by the school psychologists. The total group of approximately 650 pupils selected in each grade represented approximately the lowest 30% of the readers in that grade. As a result of Spring planning for the Fall project, children who normally would have been retained were promoted and a number of children with border-line mental retardation were kept in the regular class rather than assigned to special class. The group of low readers thus included low readiness children, handicapped children with special learning disabilities or mental retardation, slow learners (although the district had fewer than would be expected from a normal distribution) and other children who for one reason or another were

having difficulty learning to read.

Experimental Instructional Procedures and Teacher Training Provisions

The instructional methods and the teacher training procedures were developed by the staff of the school district, largely by the project directors, Ms. M. L. Enfield and Victoria Greene. (See acknowledgments at beginning of paper.) They developed new procedures and modified others for teaching to classroom groups. A description of the project and the instructional procedures used are available from them. A brief summary is included here to orient the reader.

The instructional approach represented basically a synthetic-phonic set of decoding procedures imposed on a slow moving, linguistically organized reading series. Multisensory techniques including tracing in sand, spelling and writing were used for the introduction of new concepts and to reinforce those already encountered but not fully mastered. Grapheme-phoneme relationships were taught separately as isolated sounds and symbols, and then were combined into words. Sequencing and blending behaviors were carefully shaped when the children integrated sounds into words. Phonic structures, including the cues which determine the sounds that are called for by the symbols, were taught as concepts. Much of the original source for the instructional procedures was taken from the clinical tutoring procedures of Orton (1964) and Gillingham and Stillman (1956). When the children had mastered the ability to decode words using a particular set of sound-symbol relationships

they practiced these skills by reading in the linguistically organized material of the SRA Basic Reading Series (Rasmussen and Goldberg, 1965).

Ten resource teachers were selected as outstanding teachers from the regular elementary staff of the district. During the month of August they spent each day in a workshop designed to teach them the techniques which the learning disability tutors had been using with individuals or small groups. The members of the teaching staff for this workshop were the Special Learning Disabilities (SLD) Coordinator and the SLD Supervising and Demonstration Teacher. These two instructors and the ten resource teacher trainees made many of their materials and wrote a manual and lesson plans as part of the training.

At the end of the month's training, the ten resource teachers were each assigned to two elementary schools in the district, where they initiated the training of the regular classroom teachers in the new techniques. First the third grade pupils in the low reading groups were taught in each classroom each day by the resource teacher while the classroom teacher observed. When the classroom teacher felt ready to teach a particular skill she took over the teaching task while the resource teacher observed. Resource teachers attended afternoon workshops several times a week in which they learned new skills as the children were ready for them. They then demonstrated these skills to the classroom teachers in their two buildings. At the end of six weeks, in the middle of November, the regular third grade teachers began teaching their low reading groups without help and the resource teachers began teaching the second

grade low reading groups in each class while their teachers watched. After six weeks the resource teachers returned to the third grades for a week. After that they were available to any of the classroom teachers for questions or an occasional visit. The last week in January they began teaching those first graders who were making slow progress in basal primers and had been selected by their teachers for the low reading groups. Some second and third graders who were not able to keep up with the group were tutored in addition to their lessons in the classroom. This tutoring group represented roughly ten percent of the project children or approximately 3% of all children in second and third grade in the district.

Tests Administered

The Gallistel-Ellis Linguistic Reading and Spelling Test (GE) consists of three sub-tests: a) a measure of the ability to give the sounds for letters and combinations of letters such as digraphs and dipthongs b) a measure of word recognition or the ability to decode words by sounding out their parts and c) a measure of the ability to spell words which contain these same sound-symbol relations. The reading and spelling subtests are divided into eight categories of phonetically regular words and one section of phonetically irregular words based upon the linguistic structure of the words and the phonic elements they contain. Within each section words progress in difficulty from frequently used words that might have been learned as sight words, through new words which require transfer of knowledge of the sound-symbol relations and the phonic principles to the recognition

of new words, to nonsense words or syllables which measure pure decoding skills and furnish no meaning or semantic clues. The word recognition and sound-symbol subtests must be individually administered but the spelling test can be administered to small groups. Scoring is based on percentage of words correct in each section and furnishes criteria for mastery of each task or skill rather than global grade level scores based on norms.

The Wide Range Achievement Test (WRAT) is an individually administered measure of the child's ability to correctly pronounce a sample of words selected from basal readers at each grade level. Words are selected on the basis of their frequency of use rather than their phonic structure and the progression corresponds with basal rather than linguistic readers. The score obtained is a grade level score based on a normative sample.

Sample Selection and Testing Schedule

In late September just before experimental instruction began, the GE Test was administered to over 100 third graders from the low reading groups by the resource teachers as a part of their training in the experimental workshop. The tests from 50 children were randomly selected from this group (after elimination of invalid instruments) for the sample to be followed up in the spring.

In the third week of November, just before the beginning of experimental instruction for the second grade low reading group, the GE test was administered to 50 project second graders who were

randomly selected from ten of the twenty schools. The tests were administered by graduate students and two tutors trained by the authors. In mid-January just prior to the beginning of experimental instruction in the first grades, the GE test was administered to 64 first graders who were randomly selected from those chosen for the project. Again the sample was drawn from approximately half of the schools in the district. This and all post-testingwas done by trained graduate students. The post-test was administered to all subjects in the middle of May. By the time of post-testing experimental instruction for the first graders had proceeded for approximately 4 months, for the second graders 6 months, and for the third graders 8 months. Some subjects were lost because of incomplete data or because they moved. The final sample consisted of 58 first graders, 49 second graders, and 50 third graders. These randomly selected samples represented from 7 - 9% of the project children in each grade. The following year, during the end of November at approximately the same time as the GE pre test had been administered as a pretest to the original second graders, the GE test was readministered as a second post test to the original sample of first graders who now constituted the new class of second graders.

At the beginning of experimental instruction and again in May the Wide Range Achievement Test was also administered to most of the children in our sample by the school psychologists in the district as part of the district's own evaluation efforts.

Statistical analysis

Scores within each word category on the GE test represent the

percentage of words or sounds correct. For each grade, mean pre and post test scores were obtained for each word category. Mean raw scores on the WRAT word recognition test were computed and converted to grade equivalent scores. Subject scores were tabulated into frequency tables to indicate the distribution of skills within the low reading population and to ascertain the skill level of those having the most difficulty learning each task.

To compare progress under experimental instruction with previous progress under a basal approach a second analysis was conducted. Pre test scores of the original second grade class, obtained in November, were treated as a control group. These were compared with the post test scores obtained at approximately the same time the following year from the new second grade class who were treated as the experimental group. This experimental group (the original first grade class) who were by then in second grade had had almost a year of experiment instruction whereas the control group second grade class had had only basal instruction at the time their pre test scores were obtained.

In the comparison of control and experimental group data for the third grade sample, test scores for the experimental group were not obtained at the same time of year as for the control group.

Post-test scores of the second graders obtained early in May were treated as the experimental group since these second graders would be in third grade the following September. The scores of this experimental group were compared with the September pre-test scores for the original third graders (the control group) who had had only

traditional basal instruction at the time of pre-testing. The experimental group had had six months of experimental instruction. The control group tested at the end of September may have lost skills over the summer vacation which are not reflected in the experimental groups scores, since the experimental group was tested in May before vacation intervened. However the control group had had two months of additional instruction (May and September) which the experimental group had not had. This additional instruction would presumably offset any possible vacation loss. Although matching testing dates would have yielded a more exact experiment-control comparison, Spring testing was required for curriculum planning for the coming year. The differences in coding skills acquired by the experimental group were so marked that repeating Fall testing to match control group testing dates was deemed unnecessary. The significance of the differences between experimental and control groups was measured through use of "t" tests for the means and chi square analysis for the frequency distributions.

Since the same teachers in the same schools in the same community taught both experimental and control groups, schoo, community and teacher variables were controlled. (See Dykstra, 1967 and Dunn and Bruininks, 1968 for a discussion of the importance of these variables.) However, since all low reading groups in the district received the experimental instruction it was not possible to control for either the "Hawthorne effect" or for the effect of additional teacher training.

Results

Table 1 presents mean GE and WRAT scores on the Fall pre-test and the Spring post-test for each grade. The marked increase from pre-test means to post-test means indicates that a significant gain in reading skills was achieved. The children gained in both decoding skills, as measured by the percent of words correct in each word category of the GE test, and in sight word recognition of frequently used words, as measured by the WRAT grade level scores. The means for the second and third grades are graphed in Figure 1. As can be seen from Figure 1, under traditional instruction the third graders had gained very few additional coding skills not already acquired by second graders. Direct teaching of these coding skills during experimental instruction produced almost equivalent gains for both the second and third graders. The slightly lower performance of the second graders probably resulted from the slightly shorter time they received experimental instruction.

Mean gains do not indicate what is happening to readers at the bottom of the low reader distribution--the reading disability population. To determine this a frequency distribution of skills is necessary. The distribution of pre-test scores on coding skills from the GE test for second and third graders is presented in Table 3. The distributions of WRAT word recognition scores, both pre and post test, are presented in Table 2. Under basal instruction by the beginning of third grade 58% of the low reading group in this district were unable to decode three-letter short-vowel words above the 40% correct level. This level requires more than sight recognition of

a few common words and entails transfer of phonic generalizations to the decoding of new words. In other words, 58% of the third grade low readers, or approximately 17% of all third graders in the district, had mastered no generative decoding skills based on the application of phonic knowledge. 30% of these third grade low readers had a sight vocabulary below the second grade level. Thus, before introduction of the experimental program, 30% of the low reading third graders, or approximately 9% of all third grade children in the district, were able to read only first grade materials. In other words somewhere between 9 and 17% of the readers in this moderately affluent suburban metropolitan district were seriously retarded in reading skills at the beginning of third grade. The group included a few children with borderline retarded mental abilities, but the predicted achievement of even these pupils, based on the Bond-Clymer-Hoyt formula (Bond & Tinker, 1957), would have been 2.6 or well above the first grade level. In a typical distribution of this kind, many of the children reading above the first grade level but below their third grade placement would be found to have mental abilities well above average. It would seem, therefore, that the estimate that 9 to 17% of the third grade pupils in this suburban district were seriously retarded in reading skills at the beginning of the experiment is a conservative estimate.

The coding skills these low readers acquired after eight months of experimental instruction for the first graders, six months for the second graders and eight and a half months for the third graders are represented by the post-test data reported in Table 6. Particu-

larly significant is the finding that no low readers in the random samples tested failed to master the first decoding or word recognition skills in Section I of the GE test to the generative or transfer level. Such mastery is represented by more than 40% recognition of three-letter short-vowel words. The establishment of this first decoding pattern is critical since new sounds can be assimilated into the process once the decoding process itself is firmly established. It is this skill which learning disability children, particularly those with low auditory processing skills, find so difficult to establish. Since the low reading groups in the experiment included all low readers in these grades, they necessarily included a number of children who would meet the definition of severe learning disability whether one bases this identification on the severity of the retardation in reading skills acquired or on measures of deficiencies in perception and processing (see Gallistel, Boyle, Curran and Hawthorne, in preparation, for aptitude descriptions of the first graders in this study). The May post-testing also revealed that less than 10% of the second and third graders had failed to acquire mastery of the second decoding skill--decoding 4, 5, and 6 letter words that contain consonant blends and digraphs with short vowels. Only 14% of the second graders and 22% of the third graders had failed to acquire skill in decoding or recognizing new long-vowel words. Fifty percent of the second graders and 60% of the third graders had mastered the decoding of most one syllable words with vowel combinations. More than 25% of these "low reading" second and third graders had mastered

the decoding skills involved in recognizing one syllable words with soft "c" and "g", one syllable words with "vowel-r", and two syllable words with simple endings. In other words, after approximately a year of experimental instruction the upper quartile among the low reading second and third grade group had largely mastered the decoding of all one syllable words as well as two syllable words with simple endings. They were ready to work on, or were working on the decoding of multi-syllable words.

Comparison of the pre and post test distributions reveals a marked increase in the range of coding skills represented within the groups and suggests that pacing and meeting the needs of all children within the group may be more difficult during the second year of the project.

Next we compared the distribution of coding skills acquired under previous traditional basal instruction with those acquired under experimental instruction.

Two control and experimental comparisons were available, one for second graders and one for third graders. The scores attained by the second grade class on the pretest administered in November after they had had only basal instruction (control group) were compared with the scores attained by the second grade class the following year (experimental group). By this time (middle of November-early December) this new second grade group had had almost a year of experimental instruction. Comparisons of the means for each word category in the GE test are presented in Table 5. The Experimental group scored significantly higher than the control group in each word

category, though the gains in the multisyllable words did not indicate that the experimental group had acquired any generalizable skills in decoding multisyllable words. The distribution of the experimental group's coding skills is compared with the distribution of the original second graders coding skills in Table 5. These distributions are shown graphically in Figure 2. The differences are notably significant both educationally and statistically. (Chi squares on the differences were significant in all word categories except Multisyllable words. Though zero frequencies in some cells violated assumptions for chi-square analysis, the differences between groups were so marked that it was felt that the significance of the tests could be validly accepted.)

62% of the second graders in the control group had not reached the 40% correct level or transfer stage in decoding simple three letter short vowel words. In contrast, none of the experimental group had failed to reach this level - the first critical decoding task. All but a few had in fact also mastered Category II (Consonant Combinations), which requires additional sequencing and blending skills. Only 7% had failed to reach transfer level (40% correct) on this task whereas 81% of the control group under traditional instruction had failed to reach this level.

Similar comparisons were made of control group and experimental group third graders. Comparisons of the means for each word category, presented in Table 7, indicate that, again, the experimental group scored significantly higher than the control group in each word category except Multisyllable Words. Comparison of the distributions

of these skills is presented in Table 8 and Figure 3. Whereas 58% of the control group third graders had failed to acquire the first critical decoding skill to the transfer level under traditional instruction, none of the experimental group third graders had failed to acquire this skill. 78% of the control group were unable to decode Consonant Combination words to the 40% correct level but only 4% of the experimental group were unable to do this. It is clear that the direct teaching of decoding during experimental instruction produced markedly greater coding skills than had been acquired under previous traditional instruction. This was true for both the slowest and the fastest learners among the low reading groups.

A final purpose of the present project was to compare data on decoding scores obtained from the GE test with word recognition scores on the WRAT. Table 3 presents the distribution of word recognition scores from the WRAT. The WRAT data were gathered by the school district as part of its official evaluation. Scores were available for only 85 to 95% of the pupils in the coding skills measurement sample. They indicate that there was sizeable transfer of decoding skills to recognition of words from basal readers. Since many of the basal words represent advanced code elements and word structures that would not have been learned by decoders in the early stages of learning, effective comparative evaluation of the two reading approaches requires measures of word recognition based on both a basal sequence and a coding sequence of phonetically regular words. The distribution of these WRAT word recog-

nition scores reveals that the whole group, including ever the slowest learners at the bottom of the group, gained in sight word recognition of basal words as well as in their ability to decode phonetically regular words. A marked improvement is apparent in the Spring scores of the second grade class about to enter third grade compared with the scores of the original third grade class obtained in the fall of the previous year. The difference between the Fall scores of the traditional second grade class and the Spring scores of the experimental first grade class about to enter second grade is less marked but still noticeably improved. As in comparisons of coding skills, the difference in the time of year in which testing occurred makes direct comparisons and interpretations somewhat difficult. Since WRAT scores are normed, theoretically the percentage of pupils falling the same number of months below grade level can be calculated using the month of testing in each case as the expected grade level score. The results of such a comparison indicate that the percentage of children in the low reading group who scored more than two fifths of a year below grade level at the end of first grade and the beginning of second grade had dropped from almost 50% to 2%. Since the low reading group represented the bottom 30% of the readers in these grades, the estimated incidence of serious reading disability based on WRAT scores had dropped from 15% to less than 1% at the beginning of second grade. The percentage of project children scoring more than a year below grade level at the beginning of third grade on the pre-test was over 30%. The Spring

test scores of the comparable second grade group showed only 2% scoring more than a year below grade level. The estimated drop in incidence of reading disability based on WRAT word recognition scores was from 9% to less than 1% of all third graders in the district.

Conclusions and Discussion

We have reported an evaluation of pupil progress in an experimental project that taught low readers in regular classes using systematic phonic instruction on phonically controlled words and multisensory techniques. The evaluation gained in theoretical interest and practical utility from the use of an instrument that measures the development of specific skills in a sequence of phonic coding skills. This evaluation instrument permitted tabulation of the frequencies with which specific skills had been mastered, both before and after the program. Such analysis proved valuable in determining what was learned by those children who had the most difficulty mastering and using the code in recognizing new words. It also helped to evaluate the progress of low readers with milder difficulties.

The gains in decoding skills which were evidenced were both statistically and educationally significant, and occurred both among the fast learners and the slow learners within these low reading groups. Tabulation of data from the experimental testing instrument into frequency distributions clearly indicated the mastery level attained on each skill by each subgroup within the low

reading group. As a result the precision of curriculum evaluation was immeasurably enhanced so that planning for the coming year could be based on knowledge of the approximate skill level attained by each subgroup. Pre-test assessment indicated that the majority of low readers in each grade started with little or no decoding skills at the beginning of the project. By the end of the first year of the project a large increase in the range of coding skills represented within these low reading groups was apparent. This markedly increased range of skills suggested that individualization strategies within the groups would be even more necessary and probably more difficult the second year of the project compared with the first year. Similar testing and frequency tabulations at the end of the second year of the project should indicate the effectiveness of the individualization strategies adopted.

Comparison of specific skills acquired by children at the bottom of the distribution before and after experimental intervention indicated a sharp increase in the number of low readers who had acquired mastery of the first decoding skills by the end of each grade. These first skills included the ability to recognize new words based on primary alphabetic principles. The increased proficiency in the low reading groups resulted in a dramatic decrease in the percentage of children in all three primary grades who could not use even the simplist phonic decoding principles.

In the comparisons between control group and experimental groups in both second grade and third grade the number of children unable

to use these first decoding skills to recognize new words dropped from approximately 60% of each low reading group (i.e., from approximately 18% of the entire classroom population) to zero. Since intensive phonic instruction is widely believed to be too difficult for many low readers, this zero incidence of failure to master the first critical decoding and phonic generalization skills by the end of less than a year of experimental instruction is one of the significant findings of the study. It indicates that marked modification of classroom procedures for teaching low readers, intensive teacher training, and additional tutoring of 3% of the population in this probably fairly typical suburban district succeeded in reducing the incidence of severe decoding disability to zero. In addition, the data indicate that low reading children with milder difficulties were able to become relatively independent beginning readers who could successfully recognize new words. Finally the evaluation data indicate that after six to eight months of experimental instruction many of these decoding and phonic generalization skills transferred to improved recognition of sight words drawn from basal readers that are not phonetically controlled.

Also significant are the findings from the pre-test data which reveal that under previous traditional instruction in spite of a large-scale supplementary tutoring program, 58% of our sample of beginning third grade low readers, or an estimated 17% of the third grade pupils in the district, had not mastered the first phonic generalization and decoding skills involved in recognition of new three-letter short-vowel words. More than 30% of the low readers sampled, or an estimated

9% of the third graders in the district were also a year or more below grade level on WRAT word recognition scores at the time experimental instruction began. It is clear why the district was finding an individual tutoring model for treating learning disabilities an expensive proposition which could not keep up with the waiting lists and with parental pressure for more tutoring services.

The implications are that all but a very small number of middle class suburban primary grade children can apparently be taught these early decoding skills in a year or less given the kinds of massive infusion of new teaching techniques, intensive teacher training procedures, resource teacher help, and tutoring service which characterized this project. This universal learning of early decoding skills took place regardless of the fact that many of these children had low auditory aptitudes. (For data on the distribution of aptitudes for the first grade group see Gallistel, (Boyle, Curran and Hawthorne, in preparation.) The study does not indicate whether the same results could have been accomplished by other means. The present project included careful and innovative procedures for retraining classroom teachers, the use of multisensory techniques on phonically regular material that moves slowly, and skillful individualization within groups. Whether all or only certain parts of the above procedures are essential could not be tested.

It should be noted that the experience, competence and leadership qualities of the coordinator and the director of the project are exceptional. Whether the results of the present project could

be replicated in other districts would need to be ascertained.

The present study did not include evaluation of skill in reading or comprehending sentences, paragraphs, or books. Whether, when, or how such decoding skills transfer to connected reading and comprehension is at present uncertain. The percentage of children who may have difficulty developing more advanced coding skills or transferring and integrating decoding with the more complex processes involved in fluent reading and comprehension is also unknown. Follow-up studies need to be conducted which continue and expand the present evaluation procedures to include accuracy of oral reading, and comprehension and speed during silent reading. Charting the development of each skill and analyzing the relationships between skills should help answer some of these questions.

It should be emphasized that the experimental instruction was eventually carried out largely by regular class teachers within their own classes. If follow-up studies indicate that the marked success of the first year of the present project in boosting early decoding and word recognition skills is followed by success in reading itself, and if the results prove replicable in other school systems, then the implications for both special education and regular education will be considerable.

The reporting of evaluation data in the form of frequency distributions made it possible to assess the progress of children in the lowest learning brackets. Similar procedures for other skills and outcome could conceivably furnish an assessment model on which

new patterns for funding services to children with learning handicaps could be based.

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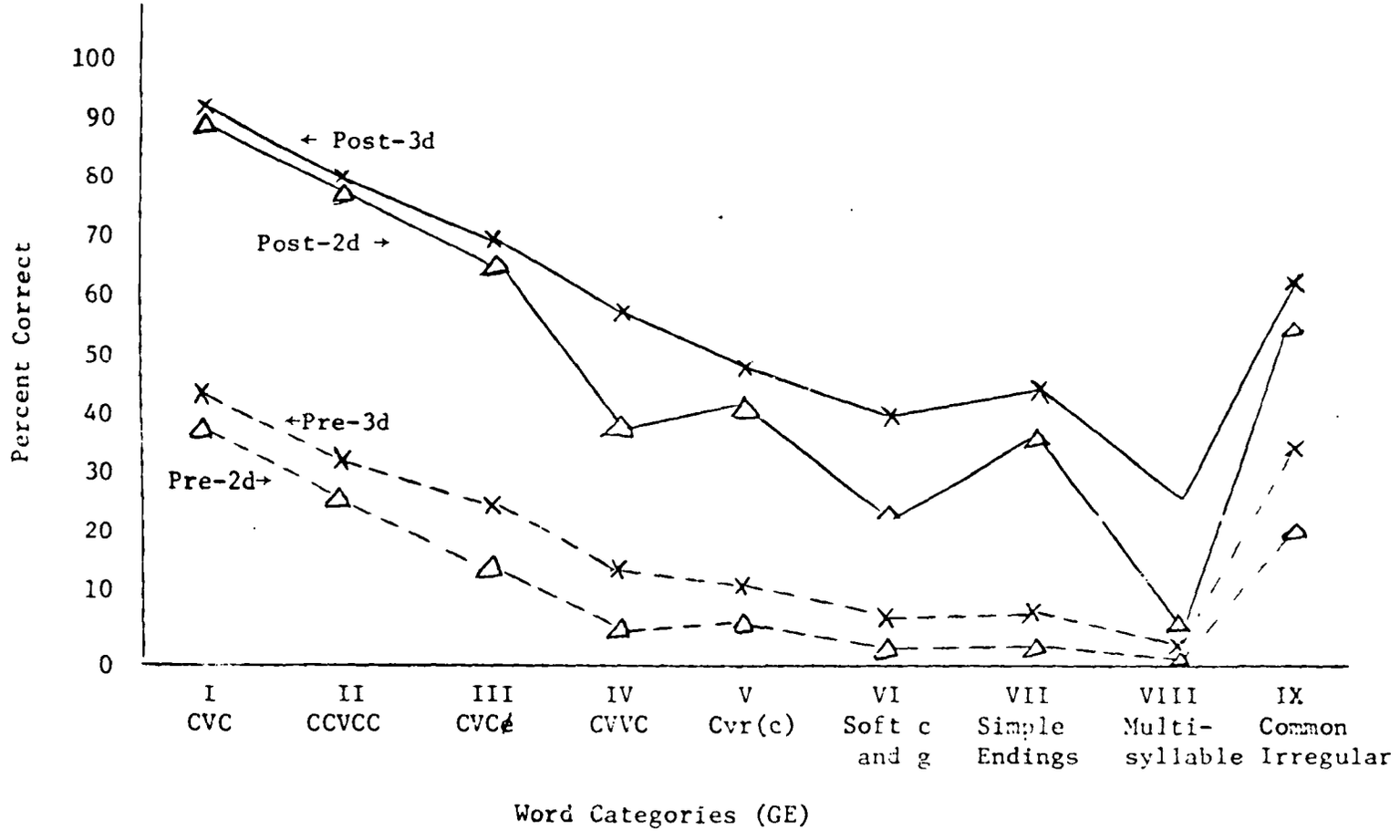


Figure 1: Mean Pre and Post Test Coding Skills of Second and Third Graders

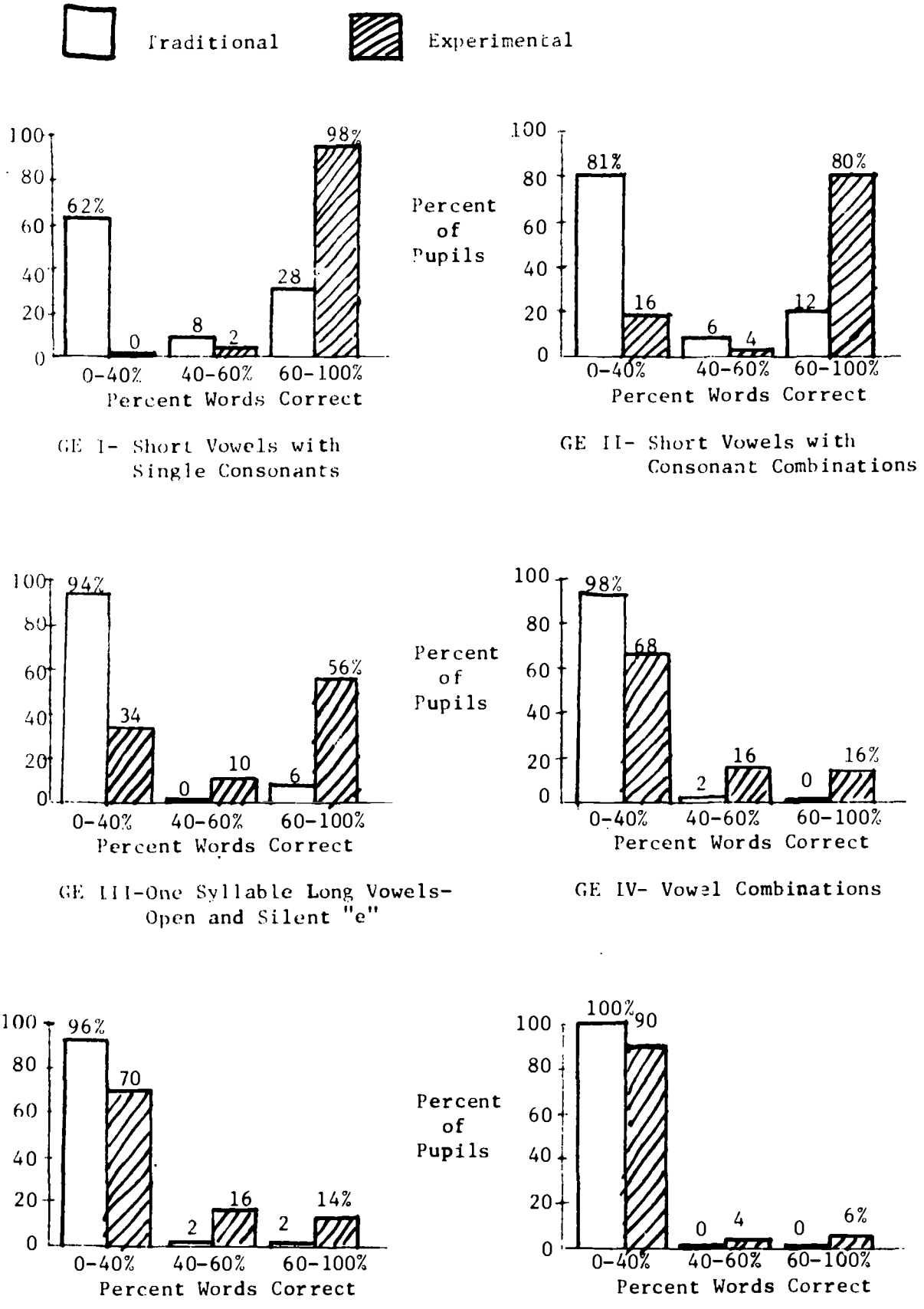
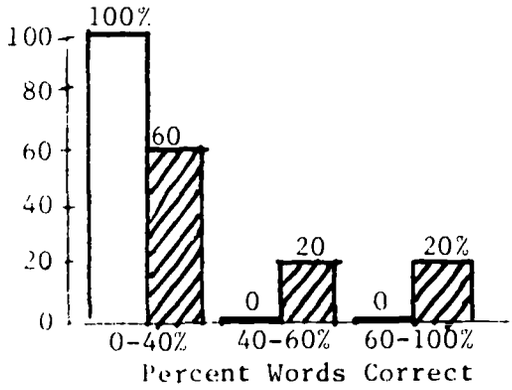
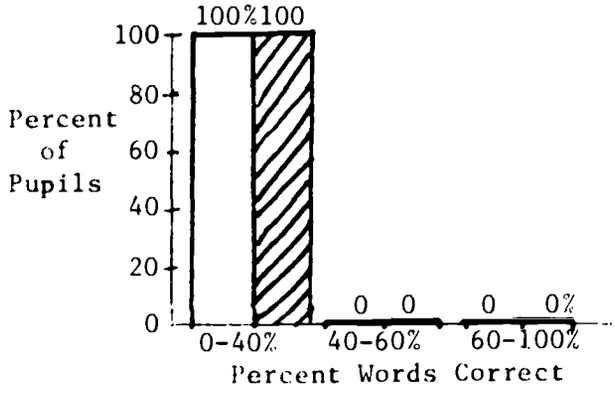


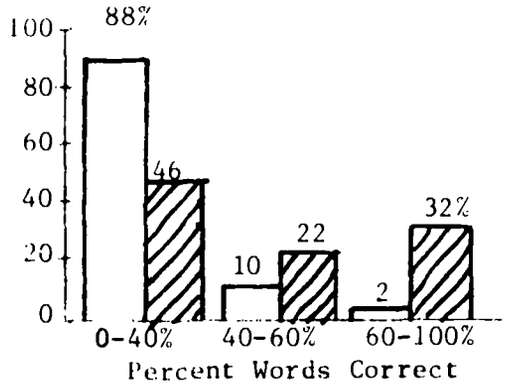
Figure 2: Comparison of Decoding Skills Acquired by Early Second Grade Under Traditional and Experimental Instruction



GE VII- Two Syllable-
Simple Endings



GE VIII- Multisyllable and
Other Two Syllable



Percent
of
Pupils

GE IX- Irregular

Figure 2: (Continued)

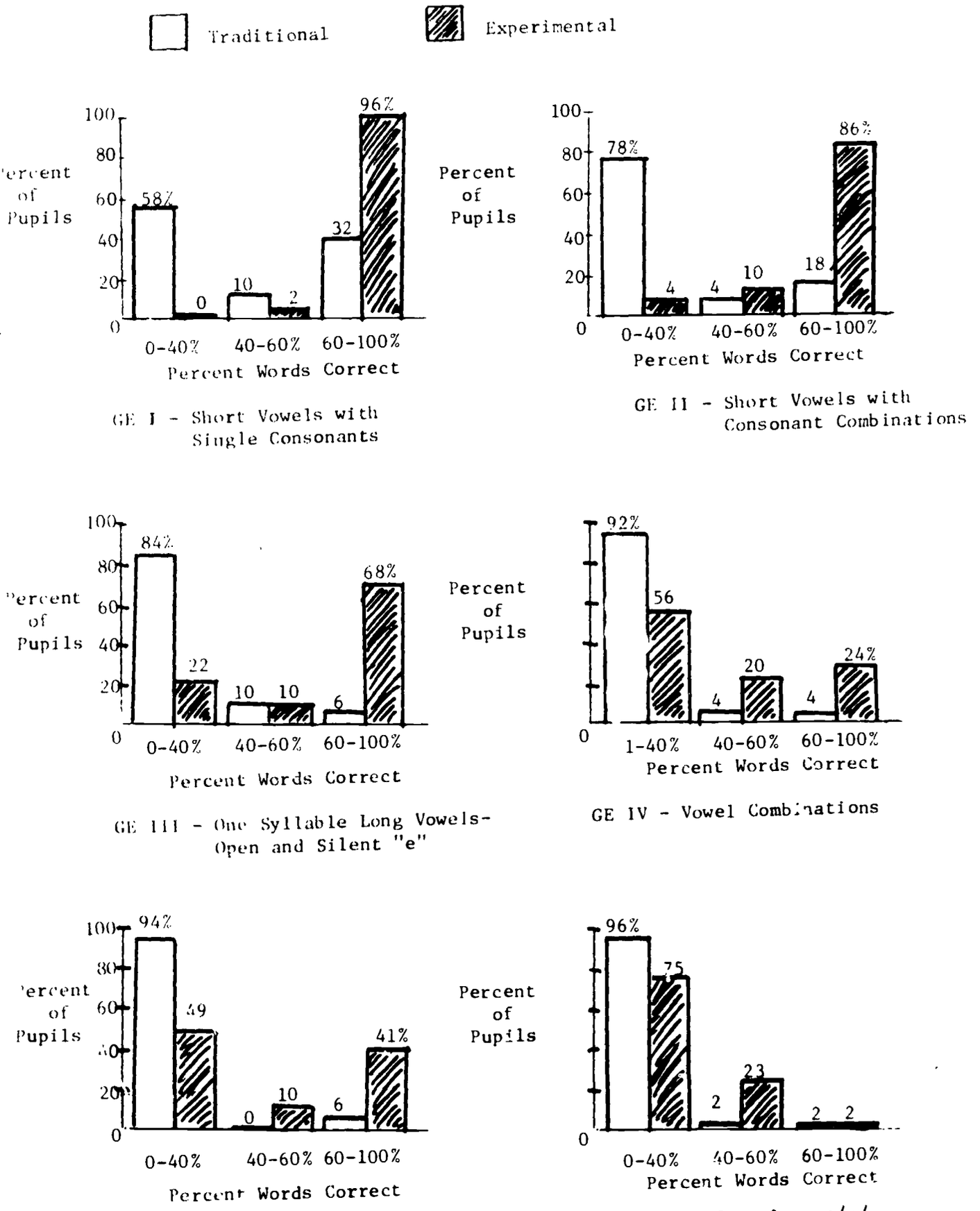
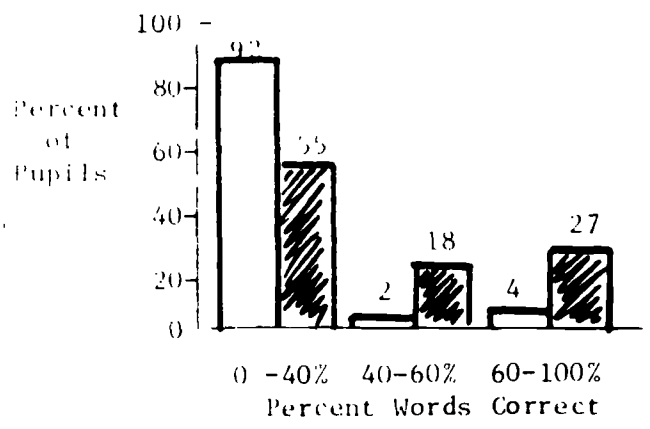
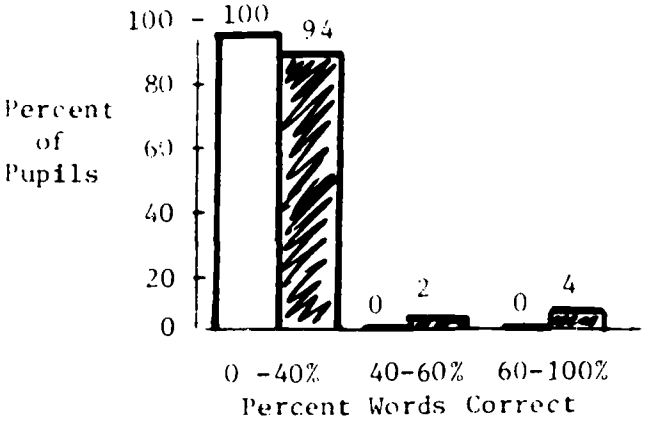


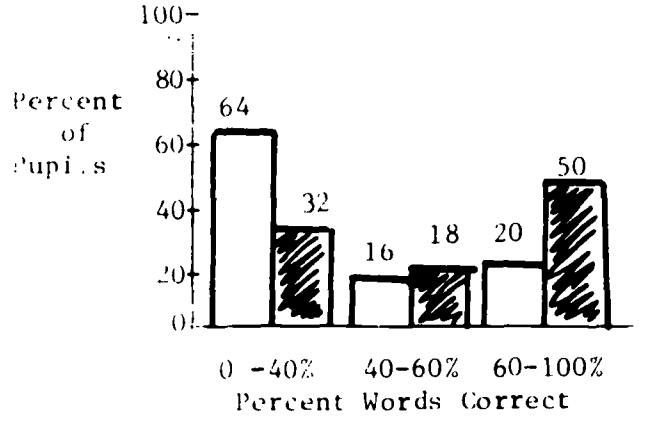
Figure 3: Comparison of Decoding Skills Acquired by Early Third Grade Under Traditional and Experimental Instruction



GE VII- Two Syllable-
Simple Endings



GE VIII - Multisyllable and
Other Two Syllable



GE IX - Irregular

Figure 3: (Continued)

Table 1

Mean Pre and Post Training Reading Achievement Scores

	First Grade		Second Grade		Third Grade	
	Pre (Jan.) N=49	Post (May) N=49	Pre (Nov.) N=43	Post (May) N=43	Pre (Sept.) N=49	Post (May) N=49
WRAT						
Grade Equivalent Score	1.3	2.0	1.8	3.1	2.3	3.7
GE Decoding Skills						
% Words Correct						
One Syllable Words:						
Short Vowels - Single Consonants	11.4%	73.3%	39.7%	89.9%	43.0%	89.7%
Short Vowels - Consonant Combinations	.5	47.2	27.0	77.9	31.3	77.2
Long Vowels (¢)	1.1	15.9	15.1	64.4	24.8	68.9
Vowel Combinations	.8	3.8	5.5	39.6	14.8	58.2
Vowel and "r"	1.3	4.3	6.7	44.2	10.7	48.0
Soft "c" and "g"	1.3	4.5	2.2	23.0	7.3	41.1
Simple Endings	.8	.5	3.2	37.9	8.8	46.2
Multisyllable Words	1.5	.0	.0	5.0	1.2	27.6
Total Regular Words	2.7	21.8	13.6	50.3	19.0	59.2
Irregular Words	3.0	13.8	22.0	55.6	36.0	62.5
Total All Words	2.7	20.8	14.6	50.9	21.0	59.6

Table 2

Percentage of Low Reading Group Scoring at Various Grade Levels on the WRAT Reading Test

	First Grade		Second Grade		Third Grade	
	1	2	3	4	5	6
	Pre (Jan) N=49	Post (May) N=54	Pre (Nov) N=43	ost (May) N=46	Pre (Sept) N=49	Post (May N=49
5.4 - 5.5				2.2%		
5.2 - 5.3				-		
5.0 - 5.1				-	2.0%	6.1%
4.8 - 4.9				2.2	-	6.1
4.6 - 4.7				-	-	2.0
4.4 - 4.5				-	-	6.1
4.2 - 4.3				-	-	6.1
4.0 - 4.1				2.2	-	12.2
3.8 - 3.9				10.9	2.0	6.1
3.6 - 3.7				6.5	-	6.1
3.4 - 3.5				6.5	-	8.2
3.2 - 3.3				4.4	-	6.1
3.0 - 3.1		1.9%		18.6	2.0	12.2
2.8 - 2.9		3.7		23.9	6.1	12.2
2.6 - 2.7		9.3		10.9	4.1	2.0
2.4 - 2.5		3.7	4.7%	6.5	20.4	2.0
2.2 - 2.3		14.8	9.3	-	18.4	8.2
2.0 - 2.2		16.7	11.6	-	14.3	
1.8 - 1.9	2.0%	13.0	25.6	2.2	12.2	
1.6 - 1.7	6.1	25.9	30.2	-	14.3	
1.4 - 1.5	40.8	9.3	14.0	-	.0	
1.2 - 1.3	38.8	-	2.3	2.2	2.0	
1.0 - 1.1	4.1	1.9	2.3		2.0	
.8 - .9	4.1					
.6 - .7	4.1					
.4 - .5						
.2 - .3						

Table 3

Distribution of Second and Third Grade Decoding Skills after Traditional Instruction: Pre-test Scores (% of Pupils Scoring at Each Level)

Percent of Words Correct	Second Grade (N=49)	Third Grade (N=50)
I - Short Vowels-Single Consonants		
81-100%	10%	16%
61- 80	18	16
41- 60	8	10
21- 40	29	38
0- 20	35	20
II - Short Vowels-Consonant Combinations		
81-100%	4%	2%
61- 80	8	16
41- 60	6	4
21- 40	26	36
0- 20	56	42
III - One Syllable Long Vowel		
81-100%	4	-
61- 80	2	6
41- 60	-	10
21- 40	12	22
0- 20	82	62
IV - Vowel Combinations		
81-100%	-	-
61- 80	-	6
41- 60	2	10
21- 40	4	22
0- 20	94	62
V - Vowel with "r"		
81-100%	-	2
61- 80	2	4
41- 60	2	-
21- 40	2	4
0- 20	94	90
VI - Soft "c" and "g", s /z/		
81-100%	-	2
61- 80	-	-
41- 60	-	2
21- 40	2	4
0- 20	98	92
VII - Two Syllable-Simple Endings		
81-100%	-	-
61- 80	-	-
41- 60	-	-
21- 40	2	2
0- 20	98	98
VIII - Multisyllable and Other Two Syllable		
81-100%	-	-
61- 80	-	-
41- 60	-	-
21- 40	-	2
0- 20	100	98
IX - Common Irregular Words		
81-100%	0	4
61- 80	2	16
41- 60	10	16
21- 40	24	24
0- 20	64	40

Table 4

Distribution of Decoding Skills After 6 1/2 Months to 9 Months of Experimenta Instruction: Post-test Scores (% of Pupils Scoring at Each Level)

% Words Correct	First Graders (N=50) Dec.71	Second Graders (N= 9) May 71	Third Graders (N=50) May 71
I - Short Vowels-Single Consonants			
81-100%	72%	80%	86%
61- 80	26	18	12
41- 60	2	2	2
21- 40	0	-	-
0- 20	0	-	-
III - Long Vowels			
81-100%	32	29	38
61- 80	24	39	30
41- 60	10	10	18
21- 40	4	6	4
0- 20	30	16	10
V - Vowels with "r"			
81-100%	2	10	14
61- 80	12	31	32
41- 60	16	10	8
21- 40	20	18	14
0- 20	50	31	32
VII - Two Syllable with Simple Endings			
81-100%	0	4	10
61- 80	20	23	26
41- 60	20	18	18
21- 40	14	14	18
0- 20	46	41	29

% Words Correct	First Graders (N=50) Dec.71	Second Graders (N=49) May 71	Third Graders (N=50) May 71
II - Short Vowels Consonant Combinations			
81-100%	44%	51%	46%
61- 80	36	35	40
41- 60	4	10	4
21- 40	8	-	8
0- 20	8	4	2
IV - Vowel Combinations			
81-100%	6	10	24
61- 80	10	14	36
41- 60	16	20	8
21- 40	24	25	12
0- 20	44	31	20
VI - Soft "c" and "g"			
81-100%	0	2	6
61- 80	6	-	20
41- 60	4	23	26
21- 40	22	8	12
0- 20	68	67	36
VIII - Multisyllable and Other Two Syllable			
81-100%	0	2	6
61- 80	0	2	8
41- 60	0	2	20
21- 40	4	-	10
0- 20	46	94	56
IX - Common Irregular Words			
81-100%	4	10	24
61- 80	28	14	36
41- 60	22	20	8
21- 40	28	25	12
0- 20	18	31	20

Table 5

Comparison of Mean Decoding Skills Acquired By
Early Second Grade Under Traditional and Experimental Instruction

	Mean Percent Words Correct		Standard Deviations		t's between
	Traditional 1970 classes (N=50)	Experimental 1971 classes (N=50)	Traditional 1970 classes (N=50)	Experimental 1971 classes (N=50)	Mean Percents
One Syllable Words with:					
I Short vowels single consonants	39.36%	87.20%	27.40%	10.20%	11.46***
II Short vowels consonant combinations	26.90	72.70	22.80	26.00	9.27***
III Long vowel silent e	14.80	57.20	19.40	36.66	7.15***
IV Vowel combinations	5.36	32.24	8.56	26.76	6.69***
V Vowel with "r"	6.53	28.00	14.60	27.46	4.83***
VI Soft c & g, s as /z/	2.13	17.86	5.40	18.53	5.70***
VII Two Syllable Simple Endings	3.12	30.64	5.56	26.36	7.15***
VIII Multisyllable	0.00	4.00	0.00	12.33	2.26*
Total I - VIII	13.45	44.15	10.65	18.81	9.94***
IX Irregular	22.20	46.50	16.20	24.05	5.87***
Total - all words	14.45	44.05	10.30	18.30	9.86***

* $p < .025$
*** significant beyond the .001 level

Table 6
Comparison of
Distribution of Decoding Skills Acquired by Early Second Grade
Under Traditional and Experimental Instruction

% Words Correct	Traditional 1970 (N=49)	Experimental 1971 (N=50)
I - Short Vowels-Single Consonants		
81-100%	10%	72%
61- 80	18	26
41- 60	8	2
21- 40	28	0
0- 20	34	0
III - One Syllable-Long Vowel ¢		
81-100%	4	32
61- 80	2	24
41- 60	-	10
21- 40	12	4
0- 20	82	30
V - Vowel with "r"		
81-100%	-	2
61- 80	2	12
41- 60	2	16
21- 40	2	20
0- 20	94	50
VII - Two Syllable-Simple Endings		
81-100%	-	0
61- 80	-	20
41- 60	-	20
21- 40	2	14
0- 20	98	46
IX - Common Irregular Words		
81-100%	0	4
61- 80	2	28
41- 60	10	22
21- 40	24	28
0- 20	64	18

% Words Correct	Traditional 1970 (N=49)	Experimental 1971 (N=50)
II - Short Vowels-Consonant Combinations		
81-100%	4%	44%
61- 80	8	36
41- 60	6	4
21- 40	26	8
0- 20	55	8
IV - Vowel Combinations		
81-100%	-	6
61- 80	-	12
41- 60	2	16
21- 40	4	24
0- 20	94	44
VI - Soft "c" and "g", s /s/		
81-100%	-	0
61- 80	-	6
41- 60	-	4
21- 40	2	22
0- 20	98	68
VIII - Multisyllable-Other Two Syllable		
81-100%	-	0
61- 80	-	0
41- 60	-	0
21- 40	-	4
0- 20	100	96

Table 7

Comparison of Mean Decoding Skills Acquired By
Beginning Third Grade Under Traditional and Experimental Instruction

		Mean Percent Words Correct		Standard Deviations		t's between
		Traditional 1970 classes (N=50)	Experimental 1971 classes (N=49)	Traditional 1970 classes (N=50)	Experimental 1971 classes (N=49)	Mean Percents
One Syllable Words with:						
I	Short vowels single consonants	43.04%	89.86%	26.91%	9.75%	11.35***
II	Short vowels consonant combinations	31.30	77.86	21.23	19.70	11.19***
III	Long vowel silent e	24.79	64.35	17.92	28.17	8.27***
IV	Vowel combinations	14.80	39.59	18.16	22.65	5.11***
V	Vowel with "r"	10.68	44.22	18.41	28.59	6.57***
VI	Soft c & g, s as /z/	7.34	22.99	17.41	30.54	3.82***
VII	Two Syllable Simple Endings	8.80	37.88	14.39	27.57	6.53***
VIII	Multisyllable	1.20	5.04	5.98	17.30	1.47
	Total I - VIII	19.04	50.26	14.32	16.67	9.80***
IX	Irregular	36.0	55.61	24.60	27.60	3.70***
	Total - all words	20.98	50.91	14.44	16.96	9.27***

*** Significant beyond the .001 level

Table 8
Comparison of
Distribution of Decoding Skills Acquired by Beginning of Third Grade
Under Traditional and Experimental Instruction

% Words Correct	Traditional (N=50)	Experimental (N=49)
I - Short Vowel-Single Consonants		
81-100%	16%	80%
61- 80	16	18
41- 60	10	2
21- 40	38	0
0- 20	20	0
III - One Syllable Long Vowel		
81-100%	-	29
61- 80	6	39
41- 60	10	10
21- 40	22	6
0- 20	62	16
V - Vowels with "r"		
81-100%	2	10
61- 80	4	31
41- 60	0	10
21- 40	4	18
0- 20	90	31
VII - Two Syllable Words w/ Simple Ending		
81-100%	-	4
61- 80	-	23
41- 60	-	18
21- 40	2	14
0- 20	98	41
IX - Common Irregular Words		
81-100%	4	25
61- 80	16	25
41- 60	16	18
21- 40	24	12
0- 20	40	20

	Traditional (N=50)	Experimental (N=49)
II- Short Vowel-Consonant Combinations		
	2%	51%
	16	35
	4	10
	36	-
	42	4
IV- Vowel Combinations		
	-	10
	4	14
	4	20
	16	25
	76	31
VI- Soft "c" and "g"		
	2	2
	-	-
	2	23
	4	8
	92	67
VIII- Multisyllable and Other Two Syllable		
	-	2
	-	2
	-	2
	2	-
	98	94

In discussing test results Section IV is made Section VI, Section VI is Section V and Section V is Section IV.

INSTRUCTIONS

GALLISTEL-ELLIS LINGUISTIC READING AND SPELLING TEST

The materials have two numbering systems. The letters and numbers A1, A2, B1, B2, D1, D2, refer to skills tested. A is for sounds, B is for phonetically regular words, 1 is for reading, 2 is for spelling; D is for phonetically irregular words. The numbers and letters 1-6E, 1-6S, 1-3R and 1-3T are labels for all the materials, used so that we can refer quickly to any sheet and avoid the confusion of titles.

READING - Begin with this section since it is usually easiest.

Directions for sections I through VIII on forms 1F and 1S.

Procedure:

1. Give the student Form 1S. Say to him: I want you to read some words. Some of them are real words and some of them are not real words, but I want you to pronounce them as if they were part of a word you had never seen before. Start here (pointing to can) and read across the page. Then read the next line. Read until I tell you to stop. Place a card under each line as the student reads.

2. Mark on Form 1E each word pronounced correctly with a C. If the pupil mispronounces a work, write what he says beside the word. If he corrects the word by himself mark a C over the mispronounciation and count it correct. If he refuses a word urge him briefly to try it even if he doesn't recognize the word. If he still makes no attempt, indicate it with a dash above the word.

3. Have the pupil attempt all the words in section I.

4. Beginning with section II, given any consecutive six words, if a pupil misses any five of those six, discontinue testing in that section.

5. After the pupil has missed five of six words in a section, ask him to read the first two words in the following section. If he gets either word correct, continue testing until he again misses five out of six words in a section. Again ask him to read the first two words in the following section, continuing if he gets either correct.

6. Discontinue testing in Section B Phonetically Regular Words when a pupil has missed five out of six words in any section and the first two words in each of the two following sections.

7. Then have the pupil read in Section D.1 Phonetically Irregular Words until he misses five out of six words.

Possible Test Modifications:

Note that words are arranged in columns by vowels. If you are using the test to measure skills you have taught and some vowels have not been taught yet, have student read in rows but only include the columns for the vowels you have taught. Cover the others if you wish. Score the appropriate sub-totals. For test-shy students each section can be mounted on a card and given

Procedure:

1. Provide the pupil with a pencil and paper and have him write his name at the top. Date the paper. If you use Form 6E, Student Spelling Sheet, the Phonetically Irregular Words are first. They are often forgotten, so always give them first if it is necessary for you to remember them.

2. Dictate the words on Form 3S by rows, not columns. Mark the words correctly spelled with a C and those incorrectly spelled with an x on the record sheet (Form 3E).

3. Again, give all of section I.

4. Beginning with section II, given any consecutive five words, if a student misses any four of those five, discontinue testing in that section. (Unlike reading, where the pupil must miss five out of six.)

5. After the pupil has missed four out of five words in a section, dictate the first two words in the following section. If he gets either correct, continue until he misses four of five words again, and proceed to the next section.

6. Discontinue Part B.2. Spelling Phonetically Regular Words when the pupil has missed four out of five words in any one section and the first two words in each of the two following sections.

7. Then dictate the words in Part D.2. Spelling Phonetically Irregular Words until the pupil misses four out of five words. Don't forget to give these.

Possible Test Modifications:

The Spelling Test may be given in a group rather than individually. In this case more words will need to be dictated to test the limits of the child who can go the farthest. Tell the children that you do not expect them to know all of these words but that you want to find out what they know and what they don't before teaching them. It is easiest if you give the irregular words first, and have the papers numbered ahead of time (or use Form 6E-Student Spelling Sheet).

Scoring:

Count reversals which produce another letter such as b for d as errors, but do not count other reversals such as ɔ for c as spelling errors. Mark the words correctly spelled with a C on the record sheet, those incorrectly spelled with an X and those refused with a dash through the word. Total the number correct in each section and enter in the spaces provided at the bottom of each section. Enter the scores on the separate scoring sheet (Form 5E).

INSTRUCTIONS FOR PROGRESS RECORD OF CODING SKILLS (Form 4E)

This form is a good summarizing sheet for parents and classroom teachers. The scores should be entered as precents to be meaningful. Figure the percents by dividing the number correct for each section by the number possible for that section. This information will be on Form 5E already. The Percentage Tables (Form 6S) have the percents for all possible test scores. Notice that the progress

one or two sections at a time. Always be sure to indicate any changes on the recording sheets.

Scoring:

Count the number correct on each section and enter it in the space provided at the end of each section. Enter these section totals on the separate scoring chart (Form 5E).

SOUNDS IN ISOLATION

Procedure:

Present student's copy of Sounds in Isolation sheet (Form 2S) to the student, show him where to begin and have him read down the column of sounds. Use a card or finger to help him keep his place. Use the other copy of the sounds sheet (Form 2E) to record the student's name, the date, and his responses. If he does not respond within 5 seconds, move on by saying "next." In no way should your expression, words or voice give him an indication as to whether or not he is correct. He should be praised for trying and cooperating. Say to the student, "Tell me the sound that each letter (or letters) makes. If you are not sure, you can guess. Do not worry about any you do not know. Do the best you can." Have each student try all sounds through the last vowel "e". After that whenever student has missed four out of five consecutive sounds, discontinue test by asking him to look through the rest of the letter sets and tell you the sounds for any that he knows.

Some letters have two or more sounds such as each vowel, hard and soft "g" and "c". A dash for recording each sound is indicated on the record sheet and the additional sound to be asked for is indicated above the record dash. Mark C above the dash or over the sound indicated above the dash. Some letter combinations (such as ch, ui, etc.) sometimes have a sound that is used rarely and is usually considered an exception, but which students may give. These sounds are indicated in parentheses with no dash on the chart. If the student gives one of these sounds for the letters, ask him "What other sound can that (those letters) letter make? and check his response. Do not ask any student who gives the most common sounds indicated above the dashes to give the other more rare sounds indicated in parenthesis.

Possible Test Modifications:

Sounds can be tested from cards sorted into piles of known and not known and then recorded after sounds on the record sheet.

Scoring:

Only correct sounds called for by the dashes are counted in the total correct. Do not count sounds given in parentheses. The total possible correct sounds for each group is given on the scoring chart (Form 5E).

SPELLING

Be sure to use the Spelling sheet; Gallistel Ellis Linguistic Spelling Test. Examiner's Dictating and Recording Copy (Form 2

report (Form 4E) is grouped by phonetic category rather than skill. Therefore sounds, reading, and spelling for section I are together, sounds, reading, and spelling for section II are together, etc.

The remaining materials are for ongoing teaching and testing.

Form 2R, Reading Isolated Sounds (Student Reading and Recording Copy), can be used as a daily check list of progress by having the student read the sounds he has learned and filling an X in the appropriate box for each correct response, and a (✓) for an attempted or self-corrected response.

Form 3T, Phonetically Irregular Words, can be used in conjunction with Form 3R, in a manner similar to Form 2R, for both reading and spelling. The words should be introduced as needed in the student's reading materials, and should not be used so extensively that this task becomes a detriment to the acquisition of regular decoding skills.

Forms 1T and 2T, B. Phonetically Regular Words and C. Sentences with Phonetically Regular Words, can be used as a periodic check on the student's competency in each of the phonetic categories. The different lists under each numbered section are to be used in consectuive testing periods so that the student has not merely performed by memorizing the list. Form 1R, Student Recording Form, is to be used when recording, for reading words, reading sentences, spelling words and spelling sentences, as indicated at the top.

The recording forms provide records from which the student and other interested persons can ascertain progress through the various stages of the learning task, as well as providing a thorough breakdown of objectives to be achieved, and should be filled in carefully.

B.1. READING PHONETICALLY REGULAR WORDS

Student's Reading Copy

I.	can	big	fox	sun	red
	fat	mix	hop	cup	yet
	pal	kid	job	hub	web
	jam	vim	rot	yum	peq
	lan	ziv	wot	sud	ket
II.	that	kiss	stop	shut	help
	track	mint	strong	flunk	chest
	splat	frisk	prod	spun	smell
	cran	glim	clob	grum	ject
III.	make	kite	hope	cube	she
	plate	drive	slope	flute	spy
	tate	vide	plode	pute	lete
IV.	match	bridge	dodge	fudge	fence
	rage	price	hose	huge	cent
	ratch	cin	podge	duce	gen

V.	may	hook	joy	clown	teach
	snail	pie	flow	spoon	head
	haul	might	soak	shout	cheek
	crawl	chalk	soil	glue	grew
	wain	wright	moil	cruit	tween
VI.	star	dirt	cord	burn	herd
	spare	hire	chore	cure	cheer
	gar	pire	nore	tur	ser
VII.	table	kitten	hopping	puppies	better
	candy	finest	wobble	cupful	fender
	magnet	hiding	goblin	brushes	netted
	smarty	slices	folly	gunned	velvet
	fambin	flimmer	gobies	hufed	bezzle
VIII.	station	indicate	explosion	instrument	envelope
	fantastic	administer	photograph	suction	entertain
	satponder	dipsoping	lopaicom	tumsiptic	esterpin

D.1. READING PHONETICALLY IRREGULAR WORDS

was	have	what	one	mother
where	again	does	pull	could
nothing	many	because	always	laugh
above	thought	whose	toward	honest