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A Study Of Reading Achievement Of Bilingual (Spanish/English) Pupils In Grades Three And Five Taught Under Three Different Models Of Instruction

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A STUDY OF READING ACHIEVEMENT OF BILINGUAL
(SPANISH/ENGLISH) PUPILS IN GRADES THREE
AND FIVE TAUGHT UNDER THREE DIFFERENT
MODELS OF INSTRUCTION

A Dissertation
Presented to
the Faculty of the Graduate School
University of the Pacific

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

by
John A. Chavez

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August 20, 1982

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A STUDY OF READING ACHIEVEMENT OF BILINGUAL (SPANISH/ENGLISH)
PUPILS IN GRADES THREE AND FIVE TAUGHT UNDER
THREE DIFFERENT MODELS OF INSTRUCTION

Abstract of Dissertation

PROBLEM: Teaching limited English proficient pupils to read English is a primary concern of teachers in the United States. The problem educators face is how to accomplish the goal effectively. The emphasis on acquisition of oral fluency of English and quick introduction to reading has had mixed results. The controlled studies testing the hypotheses of primary language approaches are scarce.

PURPOSE: The purpose of this study was to examine achievement test results of bilingual Spanish/English third and fifth grade students who were taught to read: 1) initially in the primary language and then English, 2) were taught to read English with enroute assistance in the primary language, and 3) were taught to read English without recourse to the pupils' primary language. The achievement test scores of the pupils were subjected to statistical treatment to assess the effectiveness of the three approaches to instruction.

PROCEDURES: The achievement test scores of fifty-one third grade and thirty-five fifth grade pupils taught under three different models of instruction, i.e., the Primary Language Approach, the Concurrent Language Approach, and the Direct Language Approach, were analyzed. The analytic procedure adopted was to compare pre and post test scores by both parametric (t-test) and non-parametric (Wilcoxin) tests. A .05 level of confidence was adopted for all analysis. The results of the Bilingual Syntax Measure administered individually in Spanish and English were used as a measure of bilingualism. As a preliminary measure to the ANCOVA, a test was conducted to determine if the groups differed on the pretest.

FINDINGS: By the time of the post test by both the parametric and non-parametric tests for the third grade, there was no statistically significant difference between pre and post test results. The results of the regression analysis did find a significant decrease between pre and post tests for the Concurrent approach group. For the fifth grade, by both the parametric and non-parametric tests, the Primary Language approach group scored higher on both pre and post tests. For the Concurrent Approach group, there was a statistically significant decrease between pre and post tests at the .05 level by both parametric and non-parametric tests.

RECOMMENDATIONS: A long range study that provides for control of variables, such as teacher selection, delivery of instruction, and language proficiency of teachers and students should be conducted in an urban center. A study that controls for these variables before the fact will provide more conclusive evidence regarding the more effective instructional approaches for Spanish/English bilingual pupils in the United States.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	
LIST OF TABLES	vii
CHAPTER ONE	1
The Nature and Scope of the Study	1
Purpose of the Study	8
Significance of the Study	10
Definition of Terms	13
Overview	14
CHAPTER TWO	16
REVIEW OF LITERATURE	16
Bilingual Instructional Approaches	16
Reading in a Bilingual Program	21
The Issue of Language Proficiency	36
Summary	45
CHAPTER THREE	47
METHODS AND PROCEDURES	47
The Research Hypothesis	47
The Setting	48
The Sample	49
The Instrumentation	49
The Data Collection	52

The Treatment of the Data	53
Summary	54
CHAPTER FOUR	56
FINDINGS AND ANALYSIS OF DATA	58
Results for the Third Grade	58
Results for the Fifth Grade	63
Summary	69
CHAPTER FIVE	71
SUMMARY AND RECOMMENDATIONS	71
Background of the Study	71
Summary of the Results	74
Related Questions	78
Conclusions	82
Recommendations	85
BIBLIOGRAPHY	89
APPENDICES	
A. Teacher Questionnaire	96
B. Instructions for Administering Classroom Observation Instrument	98
Classroom Behavior Instrument	103
C. Bilingual Syntax Measure	106
D. Comprehensive Test of Basic Skills Reading Vocabulary	108
Reading Comprehehsion	110
E. Regression Analysis	111
F. Parametric Tests	113

List of Tables

Table	Page
1. T-Test Values for Third Graders	58
2. Wilcoxin Matched Pairs Signed Ranks Test Results for Third Graders	59
3. Analysis of Variance Third Grade Pretest	61
4. Analysis of Variance Third Grade Posttest	62
5. T-Test Values for Fifth Graders	64
6. Wilcoxin Matched Pairs Signed Ranks Test Results for Fifth Graders	65
7. Analysis of Variance Fifth Grade Pretest	67
8. Analysis of Variance Fifth Grade Posttest	68

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CHAPTER ONE

The Nature and Scope of the Study

Young children from non-English speaking homes in the United States face the dual task of learning a second language and simultaneously struggling with the socialization process and academic endeavors thrust upon them when entering school for the first time. Leaving the familiarity of the home environment to face the strange world of the classroom and the rigors of schooling is for many young learners a traumatic experience, and for the non-English speaker who can neither understand the language nor use it as a medium of expression, the task may be doubly difficult.

A disproportionate number of Spanish speaking students in the United States do not attain full literacy in English and despite repeated attempts to modify the reading programs to make them more effective the problem of low achievement in reading persists. DeAvila and Ulibarri report that investigations provide evidence that education of the Spanish speaking is characterized by excessive grade repetition, high dropout rates, and low academic achievement¹

¹ Edward A. DeAvila and Daniel M. Ulibarri, "Theoretical Perspectives on the Selection of Instructional Techniques for Hispanic Students," Educating English-Speaking Hispanics, ed., L. A. Valverde, et al. (Virginia: Association for Supervision and Curriculum Development, 1980). P. 15.

generally. Drawing from the National Assessment of Education Progress Report Crane² cited five areas where the Hispanic child is below the national average. One of these areas is reading. The 1975 report of the U. S. Commission on Civil Rights also cited low academic achievement in many language minority children in both the pupil's own native language and English. By the 12th grade the Mexican American student is 3.5 years behind the national norm in verbal ability and 3.3 in reading.³

Researchers⁴ who have considered the issue of low academic achievement of bilinguals have historically attributed the cause to socio-cultural and attitudinal factors. However, Cummins⁵ has argued that low academic achievement cannot be explained by these factors and instead blames the lack of meaningful data as the problem. Troike has cited

² Robert Crane, Hispanic Student Achievement in Five Learning Areas: 1971-1975. National Assessment of Education Progress Report NoBr-2 ED 138414, May 1977.

³ U. S. Commission on Civil Rights. A Better Chance to Learn, (Washington D.C.: GPO, 1975). P. 18.

⁴ J. Donald Bowen, "Linguistic Perspectives on Bilingual Education." Frontiers of Bilingual Education. (Rowley, Massachusetts: Newberry House, 1977); Christina Bratt Paulston, Bilingual Bicultural Education, Review of Research in Education (1978); Merrill Swain, "Home-School Language Switching," Understanding Second Language Learning: Issues and Approaches, (Rowley, Massachusetts: Newberry House, 1978).

⁵ James Cummins, "Linguistic Interdependence and the Educational Development of Bilingual Children," Review of Educational Research, Volume XXXIX No. 2 (Spring 1979), 222-251.

the scarcity of research relevant to bilingual education and has blamed it on the lack of funding⁶--a fault that has only recently been rectified by the National Institute of Education.⁷ This writer's review of the research projects that have been funded by the National Institute of Education has led him to conclude that only one of the projects is investigating the teaching of English reading to bilingual Spanish/English pupils. Most research efforts conducted thus far have concentrated on reporting summative data and have left the study of instructional strategies to other researchers. These efforts have been directed at individualized⁸ as well as group bilingual education programs. The impact study discussed in the succeeding pages conducted by the American Institute for Research⁹ of the Title VII projects was a large scale effort including many projects.

The data derived from the study reported by McConnell¹⁰

⁶ Rudolph Troike, "Synthesis of Research on Bilingual Education," Educational Leadership, Vol. XXXVIII, No. 6, (March 1981), 498-503.

⁷ Michael Timpane, H. Compendium of Bilingual Education and Related Projects, (Washington, D.C., National Institute of Education, July 1980), p. 35.

⁸ Beverly McConnell, "Does Bilingual Education Work?" Bilingual Resources, (Los Angeles: National Dissemination and Assessment Center, 1980), Volume III, No. 7, 23-27.

⁹ American Institute for Research, Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program, (Los Angeles, National Dissemination and Assessment Center, August 1978), Volume II, No. 1.

¹⁰ McConnell, Op. cit. p. 24.

on individualized bilingual instruction illustrates that the Title VII pupils scored significantly higher on tests for English reading and mathematics when compared to the comparison group of the same age and language dominance. These results are in direct contrast to those derived by the impact study conducted by the American Institute for Research under contract to the Department of Health, Education and Welfare.

The results reported by the American Institute for Research would tend to demoralize even the most ardent supporters of bilingual education if it were not for the weaknesses of the procedures utilized in the conduct of the research. For instance, not all of the procedures of the study were objectively derived.¹¹ The classification of students with Hispanic antecedents is a case in point. The teacher of the students was asked to indicate the category which best described the student. For example, English dominant in reading and math; bilingual in reading and knows mathematics in English; Spanish dominant in reading and mathematics; or bilingual in reading and knows mathematics in Spanish. There is also evidence¹² to suggest that students were also identified as monolingual in English or as

¹¹ J. Michael O'Malley, "Review Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program," Bilingual Resources, (Los Angeles, National Dissemination and Assessment Center, Winter 1978), Volume I, No. 2, 6-10.

¹² Ibid. p. 6.

limited English speaking. It is unclear how these terms were defined. Moreover, the validity and reliability of teacher judgment is not explained. And finally the reader is led to equate dominance with proficiency in the language.

The issue of group comparability is the most critical area of the report. Group comparability was established as a two group pre-test/post-test design, i.e., one of the groups represented students in the Title VII Spanish/English project, and the second group represented members of non-Title VII classrooms identified by each site who were similar in ethnicity, linguistic background and socioeconomic status.¹³ No random assignment was involved.

Given the statistical treatment, i.e., analysis of covariance, comparison to national norms, and analysis of growth rates, specific assumptions can be made, i.e., that groups randomly assigned to treatment or non-treatment groups are from the same population. If this standard cannot be met, then the groups must be tested for initial differences on relevant variables. The test applied in this case was the California Test of Basic Skills (CTBS), Form S.¹⁴ The results showed that the non-Title VII group

¹³ Robert A. Cervantes, "An Exemplary Consafic Chingatropic Assessment: The AIR Report", Bilingual Education Paper Series, (Los Angeles, National Dissemination and Assessment Center, March, 1979), Volume II, No. 8, 13.

¹⁴ Comprehensive Test of Basic Skills, McGraw-Hill, Monterey, California. See Appendix D for a description of the test administered.

did better in grades 4 and 5 for CTBS Total Reading Score. This is but one example of discrepancies between the Title VII group and the non-Title VII group. Although the American Institutes of Research (AIR) researchers describe the groups as being "reasonably"¹⁵ comparable there is clear cut evidence that differences existed between the groups from the outset. Tests of significance for differences between the two groups found significant relationships in 5 of the 15 comparisons. The AIR researchers performed the analysis of covariance nevertheless and justified their action by stating that the "large number of Hispanic students present in the analysis samples was undoubtedly the reason that small differences were statistically significant."¹⁶

It should be also noted that the attrition rate in the non-Title VII group exceeded that of the Title VII group by from 11 to 18 percent. Given the speculation that Hispanic origin students have a greater mobility rate and are over represented in the ranks of students with low achievement it may be that the attrition rate reduced the number of low achievers of the non-Title VII group. Again the researchers disclaim any impact on the results by stating that the attrition was not "dramatic."¹⁷

¹⁵ O'Malley, Op. cit.

¹⁶ O'Malley, Op. cit., p. 7.

¹⁷ Ibid. p. 8.

The geographical location of the Title VII and non-Title VII classrooms has cast further doubt about the comparability of the groups. Eighteen of the 38 Title VII sites were unable to identify appropriate comparison classrooms, thus a number of questions about factors related to environmental influence arose. It is not clear how dissimilar environment affects student achievement, but the possibility for it exists.

And finally, the Impact Study of the Title VII projects conducted by the American Institute for Research encompassed a broad range of purposes as well as projects. The result is a summary of outcomes drawn from all sites. It is impossible to effectively synthesize the information presented regarding degree of implementation, hence the recommendations remain open to question.

With the enactment of the Bilingual Education Act in 1968 an opportunity to study the subject generally and write a whole new chapter of educational history presented itself. On the issue of language and thinking in the bilingual child, for example, no empirical evidence was cited in the U.S. Commission on Civil Rights Report¹⁸ of 1975. The report does, however, recognize the importance of the pupil's primary language in the classroom. The hypotheses underlying bilingual education is that bilingual personnel, bilingual materials, instruction in the primary language,

¹⁸ U. S. Commission on Civil Rights Report, 1975.

and improvement of the pupil's self-concept will result in significant student achievement. Within this framework a variety of instructional approaches exist. This study indentified three approaches of instruction commonly utilized in bilingual programs and studied the student achievement data of six different groups (fifty-one third graders, thirty-five fifth graders) taught under those approaches.

Purpose of the Study

The purpose of this study was to investigate which of three approaches of instruction make a significant difference in the reading achievement of bilingual Spanish/English pupils as measured in English. Those three approaches were as follows:

- a learning to read first in the primary language, then transferring those cognitive skills to English.
- b utilization of the primary language for instruction as enroute process to learning to read in English.
- c learning to read in English while simultaneously requiring oral fluency in English.

For the purposes of consistency those three approaches are referred to throughout the study as 1) the Primary Language Approach; 2) the Concurrent Approach; and 3) the Direct approach.

During the length of the study other questions related

to the instruction and achievement of bilingual children evolved. The writer feels that these questions are pertinent to this study. Those questions are as follows:

1. What is the optimum age for introduction of instruction in English to a pupil whose primary language is other than English?
2. What is the optimum level of oral fluency needed for successful introduction of reading in English?
3. At what point does the bilingual pupil Spanish/English begin to achieve at the same level as his English speaking peer?
4. What are the classroom management problems that the bilingual teacher encounters to implement instruction of:
 - a) reading in the primary language
 - b) reading in English.
5. At what point does the bilingual pupil no longer require the enroute assistance of the primary language?

Hypothesis

This study posed two major hypotheses and they are as follows:

There is a significant difference in the achievement of reading English among bilingual (Spanish/English) third grade pupils as it is related to the method of instruction.

There is a significant difference in the achievement of reading English among bilingual (Spanish/English) fifth

grade pupils as it is related to the method of instruction.

Significance of the Study

Bilingual education is enjoying the attention it is getting today due to the impetus that the federal government is giving it. In a call for improved research work in bilingual education, Fernandez¹⁷ reviews the literature in the field and points to the significant impact federal legislation has had. He asserts that professional educators serving as school administrators have not been in the forefront of the decision-making process of bilingual education. They have been lagging behind and merely complying with state and federal guidelines. This study focuses on three instructional approaches utilized in teaching of bilingual children. The results of this study will assist program coordinators and school administrators to make decisions that are in concert with instructional approaches most beneficial to language minority students.

The negative prognosis for most bilingual children cannot be retracted until we have answers to some of our many questions. A child growing up in the United States has no choice but to become bilingual or monolingual, and learn in the second language. Although educators now think that the optimum age for introducing English as a second language

¹⁹ Rafael Fernandez, "Rationale for a Field Based Research and Development Project for Multi-Cultural Bilingual Education, Journal of National Association for Bilingual Education (May, 1977).

depends on several social-cultural factors, questions remain about the role that the primary language plays in the instructional program. Resistance to developing cognitive skills in the pupil's primary language persists because the effect of learning in one language and then transferring the learning to the other is not known or clearly understood.

Then there is the problem of assessment. Thus far the tests for assessing and monitoring progress in the child's primary language have not been developed, although Assembly Bill 1329²⁰ and incorporated into the California Education Code²¹ requires testing of basic skills of all students participating in bilingual programs, and to the extent appropriate instruments are available in the primary language of limited English speaking and non-English speaking (LES/NES) students.

Limitations of the Study

This study was confined to bilingual (Spanish/English) third and fifth grade pupils in six classrooms. The six classes were selected from bilingual project schools in the Oakland Unified School District. Oakland was selected as the site for the study because the writer concluded that the conditions for conducting the investigation were present. Those conditions are listed as follows: 1) bilingual

²⁰ Assembly Bill 1329. Legislature, State of California. Sacramento, 1976.

²¹ Education Code, State of California, Section 52171. Sacramento, California, 1977.

Spanish/English third and fifth graders were present, 2) bilingual Spanish/English teachers assigned to teach in the bilingual program were present, and 3) the three approaches to be investigated were being implemented.

Methodology

The students for this study were classified as bilingual (Spanish/English) on the basis of the Bilingual Syntax Measure²² administered in the Fall of 1978. Eighty six third and fifth grade pupils enrolled in the Oakland Public Schools that initially received reading instruction in English, Spanish, or bilingually were studied. Students were tested with the California Test of Basic Skills.²³

The results of the pre- and post-test of the California Test of Basic Skills would be the basis for drawing conclusions regarding the growth made by the students. Mode of instruction was monitored by direct observation of classroom instruction, and recorded on the Classroom Observation Instrument.²⁴ Each teacher was required to fill out a questionnaire²⁵ including questions designed to describe their approach to teaching reading to bilingual pupils. Samples of each are provided in the appendix.

²² Marina K. Burt, Heidi C. Dulay, and Eduardo Hernandez-Chavez, Bilingual Syntax Measure. Harcourt Brace Jovanovich, New York 1978. See Appendix C for description.

²³ Op. cit.

²⁴ Appendix A.

²⁵ Appendix B.

Definition of Terms

For the purpose of this study the following terms are defined:

Bilingual. Refers to students who speak and understand both English and Spanish.

Primary language. Refers to first language the student spoke and understood.

Monolingual. Refers to students who speak and understand English only.

Bilingual education. The use of two languages, one of which is English, as a medium of instruction.

Primary approach. Method of instruction that utilizes pupil's primary language as a medium of instruction.

Concurrent approach. Method of instruction that utilizes pupil's primary language and English interchangeably as a medium of instruction.

Direct approach. Method of instruction that utilizes only English as a medium of instruction.

L₁, L₂. Language one, language two, respectively. Specifies language being referred to in the context of the discussion.

ESL. English as a second language.

Bilingual education program. A program designed for bilingual pupils that includes instruction in English development including reading and writing skills, use of the pupil's primary language, instruction of the pupil's primary language including reading and writing, and where

instruction is provided by a certificated bilingual teacher.

Transitional bilingual program. Refers to a program where instruction in the pupil's primary language is provided only until such time that the pupil is transferred to the all-English-medium curriculum.

Language proficiency. Refers to the level of language developed including oral communicative skills, reading, and writing of either language one or two.

Title VII. This term refers to projects funded by federal grants for the purpose of improving bilingual education generally, including training, basic education, material development, and evaluation. In this study Title VII refers to bilingual instruction projects.

Overview

A study of the reading achievement of Spanish English bilingual third and fifth graders was conducted to determine under which of three methods the students achieved best. Those three methods were the Primary Language Approach, the Concurrent Language Approach, and the Direct Language Approach. Each instructional approach was defined. The Primary language approach utilizes Spanish as the medium of instruction; the Concurrent language approach utilizes both the student's first language, i.e., Spanish, and English; and the Direct language approach means use of English exclusively.

Students were selected for the study on the basis of

the results of the Bilingual Syntax Measure, an oral language proficiency test. They were then matched to method of instruction. Teacher selection was made on the bases of self identity and classroom observation. A questionnaire and observation instrument were used for this purpose.

The study was confined to students enrolled in Title VII classes in the Oakland Public Schools. Fifty-one third graders and thirty-five fifth graders were included in the study.

The study is organized into five chapters. In Chapter I, the purpose of the study, the hypothesis tested, the significance of the study, the limitations of the study, the methodology of the study, and the definitions of terms are presented. In Chapter II the literature pertaining to bilingual instructional approaches, reading in a bilingual program, methods of teaching English and Spanish reading, language proficiency, and other topics related to the study are reviewed. The methodology and procedures utilized to obtain the necessary data are discussed in Chapter III. In Chapter IV the data are analyzed and interpreted. Chapter V includes a summary of the study, a discussion on the findings, conclusions, and recommendations for further study.

CHAPTER TWO

Review of Literature

This chapter provides review of the literature that pertains to the instruction of limited English proficient students and their reading achievement. This review should provide the reader with a clearer perspective of the skills that need to be developed for success in reading, which is the basis of the study, as well as illustrate the supporting research which guided this work. Discussions will be under the following general headings:

- 1) Bilingual Instructional Approaches
- 2) Reading in a Bilingual Program
- 3) The Issue of Language Proficiency

Bilingual Instructional Approaches

Instructional approaches for teaching bilingual pupils vary enormously. Paulston has described three basic approaches: (1) where the medium of instruction is in L_2 with only one component of the program in the primary language of the pupil, (she cites the early immersion programs in Canada as an example of this type); (2) programs that use the primary language as the medium of instruction and the second language is learned as a separate subject, and (3) programs that utilize both the primary language and the second language concurrently. Paulston says that

variation between each of these approaches is predominantly found in the sequencing of language of instruction e.g., where reading is initially taught through language one or through language two or both languages utilized simultaneously. She also cites the time allotted for treatment of the various components of the curriculum noting that in the United States introduction of reading in language two is not delayed for more than one year in those programs where it is not taught concurrently.¹ This practice contrasts with the Canadian² experience where English reading is not introduced until after two years in the program. Paulston points out that the definitions of bilingual education programs in Canada and Sweden sound identical.

In Canada:

Bilingual Education can be defined as schooling provided fully or partly in the second language with the object in view of making students proficient in the second language while, at the same time, maintaining and developing their proficiency in the first language and fully guaranteeing their education development.

¹ Christina Bratt Paulston, Bilingual Education Theories and Issues, Newbury House Publishers, (Massachusetts, 1980), pp. 7-9.

² Merrill Swain, Bilingual Schooling: Some Experiences in Canada and the United States. (Toronto: Ontario Institute for Studies in Education, 1972).

In Sweden:

The goal of bilingual teaching in comprehensive school should be for the pupils to gain a parallel command of both languages.³

In actual practice a fifth grade pupil in a Canadian immersion program divides the instructional time (fifty percent in L_1 , fifty percent in L_2) between the primary language and the second language. An immigrant fifth grade pupil in Sweden is provided about two hours per week in primary language instruction.

Gamez⁴ identified two instructional approaches and refers to them as strategies. The two approaches are the native language approach, and the direct approach. She defines the native language approach as the introduction of reading the pupil's home language. The rationale for this strategy, according to Gamez, is that the development of language skills (listening, speaking, reading, and writing) is based on mastery of the sound system, structure, and vocabulary of the language. Because the child with a home language other than English has mastery of the sound system, structure, and vocabulary of the home language the native language approach to instruction is the most logical

³ Paulston, Op. cit., p. 8.

⁴Gloria I. Gamez, "Reading in a Second Language: Native Language Approach vs. Direct Method," Bilingual Resources, Volume III, No. 1 (1979), 23-25.

strategy to use in teaching the pupil to read. Gamez argues that reading skills developed in L₁ transfer to L₂.⁵

The Direct method, according to Gamez, introduces reading after oral skills of the second language have been acquired. She cites the St. Lambert and Culver City immersion experiments where students were taught in the second language (French in St. Lambert, Spanish in Culver City) with a gradual increase of English in both projects. The students in both projects acquired competence in understanding, speaking, reading, and writing in both languages.

In a paper prepared for the State Department of Education of California, Cummins paraphrased the rationale for bilingual education in the United States as follows:

Lack of English proficiency is the major reason for language minority students' academic failure. Bilingual education is intended to ensure that students do not fall behind in subject matter content while they are learning English, as they would likely do in an all-English program.

However, when students have become proficient in English, then they can be exited to an all-English

⁵ Ibid.

⁶ Gamez, p. 24.

program, since limited English proficiency will no longer impede their academic progress.⁷

This rationale is the basis for designing bilingual programs that include use of the primary language as an instructional strategy, however, the degree or extent to which it is used is not explicit. Cummins points out that the fundamental problem with this rationale is that proficiency is not defined. More on the subject of proficiency is included in the last section of this chapter.

Paulston points out that from the legislators' viewpoint bilingual programs are intended to teach the student English as quickly as possible, therefore the programs are compensatory in nature.⁸ This investigator feels that this strategy is vague and unenforceable because it fails to define the remedy, i.e., to what extent shall either the native language or English be used.

The question of which instructional approach is most effective has not been answered which serves to illustrate that research on the topic has not been exhausted. This writer suspects that part of the answer depends on defining

⁷ James Cummins, "The Role of Primary Language Development in Promoting Educational Success for Language Minority Students," Schooling and Language Minority Students: A Theoretical Framework, (Los Angeles: Evaluation, Dissemination and Assessment Center, 1981), p. 4.

⁸ Christina Bratt Paulston, "Rationales for Bilingual Educational Reforms: A Comparative Assessment," Comparative Education Review (October, 1948), 402-419.

the student population to be served and the academic expectations for bilingual pupils.

Reading in a Bilingual Program

Most experts would agree that the teaching of reading is an elementary teacher's primary concern. Much time and effort is devoted to the study of reading and methods of teaching reading. The teaching of reading in a bilingual program includes review of the definition of reading and understanding the methods used to teach reading.

McKeown⁹ cites two definitions of reading. The first one by Downing defines "reading as consisting basically of deciphering a code." The second by Schonell defines reading in terms of word recognition as "a combination of the total shape of a word, a group of letters and of individual letters in it." She also says that "words must mean ideas, not be merely mechanical patterns."¹⁰

Johnson and Myklebust¹¹ state that reading is a response to a visual symbol superimposed on auditory language. Thonas has taken that definition and translated it into a sequence of steps that account for taking

⁹ Pamela McKeown, Reading: A Basic Guide for Parents and Teachers, (London: Routledge and Kegan Paul, 1974), p. 15.

¹⁰ Ibid.

¹¹ Doris J. Johnson and Helmer R. Myklebust. Learning Disabilities: Educational Principles and Practices. (New York: Grune and Stratton, 1967).

beginning readers and transforming them into accomplished readers. These steps are as follows: (1) seeing print, (2) translating print into a meaningful sequence of sound, (3) associating recognized print with a meaningful experience, (4) relating the printed symbols to the sounds they represent, and (5) committing the print and its associations to memory. She points out that language majority students face the same dichotomy, i.e., informal language versus formal textbook language but with one fundamental difference--their conceptual development may or may not have occurred in the vernacular! Language minority children learning to read need the time to acquire the vocabulary and the syntactical clues required to extract meaning from the printed text.¹²

Learning to read speech that is graphically represented in a variety of forms i.e., alphabetic, syllabic, logographic, or in other symbolic form requires more than perceptual motor development. Thonis reminds us that it is a cognitive process that must be developed across all four modalities of listening, speaking, reading, and writing.¹³

Tinker and McCullough¹⁴ identified eighty-three

¹² Eleanor Thonis, "Reading Instruction for Language Minority Students," Schooling and Language Minority Students: A Theoretical Framework, (Evaluation, Dissemination and Assessment Center, California State University, Los Angeles, California, 1981), p. 145.

¹³ Ibid.

¹⁴ Miles A. Tinker and Constance M. McCullough, Teaching Elementary Reading (New York: Appleton-Century Crofts, Inc., 2nd ed., 1962), pp. 23-24.

different reading skills in English. Of these, seventeen skills relate to word meaning, twenty to word analysis, thirteen to types of comprehension and interpretative skills, twenty-five to study skills and eight to oral reading. The primary task of the learner, however, who is learning to read English, is to extract meaning from the printed page. But this cannot be accomplished unless the learner experiences a fair amount of success in mastering the above mentioned skills. Smith¹⁵ has suggested that the ability to make inferences from the text is a sign of a fluent speaker of the language. He points out that children who are unable to read more than one word at a time lose detail that is essential to extracting meaning from the text. Furthermore, Becker has delineated three aspects of language that are important to the acquisition of fluent reading skills. Those are the vocabulary, the relationship between language and culture, and the ability to process language out of context.¹⁶ He argues that reading comprehension is dependent on the child's fund of meaningful vocabulary.

¹⁵ Frank Smith, Understanding Reading, (New York, Holt, Rinehart and Winston, 1971), p. 94.

¹⁶ Wesley C. Becker, "Teaching Reading and Language to the Disadvantaged - What We Have Learned from the Field Research." Harvard Educational Review, 47,(1977), 518-544.

Morris¹⁷ and Carroll¹⁸ also argue that a child's fund of meaningful vocabulary and understanding of grammatical functions contributes to reading comprehension. This is supported by the high correlations between vocabulary and reading comprehension.¹⁹

Smith emphasizes that there are two insights that children must acquire prior to learning to read. Those insights are that print must be meaningful and understood to be different from speech. He says that children who have not acquired these insights will suffer from inaccurate inferences and predictions taken from print.²⁰

Enormously complex is the understanding of the differences between spoken and written language and its assimilation out of context. Olson points out that printed text is characterized by its anonymity and depends solely on linguistic clues for its interpretation.²¹ Cummins cites

¹⁷ Joyce Morris, "Barriers to Successful Reading for Second Language Learners at the Secondary Level," The Language Education of Minority Children, Bernard Spolsky, (Ed.), Rowley, Mass.: Newbury House Publishers, 1971) pp. 156-163.

¹⁸ John Bissell Carroll, Learning from Verbal Discourse in Educational Media: A Review of the Literature, Princeton, N.J., Educational Testing Service, 1971.

¹⁹ James Cummins, "Linguistic Interdependence and the Educational Development of Bilingual Children," Review of Educational Research, (Spring, 1979) 237.

²⁰ Smith, Op. cit. pp. 28-45.

²¹ David R. Olson, "Culture, Technology and Intellect," L. B. Resnick (Ed.), The Nature of Intelligence, (Hillsdale, N.J.: Lawrence Erlbaum Associates, 1976).

several investigators²² whose works have emphasized the importance of literacy in the development of language out of context and its relation to conceptual development.

Cummins points out that a child's ability to develop language facility and process it independent of interpersonal cues, such as gestures, intonation, etc., is directly related to the development of fluent reading skills.²³

Olson suggests that parents from home backgrounds where literacy is valued may be better able to promote meaning from print and may accomplish this in two ways, "through their own abstract language and ... through reading printed stories."²⁴ Cummins points out that disadvantaged language minority children without access to reading material are the students least likely to acquire high levels of linguistic competence related to acquisition of fluent reading skills. He hypothesizes that the medium of instruction may be unimportant for pupils with high levels of L₁ competence for children with low levels of language competence and no exposure to literacy in their own language the medium of instruction may be vital to their academic achievement.²⁵

²² Nan Ellasser and Vera P. John Steiner, "An Interactionist Approach to Advancing Literacy," Harvard Educational Review (1977), 47, 355-369; Olson, op. cit., pp. 189-202; Lev Semenovitch, Thought and Language, Edited and translated by Eugenia Haufman and Gertrude Vokar. Cambridge, Mass.: MIT Press 1965.

²³ Cummins, "Linguistic Interdependence..." p. 239.

²⁴ Olson, Op. cit., p. 201.

²⁵ Cummins, "Linguistic Interdependence ..." p. 239.

Reading Methods in English

There is considerable debate about the influence method has on reading achievement. Although this study focuses on the approach to the teaching of reading and not on method per se it is the researcher's opinion that some notion of method be provided the reader.

Thonis²⁶ identified four basic approaches to teaching reading in English: basal reader method, linguistic method, phonic method, and language experience method. A brief description of the basic approaches to reading follows.

The basal reader method is an approach that presents reading material in an organized sequential manner. It employs graded readers, workbooks, and supplementary lessons as prescribed by the authors and publishers of the readers. It is essential that the teacher possess a teacher's guide for each grade level.

The linguistic method according to Bloomfield and Barnhart²⁷ introduces the patterns of language according to a systematic plan that controls for the discrepancies of the language in a precise method. This approach employs sound symbol associations, simple spelling patterns, and short sentences. It emphasizes that print is a representation of

²⁶ Eleanor Wall Thonis, Literacy for America's Spanish Speaking Children, (Newark, Delaware: International Reading Association, 1976), pp. 24-27.

²⁷ Leonard Bloomfield and Clarence L. Barnhart, Let's Read, (Detroit: Wayne State University Press, 1961).

speech. Fries²⁸, a noted authority on the application of linguistics to the teaching of English as a foreign language, considered that reading was a new visual task children had to learn. They have to associate visual responses with previously discriminated auditory responses and to make these visual responses at a high speed, even automatically. Fries stressed the importance of contrastive word patterns because he considered the principle of contrast basic to both linguistic structure and visual perception.

Burmeister²⁹ describes two approaches to reading. One begins with individual letters and sounds in combinations and the other requires the learners to analyze whole words into their phonic elements. The phonics method relies on oral language and auditory skills to perceive and discriminate among the distinctions between spoken and written language. The language experience method according to Ahrendt³⁰ recognizes that a person acquires language experience out of the environment. Spoken language is

²⁸ Charles C. Fries, Linguistics and Reading (New York: Holt, Rinehart and Winston, 1963).

²⁹ Lou E. Burmeister, "Content of a Phonic Program Based on Particularly Useful Generalizations," Reading Methods and Teacher Improvement, (Newark, Delaware: International Reading Association, 1971), Pp. 27-33.

³⁰ Kenneth Ahrendt, The Development and Use of Film in the Language Experience Approach to Reading, Reading Methods and Teacher Improvement, (Newark, Delaware: International Reading Association, 1971), Pp. 98-99.

derived from words strung together that have been derived from an experience that has meaning for the learner. When a person is developmentally mature and psychologically ready, the sentences he or she strings together become the basis for reading.

How well a student extracts information from print largely determines subsequent educational progress. The poor academic achievement on the part of many minority language children is owing to this failure. Cummins³¹ contends that the differential between native speakers of English and minority language children rests with the fact that native speakers of English arrive at school possessing the necessary prerequisites for learning to read in English. In a lengthy publication he sites the research done in the field that is consistent with the hypothesis that there is an interdependence between mastery of the primary language and successful acquisition of literacy of the second language.

Reading Method in Spanish

According to Thonis³² there are six major approaches utilized in Spanish speaking countries to teach reading in Spanish. One such approach, el método onomatopéico, attempts to develop constant auditory associations for letters and sounds based upon the experiential background of

³¹ Cummins, "Linguistic Interdependence ..."
Pp. 222-251.

³² Thonis, Op. cit.

the learner. For example, the vowel sound i is taught in association with the squeal of a mouse. The sound of a train whistle recalls the u sound, etc. Each phonemic element has its individual association. After pupils have mastered the individual associations they proceed to learn to decode and reproduce the sounds orally. The consonants are presented in phrases, e.g., El túnel de Tomás está en el monte. Students are encouraged to analyze word parts and identify syllables in several positions: within words and sentences: initial, final, and medial. Practice is provided in a variety of possibilities: vowels preceded by consonants, consonant clusters and vowel combinations, consonants between vowels, and vowels in combinations.

El método alfabético requires the student to learn the names of the letters of the alphabet then combine the consonants and vowels to create syllables. The syllables are then combined to form words; for example, ma..no - mano; be..be - bebe; mo..no - mono, etc.

El método fonético emphasizes the sounds that the letters of the alphabet represent. It is similar to the método alfabético but ignores the letter names. It is a part whole system which requires synthesizing word elements, sounds, and syllables into whole words.

The whole word approach in Spanish, not to be confused with the whole word approach in English, is known as el método de palabras generadoras. Words are presented as wholes, defined, illustrated in a meaningful context, and then

committed to memory. Pupils are then required to analyze the words by identifying the syllables, the sound elements that make up the syllable and finally the letter sounds. This process requires the learner to understand the relationships between letters and sounds, sounds and syllables, and syllables and words. Once the pupil has learned to go from the whole word to the basic elements of the word process is reversed.

El método global utilizes whole words and sentences. It is based on the theory that students learn to read best by developing their own experience stories that are structured according to a particular theme. The classroom environment is structured to stimulate experiences and enrich the pupils' background. The teacher uses drawing, talking, copying, reading, and writing together so that lessons are personally interesting to each pupil.

Finally, we have el método ecléctico. This method employs a variety of features from several methods in an attempt to provide for each pupil. For the beginner, there are preparatory lessons to promote skills in spatial organization, visual-motor coordination, auditory discrimination, attention, memory, and oral language. Writing is then introduced and pupils are urged to practice the vowel sounds and letter names they represent. The consonants follow. The formation of syllables and their analysis provides additional practice for the pupils.

Although there is adequate evidence in the literature

that bilingual schooling in the southwest was not uncommon, flourishing primarily under the direction of the Catholic church,³³ the issue of utilizing a language other than English for instruction continues to be debated. Historical antecedents strongly suggest that bilingual schooling was being practiced in the Southwest and newspaper accounts of the day chronicle that the topic even then disquieted some of the citizenry. Even then, however, there was evidence of interest in a bilingual policy. In 1888 the New Mexican, a Santa Fe newspaper advocated that English and Spanish be made compulsory.³⁴

In Texas, a state whose antipathy towards the use of Spanish in the public schools is legion acquiesced and permitted instruction in Spanish in the elementary grades along its border counties with Mexico.³⁵ Although there is no recorded history regarding the use of the medium of instruction, i.e., English and Spanish, scholars do agree that it may be assumed that the use of both languages occurred.

Studies specifically concerned with the teaching of

³³ Heinz Kloss, The Bilingual Traditions in America, Newbury House, Massachusetts, September 1972.

³⁴ Jane M. Christian and Chester C. Christian, Jr., "Spanish Language and Culture in the Southwest," by Joshua Fishman, et al., Language Loyalty in the United States, London: Mouton and Company, 1966, p. 297.

³⁵ Arnold H. Leibowitz, Educational Policy and Political Acceptance: The Inception of English as the Language of Instruction in American Schools, Washington, D.C.: Eric Clearinghouse for Linguistics, Center for Applied Linguistics, March, 1971, Pp. 48-49.

reading Spanish to elementary school pupils in the United States are scarce. Carrow³⁶ found that the difficulties in comprehension of Spanish/English bilinguals may be more related to oral reading than to silent reading. In the Culver City Project Cohen³⁷ found that pupils who read well in the first language also read well in the second language. The converse also proved to be true. If the pupil read poorly in the first language, he also read poorly in the second language.

In related studies, MacNamara and Kellaghan³⁸ in Ireland, Smilansky³⁹ in Israel, and Tsushima⁴⁰ in Japan reported lower reading achievement in the second language but each for different reasons. In the Kellaghan and MacNamara study all of the subjects spoke English as their mother tongue and had learned Gaelic as a second language.

³⁶ Carrow, Sister Mary Arthur, "Linguistic Functioning of Bilingual and Monolingual Children," Journal of Speech and Hearing Disorders, XXII, (1957).

³⁷ Cohen, Andrew D., Modern Language Journal, LVIII (March 1974), Pp. 95-103.

³⁸ Thomas Kellaghan and John MacNamara, Reading in a Second Language in Ireland. Reading Instruction: An International Forum World Congress on Reading, of (Paris 1966, Newark, Delaware: International Reading Association, 1966), Pp. 231-253.

³⁹ Ibid.

⁴⁰ William I. Tsushima, and Thomas P. Hogan, "Verbal Ability and School Achievement of Bilingual and Monolingual Children of Different Ages," U.S.O.E. A Process Evaluation of the Bilingual Education Program, Title VII, Elementary and Secondary Education Act, Volume I, (Washington, D.C.: U.S. Government Printing Office, 1973).

It was found that these bilingual 12 and 13 year olds experienced difficulty in solving problems when they were expressed in their second language even though they knew the meaning of all the words and phrases employed in both English and Gaelic. It was discovered that the students read more slowly in the second language which was in part due to the lesser familiarity with the rules which govern the sequential dependencies of meaningful passages in that language. In oral reading tests to check for articulation, the researchers found that it took proportionately more time in the second language than in the first language. In a study of immigrant children in Israel, Smilansky concluded that failure to learn Hebrew at school was due to cultural deprivation. These immigrant children from Eastern or African countries adhere to their vernacular at home and for them Hebrew is a second language. Tsushima, in a study of bilingual children with Japanese mothers and American fathers living on military bases in Japan, reported lower reading achievement of bilinguals as compared to monolinguals as children grew older and progressed through the grades. The reader should take note of the fact that the learners in the latter two studies were not taught in their native language.

Results of a longitudinal study of bilingual students in Santa Fe, New Mexico reported by Leyba revealed that in the majority of comparisons, the bilingual group performed above the comparison group and closely approximated

the national norms for grades five and six.⁴¹ Inspection for trends over time did not, however, reveal clear generalizations. The most promising results were those from the longitudinal bilingual group which indicated they had caught up with the national norm group by grade five and stayed close in grade six. Both the Rock Point and Santa Fe studies are important in suggesting that bilingual instruction may have a cumulative effect. Similar effects were reported for the Navajo by Rosier and Farella.⁴² This study is reviewed in the last section of this chapter.

Troike⁴³ reported on a series of unpublished evaluations of Title VII programs. In a Philadelphia, Pennsylvania project both Anglo and Spanish speaking kindergarten students in the bilingual program exceeded the citywide mean and a control school group on the Philadelphia Readiness Test (a criterion-referenced test). Students in grades K-3 in a French/English bilingual program in Lafayette Parish, Louisiana, performed as well as or

⁴¹ Leyba, Charles F., Longitudinal Study Title VII Bilingual Program Santa Fe Public Schools, Santa Fe, New Mexico, (Los Angeles, California: National Dissemination and Assessment Center California State University, Los Angeles, June 9, 1978).

⁴² Paul Rosier, Marilyn Farella, "Bilingual Education in Rock Point - Some Early Results," *TESOL Quarterly*, X, No. 4 (December, 1976), 379-388.

⁴³ Rudolph C. Troike, Research Evidence for the Effectiveness of Bilingual Education, (Los Angeles, California: National Dissemination and Assessment Center), California State University, Los Angeles, Vol. II, No. 5, (December 1978), Pp. 6-15.

significantly better than a control group of students in the regular program in all areas. Instruments used included the Primary Abilities, the Metropolitan Achievement Test, and a criterion-referenced test for French. In Orleans Parish, Louisiana, Latino children showed a gradual measureable gain in comparison with an Anglo reference group from pre-school through grade three on the Inter American Series.

Fischer and Cabello⁴⁴ report findings from a pilot study, currently underway, that Spanish reading proficiency is the most stable predictor for English reading proficiency. Students were enrolled in a transitional bilingual program.

Skutnabb-Kangas and Toukomaa⁴⁵ found that Finnish students who immigrated to Sweden when they were 10 and 12 years old, and had had five to six years of education in their native language in Finland, were much more likely to approach the norms of Swedish students when both were tested in Swedish. In particular, achievement in math, chemistry, and physics correlated highly with Finnish language skills.

⁴⁴Kathleen B. Fischer and Beverly Cabello, "Predicting Student Success Following Transition From Bilingual Programs." Paper presented at AERA Meeting, Toronto, Los Angeles: Center for the Study of Evaluation, U.C.L.A., 1978.

⁴⁵Tove Skutnabb-Kangas and Pertti Toukomaa, Teaching Migrant Children's Mother Tongue and Learning the Language of the Host Country in the Context of the Socio Cultural Situation of the Migrant Family, (Helsinki: Finnish National Commission for UNESCO, 1976).

Modiano⁴⁶ reporting on a study conducted in the Highlands of Chiapas, Mexico reported that students who first learned to read in the vernacular or mother tongue read with greater comprehension in the second language than those who learned to read in the second language only. The null hypothesis of the study was that reading comprehension is best achieved when all reading instruction is offered in the national language. (This hypothesis is implicit in educational policies throughout the United States.) The results, however, illustrate that Mexican Indian children taught to read in the vernacular and later in Spanish scored significantly higher in Spanish reading after three years than children taught to read only in Spanish.

The Issue of Language Proficiency

This study focused on three groups of students taught under three different approaches to instruction. Placement and exit of limited-English-proficient students in a bilingual program depends on the level of English language proficiency. This practice emanates from the rationale for bilingual education fostered by the U. S. Commission on Civil Rights and presented in the first section of this chapter. This raises the question, "What constitutes proficiency?"

⁴⁶ Nancy Modiano, "National or Mother Language in Beginning Reading: A Comparative Study," Research in the Teaching of English, 2:43, April 1968.

Cummins asserts that the concept of language proficiency needs to be clarified before the cross-lingual dimensions between L_1 and L_2 can be understood. He argues that it is possible to distinguish between "...interpersonal communicative skills such as accent, oral fluency and sociolinguistic competence...and cognitive academic proficiencies"⁴⁷ and that this can be done for both the primary language and the second language.

The issue of language proficiency as espoused by other theoreticians has been discussed in recently published articles. Hernandez-Chavez, Burt and Dulay, Cummins⁴⁸ reports, have proposed a language proficiency model that involves multiple factors along three parameters: 1) the linguistic structures, 2) modality, and 3) sociolinguistic performance. This model represents sixty-four separate proficiencies, each of which is theoretically measurable. Oller claims that there is a global language proficiency factor related to cognitive and academic ability. He asserts that achievement may be measured by requiring the learner to perform tasks related to listening, speaking, reading, and writing. This assertion is supported by investigations showing high correlations between literacy

⁴⁷ James Cummins, "The Role of Primary Language Development..."

⁴⁸ James Cummins, "The Cross-Lingual Dimensions of Language Proficiency: Implications for Bilingual Education and the Optimal Age Issue." TESOL Quarterly, Vol IV, No. 2 (June 1980), p. 176.

and intellectual functioning. Verbal skills, for example, are more indicative of reading achievement than nonverbal ones.⁴⁹

The theory advanced by Canale and Swain⁵⁰ proposes four unique constructs. They include grammatical competence; (e.g., word and sentence formation, meaning, pronunciation, and spelling); sociolinguistic competence (e.g., use of appropriate language in different sociolinguistic contexts), discourse competence, (e.g., making inquiries, presenting arguments, and following prescriptions); and strategic competence, (e.g., verbal and nonverbal communication).

The main problem with the adoption of any of these theories says Cummins is that they do not explain the relationship between L_1 and L_2 . He hypothesizes that cognitive academic language proficiency in language one and two are interdependent and that the development of proficiency in the second language is related to the level of proficiency of the primary language. Furthermore, cognitive academic proficiency in the primary language and second language are manifestations of the same underlying dimension; the degree of success in literacy in language one will predict degree of success in literacy of language two.

⁴⁹ James W. Oller and Keith Perkins. Language in Education: Testing the Tests, (Rowley Mass.: Newbury House) 1978.

⁵⁰ Michael Canale and Merrill Swain, "Theoretical Basis of Communicative Approaches to Second Language Teaching and Testing," *Applied Linguistics* I (1980), Pp. 1-47.

The French-English experiment in Canada⁵¹, where native English speaking students were taught to read in French before being taught to read in English, illustrates the transferability of skills between one language and another. The pupils seized upon the similarities in syntax between French and English and the similar spellings of cognates. Drawing from another context, in which English speaking students were taught in a French immersion program after one year, the students were performing on the 40th percentile and after two years were comparable to the control group. Swain⁵² concluded from this experiment that the concurrent language approach method is less efficient than the primary language approach. There was no evidence in the Quebec Experiment that delaying instruction of English reading retarded its development.

Troike⁵³ reports that there is evidence indicating that older children learn a second language more effectively and more efficiently than younger children. This suggests that delaying the demand to function fully in the all English medium classroom may be more beneficial in the long run.

⁵¹ John G. Barnitz, "Orthographics, bilingualism and learning to read English as a second language," The Reading Teacher, 1982.

⁵² Merrill Swain, "French Immersion: Early, Late, or Partial?" The Canadian Modern Language Review, (Ed.), S.T. Carey, XXXIV (May 1978), 577-585.

⁵³ Rudolph Troike, "Synthesis of Research on Bilingual Education," Educational Leadership Vol. XXXVIII, No. 6, March 1981. Pp. 498-503.

This may be owing to the length of residence in the country, and performance in school. A picture vocabulary test was administered to the students and based on the results, the researchers concluded that age on arrival of 6-7 is critical and has some bearing in terms of progression. The data indicate that older pupils make rapid progress toward grade norms. Cummins⁵⁴ concluded that this is probably owing to their maturity and is consistent with other studies that show that L₂ learners whose L₁ cognitive and academic language proficiency is already well developed progress more rapidly.

On the issue of introduction of English language instruction Gamez⁵⁵ points to several factors that need to be considered before concluding that the student can be successfully transferred to reading in the second language. Those factors include 1) size of vocabulary in the second language, 2) attitude toward the second language, 3) instructional materials, 4) student mobility, and 5) support of home and school.

Oral fluency is popularly recognized as verification of readiness for introduction to reading therefore it is assumed that a measure of fluency indicates readiness to read that language. Perhaps it is all too commonly used as

⁵⁴ James Cummins, "The Role of Primary Language Development..." p. 29.

⁵⁵ Gamez. Op. cit., p. 25.

the only indicator. Teachers should, however, consider the vital bond between speech and print, language, and thinking before concluding that a level of oral fluency determines the timing of introduction to English reading. A specific answer to the question, therefore, cannot be provided without considering maturation, language, age, and other variables.

Thonis points out that "...if students cannot speak a language and use its vocabulary, syntax, and functional grammar at the approximate level of a six and one-half year old child, learning to read that language will be difficult."⁵⁶ By implication, that means across all four modalities including listening, speaking, reading, and writing. If we accept this premise then it follows that language minority children cannot be expected to decode words in their second language until they have reached the level of interpersonal communicative skills on a par with a six and one-half year old native speaker of English. However, care should be taken to ensure that sufficient language facility has been developed by the limited English speaker that provides for problem solving and reasoning required for academic achievement. Cummins⁵⁷ has gone to great lengths to explain the relationship between basic

⁵⁶ Eleanor Thonis, "Reading Instruction for Language Minority Students," P. 145.

⁵⁷ James Cummins, "Linguistic Interdependence..." P. 241-246.

interpersonal communicative skills and cognitive academic language proficiency. It is important that the distinction is understood lest the verbal facade be the sole determinant regarding the decision to introduce reading in English.

It is often assumed that a pupil has achieved proficiency when the student has acquired relatively high levels of interpersonal communicative skills. The research evidence indicates that it takes from five to six years to achieve grade norms in English academic skills.

Troike⁵⁸ cited several examples in his article.

A French bilingual program in St. John Valley, Maine, where students, taught bilingually after five years in the program, outperformed students in English-medium schools in English and math.

In Santa Fe, New Mexico, fifth and sixth grade bilingual Spanish students scored at near the national norm in English and exceeded it in math as measured by the Metropolitan Achievement Test.

After three or more years in a bilingual program, students in Pasco, Washington moved from the 10th to the 50th percentile in English reading and from the 14th to the 70th percentile in math. The amount of gain increased with time in the program.

In Rock Point⁵⁹, Arizona, Navajo students enrolled in a bilingual program were compared with Navajo students in as ESL program. Grade five reading scores for the ESL students were 1.6 years below grade level.

The significant outcome of the research literature

⁵⁸ Rudolph Troike. "Synthesis of Research on Bilingual Education," Pp. 498-503.

⁵⁹ Paul Rosier and Marilyn Farella. "Bilingual Education in Rock Point," Pp. 379-388.

points to the importance of determining long term effects and cautions against evaluating too early lest erroneous conclusions be reached resulting in premature exit from the bilingual program.

After only three years in the program students in grades four and five were only .6 and .5 years below national norms compared to 1.3 and 1.6 years below when they entered the program. Navajo students without bilingual programs enrolled in Bureau of Indian Affairs schools scored 1.6 years below the Rock Point students. The data indicate that students benefit from the long term effects of the program and serves to point up the importance of assessment of the pupils' cognitive academic language proficiency.

The issue of classroom management is related to assessment. In a monograph published in 1979, Cohen⁶⁰ discussed the kinds of placement errors that occur when insufficient data needed for proper placement is not available. He discussed type-A and type-B selection errors. In discussing type-A errors, Cohen points out that students with weak primary language skills and stronger second language skills may inadvertently be scheduled for instruction in the primary language in a content area.⁶¹ In other

⁶⁰ Bernard Cohen, Issues Related to Transferring Reading Skills from Spanish to English. National Dissemination and Assessment Center, California State University, Los Angeles. Los Angeles, California. Vol. III, No. 9, (April 1980) Pp. 3-5.

⁶¹ Ibid.

words, inability to read the native language presents other instructional problems. The decision to remediate or not remediate the primary language largely depends on other age and maturity as well as other sociolinguual factors.

Errors that result in actual exclusion from the program stem from low performance in both languages, i.e., the primary and second language. Too often it is assumed that it is the second language that should be remediated. This situation calls for remediation of the primary language as a form of basic instruction.

Another type of error occurs when limited-English proficient students are transferred to the all English medium curriculum too soon. This again points up the fact that all too frequently language proficiency is assumed when students are able to demonstrate relative fluency and appropriate surface communicative skills. In point of fact, students would be better served if assurance that cognitive academic language proficiency had been achieved before transference to the second language were made.

Duration of enroute assistance of the primary language depends on acquisition of cognitive academic language proficiency. To arrive at a definite answer Cohen says, "...we must measure cognition in both languages, offerint instruction in (the primary language) until the child's cognitive abilities are strong enough in English to process newly presented academic information in English."⁶² In other

⁶² Cohen, Op. cit.

words, it is essential to assess the level of cognitive skill development of language one (L_1) in order to determine level of placement in language two (L_2).

Summary

The review of the literature illustrates that reading in English requires the learner to master eighty-three different cognitive skills that are related to word meaning, word analysis, comprehension, interpretation, study, and oral recitation. The importance of these tasks is better understood when weighed in the context of teaching English reading to language minority students.

Three instructional approaches utilized in bilingual programs were reviewed. These three approaches included 1) instruction in L_2 with minimal use of L_1 , 2) instruction in L_1 with a second language component, and 3) instruction in L_1 and L_2 .

Instructional methods of teaching reading were also reviewed. Most teachers utilize one or more of four basic methods in the teaching of English reading. Those methods are: the basal reader method, the linguistic method, the phonetic method, and the language experience method. The basal reader method is perhaps the method most familiar to teachers generally.

A review of the literature also identified six approaches to teaching Spanish reading. These methods included el método onomatopéico, el método alfabético, el

método fonético, el método global, and el método ecléctico.

The methods compare to their English counterparts with little variation.

The literature regarding the teaching of reading Spanish to elementary children in the United States is sparse, however the research on the teaching of reading a second language to elementary pupils in other countries was cited. The most significant works cited were the research by Skutnubb, Kangas and Toukomaa who found that Finnish immigrants scored higher on a comprehension test in Swedish when they were instructed in the native language instead of Swedish, and higher still if they had attended school in Finland for 3-4 years before immigration, and the Modiano study similarly discovered that Mexican Indian children did significantly better when taught to read first in their own vernacular and later in Spanish. The possibility of generalizing those results to bilingual programs in the United States are promising.

The issue of language proficiency and its function in the development of academic and cognitive skills of bilingual children was discussed. In this regard the research regarding the dichotomy between basic interpersonal communicative skills and cognitive academic language proficiency was cited. Other factors that affect proficiency, such as age and length of time in a bilingual program, were also discussed.

CHAPTER THREE

Methods and Procedures

As previously noted, the purpose of this study was to investigate the most effective method for teaching bilingual Spanish/English children to read English. The study sought to provide insights into the methods advocated in bilingual programs, and make some practical suggestions based on the results of the study. This chapter delineates the methods and procedures utilized in the investigation.

The following sections concern the design and procedure of the study. Each section is presented under the following headings:

- 1). The Research Hypothesis .
- 2) The Setting and Sample Description
- 3) The Instrumentation
- 4) The Data Collection
- 5) The Treatment of the Data

Research Hypothesis

The focus of the research was to assess progress in reading of third and fifth grade bilingual Spanish/English students who have received instruction under three different modes of teaching bilingual pupils.

This study posed two basic hypotheses. They are as follows:

Hypothesis 1

There is no statistically significant difference in achievement of reading among bilingual (Spanish/English) third grade pupils as related to the method of instruction.

Hypotheses 2

There is no statistically significant difference in achievement of reading among bilingual (Spanish/English) fifth grade pupils as related to the method of instruction.

The Setting of the Study

The Title VII Bilingual Program Spanish/English of the Oakland Unified School District provided the setting for this study. The program--housed in four elementary schools with high concentrations of Hispanic students (thirty to eighty percent of total enrollment)--had been operational for over seven years, which was a key factor in the selection of the setting. Although the Hispanic student population accounts for approximately twelve percent of the total student enrollment, the majority tend to be enrolled in less than ten schools. There are 90 schools in the district not including other separate units such as preschools, day care centers and special education centers.

The schools selected also have sufficient numbers of Hispanic students that are not assigned to the designated Title VII bilingual classrooms. This was an important

factor in the design of the study and drawing of the sample.

The Sample

The sample was drawn from Title VII bilingual project schools in the Oakland Unified School District. Steps to identify subjects to be included in the study were as follows:

- 1) Students were administered the Bilingual Syntax Measure¹ to determine bilingualism.
- 2) Student placement was determined, as to whether student was placed in a Title VII bilingual classroom or in an all English medium classroom.
- 3) Teachers of designated Title VII classrooms were asked to fill out a questionnaire regarding mode of instruction.
- 4) Teachers of designated Title VII classrooms were observed to confirm results of questionnaire. A classroom observation instrument was utilized to record the frequency and use of the primary language versus use of English.

Instrumentation

Two instruments were designed by the researcher to gather information about the classroom and the teachers: the Teacher Questionnaire² regarding mode of instruction,

¹ Marina K. Burt, Dulay, Heidi C., Hernandez-Chavez, Eduardo, Bilingual Syntax Measure. Harcourt Brace Jovanovich, Inc., New York.

and the Classroom Behavior Observation Instrument.³ Two instruments were used to gather data on the students, the Bilingual Syntax Measure,⁴ and the California Test of Basic Skills.⁵

Teacher Questionnaire

The teacher was asked to rate his or her approach to instruction of bilingual students vis a vis three modes of teaching: 1) the primary language approach, 2) the concurrent approach (use of both languages interchangeably), and 3) the direct, or English as a second language approach. These results were compared to actual observed performance in the classroom. As students were assessed for oral language proficiency in both the primary language and English to determine bilingualism, they were also being identified as to placement, i.e., Title VII Bilingual classroom, or English medium classroom.

Classroom Behavior Observation Instrument

Observation of classroom teaching was undertaken and conducted of bilingual classrooms to obtain verification of language use. Observations were recorded on a Classroom

² See Appendix A for a copy of the questionnaire.

³ See Appendix B for a copy of the instrument.

⁴ Burt. Op. cit. See Appendix C for a description of test.

⁵ California Test of Basic Skills, Form S, Levels C2, CTB/McGraw Hill, Del Monte Research Park, Monterey, California, 1973. See Appendix D for a description of test administered.

Behavior Observation Instrument designed to obtain a record of the frequency of language actually used. These observations were undertaken to determine if the three modes, 1) the primary language approach, 2) the concurrent approach, or 3) the direct approach, of instruction were being commonly used throughout the project schools. A copy of the instrument is included in Appendix B.

Bilingual Syntax Measure

The results of the Bilingual Syntax Measure II, administered in both Spanish and English, were the basis for selection of students. The test is an oral language proficiency test (one of the tests approved by the State Department of Education), and students had to score at level six on both the Spanish and English versions to be classified as bilingual. The test results may be used as an indicator of language dominance with respect to basic syntactic structures; i.e., proficiency in English and Spanish can be compared to indicate whether the child is equally proficient in both languages with respect to the basic syntactic structures measured.

California Test of Basic Skills

The Oakland Unified School District administers the California Test of Basic Schools to assess achievement. Therefore, the results of that test were the data used in the study to determine reading achievement in English.

The CTBS test was administered in the Oakland Unified School District in May, 1978 as part of the annual district

scholastic achievement testing program. There are seven levels of the test, each level corresponding to the grade levels K.0 to 1.3, K.6 to 1.9, 2.5 to 4.9, 4.5 to 6.9, 6.5 to 8.9, and 8.5 to 12.9. Level 1 and Level 2 were the tests taken by the subjects in this study. The CTBS Form S was standardized on a national sample of students from kindergarten through Grade 12, randomly selected from every state. The sample included public and private school students proportionate in number to actual enrollments.

Data Collection

The data for this study were collected by first determining which classrooms and which students to include in the study and then studying the standardized test results and subjecting them to statistical treatment. The process is described in the following paragraphs.

Identification of Teachers

Two instruments were used to assist in the identification of teachers who were implementing the strategies being studied. Those instruments were described in the previous section. Upon completing the questionnaires classroom observations were undertaken of all bilingual classrooms for two purposes, 1) to verify instructional practice, and 2) to tract students' prior school experience.

Classroom observations of teachers were conducted by independent observers to avoid bias on the part of the researcher. Questionnaires returned were then matched with

classroom observations indicating implementation of primary, concurrent, or direct approach. These results formed the basis for the selection of student data to be studied.

Identification of Students

Pupils were identified on the basis of oral language proficiency in both English and Spanish. Students who scored at a level 6 on the oral language proficiency tests were included in the study.

A search of student's prior school experience was then conducted to ascertain if students had indeed been taught under the primary, concurrent, or direct approaches. And, finally, it was determined that the students had taken the CTBS test the year before.

Student Achievement Data

CTBS test results of students with matching pre and post test scores were the data collected for statistical treatment. Only scores of bilingual pupils on the basis of the BSM II were included.

Total reading test results were collected for study. The total reading score includes measurement of vocabulary and comprehension.

Treatment of the Data

The pre- and post-test raw scores were subjected to statistical treatment to determine the level of achievement of reading in English of the bilingual Spanish/English third and fifth grade students. The analytic procedure adopted

was to compare pre- and post-test scores by both parametric and nonparametric procedures.

The researcher opted for this approach because the sample sizes were small, and there was no assurance that scores were normal or that there was homogeneity of variance, both of which depend on large sample sizes. The parametric test applied was a t-test comparing the mean of the pre-test with the mean of the post-test. The Wilcoxin matched pairs signed ranks test was the nonparametric test applied.

Two dependent variables were used in the study: Pre- and post-test scores of reading achievement from the Comprehensive Test of Basic Skills and the approach to instruction, i.e., 1) Primary language approach; 2) Concurrent language approach; and 3) Direct language approach.

Summary

Chapter Three presented and outlined the methods and procedure utilized in the research. The sections included in the chapter described the setting of the study, the sampling procedure, the measurements taken to determine the sampling, the data gathered on the participants, the research hypotheses, related issues, and the statistical procedures.

This chapter also included a description of two processes utilized by the researcher to confirm method of

classroom instruction. The instruments included a self rating questionnaire and a frequency of language use classroom observation instrument, both of which are included in Appendices A and B, respectively.

CHAPTER FOUR

Findings and Analysis of Data

The purpose of this study was to investigate three instructional approaches to teaching Spanish/English bilingual pupils to read in English. The achievement data from standardized tests was analyzed to determine under which instructional approach the pupils achieved best. The significance level selected for the study was $\alpha = .05$.

The study posed two basic hypotheses:

There is no significant difference in the English reading achievement of bilingual Spanish/English third grade pupils as related to the method of instruction.

There is no significant difference in the English reading achievement of bilingual Spanish/English fifth grade pupils as related to the method of instruction.

The hypotheses were tested through an investigation of three methods of instruction:

- a. learning to read first in the primary language, then transferring those skills to English reading;
- b. utilization of the primary language for instruction as enroute process for learning to read in English; and
- c. learning to read in English while simultaneously acquiring oral fluency in English.

The data were gathered by means of standardized test scores on tests administered to the fifty one third grade pupils and the thirty five fifth graders included in the study. A total of six different groups were studied.

Other data that were gathered included information on teacher's self perception vis a vis the three modes of instruction, i.e., the primary language approach, the concurrent approach, and the direct approach. The purpose of gathering these data was to provide the researcher with a basis for initial identification of groups of pupils taught through the three respective methods. Some classroom observations were conducted in order to confirm that the pupils did in fact receive instruction under the three different modes of instruction. This was part of the classroom and student selection process.

The Analytic Procedure

The analytic procedure adopted was to compare pre- and post-test scores by both parametric and nonparametric procedures. The researcher opted for this approach because the sample sizes were small, and there was no assurance that scores were normal or that there was homogeneity of variance, both of which depend on large sample sizes. The parametric test applied was a t-test comparing the mean of the pre-test with the mean of the post-test to determine if there was any significant difference. The Wilcoxin Matched Pairs Signed Ranks test was the nonparametric test applied. This procedure calculates all of the differences between

pre- and post-tests for each group to determine the number of positive and negative differences. These scores are then rank ordered from low to high. The ranks are then compared.

Results For The Third Grade

The results are reported separately for each unique group utilizing a different method of teaching. The reader should keep in mind that scores are relational, i.e., not compared to any pre-specified norm. For the third grade group the results of the t-test, the parametric procedure, are reported in Table 1. Scores for the same groups on the Wilcoxin Matched Pairs Signed Ranks test, the nonparametric procedure are included in Table 2.

In both procedures the results of the pre-test are compared with the results of the post-test in order to determine the differences. A description of the test data follows the presentation in the tables.

TABLE 1
T-Test Values for Third Graders

		MEANS			
GROUPS	Number of Cases	Pre	Post	(Difference)	T-Values
Primary	20	28.2500	29.7000	1.4500	0.69
Concurrent	20	35.1000	32.7000	-2.4000	0.96
Direct	11	37.7273	36.0909	-1.6364	0.32

Results of Parametric Test

For the Primary approach group the mean of the pre-test was 28.25 and the mean of the post-test was 29.70. The difference between pre- and post-test mean scores is 1.45.

For the Concurrent approach group the mean of the pre-test was 35.10 and the mean of the post-test was 32.70. The difference between pre- and post-test mean scores is -2.40.

For the Direct approach group the mean of the pre-test was 37.7273 and the mean of the post-test was 36.0909. The difference between pre- and post-test mean scores is -1.6364.

By the parametric test there is no statistically significant difference between pre- and post-test scores at the .05 level for any of the three third grade groups.

TABLE 2

Wilcoxin Matched Pairs Signed Ranks
Test Results For Third Graders

GROUPS	Number of Cases	Tie	Losses		Gains		Z Scores	2- Tailed Prob.
			N	-Ranks Mean	N	+Ranks Mean		
Primary	20	0	9	9.89	11	11.00	-0.597	0.550
Concurrent	20	0	12	11.13	8	9.56	-0.064	0.287
Direct	11	0	6	5.33	5	6.80	-0.089	0.929

Results of Nonparametric Tests

For the Primary approach group there were 9 students whose scores diminished between the pre- and the post-test

for a mean test score of 9.89 and there were eleven students who gained for a mean test score of 11.00.

For the Concurrent approach group there were 12 students whose scores diminished between the pre- and the post-test for a mean test score of 11.13. Eight students gained for a mean score of 9.56.

For the Direct approach group there were 6 students whose scores diminished between the pre- and post-test for a mean test score of 5.33. Five students gained for a mean score of 6.80.

By the Wilcoxin Matched Pairs Signed Ranks test, the non-parametric procedure, the pre- and post-test results were not statistically significant for any of the three groups.

Other Test Results

As a preliminary measure to the ANCOVA a test was conducted to determine if the groups differed on the pre-test. Also, it was useful to see how they compared on the unadjusted post-test scores. The data are presented for both pre- and post-tests in Tables 3 and 4, respectively.

The mean test score for the Primary language approach group at the time of the pre-test was 28.25. At the time of the post-test, the mean score was 29.70. For the Concurrent approach group, the pre-test mean score was 36.7143 and by the time of the post-test the mean score was 32.70. This result was significant at the .05 level. For the Direct approach group the mean test score at the time of the

TABLE 3
ANALYSIS OF VARIANCE
THIRD GRADE

VARIABLE PRETEST

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	2	963.2368	481.6184	2.218	0.1196
WITHIN GROUPS	49	10640.1987	217.1469		
TOTAL	51	11603.4336			

GROUP	COUNT	MEAN	STANDARD DEVIATION	STANDARD ERROR	MINIMUM	MAXIMUM	95 PCT CONF INT FOR MEAN
PRIMARY	20	28.2500	10.9730	2.4536	16.0000	56.0000	23.1145 TO 33.3855
CONCURRENT	21	36.7143	15.4342	3.3680	14.0000	69.0000	29.6887 TO 43.7398
DIRECT	11	37.7273	18.9425	5.7114	14.0000	67.0000	25.0015 TO 50.4530
TOTAL	52	33.6731	15.0837	2.0917	14.0000	69.0000	29.4737 TO 37.8724

TABLE 4
ANALYSIS OF VARIANCE
THIRD GRADE

VARIABLE POSTTEST

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	2	296.3748	148.1874	0.682	0.5106
WITHIN GROUPS	48	10433.3022	217.3605		
TOTAL	50	10729.6758			

GROUP	COUNT	MEAN	STANDARD DEVIATION	STANDARD ERROR	MINIMUM	MAXIMUM	95 PCT CONF	INT FOR MEAN
PRIMARY	20	29.7000	9.4707	2.1177	13.0000	46.0000	25.2676 T0	34.1324
CONCURRENT	20	32.7000	14.4262	3.2258	10.0000	60.0000	25.9483 T0	39.4517
DIRECT	11	36.0909	21.8515	6.5885	0.0	75.0000	21.4108 T0	50.7709
TOTAL	51	32.2549	14.6490	2.0513	0.0	75.0000	28.1348 T0	36.3750

pre-test was 37.7273 and at the time of the post-test the mean score was 36.09.

A regression analysis was conducted for both third and fifth grades (separately) in which the variables entered into the regression equation were: first, the pre-test scores; second, the Group Designation (a trivariate); and third, the post-test scores. In this way the variance contributed by the group effect was distinguished from the variance of differences in the post-test scores. Calculations were then done to compute the F value associated with the group effect.¹

For the third grade, there were 2/48 degrees of freedom associated with this test; and the F value was .13256, which was not significant.

Results For The Fifth Grade

The data for the fifth grade are shown in Table 5 which contains the t-test data and Table 6 which contains the Wilcoxin matched pairs signed-ranks test data. Again, the reader is cautioned to keep in mind that the scores are relational, and not compared to any pre-specified norm.

¹Test used to calculate F value. See Appendix E.

TABLE 5
T-Test Values for Fifth Graders

GROUPS	Number of Cases	MEANS			T-Values	2-Tailed Prob.
		Pre	Post	(Difference)		
Primary	12	52.0833	53.1667	1.833	0.31	0.765
Concurrent	15	41.8000	33.2000	8.6000	2.25	(0.041)
Direct	8	42.6250	36.6250	6.0000	1.88	(0.102)

TABLE 6
Wilcoxin Matched Pairs Signed Ranks Test Results For Fifth Graders

GROUPS	Number of Cases	Ties	Losses		Gains		Z Scores	2-Tailed Prob.
			N	- Ranks Mean	N	+ Ranks Mean		
Primary	12	0	5	7.30	7	5.93	-0.196	0.845
Concurrent	15	1	10	8.25	4	5.63	-1.883	0.060
Direct	8	0	6	5.00	2	3.00	-1.680	0.093

Results Of The Nonparametric Test

For the Primary approach group there were 5 students whose scores diminished between pre- and post-tests for a mean score of 7.30 and 7 who gained for a mean score of 5.93.

For the Concurrent approach group there were 10 students whose scores diminished between pre- and post-tests for a mean score of 8.25. Four students gained for a mean score of 5.63.

For the direct approach group there were 6 students whose scores diminished between pre- and post-tests for a mean score of 5.00. Two students gained for a mean score of 3.00.

By both the parametric and nonparametric tests the Primary approach group scored higher than either the Concurrent and Direct approach at the time of the pre-test. The Primary approach group also scored higher on the post-test.

For the fifth grade group taught under the Concurrent approach method there was a statistically significant decrease between pre- and post-test scores at the .05 level as measured by both parametric and nonparametric procedures.

For the group taught under the direct approach method there was also a statistically significant decrease between pre- and post-test scores, (.10) as measured by the parametric test and (.09) as measured by the Wilcoxin matched pairs signed rank's test.

Other Test Results

As a preliminary measure to the ANCOVA, tests were run to determine whether the groups differed on the pre-test. It was assumed that data would be useful when comparing the unadjusted post test scores. The data for both pre- and post-test is presented in Tables 7 and 8 respectively.

The results of the pretest for all three fifth grade groups indicate that the group taught under the primary language approach started out higher with a mean of 53.6154

than the other two groups taught under the bilingual approach and the direct method with means of 41.80 and 42.625 respectively. The differences were not significant at the .05 level.

The results of the post-test indicate that the mean test score for the primary approach (53.1667) remained significantly higher while the concurrent approach group (33.20) and for the Direct approach group (36.6250) dropped substantially. The test results show that under the Primary language approach the students outperformed the other two groups.

A regression analysis was also conducted on the fifth grade scores in which the variables entered into the equation included 1) the pre-test scores, 2) the Group designation (a trivariate) and, 3) the post-test scores. The variance contributed by the group effect was partialled out from the variance of differences in the pre-test scores. Calculations² were done to compute the F value associated with the group effect.

For the fifth grade, there were 2/36 degrees of freedom. The F value was 3.745, which was significant at the .05 level. Required F was 3.29.

²Test used to calculate F value.
See Appendix E.

TABLE 7
ANALYSIS OF VARIANCE
FIFTH GRADE

VARIABLE PRETEST

SOURCE		D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F	PROB.
BETWEEN GROUPS		2	1107.3814	553.6907	1.952	0.	1580
WITHIN GROUPS		33	9359.3496	283.6165			
TOTAL		35	10466.7305				

GROUP	COUNT	MEAN	STANDARD DEVIATION	STANDARD ERROR	MINIMUM	MAXIMUM	95 PCT CONF INT	FOR MEAN
PRIMARY	13	53.6154	16.8154	4.6637	18.0000	77.0000	43.4540 T0	63.7768
CONCURRENT	15	41.8000	15.6807	4.0487	25.0000	75.0000	33.1163 T0	50.4837
DIRECT	8	42.6250	18.9882	6.7134	18.0000	68.0000	26.7505 T0	58.4995
TOTAL	36	46.2500	17.2930	2.8822	18.0000	77.0000	40.3989 T0	52.1011

TABLE 8
ANALYSIS OF VARIANCE
FIFTH GRADE

VARIABLE POSTTEST

SOURCE		D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS		2	2841.0274	1420.5137	5.121	0.0188*
WITHIN GROUPS		32	8875.9307	277.3728		
TOTAL		34	11716.9570			

GROUP	COUNT	MEAN	STANDARD DEVIATION	STANDARD ERROR	MINIMUM	MAXIMUM	95 PCT CONF INT	FOR MEAN
PRIMARY	12	53.1667	14.9169	4.3061	30.0000	78.0000	43.6889 TO	62.6444
CONCURRENT	15	33.2000	18.7395	4.8385	0.0	75.0000	22.8224 TO	43.5776
DIRECT	8	36.6250	14.6963	5.1959	19.0000	60.0000	24.3386 TO	48.9114
TOTAL	35	40.8286	18.5638	3.1379	0.0	78.0000	34.4517 TO	47.2055

Summary

The results of the study were obtained by conducting parametric and nonparametric tests. As a preliminary measure to the ANCOVA, a test was conducted to determine if the groups differed on the pre-test. The results for the third and fifth grades by the parametric and nonparametric tests are summarized in the following paragraphs.

The results for the third grade group by both the parametric and nonparametric test would indicate that the group taught under the direct approach was doing best at this level. However, the data is inconclusive. Students taught by the primary language approach method showed a slight gain of 1.45 between pre- and post-test by the parametric test. Pupils taught under the Concurrent and Direct method showed slight losses between pre- and post-tests: 2.40 and 1.6264, respectively. The results of the nonparametric tests indicated that fewer students taught under the Primary language approach method lost between pre- and post-test (9 losses, 11 gains), then for students taught under the Concurrent approach (12 losses, 8 gains), on the Direct approach (6 losses, 5 gains). Note that the students taught under the Concurrent approach experienced the greatest number of losses. Although the third grade data by these two tests indicated that the group taught under the Direct method was doing best, no conclusive statement could be drawn at this stage for any of the three approaches regarding the instruction of bilingual pupils.

The results for the fifth grade pupils by both the parametric and the nonparametric test indicate that the Primary language approach group outperformed the Concurrent and Direct approach groups. The parametric test results for the Primary approach group show pre- and post-test mean scores of 52.08 and 53.1667 for a gain of 1.83. The Concurrent approach group results were 41.80 on the pre-test and 32.20 on the post for a net loss of 8.6. For the Direct approach group the results show 42.6250 on the pre-test and 36.6250 on the post for a net loss of 6.0. The results of the nonparametric tests indicate that in the Primary language approach group there were 5 students who lost and 7 who gained; in the Concurrent approach group there were 10 who lost and 4 who gained; and in the Direct approach group there were 6 who lost and 2 who gained. By both the parametric and nonparametric tests it may be concluded that at the fifth grade level the Primary language approach group was outperforming the groups taught under the concurrent and Direct methods.

CHAPTER FIVE

Summary and Recommendations

This chapter provides a background summary of the study, summary of the results, and draws conclusions based on the results regarding the hypotheses posed. The results include a discussion of the related questions that evolved as a natural outcome of the study. Recommendations for future study are based on the conclusions.

Background of the Study

It was noted in Chapter 1 that the large scale evaluation research conducted by the American Institutes of Research in 1975-76, depicted a rather bleak picture of the results of bilingual education generally. The general design of the Impact Study was one of contrasting the performance of students enrolled in Title VII Spanish/English bilingual projects and students not enrolled in such projects. The Title VII group of students consisted of an estimated 5300 students in 38 projects. The non-Title VII group of students consisted of approximately 2400 students in 50 schools.

The Impact Study conducted by the American Institutes for Research has been the subject of much controversy. The final evaluation report concluded that Title VII projects were ineffective. However, the report is not without its detractors.

The conclusions drawn by the AIR researchers have been challenged on the grounds of the weakness of the study design and that the controls related to student characteristics and program variation were insufficient. It has also been pointed out that generalizations to California's¹ bilingual program cannot be made from the AIR report for lack of an operational definition of bilingual education that coincides with California law. The criticisms challenging the study design, and therefore its findings, are summarized below.²

- 1) The method used to identify limited-English-speaking pupils is unreliable.
- 2) Group comparability of students in Title VII and non-Title VII programs is lacking.
- 3) Variations, such as program implementation, instructional time, and curriculum, were not controlled.
- 4) Test administration and data analysis was faulty.
- 5) The time between pre and posttest was limited.
- 6) Alternative data analysis was not considered.

¹ Robert A. Cervantes, "An Exemplary Consafic Chingatropic Assessment: The AIR Report", Bilingual Education Paper Series, Los Angeles, National Dissemination and Assessment Center, March, 1979, Volume II, No. 8, P. 13.

² J. Michael O'Malley, "Review Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program", Bilingual Resources, Los Angeles, National Dissemination and Assessment Center, Winger 1978, Volume I, No. 2, Pp. 6-10.

In contrast to the large scaled study conducted by the American Institutes for Research, this study limited its scope: to analyze the student achievement data of third and fifth grade bilingual Spanish/English pupils who were taught under three methods of instruction. The data for each group were analyzed separately.

This study investigated three modes of instruction for the purpose of determining which approach to teaching reading would benefit bilingual pupils most. The three modes of instruction included learning to read in Spanish before learning to read in English, learning to read in English and utilizing Spanish only as en route support, and finally, learning to read in English with no apparent recourse to Spanish. These three approaches to instruction were dubbed Primary Language Approach, Concurrent Language Approach, and Direct Language Approach, respectively.

The study focused on third grade and fifth grade pupils enrolled in the Oakland Unified School District. The researcher conducted an empirical search for classes that were using the three different methods of instruction. The search included teachers' perceptions of themselves and what they philosophically believe that were gathered from a questionnaire distributed to teacher participants. Classroom observations were also conducted to ensure a match between the method the teacher perceived was being implemented and what, in fact, is practiced.

This study posed two basic hypotheses. They are as follows:

1. There is a significant difference in the achievement of English among bilingual (Spanish/English) third grade pupils as it is related to the method of instruction.
2. There is a significant difference in the achievement of reading English among bilingual (Spanish/English) fifth grade pupils as it is related to the method of instruction.

Summary of the Results

The results of the study were obtained by conducting parametric and nonparametric tests. As a preliminary measure to the Analysis of Covariance (ANCOVA), a test was conducted to determine if the groups differed on the pre-test. The results for the third and fifth grades by the parametric and nonparametric tests are summarized in the following paragraphs.

Results for the Third Grade

The results for the third grade group by the parametric test would indicate that the group taught under the Direct approach were doing best at this level. However, the data are inconclusive. Students taught by the Primary language approach method showed a slight gain of 1.45 between pre and post tests. Pupils taught under the Concurrent and Direct method showed slight losses between pre and post tests, 2.40 and 1.6264, respectively.

The results of the non-parametric tests indicated that for students taught under the Primary language approach method there were 9 students whose scores declined and 11 students whose scores improved between pre and post tests; for students taught under the Concurrent approach there were 12 students whose scores declined and 8 students whose scores improved between pre and post tests; and for the Direct approach group 6 students whose scores declined, and 5 students whose scores improved between pre and post tests. It should be noted that the students taught under the Concurrent approach experienced the greatest number of losses. Although the third grade data by these two tests indicated that the group taught under the Direct method was doing best, no conclusive statement could be drawn at this stage because the results were not significant for any of the three groups.

Results for the Fifth Grade

The results for the fifth grade pupils by both the parametric and the nonparametric tests indicate that the Primary language approach group out-performed the Concurrent and Direct approach groups. The parametric test results for the Primary approach group show a pre test mean score of 52.08 and a post test mean score of 53.1667 for a gain of 1.83. The Concurrent approach group results were 41.80 on the pre test and 32.20 on the post test for a net loss of 8.6. For the Direct approach group the results show 42.6250 on the pre test and 36.6250 on the post test for a net loss of 6.0.

The results of the nonparametric tests indicate that between the pre and post tests for the Primary language approach group there were 5 students whose scores declined and 7 students whose scores improved; in the Concurrent approach group there were 10 students whose scores declined and 4 students whose scores improved; and in the Direct approach group there were 6 students whose scores declined and 2 students whose scores improved. By both the parametric and nonparametric tests it may be concluded that at the fifth grade level the Primary language approach group was outperforming the groups taught under the Concurrent and Direct methods.

Hypothesis One

Hypothesis one stated that there is significant difference in achievement of reading English among bilingual (Spanish/English) third grade pupils as it is related to the method of instruction. The test results were reported for three groups of third grade students taught under three different methods: the Primary Language Approach, the Concurrent Language Approach, and the Direct Language Approach. The data were treated and analyzed by a parametric test (t-test) and a nonparametric (Wilcoxin) matched pairs signed ranks test. The results as analyzed by both procedures showed no statistically significant difference for any of the three groups. Although the Direct language group was outperforming the Primary language and Concurrent approach groups the results were not statistically significant. On the basis of

the analysis of the data, hypothesis one is rejected.

Hypothesis Two

Hypothesis two stated that there is significant difference in achievement of reading English among bilingual (Spanish/ English) fifth grade pupils as it is related to the method of instruction. The parametric test results (refer to Page 64, Table 5) with reference to this hypothesis indicate that at fifth grade the group taught under the Primary language approach started out ahead of both the Concurrent and Direct language approaches (52.08, 41.80, and 42.6250) respectively. By the time the post test was administered the Primary language group continued to outperform the Concurrent and Direct Language approach groups. (53.17, 33.20, 36.63) respectively. These test results showed a statistically significant decrease (.041) between pre and post for the Concurrent approach group. It may therefore be concluded, that of the three methods, the Concurrent Approach has a negative effect on student performance.

The results of the nonparametric test indicate that scores of students in the Primary Approach group (5) declined between pre and post tests; for the Concurrent Approach group (10) and for the Direct Approach group (6). More students from the Primary approach group (7) gained between pre and post tests than for the Concurrent approach group (4), or the Direct approach group (2). For the group taught under the Concurrent language approach there was a statistically significant decrease between pre and post (.06) test. On the

basis of the analysis of the data hypothesis two is accepted.

Related Questions

Several questions related to this study and pertinent to the teaching of bilingual pupils generally were included in Chapter 1. The results of the study and the supportive literature that helped guide it shed some light on some possible answers. A brief discussion of each question is provided in the succeeding paragraphs.

Question #1. What is the optimum age for introduction of instruction in English to a pupil whose primary language is not English?

The results of this study tend to confirm that age is probably a factor in the successful introduction of instruction to English reading. This conclusion is supported by the research reported by Cummins, Skutnabb-Kangas, and Modiano.

Reporting in the TESOL Quarterly, Cummins³ discussed the research completed by Ramsey and Wright on students born outside of Canada who learned English as a second language. The researchers studied the relationship between age on arrival, length of residence, and performance. Based on the results, the researchers concluded that age on arrival is critical and has some bearing in terms of progression toward grade norms.

3

James Cummins, "The Cross Lingual Dimensions of Language Proficiency: Implications for Bilingual Education and the Optimal Age Issue," TESOL Quarterly, Vol. IV, No. 2, June 1980, Pp. 175-187.

Cummins⁴ concluded that this is probably owing to their maturity and that cognitive and academic language proficiency is already well developed in the first language. The study reported in this document indicates that the third grade groups had not yet provided significant data, under any of the three instructional approaches, to lead the teacher to conclude that introduction to an all-English-medium program was warranted.

At the fifth grade the data indicates that the students taught under the Primary language approach were doing better than the other two groups at the time of the pre-test and continued to outperform their peers by the time of the post-test. Again, this tends to support Cummins'⁴ hypothesis that age and development of cognitive academic language proficiency influences performance.

Question #2. What is the optimum level of oral fluency needed in English for successful introduction of reading?

Cohen in his article cited the dependence on size of vocabulary for ultimate academic success under the Direct language approach.⁵ Although no word counts were conducted

⁴ James Cummins, "The Role of Primary Language in Promoting Educational Success for Language Minority Children." Schooling and Language Minority Students: A Theoretical Framework, Evaluation, Dissemination and Assessment Center, California State University, Los Angeles, Los Angeles, CA 1981. P. 3.

⁵ Bernard Cohen, "Issues Related to Transferring Reading Skills from Spanish to English." National Dissemination and Assessment Center, California State University, Los Angeles. Los Angeles, California, Volume III, No. 9 (1980). Pp. 6-13.

of either L_1 or L_2 for either the third grade or the fifth grade groups in this research, it may be inferred from the results, particularly at the fifth grade level, that pupils taught under the Primary language approach had acquired sufficient vocabulary to cope with instruction in the all-English-medium classroom. This is consistent with the studies concluded in Canada, Sweden, and Mexico.

Question #3. At what point does the Spanish/English bilingual pupil begin to achieve at the same level as his English speaking peer?

This study did not provide any definitive answer to this question simply because no comparisons were made between bilingual pupils and monolingual English speaking pupils. However, drawing from the research cited, it appears that length of time in the bilingual program and language proficiency are important factors. Discussion on this issue is provided by Cummins⁶, et al. Citing research evidence that older language two learners approach grade norms more rapidly than younger language two learners, it may be inferred that length of time in the bilingual program influences performance. The most significant example was reported by Skutnabb-Kangas and Toukomaa on Finnish children who immigrated at age 10-12.⁷ The extent to which proficiency in

⁶ Cummins. Op. Cit. P. 29.

⁷ Tove Skutnabb-Kangas and Pertti Toukomaa, Teaching Migrant Children's Mother Tongue and Learning the Language of the Host Country in the Context of the Socio Cultural Situation of the Migrant Family, (Helsinki: Finnish National Commission for UNESCO, 1976).

their own language was developed prior to contact with Swedish was strongly related to how well Swedish was learned. The older children maintained proficiency in Finnish at a level close to Finnish students in Finland and had developed skills in Swedish comparable to those of Swedes. The younger pupils were not able to match either their Finnish or Swedish peers.

Question #4. What are the classroom management problems that the bilingual teachers encounter to implement instruction of reading in the primary language, and reading in English?

Although this study did not specifically address problems of classroom management, the literature that guided this research alludes to the issue. Cohen⁸ points out in his work that improper assessment often results in placement errors. He points out that students with weak primary language skills and stronger second language skills may inadvertently be scheduled for instruction in the primary language. The converse may also occur, i.e., students with stronger primary language skills and weak second language skills may be prematurely scheduled for instruction of reading in the second language.

The interdependent language issue discussed by Cummins⁹ also relates to this problem.

8

Bernard Cohen, Issues Related to Transferring Reading Skills from Spanish to English. National Dissemination and Assessment Center. Los Angeles, CA, 1979.

9. Op. cit. Pp. 12-25.

Question #5. At what point does the bilingual pupil no longer require the enroute assistance of the primary language?

The findings offer no conclusive evidence. It appears that the best answer is provided by Cohen.¹⁰ He points to the importance of proper assessment to determine placement in the reading program. Teachers must assess for cognition in both languages and provide instruction in the primary language until such time that the pupil is on a par with his English speaking peer and is able to cope with instruction in an all-English medium classroom.

The results of the groups taught under the Concurrent Language Approach indicate that proper assessment is critical. It may also mean that enroute assistance in the primary language at these grade levels was not adequate.

Conclusions

The notion that the approach to instruction makes a difference is not new. The annals of educational history are replete with studies on methods of teaching one subject or another. This study began with this investigator's concern for the negative prognosis for bilingual children. The following conclusions are based on the findings made as a result of this study. The reader is advised that these conclusions are not absolute and are based solely on existing research.

10. Op. cit. Pp. 7-13

1. The data led this investigator to conclude that bilingual Spanish/English students do best in English reading if taught to read initially in Spanish. Other research to support this conclusion was reported in studies by Modiano, Skutnabb-Kangas, and Farella. By the time of the post test the third grade group taught under the Primary language approach even then showed gains as opposed to losses experienced by the groups taught under the Concurrent and Direct approaches. These results (although not significant) and those for the fifth grade (significant for the group taught by the Concurrent method) indicate that delaying introduction of English reading results in greater achievement for bilingual Spanish/English pupils.

2. The Primary Language Approach group at fifth grade outperformed both the Concurrent Approach group and the Direct Approach group on both the pre and post tests. These results lead this researcher to conclude that the benefits of the Primary Language Approach are cumulative. This conclusion is supported by research, e.g., age on arrival studies reported by Cummins, the Skutnabb-Kangas study of Finnish/Swedish students, and other studies cited in the literature. These studies strongly suggest that pupils who have mastered basic skills in their own language also master them successfully in the second language.

3. This study provided evidence that the Concurrent Language Approach produces deficit achievement. This occurred for both the third and fifth grade groups. The

practice of switching from one language to the other during instruction appears to produce confusion and frustration in the student when the same support cannot be provided in print. In other words, the enroute support in the primary language that is provided by the instructor in the classroom cannot be duplicated in his or her absence. Printed material does not contain that assistance.

4. The evidence provided by this study and available research favors the sequencing of instruction; i.e., development of skills in the primary language followed by instruction in the second language.

5. The results of this study indicate that the Primary language approach to instruction of bilingual Spanish/English pupils results in greater achievement for these pupils. This may indicate that premature introduction of reading in the second language may be detrimental to students' long range school achievement.

6. The results of this study indicate that oral language proficiency of the primary language is as essential as oral language proficiency of the second language (in this case English). This leads this investigator to conclude that a high level of proficiency of the pupil's primary language influences proficiency of the second language.

7. The results of this study suggest that high levels of oral language proficiency of both languages is related to reading achievement. The fact that continued demonstration of proficiency of the primary language was not a goal of the

groups taught under the Concurrent or Direct approach may account for their deficit performance. Clearly it accounted for the instructional strategy. Although this investigator cannot state unequivocally that demonstrated proficiency of the primary language was a goal of the instructional program for the group taught under the Primary language approach, it may be inferred that it was highly valued.

Recommendations

Many important questions for educators and researchers remain. The AIR report frustrated the bilingual community, not only because the results were disappointing but also because those who oppose bilingual education programs for whatever the reason, seized upon the results to conclude that bilingual programs were a poor investment. The report received wide publicity in the press and provided the detractors of bilingual education programs with lots of fodder for their arguments. Unfortunately, reports of this type too often leave the impression that the evidence is overwhelming and irrefutable. When the analysis of the report was made and irregularities cited, another view prevailed and other research has subsequently been planned. The weaknesses cited in the AIR report have served as the basis for this study and the recommendations noted herein are a result of this experience.

First, this study should be replicated in a long range experiment, controlling for all variables. In this study it

was not possible to control all the variables, such as the method of instruction, across all grade levels, i.e., from the date of entry into the program to the date of assessment.

Second, the process of transfer of reading across the orthographic systems should be carefully monitored in order to determine the rate of transfer between phonemic systems. Thonis¹⁰ cites the research that points to evidence that phoneme-grapheme regularity can serve to assist the learner with decoding skills in the first language, but may not necessarily assist with higher levels of cognitive achievement of comprehension in a second language. This study was not able to include investigation of this process.

Third, study the effects that various methods of teaching reading in Spanish (discussed in the literature), i.e., el método onomatopéico, el método alfabético, el método fonético, el método de palabras generadoras, el método global, and el método ecléctico, vs. the various methods of teaching pupils to read in English, i.e., the basal, linguistic, phonic, and language experience methods. These methods may influence each other and may have some transferability from one language to the other.

Fourth, studies completed on populations outside of the United States should be replicated with Spanish speaking

children in the United States. The various instructional approaches have not been clearly defined for U.S. teachers nor has the relationship between experiential background, intellectual maturity, nor chronological age has been fully explained.

Fifth, the U.S. born population of Spanish speakers deserves special attention. This segment of the Spanish speaking population whose parents have received little or no instruction in Spanish (although it may be their dominant language), and who may be communicating with their children in some variety of Spanish, are influencing linguistic patterns that the school has heretofore not recognized. It is an unfortunate fact that bilingual schooling has served the foreign-born more than the U.S.-born student. However, there is a growing awareness that many Spanish speaking students would benefit from participation in a bilingual program designed to remediate the home language prior to demanding full participation in an all-English-medium classroom. This change could conceivably lead to improved instruction and achievement.

Sixth, eliminate the Concurrent language approach from among the instructional options utilized in bilingual programs for students who are ten years of age and younger. The research evidence available strongly suggests that enroute support for young learners with a home language other than English is inadequate and has long term detrimental effects on their academic achievement.

This study was conducted with the high hopes that the results would contribute to the field of the instructional technology needed to improve education for bilingual Spanish/English pupils. It is hoped that that was accomplished. Perhaps more importantly it has served to increase the investigator's understanding of bilingual educational theory and application, hence perhaps the most meaningful contribution to the education of bilingual pupils has yet to be made.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

- Ahrendt, Kenneth. The Development and Use of Film in the Language Experience Approach to Reading, Reading Methods and Teacher Improvement. Newark, Delaware: International Reading Association, 1971.
- Bloomfield, Leonard and Barnhart, Clarence L. Let's Read. Detroit: Wayne State University Press, 1961.
- Bowen, J. Donald. "Linguistic Perspectives on Bilingual Education." Frontiers of Bilingual Education. Rowley, Massachusetts: Newbury House, 1977.
- Burmeister, Lou E. "Content of a Phonic Program Based on Particularly Useful Generalizations," Reading Methods and Teacher Improvement. Newark, Delaware: International Reading Association, 1971.
- Carroll, John Bissell. Learning from Verbal Discourse in Educational Media: A Review of the Literature. Princeton, N.J. Educational Testing Service, 1971.
- Christian, Jane M. and Christian, Chester C., Jr. "Spanish Language and Culture in the Southwest," by Joshua Fishman, et al., Language Loyalty in the United States. London: Mouton and Company, 1966.
- Fries, Charles C. Linguistics and Reading. New York: Holt, Rinehart and Winston, 1963.
- Johnson, Doris J. and Myklebust, Helmer R. Learning Disabilities: Educational Principles and Practices. New York: Grune and Stratton, 1967.
- Kellaghan, Thomas and MacNamara, John. Reading in a Second Language in Ireland. Reading Instruction: An International Forum World Congress on Reading, of Paris 1966. Newark, Delaware: International Reading Association, 1966.
- Kloss, Heinz. The Bilingual Traditions in America. Newbury House, Massachusetts, 1972.

- Leibowitz, Arnold H. Educational Policy and Political Acceptance: The Inception of English as the Language of Instruction in American Schools. Washington, D.C.: Eric Clearinghouse for Linguistics, Center for Applied Linguistics. March, 1971.
- McKeown, Pamela. Reading: A Basic Guide for Parents and Teachers. London: Routledge and Kegan Paul, 1974.
- Morris, Joyce. "Barriers to Successful Reading for Second Language Learners at the Secondary Level," The Language Education of Minority Children. Bernard Spolsky, (Ed.) Rowley, Mass.: Newbury House Publishers, 1971.
- Oller, James W. and Perkins, Keith. Language in Education: Testing the Tests. Rowley Mass.: Newbury House 1978.
- Olson, David R. "Culture, Technology and Intellect," L. B. Resnick (Ed.) The Nature of Intelligence. Hillsdale, N.J.: Lawrence Erlbaum Associates, 1976.
- Paulston, Christina Bratt. Bilingual Education Theories and Issues. Newbury House Publishers, Massachusetts, 1980.
- Swain, Merrill. "Home-School Language Switching," Understanding Second Language Learning: Issues and Approaches. Rowley, Massachusetts: Newbury House, 1978.
- Swain, Merrill. Bilingual Schooling: Some Experiences in Canada and the United States. Toronto: Ontario Institute for Studies in Education, 1972).
- Skutnabb-Kangas, Tove and Toukomaa, Pertti. Teaching Migrant Children's Mother Tongue and Learning the Language of the Host Country in the Content of the Socio Cultural Situation of the Migrant Family. Helsinki: Finnish National Commission for UNESCO, 1976.
- Smith, Frank. Understanding Reading. New York: Holt, Rinehart and Winston, 1971.
- Thonis, Eleanor Wall. Literacy for America's Spanish Speaking Children. Newark, Delaware: International Reading Association, 1976.
- Tinker, Miles A. and McCullough, Constance M. Teaching Elementary Reading. New York: Appleton-Century Crofts, Inc., 2nd ed., 1962.
- Vyotsky, Semenovitch Lev. Thought and Language, Edited and translated by Eugenia Haufman and Gertrude Vokar. Cambridge, Mass.: MIT Press 1965.

Periodicals

- Barnitz, John G. "Orthographics, bilingualism and learning to read English as a second language." The Reading Teacher. (1982).
- Becker, Wesley C. "Teaching Reading and Language to the Disadvantaged - What We Have Learned from the Field Research." Harvard Educational Review, 47. (1977), 518-544.
- Canale, Michael and Swain, Merrill. "Theoretical Basis of Communicative Approaches to Second Language Teaching and Testing." Applied Linguistics I. (1980), 1-47.
- Carrow, Sister Mary Arthur. "Linguistic Functioning of Bilingual and Monolingual Children." Journal of Speech and Hearing Disorders, XXII. (1957).
- Cervantes, Robert A. "An Exemplary Consafic Chingatropic Assessment: The AIR Report." Bilingual Education Paper Series. Los Angeles, National Dissemination and Assessment Center. Volume II, No. 8. (March, 1979), 13.
- Cohen, Bernard. "Issues Related to Transferring Reading Skills from Spanish to English." National Dissemination and Assessment Center, California State University, Los Angeles. Volume III, No. 9. (1980), 6-13.
- Cohen, Andrew D. Modern Language Journal, LVIII (March 1974), 95-103.
- Cummins, James. "The Cross Lingual Dimensions of Language Proficiency: Implications for Bilingual Education and the Optimal Age Issue." TESOL Quarterly, Volume IV, No. 2 (June 1980), 175-187.
- Cummins, James. "Linguistic Interdependence and the Educational Development of Bilingual Children." Review of Educational Research, Volume XXXIX, No. 2 (Spring 1979), 222-251.
- Ellasser, Nan and Steiner, Vera P. John. "An Interactionist Approach to Advancing Literacy." Harvard Educational Review 47. (1977), 355-369.
- Fernandez, Rafael. "Rationale for a Field Based Research and Development Project for Multi-Cultural Bilingual Education." Journal of National Association for Bilingual Education. (May, 1977).

- Gamez, Gloria I. "Reading in a Second Language: Native Language Approach vs. Direct Method." Bilingual Resources, Volume III, No. 1 (1979), 23-25.
- Leyba, Charles F. Longitudinal Study Title VII Bilingual Program Santa Fe Public Schools, Santa Fe, New Mexico. National Dissemination and Assessment Center California State University, Los Angeles, (June 9, 1978).
- McConnell, Beverly. "Does Bilingual Education Work?" Bilingual Resources. National Dissemination and Assessment Center, Volume III, No. 7 1980), 23-27.
- Modiano, Nancy. "National or Mother Language in Beginning Reading: A Comparative Study." Research in the Teaching of English, 2:43 (April 1968).
- O'Malley, J. Michael. "Review Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program," Bilingual Resources. National Dissemination and Assessment Center, Volume I, No. 2, (Winter 1978), 6-10.
- Paulston, Christina Bratt. "Rationales for Bilingual Educational Reforms: A Comparative Assessment," Comparative Education Review (October, 1948), 402-419.
- Paulston, Christina Bratt. "Bilingual Bicultural Education," Review of Research in Education. (1978).
- Rosier, Paul and Farella, Merilyn. "Bilingual Education in Rock Point - Some Early Results." TESOL Quarterly, X, No. 4 (December, 1976), 379-388.
- Swain, Merrill. "French Immersion: Early, Late, or Partial?" The Canadian Modern Language Review, (Ed.), S.T. Carey. XXXIV (May 1978), 577-585.
- Troike, Rudolph. "Synthesis of Research on Bilingual Education." Educational Leadership, Volume XXXVIII, No. 6 (March 1981), 498-503.
- Troike, Rudolph C. Research Evidence for the Effectiveness of Bilingual Education. National Dissemination and Assessment Center, California State University, Los Angeles, Volume II, No. 5 (December 1978), 6-15.

Other Sources

- American Institute for Research. Evaluation of the Impact of ESEA Title VII Spanish/English Bilingual Education Program. National Dissemination and Assessment Center, Volume II, No. 1 (August 1978),
- Burt, Marina K., Dulay, Heidi C. and Hernandez-Chavez, Eduardo. Bilingual Syntax Measure. Harcourt Brace Jovanovich. (1978).
- California. Assembly Bill 1329. (1976).
- California. Education Code, Section 52171. (1977).
- Comprehensive Test of Basic Skills. McGraw-Hill, Monterey, California.
- Crane, Robert. Hispanic Student Achievement in Five Learning Areas: 1971-1975. National Assessment of Education Progress Report NoBr-2 ED 138414, (May 1977).
- Cummins, James. "The Role of Primary Language Development in Promoting Educational Success for Language Minority Students." Schooling and Language Minority Students: A Theoretical Framework. Evaluation, Dissemination and Assessment Center, (1981), 4.
- DeAvila, Edward A. and Ulibarri, Daniel M. "Theoretical Perspectives on the Selection of Instructional Techniques for Hispanic Students." Educating English-Speaking Hispanics, Ed., L. A. Valverde, et al. Virginia: Association for Supervision and Curriculum Development (1980), 15.
- Fischer, Kathleen B. and Cabello, Beverly. "Predicting Student Success Following Transition from Bilingual Programs." Paper presented at AERA Meeting, Toronto, Los Angeles: Center for the Study of Evaluation, U.C.L.A. (1978).
- Skutnabb-Kangas, Tove and Toukomaa, Pertti. Teaching Migrant Children's Mother Tongue and Learning the Language of the Host Country in the Context of the Socio Cultural Situation of the Migrant Family, Helsinki: Finnish National Commission for UNESCO, (1976).

Thonis, Eleanor. "Reading Instruction for Language Minority Students." Schooling and Language Minority Students: A Theoretical Framework. Evaluation, Dissemination and Assessment Center (1981), 145.

Timpane, Michael H. Compendium of Bilingual Education and Related Projects, Washington, D.C., National Institute of Education, (July 1980), 35.

Tsushima, William I. and Hogan, Thomas P. "Verbal Ability and School Achievement of Bilingual and Monolingual Children of Different Ages." U.S.O.E. A Process Evaluation of the Bilingual Education Program, Title VII, Elementary and Secondary Education Act, Volume I. U.S. Government Printing Office (1973).

U. S. Commission on Civil Rights. A Better Chance to Learn, Washington D.C.: GPO, (1975), 18.

APPENDIX A

TEACHER QUESTIONNAIRE

Bilingual education has utilized three main approaches to instruction of bilingual pupils, e.g., initial instruction in the primary language, instruction bilingually; i.e., concurrent use of both English and the primary language, or total instruction in the second language. Proponents of each method have advanced persuasive arguments on the merits of their preferred approach. Please rate yourself on how you perceive yourself as a bilingual teacher vis-a-vis the instructional approach by checking the appropriate square.

To the teacher:

Please check the square in the columns on the right hand side of the page that best completes the sentence below regarding where you stand as a bilingual teacher (both philosophically and in practice).

No Names Please

1. My teaching approach is best described as utilizing the
2. I believe pupil should be taught to read utilizing the
3. I believe pupil should be given assistance as needed utilizing the
4. I believe pupil should receive instruction in basic skills utilizing the
5. I believe pupil should receive instruction in all areas of curriculum

Primary Language Approach *	Concurrent Approach **	Direct Method or ESL Approach ***
()	()	()
()	()	()
()	()	()
()	()	()
()	()	()

* Primary = Home Language. Spanish in this case - at least in the initial stages.

** Concurrent Approach
Bilingually = i.e., both languages - Spanish and English

*** Direct or ESL Approach = refers to English only.

APPENDIX B

INSTRUCTIONS FOR ADMINISTERING CLASSROOM BEHAVIOR OBSERVATION INSTRUMENT

INTRODUCTION

The Classroom Behavior Observation Instrument was designed to examine patterns of instructional strategies and academic learning time in the bilingual class-room. It is not intended nor could it be utilized to evaluate individual teach-ing performance.

Specifically, the observer will (in chronological order) (1) ask the teacher to describe the learning tasks of the students before the observation begins, (2) observe the number of children present, (3) note the classroom noise level, (4) determine the number of students to whom the teacher is directing her or his attention, (5) check the mode of one of the three aspects of the teacher-student learning act (teacher presentation, teacher monitoring, or teacher feedback), count the number of children off-task, and (6) characterize the behavior of other adults in the classroom. To record the above information will take approximately forty-five seconds to one minute.

The observer will then classify (7) teacher location. (8) The amount of praise and encouragement by adults should be classified last.

The first six classroom characteristics are intended to be "camera-like." That is, each has a specific behavioral referent and the observer records exactly what is occurring at the precise time that the observer makes the observation. For example, "classroom noise level" is assessed immediately after the "classroom count" has been recorded, etc.

It should require about two minutes to record all of the observations in each column. Therefore, it will be necessary to remain about 20 minutes in each classroom to complete all ten columns. If possible, appointments should be scheduled for the middle portion of the reading period. If reading is from 9-10 a.m., the observation should occur from 9:20 - 9:40 a.m.

1. Plan to arrive at the site 10 minutes before the instructional period begins. After notifying the school secretary that you are in the building, allow time for a 2-3 minute conversation with the teacher before the class begins.

- a. Obtain numbers of aides, parents or other volunteers, student teachers, and students serving as tutors. Discuss briefly the nature of the teaching tasks to be presented. Record numbers and specific tasks on observation form in advance of beginning observation. Please use pencil.
 - b. Request that the teacher tell the students you are from the Bilingual Department and that you are visiting the classroom to see how their classroom works. The students should be asked to refrain from talking to you.
 - c. Request to be seated in the least obtrusive area of the room where you can hear and see the most easily.
2. Begin the observation process by following Column one down the page. Check the appropriate boxes: E = English and P = Primary Language. Move to the top of Column 2 and repeat the process, followed by Column 3, 4, etc., through 10. Each column should require approximately two minutes.
 3. Definitions of observation components:

Task description: The teacher's academic and behavioral expectations of the students, at any moment the task includes what the students are to learn and how they are expected to behave (e.g., a) content: use of pronouns; b) behavior: working quietly on worksheet at seat). If expectation changes during the 20 minute period, please record. Also note the task is unclear to students or unstated.

Classroom count: Total number of students in the classroom at any particular moment during the observation. This is to be recorded in all 10 columns, since the number present may change during the observation.

Classroom noise level: We recognize that some noise is appropriate to the learning task (e.g., reading in unison, etc.). The variable measured in this category refers only to inappropriate or negative sounds which distract students from their tasks, (e.g., shouting, slamming books, moving furniture, giggling, throwing objects, inappropriate conversation, etc.).

High: Noise level obviously distracts the majority of students from carrying out expected tasks

Medium: Noise level distracts some students

Low: Few or no student distracted by noise

Silent: Self-explanatory

Instructional Setting: The organizational structure of the teacher-student learning act as it relates to learning tasks. Specifically, it refers to that group of the students that the teacher is addressing at the time. Record the number of students in the appropriate category.

Non-Instructional Setting/Teacher Presentation/Teacher Monitoring, Teacher Feedback: This instrument assumes that teacher involvement may be classified in four ways: as non-instructional, or in one of the three categories of the teacher-student learning act (presentation, monitoring, feedback). The teacher can only be involved in one of the four at any particular moment. Consequently, only one of the four is to be marked in each column, if possible. More than one category may be marked in unusual circumstances.

- Non-Instructional Setting: Interruptions not related to instructional classroom activities, e.g., fire drill, announcement over loud-speaker, parent visits, correcting yesterday's papers, "paper work," etc. Record "number of students off-task" for non-instructional setting also. Since the teacher is not technically interacting with the students, Teacher Presentation, Teacher Monitoring, and Teacher Feedback could not be recorded. Student/Adult Interaction would be left blank also. (See definitions of "off-task" below).
- Teacher Presentation: The teacher is explaining concepts through the act of showing or telling. The teacher may be explaining the tasks or behavioral expectations to the students - telling them what to do during the next phase of the learning act. Please check one of the modes of presentation listed and record the number of students off-task in the entire classroom at that particular moment.

If at any time the teacher begins to show or tell a student or group of students how to perform the task, the teacher is no longer monitoring-- mark Teacher Presentation instead.

- Teacher Feedback: The teacher is engaged in informing the students about the adequacy of their task accomplishment and behavior. Teacher Feedback is not a nod of the head or occasional words of encouragement. Feedback is an organized and specific evaluation of how well the student performed relative to some standard (e.g., "15 out of 20 is o.k., but you should have done better," or "your behavior today was better than yesterday for the following reason..."). Please check one of the modes of feedback listed and record the number of students off-task in the entire classroom at that particular moment.

Off-task: A student is off-task if he or she is not adhering to the teacher's academic and behavioral expectations. We

are not judging the appropriateness of the teacher's expectations. We can only assume that if students are reading or carrying out an educational activity or procedure with the teacher's permission, the students are learning. Therefore, the following activities, if unauthorized or inappropriate, are examples of off-task behavior:

- communicating with another student (talking, laughing, playing)
- out of seat, wandering around the room
- excessive sharpening of pencil
- clearly unoccupied at seat
- unrelated activities--eating, doodling, math during reading period
- obvious daydreaming, which clearly does not relate to the task
- excessive organization of materials, which is obviously intended to avoid the task (however, getting one's book out of desk when asked is on task)
- a student who is sufficiently disturbed by another student, so that he cannot do the task at hand, is also considered to be off-task

In the upper half of the space provided, record the number of students with whom the teacher is directly involved who are off-task (group work). In the space below, record the number of students in the classroom who are off-task.

Other adults: Includes instructional assistants, parents or other volunteers, student teachers, and cross-age tutors. Record the number of other adults engaged in each of the three activities.

Teacher Location: "Stationary" means that students are required to go to a central location for assistance by the teacher, while "non-stationary" means the teacher goes to the students. Check the appropriate box.

Use of Praise and Encouragement by Adults: An estimate of the number of times the adults verbally or otherwise praised or encouraged students for task accomplishments and behavior during the previous two minutes. The three categories at the bottom refer to the use of negative comments.

Check the appropriate measure in each column.

Achievement Orientation of the Classroom: An estimate of the main purpose of the classroom.

CLASSROOM BEHAVIOR
OBSERVATION INSTRUMENT

Task:

	CLASSROOM COUNT
	Total # Children
I.	CLASSROOM NOISE LEVEL
	High
	Medium
	Low
	Silent
II.	INSTRUCTIONAL SETTING (NO.S)
	Whole Class
	Large Group (9-)
	Small Group (3-8)
	Individual or Pair (1-2)
III.	NON-INSTRUCTIONAL SETTING
	No. of Students Off-Task

Mode of teacher-student learning act:

Teacher presentation:_____ Teacher monitoring:_____

Teacher feedback:_____

[illegible]

VIII.	LOCATION																			
	Stationary																			
	Non-Stationary																			
IX.	OTHER ADULTS (NO.S)	IA(s)	()	Volunteers	()													
	Coordinated or Directed Group Activities																			
	Assisted Individual Students																			
	Performed Other Tasks (No student contact)																			

Time Completed:

Comments:

Be sure to leave the last page with the teacher.

-

APPENDIX C

BILINGUAL SYNTAX MEASURE

Bilingual Syntax Measure (BSM)

What the BSM Measures - BSM I (K-2) - BSM II (3-8)

Language dominance with respect to basic syntactic structures.

If both the primary language and English are assessed with a BSM the results can be used as an indicator of language dominance with respect to basic syntactic structures; i.e., the student's proficiency in English and the primary language can be compared to indicate whether, and to what degree, the student is structurally dominant in English or in the primary language. This comparison would also indicate whether the student is a "balanced bilingual" with respect to the basic syntactic structures of both languages. Thus, the BSM reveals the degree of bilingualism with respect to certain basic syntactic structures both in English and in the primary language.

Structural proficiency in English as a second language.

The BSM can be used to measure students' structural proficiency in English. It can be used with all students from other native language backgrounds.

APPENDIX D

DESCRIPTION OF THE TESTS

The Complete Battery book contains tests in six basic skills areas: Reading, Language, Mathematics, Reference Skills, Science, and Social Studies. In addition, the following separate books are available:

1. a partial battery, containing the Reading, Language, Mathematics, and Reference Skills tests;
2. Reading and Reference Skills;
3. Science and Social Studies

The six areas are divided into ten separately timed tests, as shown in Table 1.

The directions in this manual for administering each test may also be used for the separate Reading and Reference Skills and Science and Social Studies test books.

All items in the battery are multiple choice. Except for the Spelling test at Levels 1 and 2, in which there are only two answer choices per item, all items have four alternatives. Brief descriptions of the ten tests in the complete battery follow.

Test 1 - Reading Vocabulary

Test 1 contains 40 items, each of which consists of a stem phrase and four discrete words for alternatives. The selection of words of appropriate difficulty was based on

A Revised Core Vocabulary: A Basic Vocabulary for Grades 1-8, by Stanford E. Taylor, Helen Frackenpohl, and Catherine E. White (Huntington, N.Y.: Educational Developmental Laboratories, 1969). The student's task is to choose the synonym for the underlined word in the phrase.

Use of a stem word in a phrase parallels the way in which a learner is exposed to new vocabulary and, more broadly, the way language "works." The use of a phrase as context provides a mental image for the students and helps them to recognize the stem word as familiar. However, even though the stem word is placed in the context of a phrase, the vocabulary test is a measure of the student's knowledge of the denotative meaning, or dictionary definition, of the word.

The skill of defining a word in the context of a phrase is quite different from the skill of actually determining word meanings through context. To demonstrate the skill of determining word meaning from context, the student must be able to use "context clues"; specifically direct definition, restatement, example, explanation, and comparison or contrast. The context of a whole sentence, sometimes even a paragraph, must be used to determine the meaning of an unknown word. Thus, the item that measures ability to determine word meaning through context must be a whole sentence and one that expresses a complete thought. Such items are included in Test 5, Language Expression.

Test 2 - Reading Comprehension

Test 2 contains 45 items based on seven reading selections.

Some reading passages portray feelings and situations universally experienced by young people; other passages present enriching informative material. At this level, a conscious effort was made to include some content which portrays children experiencing emotions, because it was felt that reading material used in the elementary grades ought to provide children with a means for learning to understand and cope with their emotions.

The test items measure specific skills in both literal and critical comprehension. Critical comprehension skills ought to be used by readers as early as Grade 3. More than half of the items in this test measure skills in critical comprehension.

APPENDIX E

REGRESSION ANALYSIS

A regression analysis was conducted in which the variables entered into the equation were first, the pretest scores, second, the Group designation (a trivariate) and third, post test scores.

In this way, the variance contributed by the group effect was partialled out from the variance of differences in the pretest scores.

The regression analysis was conducted for both the 3rd and 5th grades separately.

To test the Group effect, hand calculations were done to compute the F value associated with the group effect.

For the 3rd grade, there were 2/48 degrees of freedom associated with this test; and the F value was .13256, which was not significant.

For the 5th grade, there were 2/36 degrees of freedom, and the F value was 3.745, which was significant at the .05 level (required F was 3.29).

Tests for parallelism (group x pretest interaction) were not significant for both grade levels.

The test used to calculate the F value was:

$$\frac{SS_{\text{reg for step 2}} - SS_{\text{reg for step 1}}}{SS_{\text{resid}}}$$

with degrees
of freedom =

$$\frac{q'}{n - (p' + q') - 1} = \frac{q'}{n - (q' = \# \text{ of variables entered on the step})}$$

$p' = \#$ of variables
entered on
previous step)

A test was also made on the adjusted means
(a contrast between groups)

APPENDIX F

TESTING THE STATISTICAL SIGNIFICANCE OF THE DIFFERENCE BETWEEN TWO MEANS: THE T-TEST FOR UNMATCHED GROUPS

The t-test is a test to see if there is a statistically significant difference between the mean scores of two groups--say, an experimental (E) group and a control (C) group. Demonstrating whether or not a difference is statistically significant is important: a statistical test tells you how frequently your result would be expected to occur simply by chance if indeed there were no real difference in E-group and C-group performance. A difference that a statistical test determines to be not significant must be considered too small and chancy to be taken seriously. Some of the logic underlying the t-test of significance is explained in the following paragraphs.

Suppose a group of students comprising a class have all been taught in the same way all year. You arrive in April and randomly divide the class into two subgroups, giving both the same test. You would not expect to find that the scores of the two random subgroups are very different. On the other hand, the mean scores of these subgroups are not likely to be exactly the same either. Because all scores are susceptible to errors and variability, any two sets of test scores--even from essentially the same group--will have slightly different means. Just how different the two means turn out to be will depend upon:

1. The sizes of the subgroups. The larger the number in each subgroup, the more you can expect the mean of each subgroup to be the same as the mean of the whole original group.

2. The variability of the scores. The wider the variation you find among the scores, the more likely it is that the means will be, by chance selection, quite a bit different.

The t-test is designed to help you take into account these two factors--group size and score variability--when interpreting the difference you have observed between groups. If a t-test were applied in the situation just described, you would expect it to show that, given the variability of scores in the two groups, the difference between means was not big enough to reach statistical significance. You would conclude that the two subgroups were not really different.

Now, suppose that a group of students has been divided randomly into two groups. One has been taught by what you have been told is a good method, and the other group has been taught by a method that you suspect to be much poorer. Again, you give a test, and find the means for the two groups. Sure enough, as expected, one group has a higher mean score than the other. But you have to consider the possibility that this difference was due to chance--that the two groups are in reality performing equivalently. Only by first ruling out this possibility will you be able to consider the difference in results worth mentioning.

One way to see if the difference is too large to be just a chance fluke would be to pool all the scores from both groups and keep selecting random subgroups and recording the difference between the means. If

the differences between pairs of groups obtained in this way were smaller than the difference found when you divided the students according to how they were taught, then you would conclude that teaching method had really made a difference. This procedure would work well, but it would be very time-consuming.

The t-test is a quick way of accomplishing the same end by applying what amounts to the same procedure. It answers the question: Is the obtained difference between the means bigger than the differences you would expect to obtain if the two groups were actually equivalent? In other words, is the difference you obtained bigger than the differences which could be expected to occur by chance sampling variation?

To apply a t-test to the difference between means, you calculate an obtained t-value by inserting into a formula the obtained difference between means and its associated standard deviation, representing the variability of scores. You then check the obtained t-value against a tabled t-value. The tabled t-value is read from a table organized according to the number of cases in each group. If the obtained t-value is larger than the tabled t-value, this means the obtained difference between means is larger than would be expected if the groups were not really different.

When to use the t-test

The t-test is most often used in conjunction with research and evaluation designs to scrutinize differences in scores--achievement, attitude or whatever--between experimental and control groups.

You might want to use a t-test to check if pretest scores of two randomly composed groups are equivalent, that is, as an indicator of whether randomization has worked. The two groups can be considered equivalent if the obtained t-value is less than the tabled t-value. This indicates absence of a statistically significant difference on the same measure used. A true, randomly selected, control group will almost always turn out to be equivalent to the randomly selected experimental group. In the case where you are using a non-equivalent control group--one not found by random assignment--a test for significant pretest differences is essential. Conclusions about the final effects of a program will be strengthened if a t-test of the difference between E- and C-group pretest means shows no statistical significance. This indicates the E- and C-groups probably started out equivalent in achievement, attitudes, or whatever.

You should compute a t-test to check if the difference in posttest scores between two groups, usually an E- and a C-group, is statistically significant.

The t-test has non-design uses as well, all of them situations where you want to know if score differences between two groups on some measure are significant. You might want to test, for example, whether boys and girls are achieving equally well in a certain reading program. A t-test will tell if the boys' mean score is significantly different from the girls' mean score. You can use a t-test to examine the difference between attitudes of certain parent groups or between program implementation practices at different sites.

In general you can use a t-test to search out statistically significant differences between any two groups you can identify on any measure you can administer--though how you interpret the results will differ from one situation to another. There is one qualification to this sweeping statement, however: the t-test is most appropriate for determining the significance of the difference between means when the number of participants in each of the two groups is about equal. If the group sizes are quite unequal (say if one group is more than 20% larger than the other), then look at the standard deviation associated with each group's mean before using the t-test. If the standard deviations are similar, go ahead with the t-test. If the standard deviations

are similar, go ahead with the t-test. If they are quite different, you should probably use the Mann-Whitney U Test (Worksheets 3C, D, and E) instead of or in addition to the t-test. Alternatively, you could make the numbers per group equal by randomly removing scores from the larger groups so that it equals the size of the smaller group, and then performing the t-test with only the data from these equalized groups.

Note, as well, that the t-test does not tell you whether or not a statistically significant difference is an important difference. You or your evaluation audience will have to judge this for yourselves by examining differences and asking if they are large enough to be considered important educationally.

THE WILCOXON MATCHED-PAIRS SIGNED-RANKS TEST*

FUNCTION

The Wilcoxon matched-pairs signed-ranks test is a nonparametric alternative to the t-test for two related samples. It may be used in either repeated measurements or matched-pairs types of designs. For a discussion of these designs, see Section 25.1. The Wilcoxon test requires data on at least an ordinal scale, and these data are assumed to be continuously distributed. The test does not require normality of distribution.

RATIONALE

Suppose that a random sample of paired measures is available from some population of interest. Let d be the difference between any pair of measures. Rank these difference scores from one to N (where N is the number of pairs), with respect to magnitude but without respect to sign (for example, 0, +2, -2, -3, +4, and so on). After ranking the difference scores in this fashion, separate the ranks into two groups, those corresponding to the positive difference scores and those corresponding to the negative difference scores. Let T_a be the sum of the ranks for the positive differences, T_b the sum of the ranks for the negative differences, and T be equal to the smaller of these two

There are 2^N unique sets of signed ranks in the situation described. If the relationship between the scores in each pair is a completely random one, each of these 2^N sets is equally probable. If N is six, for example, there are 64 sets, and the probability that T_a will be zero is $1/64$; the probability that it will be one is also $1/64$, and the probability that it will be one or zero is $2/64$. The probability that T_b will be zero is $1/64$, and the probability that either T_a or T_b will be zero is $2/64$. Following this pattern, the sampling distribution of T could be established for any sample size, and a table could be constructed for testing both one- and two-tailed hypotheses at any desired levels of significance. Table 9 in the Appendix is such a table.

If the relationship between the scores in each pair is a completely random one, the expected values of T_a and T_b would be the same, and the value of T would be maximum under these circumstances. If, however, there is a systematic tendency for the positive differences to be greater than or less than the negative differences, T will tend to be smaller, with T equal to zero representing two maximally different samples.

*John T. Roscoe. Fundamental Research Statistics for the Behavioral Sciences (Holt, Rinehart and Winston, Inc.: New York, 1975). Pp. 238-9.