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ABSTRACT

This study investigated whether there were significant differences in the acquisition of oral language and reading skills among limited-English-speaking, Hispanic elementary school students receiving instruction through three different bilingual reading approaches, and what other variables might be important. The three reading approaches were: (1) teaching reading in the native language prior to the formal introduction of English reading; (2) teaching reading in the native language and English concurrently; and (3) teaching reading in English exclusively. Three groups of children were studied: 6 year olds, 8 year olds, and 10 year olds. In oral English, findings indicated statistically significant differences among the 6 and 8 year olds: students receiving English-only instruction performed better than students receiving bilingual instruction. In English reading, the findings indicated statistically significant differences only among 6 year olds: students receiving English-only reading instruction performed better than bilingual program students. In Spanish reading, students who received reading instruction in Spanish and English performed better than those who received reading instruction in English only. As far as the independent variables are concerned, English as a Second Language (ESL) instruction and teacher training appeared to be significant predictors of English reading scores among younger children. Oral proficiency in Spanish was significant for all three age groups in Spanish reading, and was a positive predictor of oral English proficiency among 6 year olds and a negative predictor among 10 year olds. (CMG)

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**Bilingual Oral
Reading Skills Among
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**A Comparison of Bilingual Oral Language
and Reading Skills Among Limited
English-Speaking Students From Spanish
-Speaking Backgrounds**

by
Vicki Gunther

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Chapter 1

INTRODUCTION

Purpose

Educators generally agree that the entire school curriculum is based upon a student's ability to read. Numerous studies have indicated that the level of reading ability is a reliable predictor of academic success in subject areas of instruction. With regard to students of limited English proficiency, it is apparent that their ability to read in English is related to their ability to speak and understand English. Through specialized programs of instruction, school systems across the country are trying to meet the needs of these students. Among these programs, bilingual education is the most prevalent.

The principal goal of this monograph was to study the effects of teaching reading, under different linguistic conditions, on the acquisition of oral language and reading skills among groups of limited English-speaking students. The different linguistic conditions included: (1) teaching reading in the native language prior to the formal introduction of English reading; (2) teaching reading in the native language and English concurrently; and (3) teaching reading in English exclusively.

Background Information

Nationwide, there are more than five million school-age children who speak a language other than English or who live in households in which a language other than English is spoken (National Clearinghouse for Bilingual Education, 1978). The need to design effective educational programs for these children is one of the most pressing tasks confronting policymakers and educators at federal, state, and local levels. However, basic program designs and subsequent modifications require quality research and evaluation. As stated by Troike (1978):

Bilingual education is in critical need of research, both basic and operational, and unless it receives this support, this great experiment could become just another passing effort in the history of American

education which failed to achieve its goals—to the detriment of millions of school children and of our whole society. (p. 2)

The need for more systematic research on the effects of bilingual education is especially important in light of the proliferation of programs throughout the country. In part, the impetus for implementing bilingual programs has come from recent legislation as well as judicial action.

Legislative and Judicial Action

In 1965, Congress passed the Elementary and Secondary Education Act (ESEA), and in 1967, under Title VII, funds were appropriated for the operation of programs designed to serve the needs of children of limited English-speaking ability. The law, commonly referred to as "The Bilingual Education Act," defines a bilingual program as follows:

[Bilingual education is] . . . the use of two languages, one of which is English, as mediums of instruction for the same pupil population in a well-organized program which encompasses all or part of the curriculum and includes the study of the history and culture associated with the mother tongue. A complete program develops and maintains the children's self-esteem and a legitimate pride in both cultures. (U.S. Office of Education, 1971, p. 1)

In 1974, the federal government again influenced the educational scene with the landmark *Lau v. Nichols* Supreme Court decision, declaring that:

. . . the failure of the San Francisco school system to provide English language instruction to approximately 1,800 students of Chinese ancestry who do not speak English, or to provide them with other adequate instructional procedures, denies them a meaningful opportunity to participate in the public educational program and thus violates Section 601 of the Civil Rights Act of 1964, which bans discrimination based "on the grounds of race, color, or national origin," in all programs or activity receiving federal assistance. (*Lau v. Nichols*, 1974)

The Court ordered the San Francisco school district to take affirmative steps to remedy the situation and to ensure that national origin minority groups would receive an education free from unlawful discrimination. Although the Supreme Court did not expressly endorse bilingual education as the remedy, it legitimized bilingual programs, and encouraged additional federal and state legislation (Teitelbaum & Hiller, 1977).

In the summer of 1975, the Office of Education issued findings of a task force established subsequent to the *Lau* decision. The "Lau

Remedies," as the findings are commonly referred to, are guidelines and educational approaches to be considered as appropriate affirmative steps. Over 300 school districts throughout the country were found to be out of compliance with Title VI of the Civil Rights Act and had to submit compliance plans to the Office for Civil Rights which were in accordance with the Lau Remedies.

The Lau Remedies provoked both controversy and criticism. While they did not mandate bilingual education, they stated that English as a second language (ESL) programs were not appropriate for children in the elementary and intermediate levels of school.

Because an ESL program does not consider the affective nor cognitive development of students in this category and time and maturation variables are different here than for students at the secondary level, an ESL program is *not* appropriate (Task Force Findings, 1975, p. 7)

As a result of legislation and judicial action at the federal level, a significant amount of state legislation was generated. By 1975, 16 states had permissive bilingual education statutes, six had permissive and mandatory statutes, and two had mandatory statutes or regulations (Geffert, Harper, Sarmiento, & Schember, 1975).

Because federal and state laws, as well as court decisions have allowed school districts flexibility in implementation, bilingual programs frequently differ in terms of general goals and objectives. Specifically, they differ in terms of the distribution of the two languages in the curricula, the language(s) used for introducing initial reading skills, the extent to which cultural factors are emphasized, the extent to which parents are actively involved, the amount of teacher training provided, teacher certification, and other factors.

Unmet Needs of Practitioners

Inasmuch as programs differ on a number of levels, it has been difficult to construct comprehensive research designs to assess program effectiveness. Both proponents and opponents have been able to support their arguments by citing available studies which either support or negate the effectiveness of bilingual education. This has contributed to the present state of confusion among practitioners.

To design and implement effective programs, the practitioner is in dire need of answers to basic questions. What are the basic competencies that teachers should possess in a bilingual program? Are particular organizational models more effective than others, e.g., team-teaching, pull-out, self-contained? How important is age in second language

learning? Should all limited English speakers first learn to read in their native language? When should English be introduced? When should students be removed from a bilingual program? What are the best ways of teaching reading to limited English speakers? What are the salient variables which affect student performance? These questions could be continued ad infinitum, and some questions are yet to be formulated.

While considerable sums of money have been spent on research on teaching and learning in monolingual settings, very little research has been conducted in bilingual settings. As a result, few data have been accumulated upon which to base sound, pedagogical decisions.

Scope of the Present Study

While all of the above questions are of practical interest to the educator, the teaching of reading to limited English speakers and the acquisition of related skills were selected as the focus of this study.

There are a number of common approaches and methods to teach initial reading skills which include linguistic, phonics, whole-word, experiential, kinesthetic, and eclectic-based techniques. The terms "reading approach" and "method" are also found in the literature on bilingual education and refer to language sequencing in reading and subject-area instruction. For purposes here, the term "approach" will be used to refer to the different ways of sequencing language in teaching reading; e.g., teaching reading in the native language; teaching reading in the native and target languages concurrently; or teaching reading in the target language, exclusively.

Based on ten years of experience working within one of the largest school systems in the nation, the author often found more than one "bilingual reading approach" being practiced in various classrooms of a given school. Selection of the language or languages for initial reading instruction was often at the discretion of the local administrator or classroom teacher.

As a result of my observations, several questions were raised. Were there specific criteria used by school personnel in selecting a bilingual reading approach? Were specific student characteristics considered, or was selection based on staff characteristics and physical facilities? Were school administrators aware that there *were* choices available? Again, the choices were many, including what text to use, maximum time to be devoted to reading, and skill-area emphasis. In short, there did not appear to be any systematic manner of selecting the language

medium of instruction nor the other variables mentioned.

Thus, the first research question focused on investigating the effect of different bilingual reading approaches on the acquisition of oral language and reading skills among limited English-speaking students. For purposes here, the three bilingual reading approaches were defined as follows:

1. **Native Language Approach** — Initial reading instruction is introduced in the native language (L1), i.e., Spanish, prior to the formal introduction of reading instruction in English (L2).
2. **Concurrent Approach** — Reading instruction is introduced in Spanish and English (L1 and L2).
3. **Direct Method** — Reading instruction is introduced exclusively in English (L2).

The second research question explored the identification of variables related to the acquisition of oral language and reading skills. Variables included: age, sex, ethnic background, socioeconomic status, years enrolled in a bilingual program, ESL instruction, teacher attitudes, and teacher training.

In Chapter 2, research on teaching reading to second language learners was reviewed, including studies on reading approaches, psycholinguistic strategies, and variables related to the teaching and learning of reading.

The remainder of the present work is a description of this empirical study investigating oral language and reading skills of Spanish-background students who were of limited English-speaking fluency. Chapter 3 describes the methods and procedures including information on hypotheses, design, sample selection, data collection, procedures, and preliminary analyses of data. Pretest and posttest data were collected on approximately 300 students, ages 6, 8, and 10, who attended elementary schools in the Chicago metropolitan area during the 1977-78 school year. The statistical tests used to analyze pretest and posttest data were univariate and multivariate analyses of covariance, and regression analysis.

In Chapter 4, results are reported and discussed for the statistical tests organized by age and skill area, i.e., English reading, oral English, and Spanish reading. The results of the univariate and multivariate tests indicate where there were statistically significant differences among groups of students taught by different reading approaches. Sociological, instructional, and linguistic variables, which

accounted for significant proportions of the variance, are discussed and reported through regression analysis.

Chapter 5 provides a summary of the results, limitations of the study, implications for practitioners, and recommendations for future research.

Chapter Summary

Primarily due to federal and state legislation and judicial action, bilingual education programs are being implemented throughout the nation. However, very little systematic research is available upon which to base sound, pedagogical decisions.

The next chapter substantiates the need to investigate further the effects of different reading approaches on the acquisition of oral language and reading skills and to identify variables which relate to the acquisition of skills. Although there do not appear to be any clear-cut answers as to the most effective bilingual reading approach, the rationale is established for embarking upon the study described in chapters 3 through 5.

School districts across the country are striving to implement quality bilingual programs to ensure equal educational opportunities. It is hoped that this dissertation will contribute to the state of the art, and ultimately, to future program refinement.

Chapter 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter is to review the literature on teaching reading to second language learners in the elementary grades. The first section is an overview of the current status of research in bilingual education, including a discussion of research priorities recently suggested in the literature. The second section is a general review of psycholinguistically oriented reading research conducted in bilingual settings. The body of the chapter reviews specific studies on different approaches to teaching reading to second language learners including the native language and concurrent approaches, the direct method, and immersion programs. The concluding section is a review of those studies focusing on variables, other than pedagogical approach, which appear to relate to the successful acquisition of oral language and reading skills among second language learners.

Status of Research in Bilingual Education

An Overview

The research literature on the effects of bilingual education is fraught with contradictory findings, and it is difficult for those seeking information to find out what they want to know. Some information comes from doctoral dissertations and small-scale studies, while other information is drawn from program evaluations. In addition to personal bias and poor operational definitions, there has been a lack of uniformity in overall research design (Paulston, 1974).

In 1974, the Center for Applied Linguistics surveyed over 150 evaluation reports and found that only seven met minimal criteria for acceptability and thus contained usable information (Troike, 1978). In another study, 180 evaluation reports and research studies were surveyed, and all but three of the evaluations and 12 of the studies were rejected (Zappert & Cruz, 1977). Some of the shortcomings of the studies cited included the following:

- No control for socioeconomic status;
- Inadequate sample size, improper techniques, or excessive attrition rate;
- No baseline comparison data, no control group, or nonrelevant comparisons;
- No control for initial language dominance;
- Significant differences in teacher qualifications or characteristics, or other confounding variables; and
- Insufficient statistical information or improper statistical applications. (pp. 4-6)

It has been especially difficult to draw conclusions and make generalizations based on studies conducted in different settings. Nevertheless, the Office of Education attempted to do this with Title VII programs by subcontracting the American Institutes for Research (AIR) in Palo Alto, California.

In April 1977, the Office of Education released interim findings of the AIR Report stating that, on a national level, the programs were producing mixed results (American Institutes for Research, 1977). The evaluation involved 38 Spanish-English projects in 11 states which were in their fourth or fifth year of Title VII funding. Some 5,300 Title VII students and 2,400 of similar backgrounds not enrolled in the program were tested in the fall of 1975 and again in the spring of 1976. Major findings of the study were as follows:

1. During a 5-month period, Title VII Hispanic students made less progress in English language proficiency than their nonprogram counterparts but showed greater gains in mathematics.
2. Only one-third of the students enrolled in bilingual education classrooms were of limited English-speaking ability.
3. Eighty-six percent of the Title VII project directors reported that Spanish-dominant students often remain in bilingual classrooms after they are able to function in English (*HEW News*, 1977).

The AIR Report received a great deal of negative feedback, including a report from the Center for Applied Linguistics criticizing AIR findings on several methodological grounds (CAL, 1978). The critique was supported elsewhere (see Cardenas, 1977; Gray, 1977; O'Malley, 1978). However, Troike (1978) pointed out that the negative findings of the AIR study could not be "easily dismissed" and that many of the program inadequacies cited should be taken into consideration in improving bilingual programs.

Just as nationwide studies such as the AIR Report are inadequate, so are many of the program evaluations. Many of the evaluations prepared by local school districts are found to be inaccurate or inconclusive. The purpose of the reports and concomitant results is to maintain current funding levels or to satisfy school officials. As a result, the vast majority are worthless as a source of valid data (Troike, 1978).

Early research studies focused on the question of whether it was better to teach children to read first in the native language (L1) or the second language (L2). Due to poor operational definitions, it was difficult to draw conclusive results. Terms such as "native Spanish-speaking" and "bilingual" were used loosely to refer to groups of children whose linguistic backgrounds and language competencies varied considerably. Natalicio (1976) noted the shifts in terminology from "Spanish-surnamed" and "Spanish-speaking" to "Spanish heritage" and "Spanish background" to refer to populations in question.

Recently, studies have focused on the different ways of sequencing the language instruction in bilingual education programs, i.e., L1, L1/L2, L2, and it still remains difficult to determine if the different approaches are the main sources of positive or negative effects on student performance. (As previously indicated, the various alternatives in terms of sequencing the languages of instruction are often referred to as bilingual reading approaches; hereafter the alternatives will be referred to as such.) Cohen and Laosa (1976) stated that it is virtually impossible to introduce or even account for all of the relevant variables in a single study. A series of qualitative investigations are needed which can be replicated, so that a gradual line of research may be pursued systematically over the years.

General Research Priorities

Research priorities, both general and specific, have been identified by a number of experts in the field (Engle, 1975; NIE, 1976; Ramirez et al., 1976). Of 12 research priorities identified by Troike (1974), the following have been addressed in this dissertation: (a) research on the effects of different bilingual reading approaches with different linguistic and cultural groups and with different age groups; (b) research on problems of transfer from native language reading to reading in a second language; and (c) research on the effect of teacher attitudes.

Spolsky (1978) advocated that future research findings be reported as objectively as possible and that until "serious, well-designed studies" are conducted, a true picture of the effectiveness of bilingual education on reading and other cognitive and affective processes can not be obtained.

One of the problems has been a lack of funding for research in bilingual education. Although over \$500 million has been spent on the programs in the last ten years, less than one-half of that amount has been spent on research (Troike, 1978). Recently both the Office of Education and the National Institute of Education (NIE) were mandated by Congress to pursue research evidence to guide the development and implementation of effective bilingual programs (NIE, 1978; U. S. Office of Education, 1978). As a result, both NIE and the Office of Education have delineated specific research areas that would be fundable. Among these are studies on parental and community role in the education of children of limited English-speaking ability, the language characteristics of these children, and the most effective provisions for their education.

Transfer: A Specific Priority

An underlying theme in many of the studies on reading approach is the issue of transfer of skills—and the potential benefits of a particular reading approach in expediting transfer. Both proponents in favor of introducing initial reading instruction in the L1, as well as those in favor of introducing initial reading instruction in the L2, hypothesize that reading skills learned in one language transfer to another language. It is not at all clear, however, how such transfer takes place nor what factors are relevant to its occurrence.

Some researchers have inferred the existence of transfer by testing students in a language in which they had not received instruction; the scores were then compared with scores of students who had received instruction in that language (Lambert & Tucker, 1972; Oxman, 1977). Others have discussed the concept of transfer in terms of strategies employed by the L2 learner (Taylor, 1975).

While broad generalizations are often cited alluding to the transfer of skills, hard data are not available. Typical of the general statements found in the literature are the following:

Once the child has learned to read, a second language should present no great problem because basic reading skills are transferrable. (U. S. Commission on Civil Rights, 1975, p. 55)

...we had the impression that only a small amount of practice would be needed to transfer reading skills acquired in a non-native language to the native language. (Lambert & Tucker, 1972, p. 36)

It seems quite clear that there is a transfer of symbol-sound decoding reading skills from one language to another, provided they use the same alphabet, i.e., the same sound symbols. (Paulston, 1974, p. 19)

Specific questions on transfer have not as yet been researched thoroughly: the extent to which transfer depends on the age of students; if it depends on similarities between the orthographies and syntactic structures of the first language (L1) and second language (L2); if it is automatic, regardless of sociolinguistic and affective variables; if it occurs mostly in the mechanics of reading, that is directionality; or if it is skill-specific in areas of vocabulary, word attack, and comprehension.

Related to the claim about the transfer of reading skills, is the notion that it is easier to learn to read in some languages than in others. Many proponents of bilingual education argue that this advantage should be exploited in teaching children to read.

The child who learns to read first in Spanish or Navajo may have, in fact, a definite advantage over the child who must learn first in English. The writing system of English is not regular, and children must learn that a single sound may be spelled in many different ways. The writing system of Spanish and that which has been developed for Navajo are very regular, with close correspondence between sounds and letters. The child's ability to recognize the relationship between sound and symbol is a major factor in his success in initial reading instruction. (Saville & Troike, 1971, p. 50)

It is thus argued that reading instruction is facilitated by learning in a language that is more regular in its sound-symbol correspondences. Natalicio (1976) closely examined specific features of the Spanish writing system and challenged the previous claim.

Claims about the ease with which the transfer of reading skills occurs, especially those that appear to rest primarily (or even exclusively) on the regularity of given orthographic systems, are clearly overstated. (Natalicio, 1976, pp. 21-22)

Natalicio's point of view is shared by other researcher. DeBraslavsky (1972) claimed that learning to read Spanish (in Argentina) is not as simple as one might assume. She stated, for example, that the phoneme-grapheme correspondence has a one-to-one relationship in only nine classes (with 29 graphemes and 24 phonemes). Gibson and

Levin (1975) also argued against the assumption that the more regular the letter-to-sound correspondence of a language, the easier it is for children to learn to read. They concluded that:

...reading comprehension is little affected by the writing system or the orthography, and that the mature reader attains the competence to abstract higher order information as his exposure to the written code increases. (p. 538)

Considering that grapheme-sound correspondences represent only one aspect of learning to read, claims about transfer based solely on these correspondences are probably premature. In research on the coding of isolated words and the reading of bilingually connected discourse by skilled French-English bilingual readers, Kolers (1970) suggested that "words are perceived and remembered preferentially in terms of their meanings and not in terms of their appearance or sounds" (p. 111)

The present state of the art is inadequate, and one can only speculate on how reading skills transfer from one language to another. More comprehensive studies are needed in the general area of reading strategies and processes, and specifically, in the area of transfer. A brief review of psycholinguistically oriented research follows, focusing specifically on second language processes and strategies.

Psycholinguistic Research on Second Language Reading

First Language Reading

Much of the research on second language (L2) reading is based on psycholinguistic theories on first language (L1) reading. These theories emphasize that proficient reading is based on sampling and searching for information on the printed page and actively interpreting its meaning. Frank Smith (1972), one of the leading psycholinguistic reading researchers, described reading as follows:

Reading is not primarily a visual process. Two kinds of information are involved in reading, one that comes from in front of the eyeball, from the printed page... *visual information*, and one that derives from behind the eyeball, from the brain... *nonvisual information*. Nonvisual information is what we already know about reading, about language, and about the world in general. (p. 6)

Goodman's (1972) view of reading is similar to Smith's in that visual information is sampled by the reader to the extent it is required to confirm a prediction about meaning. For Goodman, the meaning that the reader eventually derives originates in his or her head, rather than on the page.

Both of these psycholinguistic researchers, as well as others, have focused their efforts on investigating how readers use contextual information to derive meaning from the printed page. Three types of contextual information include: orthographic constraints, syntactic constraints, and meaning constraints (Cziko, 1978). To date, there is considerable evidence that all three types are used as sources of information in reading (Goodman, 1965; Kolers, 1970; Oller, 1975; Reicher, 1969; Weber, 1970).

Considering the amount of research conducted on L1 reading, relatively little attention has been given to psychological studies of L2 reading (Brumfit, 1977).

Second Language Reading

It is obvious that there are implications of current psycholinguistic reading theories for L2 reading. Recent research demonstrates the importance of contextual information in L1 reading, and one might infer that a major difficulty on the part of second language learners may be the inability to use orthographic, syntactic, and meaning constraints effectively. Since second language learners do not have complete mastery over the new language, it is understandable that they would have difficulty relying on contextual clues.

Many second language learners do have sufficient decoding skills but are still unable to read because they cannot fully comprehend the material. The extent to which their difficulties are due to an inability to adequately use contextual clues has only recently been investigated. Nicholson (1977), for example, concluded that inability to use second language reading, even when readers possess nativelike knowledge of the syntactic and semantic systems of L2. With reference to syntactic and semantic constraints, a number of researchers have suggested that second language readers are not able to make full use of these, and instead rely heavily on the graphic information of the text (Cziko, 1978; Stafford, 1976; Young, 1972).

Although not directly concerned with the use of contextual information, some researchers have focused on the reading strategies employed by second language learners. Recent studies have investigated the extent to which the L1 influences comprehension of L2 (Brownscombe, 1977), with some researchers concluding that interference from L1 hinders reading in L2 (Cowan, 1976; Fiege-Kollman, 1977).

In contrast, other studies point to the possibility that particular strategies are developed by second language learners to compensate for their lack of knowledge of the syntactic and semantic systems of the L2 (Hatch, 1974; Oller, 1972). These findings suggest that while second language readers may perform as well as a group of first language readers, very different processes and strategies may be involved. However, very little research in this area has been done.

The majority of studies on L2 reading have focused on particular reading approaches and their relative effectiveness in terms of performance in oral language, reading, and subject-area skills. The following section is a review of the literature on teaching reading to L2 learners in bilingual programs. The various alternatives with regard to language medium of instruction are hereafter referred to as approaches.

Approaches to Teaching Reading to Second Language Learners

An Overview

The studies in this section focus on the different ways of sequencing the languages of instruction in teaching reading to second language learners. Foremost among questions frequently addressed in the literature is whether children should be taught to read first in their native language; whether they should be taught to read in two languages concurrently; or whether they should be immersed in the second language.

In an extensive review of the literature, Engle (1975) surveyed and critiqued 24 studies on the use of vernacular languages in educational programs throughout the world. She defined vernacular as the child's first language (L1) and the predominant one spoken at home. The second language (L2), or target language, was defined as the one in which the child is to develop competence. Her typology consisted of two primary models of instruction: (a) the native language approach and (b) the direct method. Through the native language approach, children are introduced to reading in the L1, receive structured instruction in the L2 as an oral subject, and are later introduced to reading in the L2. The native language is used as the medium of instruction in the content areas, and the second language is gradually introduced as the medium of instruction. The direct method, on the other hand, does not involve teaching reading in the native language. The L2 is introduced orally and reading instruction in the L2 is begun when the spoken language

has been mastered. All content area instruction is delivered in the second language.

Engle was aware of other variants to these two approaches but selected these two as contrasting models for her review of the literature. Since 1975, other typologies for teaching reading have been designed as more information on programs for L2 learners has become available.

Cohen and Laosa (1976) classified reading approaches as follows:

1. Literacy in the L1 is introduced one to three years prior to the introduction of literacy in the L2 [commonly referred to by other authors as the native language approach].
2. Literacy is introduced directly in the L2 without teaching literacy in the L1 first [referred to by Engle (1975) as the direct method].
3. Literacy in the L1 and L2 are introduced at the same time [referred to by Cohen (1975) as the concurrent approach].
4. Literacy in the L1 is introduced after literacy in the L2 has been established [as is the case in the Canadian immersion programs (Lambert & Tucker, 1972)]. (p. 150)

A modification of the above typologies was used in the subsequent review of the literature. Because many of the studies have been extensively reviewed and critiqued in numerous publications, mention will be made of them, but more emphasis will be placed on more recent studies.

The Native Language Approach

Through the native language approach, reading in the L1 is introduced one to three years prior to the introduction of reading in the L2. According to Engle (1975), one of the prerequisites of this approach is structured oral instruction in the L2. However, studies will be reviewed under this section which may or may not have included structural oral instruction in the L2.

Perhaps the most frequently cited study in support of L1 reading is Modiano's, conducted in the Chiapas Highlands of Mexico (Modiano, 1966). Children of three Indian tribes were divided into two groups: one group received initial reading instruction in the vernacular in schools run by the Instituto Nacional Indigenista (INI), and the other received initial reading instruction in Spanish in state and federally-operated schools. The groups were compared on a number of

variables, and the group that received instruction through the native language approach scored significantly higher on measures of reading comprehension.

Also investigated were the effects on student performance of the native teachers in the INI schools as compared to teachers from the dominant culture in the state and federal schools. Due to the preference of the Indian students and community for teachers of their same cultural background, it is questionable whether the differences in the two groups on reading measures were due to reading instruction in the vernacular, teacher attitudes, or teacher background (Modiano, 1973).

Support for introducing initial reading instruction in the LI in Central and South America also has been cited in the findings of Barrera-Vasquez (1953), Burns (1968), and Gudschinsky (1971).

A series of studies conducted in the Philippines, however, had mixed results (Ramos, Aguilar, & Sibayan, 1967). The Iloilo study was conducted in an area of the Philippines where Hiligayon is spoken. The experimental group received instruction in the vernacular in grades 1 and 2 and in English in grades 3 through 6. The control group received all instruction in English from grades 1 through 6. At the end of the fourth grade (two years of instruction in English for the experimental group, four for the control), "non-significant superiority in the control group was found for reading and arithmetic and a significant superiority was demonstrated for language" (Engle, 1975, p. 7).

The Iloilo study has been criticized on methodological grounds in that variables were not isolated, that there was no control for the Hawthorne effect, and that curricula materials for the two groups were not equal (Venezky, 1970).

The Rizal study in the Philippines was subsequently undertaken to investigate unanswered questions from the Iloilo study such as the most appropriate time to introduce reading in English. Two groups of students were defined according to the grade level when English reading instruction was introduced, and the grade level when English was used as the medium of instruction. The results suggested that the time at which reading was introduced in English made little difference. Results on the grade level when English was used as the medium of instruction were also not significant. The authors suggested that contradictory findings between the Iloilo and Rizal studies might have been due to differences in teacher training and the Hawthorne effect.

Tucker (1970) also conducted a study involving three classrooms in urban settings in the Philippines: all-English, all-Pilipino, and a bilingual classroom alternating days in each language. Results after one year were conflicting in that all the children did equally well on oral English and Pilipino reading measures, suggesting that there was a transfer of skills on the part of the English-only group. On English reading measures, the English-only group consistently demonstrated superior performance to the other groups. Tucker noted that this might have been due to uncontrolled variables in that the groups were not equal to begin with on pretest measures, and that analyses of covariance procedures were not used to adjust for initial differences. In conclusion, the results indicated that the alternate days bilingual approach did not result in confusion or retardation, "...rather, the bilingually instructed pupils at the end of one year appear[ed] to be developing language and content skills comparable to their control counterparts" (Tucker, 1970, p. 292).

Many other studies have been conducted throughout the world, focusing on the question of whether to introduce reading in the L1 or L2. Generally, the results from abroad are mixed. In a study in Ireland, Macnamara (1966) concluded that there were no significant differences in the language knowledge of children taught for six years in English. (For a detailed discussion of bilingual education programs in China, India, South Africa, the Soviet Union, Wales, and Belgium, refer to Cohen (1975) and Spolsky (1978).)

Research on the effectiveness of bilingual programs in general, and on the native language approach in particular, also have been made available from studies on Native American populations. Spolsky (1978) reviewed bilingual education programs for American Indians in different sociolinguistic contexts, including programs in Alaska; Seminole, Cherokee, and Choctaw programs in Oklahoma; Cree in Montana; Sioux in South Dakota; and Navaho programs in Arizona, New Mexico, and Utah.

Rosier and Farella (1976) and Rosier (1977) reported significant increases in English achievement test scores of fourth and fifth grade Navaho students at Rock Point. At Rock Point, students received initial literacy instruction in Navaho (kindergarten through grade 2) prior to being introduced to reading in English.

One of the basic assumptions of the program is that a child learns to read only once, in whatever language he is taught, but probably most

easily in the language he speaks. He can then transfer most of the skills thus acquired to another language. Learning to read in a second language may require learning new sound-symbol associations and some new rules, but the essential concepts of reading can be transferred. (Rosier & Farella, 1976, p. 380).

SAT scores for reading achievement in English of fourth and fifth graders were only .6 and .5 years, respectively, below national norms compared to 1.3 and 1.6 years below the 1972, when the bilingual education program began. Reading scores for fifth grades in other Bureau of Indian Education (BIA) schools not implementing bilingual programs were 1.6 years below Rock Point scores.

The most interesting point of this study is the authors' suggestion that the effects of bilingual instruction may be cumulative.

...that while Navaho students who had recently (in second grade) added reading in English to reading in Navaho may do no better on standardized tests than Navaho students who began reading in English, they do achieve better test scores each year thereafter. (Rosier & Farella, 1976, pp. 387-388)

Vorih and Rosier (1978) reported on program organization and administration at Rock Point which included team-teaching and a structured ESL component. The authors stated that while the student received 70% to 25% less English instruction, depending on the grade level they performed better on standardized English reading tests than their peers elsewhere on the reservation who participated in monolingual English programs.

Longitudinal studies like those previously mentioned demonstrate that bilingual education programs using the native language approach can be effective, even though the effect may not be shown by short-term, one-year-at-a-time evaluations. Whether instruction in the native language approach is the causal factor is still in question; other approaches also have shown positive results as reported in several cross-sectional and longitudinal studies.

The Concurrent Approach

Another common bilingual reading approach, often referred to as the concurrent approach, is one in which students receive initial reading instruction in two languages, the native language (L1) and the target language (L2) either during the same day (L1 A.M. and L2 P.M.) or on alternate days.

In this country, one of the earliest studies was conducted in Dade County, Florida, where bilingual programs were first implemented in

a wide scale to meet the needs of thousands of Cuban refugees (Inclan, 1971). Target students were Cuban and Anglos with subject matter presented in one language in the morning and the other language in the afternoon (half-day approach). It was found that the experimental students who received instruction through the half-day approach, performed as well as control students in language arts and math. (See Cohen (1975) and Engle (1975) for more extensive coverage of this study.)

Perhaps one of the best documented, longitudinal studies of a bilingual program using the concurrent approach was conducted in Redwood City, California (Cohen, 1975). Cohen (1975) compared 45 Mexican American children in a bilingual program, grades K-3, with 45 Mexican American children receiving conventional, English-only schooling. The experimental group was taught the academic curriculum in Spanish and English. Although the intent of the bilingual program was to introduce Spanish reading prior to English reading, in actuality, the two were introduced simultaneously. The program had been in operation since 1969, and by 1972, the third graders had had three years of bilingual schooling.

In 1975, Cohen concluded that although it was too early to assess the ultimate effects of bilingual schooling in Redwood City, the early indications were promising. In most English language skill areas, the experimental and control groups were comparable, while the experimental group was slightly more proficient in Spanish language skills. Cohen (1975) was careful to cite the limitations of his study, including nonrandom selection of students for control and experimental groups, no attempt to control for teacher differences, a relatively small sample, and variation in the treatments.

Fortunately, this research effort was continued, and students who had been in the bilingual program since grade 1 were again evaluated in grade 5 (Cohen, Fathman, & Merino, 1976). Due to attrition, the sample was reduced considerably and the authors stated that their findings were not definitive but could only be taken as suggestive. In terms of reading, it appeared that the children schooled exclusively in English performed better each year than the bilingually schooled children.

These findings suggest that reading taught via the concurrent approach may not facilitate reading in English; that instead, children who learn to read first and exclusively in English appear to do better in English reading over time. (p. 7)

Whether their findings were due to real differences in treatment, or differences in teacher and student attitudes, they cautioned that:

The findings need not indicate that *bilingual education* is incapable of making good English readers out of readers who start in their vernacular or bilingually, but rather that specific bilingual methodologies may not be successful under certain conditions. (p. 8)

Thus, one of the most important contributions made by this study was the suggestion that the concurrent approach may have had a negative effect on the acquisition of reading skills. In other words, by introducing reading skills in two languages at the same time to certain groups of students, reading competence in both languages might have been retarded. The authors stressed that in order to state whether certain methodologies are more effective for certain groups of students in specific contexts, researchers have to carefully control student characteristics and look more closely at specific treatments, teacher characteristics, and the contexts in which the programs take place.

Other studies have alluded to the possible negative effects of introducing reading simultaneously in two languages. Barik and Swain (1974) reported on the Elgin County, Ontario bilingual project where instruction in French and English was divided according to the time of day and subject matter. In this 50-50 program (also referred to as a partial immersion program), language arts was taught in French in the morning and in English in the afternoon. (Note that this is different from the situation in Redwood City where both languages were used simultaneously.) The study, conducted after the program had been in operation for three years, indicated fluctuations in the performance of the experimental group. After one year of partial immersion, there was no evidence of any lag in English language skills between the experimental and control groups. At the end of grade 2, the experimental children did lag behind their peers in the regular program. By the end of grade 3 students still lagged behind, but the gap appeared to be closing as the two language systems stabilized. This fluctuation led the authors to hypothesize that 50-50 programs "may cause students initial confusion as they attempt to develop linguistic skills in two languages concurrently, resulting in a negative effect on the native language skills" (Barik & Swain, 1974, p. 402). It should be noted that this fluctuation in performance can only be found when longitudinal studies are conducted.

Cowan and Sarmed (1976) studied bilingual program participants in Iran who were receiving reading instruction through the concurrent

approach. The authors primarily were interested in investigating the extent to which elementary school children could learn to read in two languages, English and Persian—languages which are quite different linguistically and which have different orthographies. The subjects were students in grades 1, 3, and 6 from six schools: two monolingual Persian; one monolingual English; and, three bilingual schools. One of the bilingual schools implemented an immersion approach in which instruction was in English with the exception of one and one-half hours a day devoted to Persian. The other bilingual schools had 50-50 programs in which all subjects were taught in English in the morning and Persian in the afternoon.

Results showed that the bilingually-schooled children did not perform in reading quite as well as either of the monolingual peer groups. The authors attributed this to the many linguistic differences in English and Persian. They hypothesized that the children had to develop two distinct attack strategies for reading in English and in Persian. "The net effect is that the children do not read either language quite as well as their monolingual peers" (Cowan & Sarmed, 1976, p. 100).

Their study may have implications for bilingual education programs involving languages other than Spanish. Nationwide, about 80% of the bilingual programs are for students of Spanish-speaking backgrounds. In many large urban areas, like Chicago, for example, there are programs in languages other than Spanish—Arabic, Assyrian, Cantonese, Greek, Italian, Polish, and Vietnamese. For those languages, which are very different from English, little research has been conducted to assess how reading skills are acquired and the extent to which reading skills transfer from the native language to English. If in fact the concurrent approach might adversely affect the acquisition of reading skills among students from specific language groups, serious thought should be given to modifying current bilingual education practices. At this time, the majority of bilingual programs in this country involves the teaching of reading in the native language and in English concurrently. According to Shore (1974), 52% of the Title VII programs initiated in the U.S. schools in 1969 and 1970 reported introducing reading in two languages.

Recently many studies of bilingual programs conducted in this country have reported positive results. Troike (1978) summarized the results of 12 evaluations which were a part of a survey on Title VII programs conducted by the Center for Applied Linguistics. The

evaluations indicated that the bilingual participants performed as well as or significantly better than control groups.

Recent dissertations have also reported positive effects of bilingual education programs. Levy (1976) studied Title VII bilingual programs for first and second grade Italian students in New York. Two bilingual education approaches were investigated: (a) the Fused Language Acquisition Context (FLAC) treatment groups, in which one bilingual teacher instructed an entire class of students for the whole day, and (b) the Separate Language Acquisition context (SLAC), in which students received half-day instruction entirely in English from an English-dominant bilingual teacher, and the other half-day instruction entirely in Italian from an Italian-dominant bilingual teacher. A control group consisted of Italian-dominant students receiving English instruction, exclusively. Upon completion of the study, the SLAC group was found to have achieved significantly greater gains in overall communicative ability and vocabulary development as compared to the FLAC group and the control group. In addition, the two bilingual groups combined performed better than the control group. Levy's findings support the SLAC method in particular, and bilingual instruction in general, as a viable means of educating limited or non-English-speaking students.

Legarretta-Marcaida (1976) reported on a study of five approaches which included: (1) traditional (or regular kindergarten), taught in English with no formal English as a Second Language (ESL) instruction; (2) traditional kindergarten, with ESL instruction daily; (3) bilingual kindergarten, taught in English and Spanish, using an alternate days approach and no ESL; (4) bilingual kindergarten, taught in English and Spanish, using a concurrent approach with ESL; and (5) bilingual kindergarten, taught in English and Spanish, using the concurrent approach without ESL instruction. Results indicated that bilingual treatment groups were superior to traditional treatments on measures of oral comprehension and vocabulary in English and Spanish. Specifically, treatment 3 was found to produce significantly greater gains in communicative competence in English and in Spanish.

In conclusion, the results of the studies on the concurrent approach are mixed. The following section, on the immersion approach, is a discussion of yet another alternative for teaching reading to second language learners.

The Immersion Approach

Perhaps the most well-known studies in the area of reading and academic achievement by second language learners have been conducted in Canada by a group of McGill University researchers (Lambert & Tucker, 1972). The object of their attention has been the early immersion approach where the target language, French, is the principal medium of instruction at the early grade levels for English-speaking children. In the Canadian early immersion approaches, English is introduced in language arts classes at grade 2 or 3; somewhat later, English is used to teach selected content-area subjects.

According to Cohen and Swain (1976), early immersion programs are generally characterized by the following:

- Homogenous grouping of target students and linguistic segregation from native speakers of the L2 at the onset of the program;
- Introduction of all instruction in the L2 in kindergarten and grade 1; introducing language arts in the L1 in the second, third, or fourth grades, and introducing some content instruction in the L1 by fifth grade;
- Permitting students to speak in the L1 until they are ready to communicate in the L2;
- No structured lessons in the L2;
- Pursuing the regular curriculum;
- Hiring bilingual teachers, although they only speak the L1 in the classroom and with their colleagues; and
- Voluntary program participation and parental support.

Immersion programs have been carefully planned and should not be confused with the "submersion approach" which generally has typified the nature of the school experience for many second language learners. The "submersion approach," also known as the "sink-or-swim method," was defined by Cohen and Swain (1976) as including some of the following characteristics:

- Indiscriminant grouping of target students with native L2 speakers;
- Pull-out programs teaching the second language, e.g., ESL or French as a second language, in a formal, structured way;
- Monolingual teachers;
- Little or no native language instruction in reading or the content areas; and
- Limited parent involvement.

Empirical studies conducted in various Canadian settings have reported that English-speaking students who participated in the early immersion program were able to understand, read, and write English as well as conventionally educated English-Canadians. The immersion students also communicated in French better than students taught by means of traditional, French as a second language, programs (Bruck, Lambert & Tucker, 1976).

The St. Lambert project, directed by Lambert and Tucker (1972) has served as the basic model for many immersion programs conducted in Canadian settings. Middle class, English-speaking children were voluntarily placed in an elementary school where the language of instruction was exclusively French in kindergarten and first grade, and entirely in French from grades 2-4, with the exception of two half-hour periods of English per day. By the fifth grade, students were receiving 380 minutes of French a week compared to 350 minutes of English. After a five-year assessment period, the researchers reported that the program resulted in "no native language or subject matter (i.e., arithmetic) deficit or retardation of any sort, nor . . . cognitive retardation attributable to participation in the program" (Lambert & Tucker, 1972, p. 152).

Due to the reported effectiveness of the St. Lambert project, a number of programs have been modeled after it throughout Canada. A study by Barik and Swain (1975) on a French immersion program in Ottawa found that grade 2 immersion students generally performed as well on tests of English language skills as children in conventional schools. As was the case with the St. Lambert study, grade 1 immersion participants lagged somewhat behind their English-speaking peers in English language arts, especially reading. But this lag disappeared after formal instruction in English was introduced.

Although the early immersion model has been the most widespread, other models, such as late or partial immersion, also have been implemented. Swain (1974) reported on the St. Thomas partial immersion program in which English-speaking students received instruction in French in the morning and English in the afternoon; English reading was introduced in grade 1 and French reading in grade 2. At grade 3, a group of these students was found to be less proficient in English reading than an immersion group that had not been introduced to English reading until grade 3. Swain (1974) concluded that:

...the introduction of reading in the second language in early immersion programs prior to the introduction of reading in the native language appears to foster rapid transfer of reading skills. The teaching of English reading, followed by the introduction of French reading appears to have negative effects on reading in both French and English (p. 127)

It should be noted that the St. Thomas program differed from most immersion programs in that instruction was given in one language in the A.M. and another in the P.M. Negative results from this study are congruent with findings of Cohen et al. (1976) referred to earlier.

Cziko (1976) reported on a late French immersion program initiated by the South Shore Protestant Regional School Board in Quebec. In the late immersion program, students have one or more years of traditional instruction in English and instruction in French as a second language prior to entering the immersion program. The purpose of this study was (a) to compare the English and French reading skills of two groups of immersion pupils (early and late) with appropriate English and French control groups, and (b) to investigate and compare the inter-language transfer of reading skills of the two immersion groups. As an index of transfer, partial correlations were calculated between the English and French reading scores, controlling for nonverbal intelligence. The significant positive correlations for both immersion groups indicated "that both groups were able to transfer reading skills developed via one language to the language introduced subsequently, regardless of whether they were first taught to read in the native or second language" (Cziko, 1976, p. 538).

In spite of three different educational approaches—early immersion, late immersion, and traditional schooling—all three groups performed equally on measures of English reading ability. Both early and late immersion groups did equally well on measures of French reading, although they were not comparable to the scores of the French control group.

In this country, immersion education programs have been implemented on a limited basis. The Culver City Spanish immersion program was one of the first, modeled after the Canadian programs. The program was designed for middle class, English-speaking children who were ready to read upon entering school and who were highly enthusiastic about being program participants. At the end of grade 2, the immersion students were found to be reading English at a level comparable to their monolingually school peers (Cohen, 1976). With respect to Spanish language skills, at the end of grade 1, the students

were reading at a level comparable to native Spanish speakers in Ecuador. By grade 2, they were not reading at the same level as native Spanish-speaking peers in California. Continuing evaluations of the Spanish immersion program have shown that third-year students performed as well as comparison groups in the content areas (Lebach 1974).

In this country, immersion education for majority group students is not a widespread phenomenon. This may be due to few sociostructural incentives for the middle class to enroll their children in bilingual programs (Paulston, 1975; Tucker & d'Anglejan, 1975), and to a lack of appreciation for the benefits of being bilingual (Cohen & Swain 1976).

The general findings of the immersion programs demonstrate that L2 learners can attain academic success through immersion—an approach which provides support for introducing reading instruction in the L2. In interpreting results, however, it may be remembered that the immersion programs have involved a particular student population, namely middle class, majority group students of average to above-average intelligence. The programs have also involved students belonging to a majority culture whose identity, theoretically, was not endangered by program participation.

The question remains as to the implications of immersion education for minority children. At a recent research conference in Canada on immersion education, it was suggested that further studies be conducted to investigate the possibility of offering immersion education to minority group children from working class homes (Genesse, 1976). Cohen and Swain (1976) noted that this idea would be difficult to implement due to the prevailing educational climate favoring instruction in the native language, and due to the difficulties in creating a comfortable English immersion environment which would avoid the negative characteristics of submersion education previously described.

Concluding Statement on Approaches

As of this date, there is little conclusive evidence that one approach—native language, direct method, concurrent, or immersion—is inherently superior in terms of successful acquisition of oral language and reading skills (Cohen & Laosa, 1976; Engle, 1975).

In an attempt to reconcile the apparent contradictory findings Cummins (1976; 1979) proposed two hypotheses: the threshold hypothesis and the developmental interdependence hypothesis.

According to the former, Cummins theorized that there may be threshold levels of linguistic competence children must attain in order to avoid cognitive deficits. The developmental interdependence hypothesis relates to the functional interdependence between L1 and L2 skills.

Cummins applied these hypotheses to specific educational settings. For example, Canadian studies show that when English-speaking students are immersed in French instruction in the early grades, they generally do not experience cognitive retardation. This could be due to the following:

... during the early grades the children's interaction with environment, and consequently, cognitive development, is less dependent on the mediation of language than at later grades. This may give these children a "breather" in which they can gain the L2 skills necessary to benefit optimally from an increasingly symbolic environment. (Cummins, 1979, p. 230)

With reference to minority children, Cummins suggested that widespread academic failure might be attributable to the fact that many have "less than native-like competence in both languages" (p. 231). Thus, bilingual programs, which provide native language instruction, facilitate the development of L1 skills—skills which may be requisites for further cognitive growth in the L2.

With reference to the proposed relationship between the L1 and L2, Cummins (1979) noted that the majority of immersion program participants enter school with a degree of competence in the L1, i.e., English, and that their L1 "seems to be impervious to 'neglect' by the school" (p. 233). On the other hand, since minority students in this country do not necessarily enter school with the same level of competence in the L1, they might have a need to further develop their L1 skills prior to receiving instruction in the L2.

In short, Cummins suggested that a variety of factors, including socioeconomic status, levels of language competence, and motivation, be taken into consideration in selecting an instructional approach for second language learners.

Current research efforts have been directed at identifying the specific factors which appear to relate to the successful acquisition of skills. These include student characteristics such as sex, ethnic background, age, and socioeconomic status; teacher characteristics such as experience, bilinguality, and attitudes toward L2 learners;

parental and community attitudes; and the subtle interactions among these factors.

The following section will explore the literature on variables which appears to relate to success in reading among second language learners.

Variables Relating to the Successful Acquisition of Reading Skills

According to Cohen and Laosa (1976), some of the contradictory findings in bilingual education research literature might be explained by certain "fundamental differences" among the populations sampled. These differences could be related to uncontrolled instructional variables, student variables, or teacher variables.

Following is a review of the literature on selected variables relating to the successful acquisition of reading skills among second language learners, including empirical studies investigating the effects of these variables. Inasmuch as it would be nearly impossible to discuss all of the variables that might affect reading performance, only a few variables have been selected for discussion; these relate to the study described in chapters 3 through 5. Discussed are some sociological variables (age, ethnic background, and socioeconomic status) and instructional variables (English as a Second Language (ESL) instruction and teacher attitudes toward second language learning).

Sociological Variables

Age. Recent studies in second language learning have focused on individual characteristics of the learner and among these, the age factor. It has been frequently noted that some aspects of a child's learning capacity changes as the child grows older, but the question remains as to what extent this affects language learning. For years it has been a widely accepted fact that young children acquire a language with greater ease and efficiency than older children and adults. However, the evidence to support these assumptions has been largely anecdotal. With Lennenberg's (1967) notion of a "critical period," linguists were able to support the theory of child superiority in language acquisition. Lennenberg stated that there is a biologically determined period of primary language acquisition which begins around the age of two and continues until puberty, before cerebral dominance or lateralization is

completed. This notion of a critical period has been extended to account for the relative lack of success that adults experience when learning a second language.

Recent studies have challenged the assumption that there is a biologically based critical period for language acquisition (Krashen, 1973) and researchers are now focusing on the similarities or differences in the language acquisition process among young children, older children, and adults.

Current L2 research indicates that while there seem to be changes in language acquisition with age, younger children are not necessarily better learners (Asher & Price, 1967; Bailey, Madden, & Krashen, 1974; Politzer & Weiss, 1969). Fathman (1975a) examined the relationship between age and certain aspects of the second language acquisition process. The results from her study indicated that there was some relationship between age and rate of learning: older children (11-15) received significantly higher scores on morphology and syntax subtests, while younger children (6-10) received higher scores on phonology subtests. But, there were no differences observed in the order in which the children of different ages learned to produce the morphological and syntactic structures included in the tests.

In another study, Fathman (1976) found that children in the elementary grades (K-6) generally made larger gains on measures of oral English proficiency than the secondary students (7-12). She speculated that the differences might have been related to differences in oral ability or to the type of instruction given to younger children. (Primary students generally receive more oral instruction, while older students receive more instruction on reading and writing skills.)

In 1977, Fathman reported on an investigation of the relationship between age, language background, sequence of learning, and the kinds of errors made on certain grammatical structures among 120 Spanish and Korean speakers, ages 6 through 14. She found that the sequence of learning was strikingly similar for all subjects, despite age or language background. Upon comparing the kinds of errors made, she reported that only 15% of the errors were related to language background differences, while almost no errors were related to age differences.

The age of students, however, can make a difference, especially if prior school experiences are considered. As an anecdotal observa-

tion, many professionals working with limited English speakers have reported that students who have acquired literacy skills in their native language and who immigrate to the U.S. after grade 6, acquire English more quickly and "out-perform" limited English-speaking students who have been in the U.S. schools since grade 1. This observation appears to have been supported by recent studies conducted in Sweden.

Skutnabb-Kangas and Toukoma (1977), found "if Finnish children immigrated in Sweden when they were of pre-school or primary level age, they fell within the lower 10% of Swedish children in Swedish language skills" (Troike, 1978, p. 13); older children, who had had five to six years of education in Finland, were much more likely to perform at a rate commensurate with their Swedish peers. The authors suggested that because the older children had better developed skills in the L1, i.e., Finnish, they were able to reach a higher level of mastery in Swedish language concepts. Similar to theories proposed by Cummins (1976; 1979), Toukoma and Skutnabb-Kangas (1977), discussed their findings in terms of a necessary threshold level of competence.

The basis for the possible attainment of the threshold level of L2 competence seems to be the level attained in the mother tongue. If in an early stage of its development a minority child finds itself in a foreign language learning environment without contemporaneously receiving the requisite support in its mother tongue, the development of its skill in the mother tongue will slow down or even cease, leaving the child without a basis for learning the second language well enough to attain the threshold level in it. (1977, p. 28)

Thus, considering the studies done in this country and abroad, it appears that more research is needed to determine conclusively the effects that age may have on language learning of particular groups of students.

Socioeconomic factors. Cohen and Laosa (1976) noted the need for investigate socioeconomic factors as they relate to student performance. Very few studies, however, are available related to socioeconomic factors as predictors of student performance in bilingual education programs.

Tanguma (1977), in a study of Mexican American fifth and sixth grade students in a bilingual program indicated that socioeconomic status, as predictor variable, did not significantly affect achievement gain scores.

In contrast, Powers (1978) reported that socioeconomic status accounted for a significant amount of the variance in academic achievement.

Ethnic background. Current research has indicated that different ethnic groups exhibit different patterns of ability, each displaying certain patterns of strengths and weaknesses (Lesser, Fifer, & Clark, 1965; Stodolsky, 1972). Other studies have revealed significant culture-sex interactions in the personality development of children (Laosa, Swarz, & Diaz-Guerrero, 1974). Some researchers have noted that specific behaviors, such as cooperativeness and competitiveness, differ according to membership in a given cultural group (Kagan & Madsen, 1972).

With reference to learning to read, McDermott (1977) hypothesized that reading failure could be explained by the cultural makeup of the classroom, and not by biological, psychological, or linguistic deprivation.

The hypothesis to be explored... is that for the minority child in most American public schools, success in reading and success in social interaction with one's peers in the classroom are mutually exclusive. This is so because of conflict between the child's culture and the dictates of the teacher's culture. Even the best teachers and the most intelligent of children can fall prey to such conflict, and together they produce failing records. (p. 10)

Based on the few studies cited above, it is obvious that little is known about the effect that membership in a given ethnic group has on student performance, and more empirical research is necessary.

Instructional Variables

English as a Second Language (ESL) instruction. Many of the empirical studies conducted in the area of ESL have concentrated on adult students, and very little information is available with reference to elementary students (see Cooper, 1978).

In a recent study aimed at investigating current ESL methodology in bilingual education programs, Ramirez and Stromquist (1979) identified ESL teaching practices associated with student language learning. Based on observation of 18 ESL teachers and their classes, the authors found that predominant teaching emphases on mechanical language drills and adherence to a specific sequence of language skills were ineffective. Techniques which emphasized correction of grammatical errors, as opposed to pronunciation errors, and questioning techniques with guided responses, were more effective. Selected teacher behaviors and knowledge of applied linguistics also were found to account for approximately two-thirds of the variation in student achievement in ESL.

Earlier studies on the effects of ESL instruction with elementary students suggested that ESL has little effect on certain aspects of language learning. Dulay and Burt (1973) and Fathman (1975b) reported similar orderings of grammatical structures for children enrolled in different types of language instruction programs. Other studies reported that students enrolled in ESL classes did not necessarily learn English at a faster rate than those not enrolled (Fathman, 1975a; Hale & Budar, 1970).

The results of all these studies should be evaluated carefully, inasmuch as ESL can be operationally defined in a number of ways. More research using observational techniques would clarify the role ESL plays in the acquisition of oral language skills. Rather than an ESL versus non-ESL distinction, there may be other variables including affective variables which influence language performance. Fathman (1976) also suggested that some variables to consider further might include the size of the class, hours spent in class, the grade level teaching emphasis, and the relative concentration of L2 learners in a given school.

Teacher Attitudes Toward Second Language Learners

Ever since Rosenthal and Jacobson (1968) demonstrated that teacher expectations could affect student progress, there has been a growing interest in teacher attitudes towards pupils, including attitudes toward speech. With reference to bilingual programs, in particular, it is necessary to take attitudes into consideration, for the success or failure of programs may depend on teacher attitudes (Macaulay 1977).

Many of the first attitudinal studies were related to nonstandard dialects of English. In New York City, Labov (1966) found that socially stratified dialect characteristics served as cues when listeners attempted to guess the occupation of speakers. Shuy, Baratz, and Wolfram (1967) found a high degree of correct identification of speakers' race and social status based on short excerpts of recorded speech.

In an ingenious experiment, Williams, Whitehead, and Miller (1971) showed how stereotypes affected student evaluations by dubbing standard English passages onto the videotapes of children from three ethnic groups. The black child with a standard English soundtrack was rated as more "ethnic-nonstandard" than the Anglo child. The Mexican American child was rated as markedly less "confident-eager."

With reference to second language learners, Lambert, Hodgson, Gardner, and Fillenbaum (1960) used the "match-guised technique" to compare teacher reactions to English and French. They found that subjective evaluations of speech were often affected by associations based on stereotypes held about majority and minority language groups. Similar techniques were used to study teacher attitudes toward Arabic and Hebrew (Lambert, Anisfield, & Yeni-Komshian, 1965).

Arias (1977) explored the influence of speech style of Mexican American children in relation to other personal cues on the formation of teacher expectations of pupil behavior. Her results indicated that the teachers more favorably evaluated students whose voice quality was good.

With reference to teacher attitudes toward bilingual education, Chapa (1977) found that elementary principals and teachers who had positive attitudes toward disadvantaged children were inclined to have more favorable attitudes toward bilingual education. In particular, Mexican Americans had more positive attitudes toward bilingual education than non-Mexican Americans.

In Canada, Campbell, Taylor, and Tucker (1973) found that French-speaking teachers had more favorable attitudes toward French immersion programs than English-speaking teachers.

Arias and Gray (1977) extensively reviewed much of the literature and stated that the research was inconclusive in substantiating assumptions that teacher attitudes affect the learning potential and performance of pupils. Their conclusions were confirmed by a recent evaluation study of a bilingual program in southern California which failed to produce the expected bias of Anglo teachers toward Spanish speakers (Marks & Heffernan-Cabrera, 1977).

In short, the research on the effects of teacher attitudes toward performance of second language learners must also be investigated further.

Chapter Summary

The purpose of this chapter was to review the literature on teaching reading to second language learners in the elementary grades. The review focused on four major areas: current status of research in bilingual education; bilingual education approaches to teaching reading; psycholinguistic reading research; and other factors relating to the acquisition of oral language and reading skills.

A review of the status of research on bilingual education indicated that there is not yet a systematic database upon which to form generalizations. However, research priorities recently have been identified and include studying the effects of a different reading instructional approach and problems of transfer from native language reading to reading in a second language.

Very little research has been conducted on psycholinguistic processes and strategies involved in second language reading. Further research in this area would contribute greatly to the state of the art.

The majority of the studies have focused on the different ways the first and second languages are sequenced in the bilingual education curriculum. Alternatives include native language, concurrent, and immersion approaches. To date, there is little conclusive evidence that one approach is inherently better than another.

Current research efforts are being aimed at identifying factors, other than approach, which appear to relate to the successful acquisition of oral language and reading skills.

It should be clear that there is a need for further investigation of reading approaches and the effects of selected variables on the acquisition of reading skills among L2 learners. The study described in the following chapters was designed to meet this need.

Chapter 3

METHODOLOGY

Introduction

The review of the literature is inconclusive in terms of the inherent superiority of one bilingual reading approach as compared to another for students of limited English-speaking ability. The literature is also inconclusive in terms of identifying those variables which might affect the acquisition of oral and reading skills in English. Notwithstanding, bilingual education programs are being implemented across the country with a variety of instructional approaches.

In the Chicago public schools, bilingual education programs have been mandated since July 1976 by Article 14C of the Illinois School Code in every school with an enrollment of 20 or more limited English-speaking students of the same language background.

According to the *Rules and Regulations for Transitional Bilingual Education Programs in the State of Illinois, 1976*, a bilingual education program is defined as a program of instruction

- ... in all those courses or subjects which a child is required by law to receive and which are required by the child's school district which shall be given in the native language of the children of limited English-speaking fluency who are enrolled in the program, and in English, and
- in the language arts of the native language of the children of limited English-speaking fluency who are enrolled in the program and in aural comprehension, speaking, reading, and writing of English, and
- in the history and culture of the country, territory and geographic area which is the native land of the children or of the parents of children of limited English-speaking fluency who are enrolled in the program and in the history and culture of the United States.
- No program may provide less than 90 minutes of instruction daily through the native language of the students enrolled in the program. (Section 1.08, 2-3)

Although the mandate went into effect in July 1976, bilingual programs had been implemented as early as 1969. The first were Spanish bilingual programs, and by the 1977-78 school year, there were over 160 programs serving 20,000 students from 14 language backgrounds (see Appendix A-1).

To identify the 20,000 target students in need of bilingual education, the *Functional Language Survey (FLS)* was administered individually to over 80,000 non-English background students in the spring of 1977. (Non-English background was defined as a home in which a language other than English is spoken in daily interaction.) The students surveyed represented over 100 different language backgrounds and 80% were Spanish-speaking.

The bilingual programs have been evaluated on a yearly basis by the Department of Research and Evaluation of the Chicago public schools. A recurring theme in the yearly evaluation reports is the difficulty of establishing comparison groups due to the diversity among programs.

Chicago bilingual programs...are quite diverse. Variation in the amount of instructional time, language usage of pupils, experience of teachers, teacher's dominant language, and student's language fluency is substantial. (Bilingual Evaluation Report, 1977, p. 10)

The diversity is present in terms of other instructional variables including organization model (pull-out, team-teaching, self-contained), variations in language sequencing, types of instructional materials used, staffing allocations, the extent to which instruction is individualized, and whether there is an ESL component.

With respect to organizational model, it appears to be a function of the number of target students in a given school as well as the availability of space. In previous years, the evaluation designs treated organizational model as an independent variable until it was found that model was not a key factor, and that other instructional and student variables appeared to have intervening effects.

With respect to bilingual reading approaches, a variety are implemented in the Chicago schools, and it is sometimes common to find more than one approach practiced in a given school. For example, one first grade teacher may present reading in two languages on a daily basis; another first grade teacher, in the same school, may provide reading instruction in the native language only. In short, there does not appear to be any systematic manner of selecting a reading ap-

proach. It should be noted that while current state rules and regulations are specific as to the minimum amount of time to be spent in the native language, no reference is made to the sequencing of languages in the curriculum; specifically, no reference is made to the sequencing of languages in teaching reading, i.e., bilingual reading approach.

As a result of these observations, the major intent of this study was to provide additional empirical data to assist practitioners in their selection of a bilingual reading approach.

General Statement of the Problem

The present study was designed to investigate and compare student performance on (1) the acquisition of oral language skills in English, and (2) the acquisition of reading skills in English and Spanish.

The first problem investigated in this study was whether there were significant differences in the acquisition of oral language and reading skills among groups of limited English-speaking children, ages 6, 8, and 10, receiving instruction through different bilingual reading approaches. For purposes of this study, three bilingual reading approaches have been defined:

1. *Native Language Approach (NL)* - Initial reading instruction is given, on a daily basis, in the native language (L1), i.e., Spanish, prior to formal instruction in English (L2). When students master basic reading skills in the L1, and oral skills in the L2, reading instruction is presented in the L2.
2. *Concurrent Approach (CON)* - Initial reading instruction is given in both the L1 and L2 on a daily basis.
3. *Direct Method (DM)* - Reading instruction is given exclusively in the L2 on a daily basis.

With reference to transfer of skills, it was anticipated that inferences might be drawn by investigating the English reading skills of students receiving reading instruction in Spanish only, as well as the Spanish reading skills of students receiving reading instruction in English only.

The second problem was to determine other sociological, linguistic, and instructional variables which appeared to relate to the acquisition of skills among limited English-speakers, ages 6, 8, and 10. Sociological variables included sex, ethnic background, and socioeconomic level. Linguistic variables included oral fluency levels in English and Spanish. Instructional variables included enrollment in a bilingual education program, years enrolled in the program, instruc-

tion in English as a Second Language (ESL), teacher training, and teacher attitudes toward second language learners (see Table 1).

Hypotheses

Two major hypotheses were derived:

Hypothesis 1. There were no differences among limited English-speaking students, ages 6, 8, and 10, in different reading instructional groups on measures of oral English skills, and reading skills in English and Spanish.

Hypothesis 2. There were no relationships among independent variables and dependent variables measuring oral language and reading skills for groups of limited English-speaking students, ages 6, 8, and 10.

Both hypotheses were further subdivided for each of the three age groups by skill area, i.e., oral English, English reading, and Spanish reading.

Design

The subjects were Spanish background students, ages 6, 8, and 10 who were limited in English and enrolled in 13 public and nonpublic elementary schools in the Chicago metropolitan area. Of the 37 students pretested, 306 were available for posttesting. Subjects were grouped according to three different bilingual reading approaches: th

Table 1
Sociological, Linguistic, and Instructional Variables
Relating to the Acquisition of Oral Language and
Reading Skills

<i>Variables</i>		
<i>Sociological</i>	<i>Linguistic</i>	<i>Instructional</i>
Sex	Oral fluency in L1	Enrollment in a bilingual program
Ethnic background	Oral fluency in L2	Years enrolled
Socio-economic level		ESL Teacher training Teacher attitudes toward L2 learners

native language approach (NL), the concurrent approach (CON), and the direct method (DM).

For purposes here, the native language and concurrent approaches were considered as experimental, with the direct method being the control.

Each of the three age groups were treated as subsamples. Table 2 depicts the preliminary design with cells having an *n* of 45 and a total *N* of 315. Anticipating a loss of subjects from the time of pretesting to posttesting (i.e., mortality), 379 students were initially sampled. No attempt was made to sample students, ages 8 and 10, in the native language approach. Generally speaking, bilingual teachers are anxious to have intermediate-age children exposed to reading skills in English as soon as possible, and thus, prefer the concurrent approach.

Table 2
Anticipated Preliminary Design

<i>Age Group</i>	<i>Reading Instructional Group^a</i>	<i>N</i>	<i>Total</i>
6	NL	45	135
	CON	45	
	DM	45	
8	CON	45	90
	DM	45	
10	CON	45	90
	DM	45	

Note: Total N = 315.

^aNL = Native Language Approach; CON = Concurrent Approach; DM = Direct Method.

With this design in mind, the first task was to identify those schools and classrooms where the particular approaches were being practiced. The second task involved the actual selection of students.

Selection of Schools

A priori, it was decided to select subjects from more than one classroom and more than one school for each cell. By obtaining a

cross section of students throughout the city, the following objectives would be accomplished:

- The generalizability of results would not be limited to only a few schools with similar characteristics;
- The treatment effects on groups of students from more than one ethnic background could be investigated;
- The treatment effects on students of varying socioeconomic levels could be considered; and
- Individual teacher effects would be minimized.

Other decisions were made prior to selecting schools. First, no Chicago public school was selected that had been designated by the Department of Research and Evaluation as a "focus" school for the 1977-78 citywide evaluation of bilingual programs. Excluding focus schools ensured that students sampled would not run the risk of being overtested, possibly on some of the same instruments. Second, only those principals and teachers who were willing to cooperate were included, based on initial interviews in September 1977. Third, experimental groups were selected from schools implementing bilingual programs for a minimum of three years. This ensured that bilingual programs would be operating, for the most part, within guidelines; teachers would have received inservice training on program objectives and goals; and sufficient bilingual instructional materials would be available.

Schools with Spanish language programs were selected because they were able to meet the above criteria. Additionally, more testing instruments were available in the Spanish language.

The most crucial decision was made with reference to the control group. As defined earlier, the control group consisted of students receiving reading instruction in English only, i.e., the direct method. Inasmuch as Article 14C of the Illinois School Code has mandated bilingual instruction in all public schools with 20 or more children of limited English-speaking fluency who share a common home language, there were two alternatives in terms of finding a control group: (1) select public schools with an enrollment of fewer than 20, or (2) select nonpublic schools.

For the following reasons, the second alternative was chosen. First, the schools with small enrollments of limited English-speaking children are usually not in the inner city and often differ from other schools in terms of poverty levels. It was also assumed that the en-

vironment of students in schools with fewer than 20 differs substantially from schools with significant populations of limited English-speaking children. In addition, at least a dozen schools would had to have been selected in order to satisfy the requirements for cell size. The logistics in terms of pretesting and posttesting also would have been very complex.

The better alternative was to select nonpublic schools within the same attendance areas as the selected public schools. This ensured, to some extent, similar socioeconomic levels. That the control group was selected from nonpublic schools is an obvious limitation of the study and the results have been interpreted with due caution.

In September 1977, 20 public and nonpublic elementary schools throughout the city were selected for initial visitation. Selection of public schools was based on the researcher's previous experiences working in the public schools. Schools were located in the southwest, northeast, and central sections of the city ensuring that the sample would consist of schools with predominantly Puerto Rican and Mexican background students, and schools with equal distributions of students from both ethnic groups. Selection of nonpublic schools was based on lists of schools with predominantly Mexican and Puerto Rican students, provided by the bilingual ESL educational consultant of the Chicago Archdiocese.

Principals and teachers from the public and nonpublic schools were interviewed to determine if they would be interested in participating in the study. An affirmative response was the basis for a follow-up interview in which teachers were asked the following questions:

1. In which language were students receiving daily reading instruction, and for approximately how many minutes per day?
2. For students receiving reading instruction in Spanish only, when did the teachers anticipate introducing reading instruction in English?
3. Did students receive ESL instruction and who was responsible for the delivery of instruction?
4. Were students in self-contained classrooms or did they receive ESL and/or bilingual instruction on a pull-out basis?

Based on the responses to the initial interviews, eight public and five nonpublic schools were selected.

Selection of Students

Teachers in the 13 schools were requested to provide lists of Spanish

background students in their classrooms whom they judged to be of limited English-speaking fluency (language levels I, II, and III). Next to each student's name, they were requested to include the age cycle as of December 1, 1977, ethnic background, and level of English language proficiency. Levels of English language proficiency were defined as follows:

Level I. The student does not speak, understand, or write English, but may know a few isolated words or expressions.

Level II. The student understands simple sentences in English, especially if spoken slowly, but does not speak English, except isolated words or expressions.

Level III. The student speaks and understands English with hesitancy and difficulty. With effort and help, the student can carry on a conversation in English, understand at least parts of lessons, and follows simple directions.

Level IV. The student speaks and understands English without apparent difficulty but displays low achievement indicating some language or cultural interference with learning.

Level V. The student speaks and understands both English and the home language without difficulty and displays normal academic achievement for grade level.

Level VI. The student either predominantly or exclusively speaks English. (*Functional Language Survey*, 1977)

(This six-level scale has been modified in the *Revised Functional Language Survey* of May 1978.)

A simple random selection approach was employed in which every other name was selected. The lists were then reviewed so that equal numbers of students at English proficiency levels I, II, and III were selected. (Students in levels I-III are the target groups for bilingual education, as designated by the Chicago public schools.) Level IV students were included, on a limited basis, inasmuch as these students also participate in bilingual education programs. With class lists including students from more than one ethnic background, efforts were made to ensure selection of equal numbers of students from Puerto Rican and Mexican backgrounds.

Table 3 illustrates the composition of each cell in terms of the number of schools and classrooms involved and the number of students pretested. As mentioned earlier, more than one school and more than one classroom were included in each cell to reduce individual teacher and school effects. While the preliminary design re-

Table 3
Number of Schools, Classrooms, and Students Initially
Sampled by Age and Reading Instructional Group

<i>Age Group</i>	<i>Reading Instructional Group^a</i>	<i>No. of Schools</i>	<i>No. of Classrooms</i>	<i>No. of Students</i>
6	NL	5	6	66
	CON	4	5	54
	DM	5	5	45
8	CON	7	10	88
	DM	5	8	38
10	CON	6	8	60
	DM	6	10	28

Note: N = 379.

^aNL = Native Language Approach; CON = Concurrent Approach; DM = Direct Method.

quired a total sample of only 315. 379 subjects were included in the pretesting session. This was done to anticipate sample mortality at posttesting due to student transfer to other classrooms or schools, teacher transfers, or other organizational changes which could alter the initial comparability of the groups.

Summary

Limited English-speaking students, ages 6, 8, and 10, were selected from 13 elementary schools in the Chicago metropolitan area—8 public and 5 nonpublic schools. Students were grouped according to type of reading approach, and data from the three age groups were treated separately: 379 students were pretested and, of these, 306 were posttested during the 1977-78 school year. The specific data collected are described in the following section.

Data Collected

Two types of data were collected, data relating to students and data relating to teachers. Student data included background information and pretest and posttest scores on various measures of reading and oral language skills. Teacher data included background information and a score on a language-attitude questionnaire.

Student Data

Background Information. Prior to formal collection of data through tests and questionnaires, initial data on the following were collected in September 1977: age, language proficiency level, ethnic background, enrollment in a bilingual or nonbilingual classroom, and type of reading instructional approach (native language, concurrent, or direct method).

Student Information Sheets were distributed to the teachers in April 1978 to verify the preliminary data (see Appendix D-1). By distributing these in April, teachers did not have to complete forms for students who had transferred out after the pretesting session.

The Student Information Sheet contained the following information:

- Sex
- Birthdate
- Birthplace
- Birthplace of mother and father
- Ethnic background
- Approximate number of years in U.S. (mainland)
- Number of years in a U.S. (mainland) school including preschool and kindergarten
- Enrollment in a bilingual program
- Number of years enrolled in a bilingual program
- Daily reading instruction in Spanish in minutes per day, and month during the 1977-78 school year in which this instruction began
- Daily reading instruction in English in minutes per day, and month during the 1977-78 school year in which this instruction began
- Instruction in English as a Second Language (ESL) in minutes per week, and person responsible for the instruction
- Participation in a free lunch program
- Welfare

An explanation of these variables and subsequent analyses are provided in the section *Preliminary Analyses of Data*.

Test data. Recent literature has documented the multitude of problems in selecting valid and reliable instruments to accurately assess L2 learners' skill level in reading and oral proficiency (De Avila &

Havassy, 1974; Moreno, 1970; Ramirez et al., 1976). The consensus appears to be that adequate tools may not as yet be available (Tucker, 1977). Nevertheless, researchers have continued to examine the effects of different educational approaches on the native and second language development of pupils from diverse backgrounds.

In general, most researchers have chosen to use standardized, norm-referenced tests. The apparent shortcomings of these tests have been well documented, and some of the criticisms follow:

1. They are linguistically and culturally biased in that they have been developed and standardized on entirely English-speaking populations (Briere, 1973; Perrone, 1977).
2. They measure student test-taking ability rather than acquisition of academic skills (Dyer, 1976).
3. They do not indicate the extent to which students have mastered specific instruction objectives (Skager, 1971).

To avoid the shortcomings of standardized tests, many researchers are now using criterion-referenced measures (Cornejo, 1974). The definite advantage to these tests is that they measure the mastery of skills that children have actually been taught and do not involve comparisons of performance in relation to others. But it is also important to recognize that criterion-referenced tests may not be the panacea, for they too are vulnerable to cultural bias as their content, format, and administration may be similar to those of standardized tests (Cohen, 1969; Drew, 1973).

With reference to oral proficiency and language dominance measures, numerous tests have been developed within recent years. In part, this has stemmed from recent legislation and judicial decisions mandating objective assessment techniques of students of limited English-speaking ability. Surveys of available oral language tests demonstrate their inadequacies (see Brown & Zirkel, 1977; De Avila & Duncan, 1976; Northwest Regional Educational Laboratory, 1976; Symes, 1975).

Specific steps were taken in this study to compensate for the lack of available and appropriate instruments to assess skills of limited English-speaking students. First, a combination of reading measures was used which included both standardized *and* criterion-referenced measures. Second, modifications were made in the administration of the standardized tests to ensure that the subject understood test in

structions. These modifications are included in the discussion of the respective instruments.

What follows is a description of the instruments used in this study, the rationale for selection, and any modifications made.

- I. Tests of Oral Language Proficiency - English and Spanish
 - A. *Functional Language Survey (FLS)*, May 1977, published by the Board of Education, City of Chicago.

In response to federal and state reporting requirements, the Chicago public schools conducted an exhaustive search for instruments to assess the language needs of pupils of non-English backgrounds. The search proved unsuccessful, and it was decided to develop an instrument suitable for local needs. A committee composed of professional linguists and educators with experience in bilingual education constructed the *FLS*.

A series of pilot studies resulted in the 15-item scale known as the *P*-scale. The 15-item test is administered to each pupil individually, averaging approximately 15 minutes. The first five items require the pupil to repeat verbatim sentences that the tester speaks at a normal, conversational rate. Items 6 to 10 elicit the pupil's verbal responses to questions asked. The last five items require the rate to judge how well a student is expected to respond to a certain verbal task.

Inter-item and item-to-scale Pearson correlation coefficients suggested a high degree of internal consistency. The inter-item correlations ranged from .51 to .89; the item-to-scale coefficients ranged from .79 to .91. Correlations between the 15 items and teacher ratings of student proficiency ranged between the .75 and .81. The *P*-scale was also highly correlated with standardized reading and vocabulary tests.

The *FLS* was selected because it had been used successfully by a large school system and it appeared to identify accurately students of limited English fluency.

All students, ages 6, 8, and 10, were pretested in October 1977 to ensure that the sample consisted of students limited in English. Many of the public school students had been surveyed in May 1977, but by administering the test at the same time to all subjects, public and non-public, some threats to internal validity were avoided; e.g., history, maturation, and instrumentation. (For technical information on the 1977 *FLS* and 1978 Revised *FLS*, refer to: the *Bilingual Evaluation Reports* of fiscal '77 and '78 published by the Chicago Board of

Education; and E. De Avila's report submitted to the Chicago Board of Education, "On the Development of the *Functional Language Survey: A Review of Preliminary Psychometric Findings*," September, 1977.)

B. *Language Assessment Scales*, Level I, published by Linguametrics, Inc., Corte Madera, California, 1976.

The *Language Assessment Scales (LAS)*, Level I were developed by Edward De Avila and Sharon Duncan. Two versions of this instrument are available—one in Spanish and one in English, each of which measures oral proficiency in the respective language. The *LAS* Level I is appropriate for limited English-speaking students grades K through 6 and takes approximately 20 minutes to administer individually.

The five subtests evaluate phoneme production, the ability to distinguish minimal sounds, oral syntax, comprehension, vocabulary, oral production, and ability to use language for pragmatic ends.

As reported in the test manual, an interrater reliability study indicated Pearson correlations ranging from .86 to .98 for the different subtests. Internal consistency was examined for seven age groups; correlations ranged from .63 to .96. Validity was measured by how well the *LAS* discriminated an English-speaking group from a limited English-speaking group. The differences were significant beyond the .001 level (Mann-Whitney *U* test).

The *LAS*, Level I versions in English and Spanish, hereafter referred to as *LAS(E)* and *LAS(S)*, were selected because of their comprehensiveness in assessing more than one linguistic subsystem, e.g., syntax.

Four of the five subtests of the *LAS(E)* were administered to all subjects, ages 6, 8, and 10, at pretesting and posttesting sessions. The same four subtests of the Spanish version were administered as a pretest only.

Subtest 5 was not administered because this subtest was more difficult to administer and score. Although research assistants received extensive inservice training on test administration, they were not sophisticated enough in language assessment techniques to administer accurately this particular subtest.

II. Tests of Reading Skill - English

A. *Stanford Early School Achievement Test*, Level II

Harcourt, Brace, & Jovanovich, Inc., New York, 1970

The *Stanford Early School Achievement Test (SESAT)*, Level II was designed for students in grades 1.1 through 1.8. It is a standardized test consisting of four subtests and is administered to groups. Due to the fact that the students were limited in English, only one and one-half subtests were administered, on a pretest and posttest basis, to students, age 6. "Letters and Sounds," 13 items, measured knowledge of upper and lowercase letters and beginning sounds. Eighteen items of the subtest "Word Reading" measured recognition of the printed word, independent of the context.

Another modification was made in that all test instructions were administered bilingually—first in Spanish and then in English. This was done to ensure that subjects felt comfortable and understood the tasks at hand. In testing students of limited English-speaking ability, it is often difficult to assess what they know and are able to do, especially when they do not comprehend the initial instructions.

Although validity and reliability coefficients, item analyses, percentiles and stanines are reported in the test manual, these become obsolete in light of the modifications. Raw scores were used in the statistical analyses.

B. *Stanford Diagnostic Reading Test*, Red Level
Harcourt, Brace, & Jovanovich, Inc., New York, 1973

The *Stanford Diagnostic Reading Test (SDRT)*, Red Level aids in the identification of specific strengths and weaknesses in the areas of reading comprehension, vocabulary, syllabification, auditory skills, various aspects of phonetic analysis, and rate of reading. The Red Level is intended for use with students in grades 2.5 through 4.5 and is administered to groups.

For this study, 8 and 10 year olds were pretested on Form A and posttested on Form B for three subtests: "Phonetic Analysis" (40 items); "Word Reading" (42 items); and "Reading Comprehension" (48 items). This test, and these subtests in particular, were selected because of the use of pictures associated with each item. The use of visuals ensured to a greater degree that the test would be more meaningful for the limited English-speaking student. Although the 10 year olds were technically in grade 5, they were administered Level I due to their limited fluency in English. Again, all test instructions were administered bilingually—first in Spanish and then in English. Scaled scores, rather than raw scores, were used in the statistical analyses.

C. *CRS Placement/Diagnostic Test, English Version*
Crane Publishing Company, Trenton, New Jersey, 1977

The *CRS*, English version, *CRS(E)*, was developed as a placement and diagnostic instrument to accompany the English Crane Reading System. This system is an English language arts program which controls sound patterns based on those easiest to hear by second language learners. A parallel reading system and diagnostic placement instrument is available in Spanish.

The *CRS(E)* is group-administered and consists of eight subtests: "Rhyming" (6 items); "Words that Begin Alike" (6 items); "Long Vowel Recognition" (24 items); "Beginning Consonant Sounds" (2 items); "Blends" (24 items); "Short Vowel Recognition" (24 items); "Digraphs" (24 items); and "Special Vowel Patterns" (24 items).

The *CRS* was selected because it was specifically designed for the limited English speaker, and many of the test items are accompanied by visuals. For this study, 6 year olds were pretested and posttested on the first four subtests; 8 and 10 year olds on all eight subtests.

The *CRS* tests, both English and Spanish, were field-tested in 11 school districts across the country, involving approximately 2,000 students from city, suburban, semirural, and rural populations. Based on a personal communication from Dr. Barbara Crane, author of the tests, the odd-even reliability coefficient was reported to be .82. No predictive validity coefficients had been determined.

III. Tests of Reading Skill - Spanish

A. *CRS Placement/Diagnostic Test, Spanish Version*
Crane Publishing Company, Trenton, New Jersey, 1977

The *CRS*, Spanish version, *CRS(S)*, consists of six subtests: "Rhyming" (6 items); "Beginning Sounds I" (24 items); "Beginning Sounds II" (24 items); "Beginning Sounds III" (24 items); "Beginning Sounds IV" (24 items); and "Special Patterns" (24 items).

Six year olds were pretested and posttested on the first four subtests; 8 and 10 year olds on all six subtests.

The test was chosen because of its primary focus on assessing phonics skills in Spanish, and few instruments on this type are available. (For statistical information, refer to the discussion on the *CRS*, English version.)

B. *Inter-American Series. Prueba de Lectura, Level I*

Guidance Testing Associates of St. Mary's University, San Antonio, Texas

The *Prueba de Lectura* was developed by educators from Puerto Rico, Mexico, and Texas, under the direction of the late Dr. Herschel T. Manuel. Parallel forms have been developed for pretesting and posttesting.

There are two subtests which are group administered: subtest 1 assesses vocabulary (40 items) and subtest 2 assesses comprehension (40 items). Level I was designed for 6 and 7 year olds; Level II for 7 and 8 year olds, and Level III for 9 and 11 year olds.

There were problems in deciding which level of the test to administer to the respective age groups. According to the publishers, level selection is based on two criteria: (1) that the students be native speakers of the language of the test and (2) that the language of the test be used actively in the environment in which the child lives. For the subjects of this study, the first criterion was satisfied, but not the second—if it can be assumed that English predominated in some of the schools and communities. Many of the subjects had never attended school in a Spanish-speaking country nor had been enrolled in a bilingual program long enough to have attained reading skills in Spanish comparable to Spanish speakers in Puerto Rico and Mexico. For these reasons, Level I was administered, as a pretest and posttest, to all 8 and 10 year olds; 6 year olds were tested on the first 20 items of subtest 1, vocabulary.

Information on percentiles, stanines, validity and reliability coefficients are given in the test manual. Because the test instructions were presented bilingually, only raw scores were used in subsequent data analyses.

IV. Summary of Instruments

Table 4 summarizes the instruments used in this study.

Teacher Data

Background information. A questionnaire was developed to obtain background information on the teachers of students in the study (see Appendix B-2). Teacher information sheets requested the following information:

Table 4
Summary of Test Instruments Used in
Student Data Collection

<i>Instruments</i>	<i>Age Groups Tested</i>	<i>Subtests</i>	<i>Pretest Only</i>	<i>Pre- and Posttest</i>
I. Oral Language				
A. FLS	6, 8, 10	3	✓	
B. LAS(E)	6, 8, 10	3		✓
C. LAS(S)	6, 8, 10	3	✓	
II. English Reading				
A. SESAT	6	2		✓
B. SDRT	8, 10	3		✓
C. CRS(E)	6	4		✓
III. Spanish Reading				
A. CRS(S)	6	4		✓
	8, 10	6		✓
B. PRUEBA	6	1		✓
	8, 10	2		✓

- Place of birth
- Bilinguality
- Self-rating of speaking ability in English and Spanish
- Ethnic background
- Master's degree
- Course work beyond a master's degree
- Special training in bilingual education or ESL
- Special training in the teaching of reading
- Certification, level and type
- Level of students
- Years of teaching experience
- Years of teaching experience in a bilingual program
- Program model

Discussion of these variables and subsequent analyses are provided in the section of this chapter entitled *Preliminary Analyses of Data*.

Attitudes toward second language learners. Data were collected on teacher attitudes toward second language learners. Many of the studies on teacher attitudes toward language have used semantic differential techniques in which small groups of respondents are presented with audiotape or videotape speech samples and then comment upon them.

Sets of semantic differential scales are used to record comments (Williams, 1970).

Example of the semantic differential technique follows:

The child's speech indicates:
a poor education background ____: ____: ____: ____: ____:
____: a good one.

The child sounds culturally:
disadvantaged ____: ____: ____: ____: ____: ____: advantaged.

Vocabulary is:
sophisticated ____: ____: ____: ____: ____: ____: unsophisticated.

Because of the logistics involved in gathering individual student speech samples, the semantic differential technique was not selected. Rather, the *Language Attitude Questionnaire (LAQ)* was specially designed for this study in cooperation with Rae Moses, professor of linguistics, Northwestern University.

The purpose in developing the instrument was to determine if the teachers of the different instructional groups (i.e., native language, concurrent, direct method) differed in terms of their attitudes toward second language learners. The intent was not to evaluate the attitudes of the individual teachers but rather, groups of teachers.

The format of the questionnaire was modeled after other questionnaires, e.g., that of the Modern Language Association (see Appendix B-3). The original version of the questionnaire contained 15 items and a content validity study was undertaken using seven "experts" in the field. These experts included three university professors of applied linguistics, two bilingual program administrators, and two ESL consultants.

The responses from the experts were tabulated and items were validated in terms of the agreement reached by the majority. Due to a lack of agreement among the experts, items 9, 12, and 13 were omitted from the final version of the questionnaire.

The questionnaire was completed by 46 of the 52 teachers in the study. For scoring purposes, items requiring an affirmative response were given points as follows: Strongly agree - 5 points, Agree - 4 points, Uncertain - 3 points; Disagree - 2 points, Strongly disagree - 1 point. For items requiring a negative response, the points were as

follows: Strongly disagree - 5 points, Disagree - 4 points, Uncertain - 3 points, Agree - 2 points, Strongly Agree - 1 point. Total number of points were tabulated for each teacher, resulting in the score for the *Language Attitude Questionnaire (LAQ)*.

Summary

Two types of data were collected: student data and teacher data. Student background information was gathered through the use of a *Student Information Sheet*. Using a variety of oral language and reading measures in Spanish and English, 379 students were pretested, and of these, 306 were available for posttesting. Data collected on teachers included background information and attitudes toward second language learners.

Procedures in Collecting Data

Specific procedures were implemented to collect data which included student and teacher background information questionnaires, student test data, and a questionnaire on teacher attitudes toward second language learners.

In September 1977, letters requesting permission to collect data in the public and nonpublic schools were written to the respective school officials. Upon receiving approvals, local district superintendents and principals were contacted.

In August 1977, however, recruitment efforts were begun to hire research assistants to administer tests to the subjects. Through contacts with local universities, potential candidates were contacted and interviewed by telephone. The first criterion for hiring was bilinguality in English and Spanish. Preference was given to graduate students and to those with prior experience in educational testing. Due to the fact that many of the instruments had to be administered individually, at least eight persons had to be identified. Because many of those interviewed on the telephone were available only a few hours each week, ten assistants were hired.

At the first orientation meeting, research assistants were given *Background Information Sheets* to complete (see Appendix C-1). Appendix C-2 provides summary information on the research assistants from both the pretesting and posttesting periods. All research assistants were bilingual and represented a variety of Spanish-speaking ethnic groups. Since many of the students within one classroom represented more than one ethnic background, it would have been impractical for

research assistants to have been assigned to student groups on the basis of ethnic background.

A series of inservice meetings, totaling 20 hours, was conducted in September 1977 to train the assistants on test administration. A list of general procedures was distributed at the first meeting (see Appendix C-3). These included instructions on school procedures and guidelines for testing students. Test manuals were also distributed, followed by a detailed discussion and demonstration of the administration for each test. Additional instructions were prepared for the *FLS* and *LAS* instruments (see Appendices C-4 and C-5).

Research assistants were assigned classrooms within schools, and whenever possible, these assignments were based on schools close to their homes. Each assistant was given a grid with a list of student names and the tests to be administered. Instructions for completing the grids were also distributed (see Appendix C-6).

All pretesting was conducted during October and the first part of November 1977. Posttesting was conducted during May 1978. Similar inservice procedures were held for the newly hired research assistants.

With reference to the Student Information Sheet and teacher questionnaires, teachers received information on these forms prior to data collection in the spring (see Appendix C-7).

All pretest and posttest data were coded to ensure the anonymity of all the participating schools, teachers, and students.

Preliminary Analyses of Data

Pretest data, as well as data from student and teacher questionnaires, were analyzed to determine the following:

- The extent to which the instructional groups were equivalent prior to treatment;
- The instructional, sociological, and linguistic variables to be selected for further analyses; and
- The statistical analyses which would be the most appropriate.

Student Characteristics

The initial data, excluding analyses of pretest reading measures, can be categorized into three groups of variables: sociological, instructional, and linguistic. The following description of these groups of variables includes how and why specific variables were statistically treated.

Table 5
Summary Information on Number of Students Pretested and Posttested, Sex,* and Ethnic Background by Age and Reading Instructional Group**

Reading Instructional Group	Age	Sex		Ethnic Background ^a			N	Total
		F	M	M	PR	O		
NL	6	24	25	28	20	1	49	
CON		20	19	18	17	4	39	
DM		27	17	28	10	6	44	
								132
CON	8	30	32	32	26	4	62	
DM		16	19	24	9	2	35	
								97
CON	10	31	20	33	17	1	51	
DM		16	10	16	7	3	26	
								77

^aM = Mexican, P = Puerto Rican, O = Other Spanish-speaking

*Chi-squares for each of the age groups on Sex were not significant.

**Chi-squares for 6 and 10 year olds on Ethnic Background were not significant; for 8 year olds, the chi-square was significant; $p < .05$.

Sociological variables. These variables included age, sex, ethnic background, student birthplace, parents' birthplace, number of years in the U.S., community poverty index, welfare, and free lunch.

AGE—As described in Table 5, three subsamples, based on age, were established. The attrition rate for public school subjects (columns *NL* and *CON*) was 25%, for nonpublic school subjects (column *DM*), the attrition rate was 2.7%.

STUDENT SEX—Frequencies and contingency tables were used to determine the extent to which there were equal numbers of boys and girls in the instructional groups for each age sample (see Table 5). The obtained chi-squares for each of the age groups were not significant. The variable Student Sex was selected for further investigation in regression analyses.

ETHNIC BACKGROUND—Selection procedures were aimed at sampling primarily students of Mexican and Puerto Rican

background, since these two groups represent the majority of Spanish background students in the Chicago metropolitan area (see Table 5). For the 306 students, 59.7% were of Mexican background, including those born in Mexico and Mexican Americans; 35.3% were Puerto Rican, including those born in Puerto Rico and on the mainland; and 4.6% were of other Spanish-speaking ethnic backgrounds.

The obtained chi-square analyses for 6 and 10 year olds were not significant. For 8 year olds, the obtained $\chi^2 = 6.46$, $df = 2$, was significant at the $p < .05$ level. The variable Ethnic Background, was selected as an independent variable in regression analyses to determine if it significantly contributed to the successful prediction.

STUDENT BIRTHPLACE—Data on Student Birthplace were collected as further verification of ethnic background, especially in those cases for which information on ethnic background was not known by the teacher. Data on Student Birthplace were not gathered as an indicator of language proficiency due to too many intervening variables. Consider the student who was born in Mexico but came to the United States at an early age and spoke predominantly English at home. The converse was also possible, e.g., the student who was born in the United States but spoke only Spanish at home until enrolled in school.

Appendix D-1 provides information on the percentage of students born in Mexico, Puerto Rico, other Spanish-speaking countries, Chicago, and other U.S. cities. An analysis of student place of birth revealed that as age increases, the percentage of children born in this country decreases. This is understandable in that many of the younger children, although born here, come from homes where English is not the predominant language. However, the obtained chi-square analyses for each age group by instructional approach were not significant, and this variable was not included in further analyses.

MOTHER'S BIRTHPLACE AND FATHER'S BIRTHPLACE—Data on these two variables were collected as verification of ethnic background. If a student was born in Chicago and information on his or her ethnic background was not available, the latter was determined by checking parents' place of birth.

NUMBER OF YEARS IN U. S.—These data were not readily available to the teachers and there was too much missing information to justify further analyses.

COMMUNITY POVERTY INDEX (CPI)—Socioeconomic status has been shown to be related significantly to academic achievement.

(Brown, 1972; Coleman et al., 1966; Smith, 1972). Thus, one of the initial concerns in the design was to control for the socioeconomic status among the different instructional groups. To obtain an accurate index of socioeconomic status, it would have been necessary to request such information directly from the parents of subjects, since this information is not available at the local school level. Due to the complexities involved, parents were not surveyed.

To compensate for this limitation, and this can be considered as a limitation of the study, each subject was assigned a Community Poverty Index (CPI), based on his or her respective school attendance area. CPI's assigned to school attendance areas, are based on the number of families at federally determined poverty levels living within the area. (For more details on the computation of the CPI, see *Reading: Top Priority Fiscal 78*, Board of Education, City of Chicago, pp. 4-5.) Students in the nonpublic schools were assigned CPI's corresponding to the index assigned to the nearest Chicago public school.

One-way analyses of variance procedures were used for the three age samples to determine if there were significant differences among the instructional groups based on CPI. Appendix D-2 indicates that there were no significant differences among groups of 6 and 10 year olds; for 8 year olds, the differences among groups was significant at the .01 level. This variable was used in regression analyses to determine the amount of variance accounted for on various dependent variables of reading and oral language skills.

WELFARE AND FREE LUNCH—Data were collected on these variables as further indices of socioeconomic status. With reference to welfare, teachers were asked if the student's family was on welfare. A three-point scale was used: (1) Yes; (2) No; and (3) Don't Know. Teachers were not pressured to complete this item on the Student Information Sheet. Preliminary analyses revealed that teachers were unable to supply this information (or preferred not to) for 180 (59%) of the 306 cases.

An analysis of Free Lunch also revealed much missing data. It was decided not to include either welfare or free lunch in further statistical analyses.

Instructional variables.

READING INSTRUCTIONAL GROUP—This was the major blocking variable for the study. The three levels included: (1) Nati

Language Approach (NL) in which students received initial reading instruction in Spanish; (2) Concurrent Approach (CON) in which students received reading instruction in English and Spanish; and (3) Direct Method (DM) in which students received reading instruction in English (see Table 5 for numbers of students per cell). The subjects in columns NL and CON were public school students enrolled in bilingual education programs. The subjects in column DM were nonpublic students not enrolled in bilingual education programs.

Each of the three levels (reading instruction groups) was further operationally defined in terms of average number of minutes of daily reading instruction in English and/or Spanish. This information was requested from the teachers to ensure that the various classrooms in each cell did indeed employ similar approaches.

NUMBER OF YEARS IN A U. S. SCHOOL—For 6 year olds, the average number of years in a U. S. school was 2 years, with no statistically significant differences among the three instructional groups. For 8 year olds, students in instructional groups CON averaged 3.4 years; students in instructional group DM averaged 1.5 years; statistically significant at the .001 level. For 10 year olds, the mean number of years for both instructional groups was 3.6 years with no statistically significant differences.

ENGLISH AS A SECOND LANGUAGE (ESL)—On the Student Information Sheet, this variable was defined as follows:

Instruction in oral English is instruction specifically designed for students who are learning English as a second language. Individuals or small groups of students received instruction in oral English inside or outside the classroom, provided by the classroom teacher, a specially trained ESL teacher or another adult.

It was necessary to define this variable because of the tremendous amount of variation in the types of ESL programs in the public and nonpublic schools. It appears that the type of ESL instruction a school offers is often a function of the number of students to be served, staffing allocations, and individual teacher qualifications.

Nevertheless, it was decided to attempt to control for this variable and to include it in further analyses. Appendix D-3 illustrates the number of subjects per cell who received daily ESL instruction. The obtained chi-squares for 6 and 8 year olds were significant at the .001

and .01 levels, respectively; no statistical significance was found for 10 year olds.

YEARS ENROLLED IN A BILINGUAL PROGRAM—This variable applied only to students in reading groups NL and CON. Students in reading group DM were nonpublic students who were not enrolled in bilingual education programs. For 6 year olds in groups NL and CON, 14% had been enrolled in a program for one year; 86% for two years. For 8 year olds, 7% of the students in the CON group had been enrolled in a program for one year; 27% for two years; 23% for three years; and 43% for four years. The mean number of years enrolled in a bilingual program was 3.03. For 10 year olds, 18% had been enrolled for one year; 36% for two years; 23% for three years; 14% for four years; 9% for more than four years. The mean number of years enrolled in a bilingual program for 10 year olds was 2.6.

Linguistic variables. Initial data were collected on language proficiency in the L1 (Spanish) and L2 (English):

- To ensure that subjects were in fact limited in English fluency and
- To determine the amount of variance accounted for by L1 and L2 fluency levels on posttest measures of reading and oral language skills.

ENGLISH FLUENCY—The *FLS* was used to collect initial data on English Fluency. There was a maximum score of 75 points (5 per item for the 15-item test. According to the test description in the *Plan for the Implementation of Provisions of Title VI of the Civil Rights Act of 1964*, approved by the Chicago Board of Education in October 1977 cutoff points were established for different age groups to classify the students in levels of English language fluency as defined previously in this chapter. The cutoff points were as follows:

Age	I	II	III	IV
6	10	20	30	53
8	12	24	36	56
10	14	29	43	59

For example, an age cycle 6 student obtaining a score of 12 would be classified in Level I. In Appendix D-4 the frequency distribution is

levels of English proficiency is reported for the three age groups based on *FLS* scores.

One-way analysis of variance procedures were used in analyzing *FLS* raw scores for each age group. Significant differences at the .01 level were found among all three age groups. Because of statistically significant differences illustrated in Table 6, this variable was included in further analyses.

SPANISH FLUENCY—Total raw scores from *LAS(S)* were used in one-way analysis of variance procedures to determine whether the instructional groups for each of the age samples were equivalent in terms of initial Spanish Fluency. The results indicated statistically significant differences only for the 10 year olds; $F(1, 65) = 8.24, p < .01$ (see Table 6). Results were not significant for 6 and 8 year olds and it can be assumed that the instructional groups for age samples 6 and 8 were comparable in terms of their oral proficiency in Spanish. Furthermore, it might be assumed that for 6 year olds, placement in one of the two bilingual instructional groups (NL and CON) was not necessarily a function of fluency in the native language.

Student Pretest Data

Prior to using inferential statistical methods to analyze pretest data, descriptive statistics were used. In Appendix E-1, the pretest means and standard deviations for each of nine dependent variables are reported. In addition, a series of correlations was calculated to determine the relationship among the subtests of each dependent variable (see Appendix E-2). Since most of the subtest scores were mutually intercorrelated ($p < .05$), they were combined and the resulting total score was used to complete all further analyses.

One-way analysis of covariance (ANOVA) procedures were then used for each dependent variable to determine if there were significant differences, prior to treatment, among the instructional groups, i.e., NL, CON, and DM. The ANOVAs were calculated separately for each age sample.

Following are the results of the ANOVAs for each of the dependent variables.

I. Oral English

A. LAS(E)

Results from the ANOVAs for age groups 6 and 8 were significant

Table 6
Analysis of Variance Summaries Among Reading
Instructional Groups Based on FLS and LAS(S) Sources

FLS and LAS(S) Spanish Analysis of Variance Summaries

<u>Variable</u>	<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
FLS	Age 6				
	Among	3109.85	2	1554.93	6.74**
	Within	26745.14	116	230.56	
	Age 8				
	Among	4363.74	1	4363.74	14.45**
	Within	25886.99	89	302.1	
LAS(S)	Age 10				
	Among	3589.57	1	3589.57	7.18**
	Within	33486.87	67	499.9	
	Age 6				
	Among	804.04	2	402.02	2.24
	Within	21528.45	120	179.40	
LAS(S)	Age 8				
	Among	57.78	1	57.78	<1.00
	Within	9430.34	90	104.78	
LAS(S)	Age 10				
	Among	666.06	1	663.06	8.24**
	Within	5230.09	65	80.46	

** $p < .01$.

(see Table 7) indicating initial differences in oral English proficiency. For both age samples, instructional group DM had higher mean scores than the other instructional groups. No statistical significance was found for 10 year olds.

II. Reading - English

A. SESAT

The ANOVA procedure indicated significant differences among groups of 6 year olds on the *SESAT* measure of English reading (Table 7). Instructional group DM had the highest mean score ($\bar{x} = 23.45$) followed by the NL group ($\bar{x} = 18.23$) and the CON group

Table 7
Analysis of Variance Summaries Among Reading
Instructional Groups on Seven Pretest Dependent Variables

Analysis of Variance Summaries on Pretests

<u>Variable</u>	<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>
LAS(E)	Age 6 Among	4106.98	2	2053.49	11.57***
	Within	21129.64	119	177.56	
	Age 8 Among	1007.56	1	1007.56	
	Within	10262.97	89	115.31	8.74**
	Age 10 Among	343.99	1	343.99	1.91
	Within	11694.63	65	179.92	
SESAT	Age 6 Among	815.61	2	407.81	7.64***
	Within	6243.3	120	52.03	
CRS(E)	Age 6 Among	1732.0	2	866.0	8.27***
	Within	11104.62	106	104.76	
	Age 8 Among	5394.38	1	5394.38	
	Within	67671.81	80	845.90	6.38**
	Age 10 Among	6464.41	1	6464.41	8.32**
	Within	52044.81	67	776.79	
SDRTP	Age 8 Among	29914.75	1	29914.75	12.67**
	Within	219549.38	93	2360.75	
	Age 10 Among	10235.13	1	10235.13	4.22*
	Within	169863.44	70	2426.62	
SDRTWC	Age 8 Among	490339.81	1	490339.0	33.10**
	Within	1333273.0	90	14814.14	
	Age 10 Among	188715.06	1	188715.06	
	Within	1678235.00	65	25819.00	7.31**

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 7 (continued)

Analysis of Variance Summaries on Pretests

<i>Variable</i>	<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
CRS(S)	Age 6 Among	1,71.39	2	585.69	4.80**
	Within	13664.16	113	120.92	
	Age 8 Among	830.93	1	830.93	2.43
	Within	30759.46	90	341.78	
	Age 10 Among	652.87	1	652.87	2.99
	Within	15282.00	70	218.31	
PRUEBA	Age 6 Among	327.74	2	163.87	4.13*
	Within	4329.91	109	39.72	
	Age 8 Among	910.40	1	910.40	2.85
	Within	26509.83	83	319.40	
	Age 10 Among	137.92	1	137.92	<1.00
	Within	17975.75	62	289.93	

* $p < .05$.
 ** $p < .01$.
 *** $p < .001$.

($\bar{x} = 17.91$). It should be noted that the group receiving Spanish reading only had a higher mean score than the group receiving English and Spanish reading. This confirms the assumption that placement in one of the two instructional groups may not necessarily be a function of a student's initial reading skills in English.

B. CRS(E)

On the *CRS(E)*, significant differences were found for all three age samples with instructional group DM having a higher mean score than the other two groups (see Table 7).

C. SDRTP

On the phonetic analysis subtest of *SDRTP*, significant differences were found among groups of 8 and 10 year olds (see Table 7). In both cases, instructional group DM had a significantly higher mean score

D. SDRTWC

The comprehension and word reading subtests of the *SDRT* were combined into one score for the purposes of the analysis. Table 7 shows significant difference for 8 and 10 year olds.

III. Reading - Spanish

A. CRS(S)

Significant differences were found for 6 year olds at the .05 level (see Table 7). Instructional group DM (nonpublic school students) had a higher mean score on this measure of pretreatment skills in Spanish reading than instructional groups NL and CON (public school, bilingual program participants). No statistically significant differences were found among groups of 8 and 10 year olds.

B. PRUEBA

The three groups of 6 year olds were compared on the first 20 items of the vocabulary subtest (PRUEBAVOC); significant differences at the .05 level were found (see Table 7). On this measure, students receiving reading instruction in English and Spanish had the highest mean score.

Groups of 8 and 10 year olds were compared on 40 items of the vocabulary subtest plus 40 items of the comprehension subtest. No statistically significant difference were found.

Summary of Analyses of Student Pretest Data. In terms of the initial comparability of the instructional groups on pretest measures, the following can be concluded:

1. Groups of 6, 8, and 10 year olds were not equivalent in terms of initial (pretreatment) fluency in oral English.
2. Groups of 6 and 8 year olds were equivalent in terms of their oral skills in Spanish but 10 year olds were not.
3. Groups of 6 year olds were not equivalent in terms of reading skills in English but the differences were not necessarily related to their assignment in one of the bilingual program instructional reading groups.
4. Groups of 8 and 10 year olds were not equivalent in terms of reading skills in English.
5. Groups of 6 year olds were not equivalent in terms of reading skills in Spanish but 8 and 10 year olds were.

Teacher Characteristics

Background information. A number of teacher variables were examined to determine the degree to which teachers of the different instructional groups were comparable. Each of the 52 teachers was assigned a number which was subsequently coded on the respective students' computer records. Through this means, the instructional groups, by age, were compared in terms of their teacher's characteristics.

It should be noted that it was anticipated that the teachers would differ significantly on variables such as place of birth, ethnic background, and bilinguality. This was due to the fact that students in instructional groups NL and CON were participants in a bilingual program, which required that teachers be bilingual. As expected, all of the teachers in groups NL and CON were bilingual while only 5% of the DM group were bilingual.

Chi-square analyses were used for each age sample for the following variables: Teacher Bilinguality, Master's Degree, and Special Training. For Teaching Bilinguality, the obtained chi-squares for each age sample were statistically significant at the .001 level. Inasmuch as this was a function of the instructional approach, this variable was not investigated further.

The obtained chi-squares for 6 and 10 year olds, relative to whether their teachers had master's degrees, were not significant. For 8 year olds, the obtained $\chi^2 = 30.32$, $df = 1$, was significant at the .001 level.

Data were gathered on whether the teachers had Special Training in bilingual education methodology, and/or the teaching of English as a second language (ESL). The obtained chi-squares for the three age samples were significant at the .0001 level. This variable was included in further analyses.

With reference to Number of Years Teaching Experience, results of ANVOCA procedures for the three age groups indicated significant differences among the teachers of 6 and 8 year olds and no differences for 10 year olds. Since the literature is inconclusive regarding the relationship between teaching experience and student achievement, this variable was not considered in further analyses. It was decided that the variable, Special Training, would be more revealing.

Attitudes toward second language learners. Scores for groups of teachers on the *Language Attitude Questionnaire (LAQ)* were ana-

significantly different in terms of their attitudes toward second language learners. For this analysis, each teacher received a code corresponding to the reading instructional group. Using raw scores from the *LAQ*, the ANOVA procedure indicated significant differences among groups of teachers in three instructional reading groups, $F(2, 43) = 10.69, p < .001$ (see Appendix E-3). Teachers in groups NL and CON, i.e., bilingual teachers, scored on a comparable level. The teachers in group DM (nonpublic school teachers) had more negative attitudes toward second language learners based on this questionnaire. This could have been due to the fact that the majority of nonpublic school teachers were monolingual and had never been exposed to similar second language learning experiences. In addition, differences could have resulted from different types of staff development and inservice activities offered in the public and nonpublic schools. For example, public school teachers in bilingual programs regularly receive inservice training on the philosophy of bilingual education, as well as linguistic and cultural differences affecting second language learners.

Summary

Preliminary analyses of student and teacher data were performed (1) to determine the extent to which groups of students were equivalent at pretesting, and (2) to select variables for further analysis.

In terms of initial comparability among students in different reading instructional groups, students were not equivalent on measures of oral English fluency nor on measures of English reading skill. With the exception of groups of 6 year olds, students were equivalent on measures of Spanish reading skill; with the exception of 10 year olds, students were equivalent on measures of oral fluency in Spanish.

With reference to student characteristics, the following sociological, instructional, and linguistic variables were selected for further analysis: Age, Sex, Ethnic Background, Community Poverty Index (CPI), Years Enrolled in a Bilingual Program, ESL, English Fluency, and Spanish Fluency.

For teachers, two variables were selected for further analysis: Special Training and Teacher Language Attitude Score (TLAS).

In order to control for the initial differences among groups of students on posttest scores, analysis of covariance was selected as one of the statistical techniques. This statistical procedure as well as regres-

sion analysis, is described in the following section. For a complete summary list of variables selected for further analysis, see Table 8.

Description of Statistical Analyses on Posttest Data

Descriptive Statistics

Prior to using inferential statistical procedures on posttest data, Pearson product-moment correlation coefficients were calculated (1) among pretest and posttest total scores by age group, and (2) among total posttest scores for eight dependent variables by age group.

Appendix F-1, the intercorrelation matrix of pretest and posttest measures, indicated that pretest measures correlated with respective posttest measures with coefficients ranging from .55 to .85 ($p < .05$). Pretests used to measure skills in a given skills area, e.g., English reading, oral English, Spanish reading, also were correlated with posttests measuring the same skill, e.g., *CRS(E)* with *SDRTP*.

Appendix F-2, the intercorrelation matrix of total posttest scores among eight dependent variables, indicates that all posttests measuring similar skills, e.g., English reading, Spanish reading, were correlated with coefficients ranging from .57 to .77 ($p < .05$).

Means and standard deviations for pretests and posttests were calculated and are reported in Chapter 4.

Inferential Statistics

Two types of inferential statistical procedures were used in the analysis of posttest data: analysis of covariance (multivariate and univariate) and regression analysis.

Analysis of covariance. This statistical procedure was selected to test Hypothesis 1—whether there were differences among students in different reading instructional groups. This procedure involves measuring one or more concomitant variables, also called covariates, in addition to the dependent variable. When scores on the covariate variable and the dependent variable are measured by the same instrument, the covariate is referred to as a pretest and the dependent variable as the posttest. Through the analysis of covariance (ANCOVA), group means on a posttest are compared, after these group means have been adjusted for initial differences between the groups on the pretest. The covariate represents a source of variation that had not been controlled for, and through analysis of covariance, the effects of this uncontrolled source of variation are removed.

Summary List of Variables Used in Final Data Analyses

<i>Variable Name</i>	<i>Factor</i>	<i>Description</i>	<i>Scale</i>
Dependent Variables			
1. LAS(E)	Oral English Skills	<i>Language Assessment Scales, English version - LAS(E)</i> administered (pre and post) to age groups 6, 8, and 10. Total score is the composite of four subtests: Minimal Pairs, Lexical Items, Phonemes, and Sentence Comprehension.	0-96
2. CRS(E)	English Reading	<i>Crane Placement/Diagnostic Test, English version - CRS(E)</i> administered (pre and post) to age groups 6, 8, and 10. Total score is the composite of eight subtests for 6 year olds: Rhyming, Words that Begin Alike, Beginning Consonant Sounds, Long Vowel Recognition, Short Vowel Recognition, Blends, Digraphs, and Special Patterns.	0-60 (6 year olds) 0-156 (8, 10 year olds)
3. SESAT	English Reading	<i>Stanford Early School Achievement Test - SESAT</i> administered (pre and post) to 6 year olds. Total score is the composite of two subtests: Letter Recognition and Word Reading.	0-51
4. SD RTP	English Reading	Phonetic Analysis Subtest of the <i>Stanford Diagnostic Reading Test, Red Level - SD RTP</i> administered to 8 and 10 year olds using Form A at pretesting and Form B at posttesting. Raw scores were converted to scaled scores.	0-40
5. SD RTWC	English Reading	Word Reading and Reading Comprehension Subtests of the <i>Stanford Diagnostic Reading Test - Red Level - SD RTWC</i> administered to 8 and 10 year olds using Form A at pretesting and Form B at posttesting. Raw scores were converted to scaled scores.	0-90

<i>Variable Name</i>	<i>Factor</i>	<i>Description</i>	<i>Scale</i>
Dependent Variables (continued)			
6. CRS(S)	Spanish Reading	<i>Crane Placement/Diagnostic Test</i> , Spanish version - <i>CRS(S)</i> administered (pre and post) to age groups 6, 8, and 10. Total score is the composite of six subtests (first four for 6 year olds): Rhyming, Words that Begin Alike, Beginning Consonants, Special Patterns	0-60 (6 year olds) 0-108 (8, 10 year olds)
7. PRUEBA	Spanish Reading	<i>Prueba de Lectura</i> , Level I - <i>PRUEBA</i> administered (pre and post) to 6, 8, and 10 year olds. Total score for 6 year olds is the score from the first half of the Vocabulary subtest. Total score for 8 and 10 year olds is the composite score of the Vocabulary and Comprehension subtests.	0-20 (6 year olds) 0-80 (8, 10 year olds)
Independent Variables			
<i>Linguistic Variables</i>			
1. FLS	Student characteristic (English fluency)	<i>Functional Language Survey</i> , 1977 - <i>FLS</i> administered as a pretest to 6, 8 and 10 year olds to ensure that students were in fact limited in English and to determine the degree of proficiency. Total score is the composite score of three subtests.	0-95
2. LAS(S)	Student characteristic (Spanish fluency)	<i>Language Assessment Scales</i> Spanish version - <i>LAS(S)</i> administered as a pretest to 6, 8, and 10 year olds to determine the degree of proficiency in Spanish. Total score is composite of four subtests: Minimal Pairs, Lexical Items, Phonemes, and Sentence Comprehension.	0-96
<i>Sociological Variables</i>			
3. SEX	Student characteristic	Sex of student: Female Male	Female = 1 Male = 2

<i>Variable Name</i>	<i>Factor</i>	<i>Description</i>	<i>Scale</i>
4. Ethnic Background (EB)	Student characteristic	Ethnic background Mexican Puerto Rican Other Spanish-speaking	Mexican = 1 Puerto Rican = 2 Other Spanish speaking = 3
5. CPI	Student characteristic	Community Poverty Index (CPI) was based on percentage indices assigned to school attendance areas according to the number of families at federally determined poverty levels. Each student was assigned a CPI based on school attendance area.	25.2%-53.8%
<i>Instructional Variables</i>			
6. Reading Instructional Group (NL, CON, DM)	Instructional characteristic	Reading Instructional Group included three levels: NL - Native Language Approach CON - Concurrent Approach DM - Direct Method	NL = 1 CON = 2 DM = 3
7. ESL	Instructional characteristic	Teaching English as a Second Language (ESL) Yes No	Yes = 1 No = 2
8. Years Enrolled (YRSENRL)	Instructional characteristic	Years enrolled in a bilingual program, including pre-school and kindergarten	Actual number of years: 01-06
9. Special Training	Teacher characteristic	Special training in bilingual education, ESL methodology, including course work or inservice participation Yes No	Yes = 1 No = 2
10. Teacher Language Attitude Score (TLAS)	Teacher characteristic	Teacher Language Attitude Score (TLAS) was derived from the <i>Language Attitude Questionnaire</i> . There were 12 items with a potential item score of 5 points; total score of 60 points.	0-60

Analysis of covariance is particularly appropriate for this study since intact groups were involved. It should be noted that analysis of covariance compensates for pretest differences when these are due to chance factors. However, when using intact groups, it is always possible that the differences are real, i.e., the groups are not random samples from a single population. In these cases, the analysis of covariance systematically underadjusts for initial differences and can produce spurious results. In spite of this limitation, this procedure was selected because the comparison of adjusted posttest means is obviously more precise than unadjusted posttest means.

To compare instructional groups on more than one dependent variable simultaneously, multivariate analyses were computed, specifically multivariate analyses of covariance (MANCOVA). This procedure is simply an analysis of covariance in which an entire set of dependent variables is analyzed at the same time and is adjusted for correlations among the dependent variables. This procedure was selected for the following reasons:

1. As the number of dependent variables increases, the probability of finding a significant difference by chance alone increases (Bock & Haggard, 1968).
2. In situations where the dependent variables are correlated (as was the case in this study), a series of univariate tests, i.e., ANOVAs could cause the probability of a Type I error occurring (Huck, Cormier, & Bounds, 1974); to avoid Type I errors, a series of MANCOVAs were computed.
3. Multivariate analysis permits a test of the possible interactions among multiple dependent variables that cannot be evaluated if each dependent variable is tested in isolation (Cooley & Lohnes, 1962).

A preliminary step in the multivariate analysis of covariance is to compare instructional groups in terms of differences between the groups on one or more dependent variables. The null hypothesis tested is that the groups have the same population means, i.e., identical population mean vectors. In this study the statistical test used was Wilk's lambda and the calculated values for the lambda were transformed into *F*-values. Rejection of the null hypothesis at the .05 probability level indicated that the group means differed significantly from each other on at least one of the dependent variables.

Prior to using analyses of variance procedures—multivariate and univariate—it was necessary to test for various assumptions including

homogeneity of variance, $B_w = 0$, and homogeneity of dispersion matrices.

A test of the assumption of homogeneity of variance, for example, is appropriate whenever the analysis of covariance is used to compare groups that differ in size, as was the case in this study. Results of 17 Bartlett-Box F tests for homogeneity of variance are reported in Appendix F-3. For 14 of the tests, the F ratios were not significant, i.e., the null hypotheses of homogeneous variances were not rejected. Six of the homogeneity tests were significant, resulting in rejection of the null hypotheses. Following the research of Glass, Peckham, and Sanders (1972) it was decided to proceed with the analyses and to adjust the significance levels accordingly.

In the multivariate analysis of covariance, Wilk's test is based on the assumption that the data have been drawn from multivariate normal populations and that these populations have equal dispersion matrices. The latter assumption is analogous to the assumption of homogeneity of variances made in the univariate analysis of covariance. According to Huck et al. (1974) some authors claim that this assumption should be tested while others indicate that the multivariate test is robust to violations of the assumption.

In this study, the assumption was tested and the result of the tests for homogeneity of dispersion matrices are reported in Chapter 4, Table 14. Although some of the null hypotheses were rejected, indicating heterogeneous dispersion matrices, it was decided to proceed with the analyses. Following the research of Glass et al. (1972) the significance levels were adjusted accordingly.

$B_w = 0$ is a test to verify whether a significant portion of the dependent variable can be explained as a function of the respective covariates. A significant portion is explained if there is regression of the covariate on the dependent variable. If there is not significant regression of the data, the analysis of covariance should not be used. The null hypothesis for $B_w = 0$, states that there is no regression of the covariate on the dependent variable, and the hypothesis must be rejected in order to proceed with the analysis. For this study all covariates were significant at the .01 probability level.

To test Hypothesis 1, one-way multivariate and univariate analyses of covariance were used for the three age samples with the appropriate pretest(s) as covariates (see Table 9). The independent variable or fac-

**Summary of Multivariate and Univariate Analyses of
Covariance^a Used to Test Hypothesis 1^b**

<i>Sub-Hypothesis</i>	<i>Skill Area</i>	<i>Age Group</i>	<i>Analysis #</i>	<i>Dependent Variables^b</i>
1.1	Oral English	6	ANCOVA-1	LAS(E)
		8	ANCOVA-2	LAS(E)
		10	ANCOVA-3	LAS(E)
2.2	English Reading	6	MANCOVA-1	CRS(E), SESAT
			ANCOVA-4	CRS(E)
			ANCOVA-5	SESAT
		8	MANCOVA-2	CRS(E), SD RTP, SD RTWC
			ANCOVA-6	CRS(E)
			ANCOVA-7	SD RTP
			ANCOVA-8	SD RTWC
		10	MANCOVA-3	CRS(E), SD RTP, SD RTWC
			ANCOVA-9	CRS(E)
			ANCOVA-10	SD RTP
			ANCOVA-11	SD RTWC
1.3	Spanish Reading	6	MANCOVA-4	CRS(S), PRUEBA
			ANCOVA-12	CRS(S)
			ANCOVA-13	PRUEBA
		8	MANCOVA-5	CRS(S), PRUEBA
			ANCOVA-14	CRS(S)
		ANCOVA-15	PRUEBA	
10	MANCOVA-6	CRS(S), PRUEBA		
	ANCOVA-16	CRS(S)		
ANCOVA-17	PRUEBA			

^aThe respective pretests were used as covariates.

^bHypothesis 1 - There were no differences among limited English-speaking students, ages 6, 8, and 10, in different reading instructional groups on measures of oral English skills and reading skills in English and Spanish.

tor was reading instructional approach. For 6 year olds, there were three levels, NL, CON, and DM; for 8 and 10 year olds, there were two levels, CON and DM.

For the multivariate analyses, follow-up procedures were performed to compare groups on each of the dependent variables. One of the follow-up procedures was to look at the univariate F 's as a means to interpret the multivariate F 's. Discriminant function analysis was also used to determine where the significant differences were and the discriminant function coefficients were reported. In Chapter 4 the results of multivariate and univariate analyses of covariance were reported first, followed by the results of the regression analyses.

Multiple regression analysis. This procedure is a general statistical technique to analyze the relationship between a dependent variable or criterion variable and a set of independent or predictor variables. The term "multiple" refers to the inclusion of several variables as predictors.

For purposes of this study, multiple regression analysis was used to test Hypothesis 2 which made assumptions about those independent variables that appeared to relate to the acquisition of reading and oral language skills.

Initial data were collected on a variety of independent variables including sex, ethnic background, community poverty index, teacher training, teacher attitudes toward language, etc. Through regression analysis, it was possible to explore the various strengths of the independent variables and assess their relevance in terms of particular dependent variables.

Using *SPSS* subprogram[®] Regression, a total of 17 multiple regression equations were computed based on five posttests for 6 year olds and six posttests for 8 and 10 year olds (see Table 10).

In order to construct the 17 regression equations with as few predictor variables as possible, stepwise (inclusion) procedures were used. Through these procedures, specific subsets of predictor variables were isolated from among the total group of variables listed above.

In a stepwise procedure, the computer enters variables in single steps, the first being the one that explains the greatest amount of variance; the second being the one that explains the greatest amount of variance together with the first, and so on. (However, a variable is never entered into the equation if the F value is less than .01.)

Table 10
Summary of Regression Analyses Used to
Test Hypothesis 2^a

<i>Sub-Hypothesis</i>	<i>Skill Area</i>	<i>Age Group</i>	<i>Regression Equation #</i>	<i>Dependent Variable^b</i>
2.1	Oral English	6	1	LAS(E)
		8	2	LAS(E)
		10	3	LAS(E)
2.2	English Reading	6	4	CRS(E)
		6	5	SESAT
		8	6	SDRTP
		8	7	SDRTWC
		8	8	CRS(E)
		10	9	SDRTP
		10	10	SDRTWC
10	11	CRS(E)		
2.3	Spanish Reading	6	12	PRUEBA
		6	13	CRS(S)
		8	14	PRUEBA
		8	15	CRS(S)
		10	16	PRUEBA
		10	17	CRS(S)

^aHypothesis 2 - There were no relationships among independent variables and dependent variables among groups of limited English-speaking students, ages 6, 8, and 10.

^bPredictor variables for all equations included the following: the respective pretest score, Reading Instructional Group (NL, CON, DM), English or Spanish Fluency (depending on the skill area of the dependent variable), Ethnic Background, Sex, Community Poverty Index (CPI), ESL, Years Enrolled in a bilingual program, Special Training, and Teacher Language Attitude Score (TLAS).

For purposes here, the respective pretest scores were always entered into the equations first in order to control for the variations due to initial differences in skill level; this was done regardless of the percent of variance accounted for by the pretest scores. It can be argued that controlling for initial differences in the pretest represented a powerful control (Ramirez & Stromquist, 1979). Following the pretest scores, the appropriate measure of initial language fluency was entered, e.g.,

English language fluency (based on *FLS* scores), for dependent variables measuring English reading skills. After those two variables were entered, stepwise procedures were begun.

Following an analysis of the preliminary stepwise equations, final equations were generated. Parameters were set specifying a maximum number of steps which would include only those predictor variables with regression coefficients significant at the .01 or .05 probability levels. The results of the regression analyses are reported in Chapter 4, following the discussion of multivariate and univariate analyses of covariance.

Chapter Summary

This empirical study was designed to provide practitioners with additional information on reading approaches currently practiced in bilingual education. Several sociological, linguistic, and instructional variables also were investigated to determine how they related to the acquisition of oral language and reading skills.

The sample consisted on 306 Spanish background students, ages 6, 8, and 10, who were limited in English fluency and enrolled in 13 public and nonpublic schools in the Chicago metropolitan area. Students were grouped according to three different reading approaches. The native language and concurrent approaches were considered experimental, with the direct method as the control.

Two types of data were collected: data relating to students and data relating to teachers. Student data included background information and scores on seven oral-language and reading tests in English and Spanish. Pretesting and posttesting occurred during the 1977-78 school year. Teacher data included background information and a score on a language-attitude questionnaire.

Preliminary analysis of the data revealed that instructional reading groups were not equivalent on all pretreatment variables. Controlling for initial differences, multivariate and univariate analyses of covariance techniques were used to determine if there were statistically significant differences among reading instructional groups. Regression analysis was selected as the statistical technique to determine the degree to which selected independent variables related to the successful acquisition of skills.

Chapter 4

ANALYSES AND DISCUSSION OF RESULTS

Introduction

This study was concerned with two major areas: (1) the effects of reading instructional approach on the acquisition of oral language and reading skills among limited English-speaking students in different reading instructional groups, and (2) the identification and investigation of sociological, linguistic, and instructional variables which relate to the acquisition of oral language and reading skills.

Results of the study are discussed in two major sections of this chapter. The first section considers the first hypothesis—that there were no differences among reading instructional groups. Results from completing both multivariate and univariate analyses of covariance procedures are reported and discussed. (Standardized discriminant function coefficients are reported in Appendix G-1.)

Results from the regression analyses are reported and discussed in the second section in relationship to the second hypothesis. This hypothesis stated that there were no relationships among independent variables and dependent variables measuring oral language and reading skills.

The results from multivariate and univariate analyses of covariance related to the first hypothesis are presented first.

Effects of Reading Instructional Approach on Student Performance

Hypothesis 1 stated that there were no differences among limited English-speaking students, ages 6, 8, and 10, in different reading instructional groups on measures of oral language and reading skills. For purposes of reporting and discussing the results, Hypothesis 1 was divided into subhypotheses by skill area and age group:

- 1.1 Oral English Skills
 - 1.11 Six year olds
 - 1.12 Eight year olds
 - 1.13 Ten year olds

1.2 English Reading Skills

- 1.21 Six year olds
- 1.22 Eight year olds
- 1.23 Ten year olds

1.3 Spanish Reading Skills

- 1.31 Six year olds
- 1.32 Eight year olds
- 1.33 Ten year olds

Subhypothesis 1.1 - Oral English Skills

For subsets of the *Language Assessment Scales*, Level 1, English version, (*LAS(E)*), were administered to all three age groups as pretests and posttests. The results of analyses of covariance, using the pretest scores as covariates, follow.

1.11 Oral English Skills - 6 year olds

A one-way analysis of covariance (ANCOVA) procedure indicated significant differences in oral English skills among reading instructional groups, $F(2, 116) = 8.53, p < .01$. This finding led to rejection of the null hypothesis (see Table 11). As reported in Table 12, the adjusted posttest mean scores for each of the three groups were as

Table 11
Analysis of Covariance Summaries Based on the LAS(E)
Measure of Oral English Proficiency for Three Age
Groups by Reading Instructional Group

<i>Variable</i>	<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
LAS(E)	Age 6				
	Among	1775.082	2	587.541	8.53**
	Regression	7772.488	1	7772.488	
	Within	7990.117	116	68.880	
	Age 8				
	Among	286.503	1	286.503	4.66*
	Regression	2496.038	1	2496.038	
	Within	5014.883	87	57.642	
	Age 10				
Among	13.266	1	13.266	<1.00	
Regression	1518.458	1	1518.458		
Within	3463.284	63	54.973		

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

Table 12
Pretest and Posttest Means and Standard Deviations on
Seven Dependent Variables for Three Age Groups by
Reading Instructional Group^a

Variable	Age Group	Reading Instructional Group	Pretest			Posttest			Adj. d^2
			N	M	SD	N	M	SD	
LAFSE	6	NL	48	51.55	15.55	48	71.63	11.67	74.04
		CON	31	43.06	9.93	30	71.15	12.95	71.17
		DM	43	71.07	12.73	42	83.15	7.75	79.43
Total		122	63.75	14.44	120	75.11	11.22		
LAFSE	8	CON	59	73.00	10.61	5	81.39	7.51	81.43
		DM	32	79.97	10.98	32	87.13	7.21	85.22
		Total	91	75.45	11.19	90	87.18	9.36	
LAFSE	10	CON	43	75.33	12.00	43	83.17	7.91	83.88
		DM	24	79.96	15.66	23	85.75	10.52	84.03
		Total	67	76.93	13.51	66	84.45	9.03	
CMSE	6	NL	45	33.40	8.97	45	40.64	13.26	42.65
		CON	22	37.07	12.19	21	44.76	7.36	45.10
		DM	42	42.31	10.41	41	52.73	8.21	50.13
Total		109	38.57	10.90	107	46.08	11.77		
CMSE	8	CON	59	93.42	27.17	58	110.17	25.20	112.20
		DM	23	111.48	33.61	19	128.05	17.95	121.85
		Total	82	98.49	30.03	77	114.58	20.75	
CMSE	10	CON	50	99.70	27.88	48	117.29	23.26	120.23
		DM	19	121.37	27.84	15	134.69	14.98	125.86
		Total	69	105.67	29.33	64	121.64	22.59	
NESAT	6	NL	44	18.23	6.70	44	24.02	6.16	24.60
		CON	35	17.91	7.25	34	27.68	4.07	28.84
		DM	44	23.45	7.67	43	28.65	2.70	27.34
Total		123	20.01	7.51	121	26.69	4.99		
SDR*P	6	CON	63	376.11	51.53	61	464.21	38.22	410.28
		DM	33	413.58	42.42	31	433.35	42.67	421.41
		Total	96	389.25	51.52	92	414.03	41.90	
SDR*P	10	CON	47	412.28	48.65	44	478.55	39.84	420.45
		DM	25	437.32	50.41	22	441.50	50.99	429.89
		Total	72	420.97	50.36	66	423.51	45.21	
SDRTWC	8	CON	59	552.97	125.49	58	661.53	111.73	695.97
		DM	33	705.18	114.55	31	780.45	118.18	716.14
		Total	92	637.57	141.56	89	702.48	126.86	
SDRTWC	10	CON	42	643.90	146.94	39	730.90	135.51	764.74
		DM	25	753.64	181.77	22	785.14	145.28	739.32
		Total	67	684.85	148.19	61	755.57	139.71	
CRS5i	6	NL	40	41.75	12.94	40	50.40	12.00	57.60
		CON	33	37.58	10.34	32	52.50	7.03	54.38
		DM	43	45.49	9.41	43	51.14	6.62	49.50
Total		116	41.95	11.77	115	51.24	8.92		
CRS5i	8	CON	54	85.14	19.98	54	91.41	12.95	89.71
		DM	34	77.91	15.57	32	81.06	18.60	83.95
		Total	92	82.84	18.63	86	87.96	16.02	
CRS5i	10	CON	46	91.50	15.68	46	96.67	11.61	95.21
		DM	26	85.23	13.00	20	88.90	11.65	92.21
		Total	72	89.24	14.98	66	94.32	12.08	
PRUEGA	6	NL	42	10.19	6.27	42	13.60	6.21	13.60
		CON	30	12.87	7.72	29	13.03	4.10	13.04
		DM	40	8.50	5.03	35	9.40	4.73	9.40
Total		112	10.30	6.46	106	12.06	5.55		
PRUEGA	8	CON	56	50.18	16.23	50	62.18	15.45	61.05
		DM	29	72.28	20.72	27	57.48	18.83	59.57
		Total	85	57.82	18.07	77	64.53	16.74	
PRUEGA	10	CON	42	64.50	18.18	41	68.51	15.45	69.50
		DM	22	77.49	14.52	22	66.18	14.62	64.50
		Total	64	71.52	18.98	63	67.75	15.09	

^aNative Language Approach - NL, Concurrent Approach - CON, Direct Methods - DM
 Posttest means were adjusted for pretest scores through analysis of covariance

follows: Native Language (NL) = 74.64; Concurrent (CON) = 71.17; Direct Method (DM) = 79.49. In other words, students receiving English reading instruction, exclusively, had the highest posttest mean score on the *LAS(E)* measure of oral English skills.

1.12 Oral English Skills - 8 year olds

As reported in Table 11, the ANCOVA procedure indicated significant differences in oral English skills among reading instructional groups for 8 year olds, $F(1, 87) = 4.66, p < .05$. As was the case with the 6 year olds, students receiving English reading instruction, had a higher adjusted posttest mean score (85.22 versus 81.43).

1.13 Oral English Skills - 10 year olds

For 10 year olds, the ANCOVA procedure failed to indicate significant differences among reading instructional groups ($p < .05$, see Table 11). In other words, older students who received bilingual instruction appeared to do as well as those who received monolingual English instruction on this measure of oral English proficiency.

Discussion of results on oral English skills. For all three age samples, students receiving English reading instruction, exclusively, attained higher posttest mean scores on the *LAS(E)* oral English measure as compared to the other reading groups. However, the results of one-way ANCOVA procedures were significant only for 6 year olds ($p < .01$) and 8 year olds ($p < .05$). These results indicate that, among younger students, those receiving reading instruction exclusively in English performed better than students receiving bilingual instruction. For older students (10 year olds), it appeared that acquisition of oral skills in English was not affected by the type of instructional approach, i.e., bilingual or monolingual. The older student also made relatively smaller posttest gains in oral English as compared to the younger students. A similar finding was found in a study by Fathman (1976) who stated that younger students generally receive more oral language instruction than older students.

These results, however, should be interpreted with caution since this was a cross-sectional design. Current research in bilingual education has emphasized that the cumulative benefits of bilingual instruction may not always surface in cross-sectional designs (Barik & Swain 1974; Rosier & Farella, 1976). Furthermore, although several design controls were introduced in this study, some of the preliminary analyses revealed that the instructional groups were not initially equivalent. This might suggest that the English-only group of the non

public school students was, in fact, not a representative sample from the same population as the public school students.

With specific reference to the results for 6 year olds, it should be noted that the group receiving monolingual English instruction performed the best. A further analysis of the scores among the bilingual instructional groups (NI. and CON), revealed that the group receiving initial reading instruction in Spanish performed better and made greater gains on the *LAS(E)* measure of oral English proficiency than the group receiving reading instruction in English and Spanish.

There are at least a few possible explanations of the findings. Some researchers have suggested that students, who begin learning to read simultaneously in two languages, may experience more difficulty than those learning to read in one language (Cohen et al., 1976); others have reported that the concurrent approach may produce "negative transfer" (Barik & Swain, 1974; Cowan & Sarmed, 1976). An extension of these hypotheses to the learning of oral English might explain why the students in the concurrent approach did not perform as well as students in the native language approach.

Other researchers have proposed that the development of competence in the L2 is related to competence in the L1 (Cummins, 1979). For minority group children, a native language bilingual approach would promote the development of skills in the L1 and consequently prepare the child to benefit from future instruction delivered in either the L1 and L2.

An additional explanation of the findings involves consideration of common classroom practices. With the current "back-to-basics" movement in schools today, many classroom teachers of monolingual English-speaking students frequently cite the difficulties in emphasizing reading instruction as well as presenting other content area instruction. It might be assumed that the bilingual teacher has an even greater responsibility in that the required curriculum must be taught in two languages to students of varying abilities of English and Spanish fluency.

In the native language approach, the bilingual teacher only has to organize reading groups in Spanish and might have more time to spend on oral English instruction. On the other hand, the bilingual teacher in the concurrent approach has to organize reading instruction for several groups of students in two languages, thus having less time to spend on needed oral English instruction. To consider the latter as a

viable explanation, future research studies involving classroom observation techniques would have to be conducted.

Subhypothesis 1.2 – English Reading Skills

Reading tests assessing phonics skills, vocabulary development, and comprehension were administered to students as pretests and posttests.

In analyzing the results for each of the three age groups, single factor multivariate analyses of covariance (MANCOVAs) were performed on the data (see Table 13). The factor was Reading Instructional Group with three levels for 6 year olds (NL, CON, DM) and two levels for 8 and 10 year olds (CON, DM). Follow-up procedures included analyzing the univariate F tests from multivariate data (see Table 13 and univariate data (see Appendix G-1).

Using covariance procedures, posttest differences between the means of the instructional groups were analyzed after taking into account, and making appropriate statistical adjustments for, initial differences on the pretests.

1.2.1 English reading skills – 6 year olds

SESAT (1½ subtests) and *CRS(E)* (4 subtests) were administered as pretests and posttests to 6 year olds. A MANCOVA was computed to test the hypothesis that there were no differences among reading instructional groups. The MANCOVA was found to be significant, $F(4, 194) = 8.48, p < .01$. A follow-up analysis of the results indicated multivariate effect attributable to both dependent variables, with univariate F 's significant at the .01 level (see Table 13).

In Table 12, the adjusted posttest mean scores for each of three groups are reported. On the *CRS(E)* English reading measure students who received English reading instruction exclusively obtained the highest (adjusted) posttest mean score. On *SESAT*, however, the instructional group receiving reading instruction in two languages currently performed better than the other two instructional groups.

1.2.2 English reading skills – 8 year olds

For 8 year olds, the MANCOVA indicated no significant differences in English reading skill ($p < .05$, see Table 13). None of the univariate F tests (based on multivariate data) were significant, either. In other words, there were no differences in English reading among groups of students receiving either bilingual or monolingual English reading instruction.

Table 13
Multivariate Analyses of Covariance and Dispersion
Followed by One-Way Analyses of Covariance
Reporting Differences Among Reading Instructional
Groups for Three Age Samples^a

MANOVA	Age Group	F	Multivariate Test ^b			Dependent Variables	Univariate Tests		
			Wilk's Lambda	F	Test of Dispersion		MSA (df)	MSW (df)	F
1	6	4.19*	.7267	6.81**	4.11**	CRS(E)	474.6179 (2)	77.8092 (6)	6.10**
						SESAT	118.6249 (2)	11.4230 (6)	10.39**
						CRS(E)	458.8215 (1)	319.2466 (6)	1.44
2	8	3.44	.7571	41.00	1.46	SCRTP	44.0919 (1)	925.1573 (6)	<1.00
						SDRTWC	5059.3861 (1)	7267.3574 (6)	<1.00
						CRS(E)	458.8215 (1)	319.2466 (6)	1.44
3	10	2.41	.7624	41.00	1.04	CRS(E)	21.9350 (1)	216.2234 (43)	<1.00
						SDRTWC	133.2751 (1)	555.9992 (43)	<1.00
						CRS(E)	458.8215 (1)	319.2466 (6)	1.44
4	6	4.18*	.6541	10.75**	2.40**	CRS(S)	254.8685 (2)	57.4709 (6)	4.43*
						PRUEBA	362.7263 (2)	19.4187 (6)	18.68**
						CRS(S)	646.3605 (1)	66.2417 (7)	9.47**
5	8	2.70	.8103	4.85**	4.40**	PRUEBA	47.6522 (1)	129.2407 (7)	<1.00
						CRS(S)	266.9548 (1)	32.0405 (4)	8.43**
						PRUEBA	89.4165 (1)	53.7069 (4)	1.66

^aDistress were used as covariates.
 *p = .05
 **p = .01

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1.23 English reading skills - 10 year olds

Ten year olds were tested on the same English reading measures as the 8 year olds. The MANCOVA was not significant, thus repeating the results obtained for the 8 year olds sample (see Table 13). None of the univariate *F* tests were significant, either.

Discussion of results on English reading skills. For 6 year olds, the results of the statistical procedures indicated significant differences among the three reading instructional groups. Follow-up procedures indicated that both of the dependent variables (*CRS(E)* and *SESAT*) contributed to the significant multivariate effect. Of particular interest were results from the *SESAT* measure in which bilingual program participants, who received reading instruction in two languages, performed better in English reading than the other two groups. This substantiates current studies (Troike, 1978) showing that a bilingual instructional approach (in this case, the concurrent approach) may facilitate learning to read in English.

With reference to students who had received reading instruction in Spanish during the first seven months of the school year, gains were also made on English posttest measures even though they had not been exposed to the same amount of English reading instruction as the other two groups. This could suggest transfer of skills from Spanish to English.

Multivariate analyses of covariance were not significant for either the 8 or 10 year olds, suggesting that participation in a bilingual program had no adverse effects on student acquisition of reading skills. Additional benefits resulting from participation in a bilingual program can only be determined by further testing of students in the specific subject areas or by evaluating student progress longitudinally.

Again, the results must be interpreted with caution due to the nature of the design (i.e., cross-sectional), the use of intact groups, and the possibility that instructional group DM (nonpublic students) might have been representative of a different population.

Subhypothesis 1.3 - Spanish Reading Skills

The *Prueba de Lectura*, Level L, (*PRUEBA*) and subtests of the *Crane Diagnostic Reading Tests*, Spanish version (*CRS(S)*), were administered to all three age groups as pretests and posttests. Following are the results of multivariate analyses of covariance for the three age groups.

1.31 Spanish reading skills - 6 year olds

A MANCOVA was computed to test the hypothesis that there were no differences in Spanish reading skills among students in different reading instructional groups. The MANCOVA indicated statistically significant differences, $F(4, 182) = 10.76, p < .01$; follow-up procedures indicated a multivariate effect attributable to both of the dependent variables (see Table 13).

As anticipated, bilingual program participants scored higher than nonbilingual program participants who were instructed exclusively in English. Further analysis of the results revealed that on the *PRUEBA*, students receiving reading instruction exclusively in Spanish scored the highest; on the *CRS(S)*, students receiving reading instruction in English and Spanish scored the highest (see Table 12).

1.32 Spanish reading skills - 8 year olds

The MANCOVA on Spanish reading skills for the 8 year olds indicated significant differences among the two reading-instructional groups, $F(2, 70) = 4.85, p < .01$. A follow-up analysis indicated that the multivariate effect was attributable to only one of the dependent variables, *CRS(S)*, with a univariate *F* significant at the .05 level (see Table 13).

As anticipated, students receiving reading instruction in English and Spanish performed significantly better in Spanish reading than students receiving reading instruction exclusively in English.

1.33 Spanish reading skills - 10 year olds

Ten year olds were tested on the same Spanish reading measures as the 8 year olds. A MANCOVA indicated significant differences among groups, $F(2, 48) = 4.53, p < .05$ (see Table 13). These results confirm those obtained for 6 and 8 year olds in which bilingual program participants did better in Spanish reading as compared to students who received monolingual English instruction. As was the case with the 8 year olds, only one of the dependent variables, *CRS(S)*, contributed to the multivariate effect.

Discussion of results on Spanish reading skills. MANCOVAs were calculated to test whether there were differences in Spanish reading among instructional groups based on reading approach.

The MANCOVAs indicated significant differences for all three age samples. An analysis of posttest mean scores indicated that in all cases, the bilingual program participants performed better on tests of

Spanish reading than students who did not receive any reading instruction in Spanish.

With reference to 6 year olds, on one of the Spanish reading measures, students who received reading instruction in English and Spanish had a higher posttest mean score than students who received reading instruction only in Spanish. A possible explanation would be that students in the concurrent group were quantitatively exposed to more reading instruction (albeit in two languages) than the native language group who received reading instruction in only one language. This "double" exposure could have served to reinforce reading skills and perhaps to facilitate the positive transfer from one language to another.

Of additional interest were the posttest scores in Spanish reading for 6 year old students who received reading instruction in English only. Although they had not received formal reading instruction in Spanish, these students made gains on the *CRS(S)* measure from pretesting ($\bar{x} = 45.5$) to posttesting ($\bar{x} = 51.1$). It could be inferred that there was a transfer of skills from English reading to Spanish reading which would account for the gains. Since these students were, in fact, proficient in oral Spanish, reading instruction in English could have facilitated the transfer of skills to their native language, resulting in a gain rather than a loss of Spanish reading skills from pretesting to posttesting. This would confirm research conducted in Canada where English-speaking students in French immersion programs did in fact acquire basic English reading skills while receiving reading instruction in French.

Summary and Discussion of Results on the Effects of Reading Instruction on the Acquisition of Skills

Hypothesis 1 stated that there were no differences among groups of limited English-speaking students, ages 6, 8, and 10, in different reading groups on measures of oral English skills and reading skills in English and Spanish. On measures of oral English skill, the univariate ANCOVAs indicated significant differences among groups of 6 and 8 year olds. For all age groups (6, 8 and 10), students receiving reading instruction in English only attained the highest posttest mean scores.

A further analysis of oral English proficiency among 6 year olds in the two bilingual instructional groups, revealed that those receiving reading instruction in Spanish attained higher posttest mean scores than students receiving reading instruction in English and Spanish.

Perhaps the teachers who had to teach reading in one language, in this case Spanish, might have had more time to devote the teaching of oral English as compared to those teaching reading in two languages. Another explanation could be confusion among students in the concurrent group, resulting from instruction in two languages prior to having a firm base in one language, i.e., their native language.

On measures of English reading, the MANCOVA indicated significant differences among groups of 6 year olds; students receiving reading instruction in English only attained higher posttest scores than bilingual program participants. MANCOVAs for groups of 8 and 10 year olds were not significant indicating that students in a bilingual program performed as well as students in an English-only program.

MANCOVAs on Spanish reading measures were significant for all three age groups with the bilingual participants attaining higher post-test mean scores as compared to students who did not receive any Spanish reading instruction. With specific reference to 6 year olds who received reading instruction in English only, it appeared that there was a transfer to skills occurring which accounted for posttest gains or measures of Spanish reading.

All of the above results must be interpreted with caution. First, the design was cross-sectional rather than longitudinal and the cumulative effects of bilingual education could not be investigated. Second, intact groups were used and it is possible that the nonpublic students in the English-only instructional group were not, in fact, representative of the same population as the public school students.

In the following section, other variables, including instructional reading group, are investigated to determine the extent to which they relate to the acquisition of skills.

Variables Relating to the Acquisition of Skills

Hypothesis 2 stated that there were no relationships among independent variables and dependent variables measuring oral language and reading skills for groups of limited English-speaking students, ages 6, 8, and 10.

Based on preliminary analyses reported in chapter 3, the following variables were selected as independent (predictor) variables for inclusion in regression analyses to assess their independent and combined effects on pupil achievement.

Sociological Variables:

- Sex
- Ethnic Background (EB)
- Community Poverty Index (CPI)

Instructional Variables:

- Reading Instructional Group (RIG)
- ESL
- Years Enrolled in a bilingual program (YRSENRL)
- Teachers Language Attitude Score (TLAS)
- Special Teacher Training in ESL/bilingual education (SPECTRNG)

Linguistic Variables:

- English Fluency (as measured by *FLS*)
- Spanish Fluency (as measured by the *LAS(S)*)

Correlation coefficients were computed among the predictor and independent variables and are reported in Appendix G-3. For purposes of analyzing, reporting, and discussing the results, Hypothesis 2 was divided by skill area and age group as follows:

- 2.1 Oral English Skills
 - 2.11 Six year olds
 - 2.12 Eight year olds
 - 2.13 Ten year olds
- 2.2 English Reading Skills
 - 2.21 Six year olds
 - 2.22 Eight year olds
 - 2.23 Ten year olds
- 2.3 Spanish Reading Skills
 - 2.31 Six year olds
 - 2.32 Eight year olds
 - 2.33 Ten year olds

For 6 year olds, regression equations were calculated on five posttest instruments; for 8 and 10 year olds, regression analyses were calculated on six posttest instruments. Initially, stepwise regression procedures were used for each of the dependent variables, by age group, to determine whether the addition of a given variable to an equation significantly increased the total amount of variance (see Appendix C-4). After analyzing the stepwise regression equations, 17 final equations were computed as complete solutions. The results of the 17 equations are discussed in the following section.

Subhypothesis 2.1 - Oral English Skills

In investigating the variables that best predicted oral English skills,

as measured by the *LAS(E)* posttest, 11 predictor variables were initially selected for the stepwise regression procedures. Included among the 11 variables was a measure of L1 oral proficiency (based on the *LAS(S)*) to determine the relationship, if any, between oral skills in the L1 and oral skills in the L2 (see Appendix G-4).

2.11 Oral English skills - 6 year olds

Equation 1 indicated that 59% of the variance in oral English posttest scores among 6 year olds was explained by the following predictor variables: the pretest, the *LAS(S)*, membership in Reading Instructional Group DM, and Ethnic Background - Puerto Rican. The multiple correlation = .77, $F(4, 97) = 34.65$, $p < .01$ (see Table 14).

Students who scored high on the pretest and the *LAS(S)* also scored high on the posttest. These variables represented initial fluency in English and Spanish, respectively, and together they accounted for 53% of the variance in oral English posttest scores.

Membership in the English-only reading group also was a positive predictor of student gains. As previously reported in the analysis of covariance, students receiving reading instruction in English only scored highest on this posttest (refer to Table 11).

Additionally, students of Puerto Rican background, as opposed to students of Mexican and other Spanish-speaking backgrounds, were associated with higher posttest scores in oral English skills.

2.12 Oral English skills - 8 year olds

Equation 2 indicated that 48% of the variance in oral English posttest scores among 8 year olds was explained by the following variables: the pretest, *LAS(S)*, Special Training among teachers in ESL and bilingual education, student membership in Reading Instructional Group DM, and Teacher Language Attitude Score. The multiple correlation = .69, $F(5, 42) = 7.75$, $p < .01$ (see Table 14).

As was the case with 6 year olds, students who scored high on the pretest scored high on the posttest, accounting for 21% of the variance. In addition, students receiving reading instruction in English only, whose teachers had positive scores on the *Language Attitude Questionnaire*, and had special training in ESL and bilingual education methodology, were more likely to score high on the posttest measure of oral English. As opposed to 6-year olds, there was no significant relationship between L1 oral skills and L2 oral skills.

Table 14
Summary of 17 Regression Analyses
Including Equation Tests of Significance

Equation #	Age Group	N	Dependent Variable	Independent variables*	How B	Std H	Std Err B	Multiple R	R ²	Constant
1	6	102	Oral English LASIEI	LASIEI pre	52**	60	06	72	52	28.01
				LASIEI	18*	18	07	73	53	
				RIG DM	6.19**	24	1.97	75	56	
				EB PH	4.68**	19	1.77	77	59	
				Test of Significance						
			Regression MS	Residual MS	df	F				
			2134.5679	61.7114	4.97	34.85**				
2	8	48	LASIEI	LASIEI pre	32**	45	08	48	21	41.56
				LASIEI	08	08	12	47	22	
				SPECTRNG	11.21**	61	2.59	57	32	
				RIG DM	15.15**	54	4.31	65	42	
				TLAS	52*	28	23	69	48	
Test of Significance										
			Regression MS	Residual MS	df	F				
			272.0226	35.1159	5.42	7.75**				
3	10	39	LASIEI	LASIEI pre	31**	52	08	61	37	83.21
				LASIEI	18*	21	12	62	38	
				CPI	21**	27	10	67	45	
Test of Significance										
			Regression MS	Residual MS	df	F				
			367.2753	38.5163	3.35	9.54**				
4	6	96	English Reading CRSIEI	CRSIEI pre	57**	52	07	59	34	50.19
				FLS	03	05	05	67	44	
				SPECTRNG	7.71**	33	1.61	75	56	
				RIG DM	7.13**	28	1.92	81	65	
				CPI	22**	28	07	83	69	
				ESL	3.55*	15	1.62	84	71	
Test of Significance										
			Regression MS	Residual MS	df	F				
			1585.0688	43.8412	6.91	36.22**				
5	6	102	SESAT	SESAT pre	28**	43	05	55	31	21.88
				FLS	03	10	02	59	35	
				RIG CON	4.21**	37	89	66	43	
				RIG DM	3.37**	32	97	68	47	
				SPECTRNG	2.29**	23	76	72	51	
Test of Significance										
			Regression MS	Residual MS	df	F				
			252.9135	12.3933	5.97	20.41**				
6	8	48	CRSIEI	CRSIEI pre	77**	72	12	88	48	78.53
				FLS	19	12	16	89	48	
				ESL	23.96*	25	10.34	73	53	
Test of Significance										
			Regression MS	Residual MS	df	F				
			5620.4795	348.3745	3.44	18.71**				

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Table 14 (continued)

Equation #	Age Group	N	Dependent Variable	Independent Variables*	Raw B	Std B	Std Err B	Multiple R	R ²	Constant
7	8	49	SDRTP	SDRTP pre	34**		45	10	50	25
				FLS	47		23	26	54	30
Test of Significance										
					Regression MS	Residual MS	df	F		
					8511.585	880.4975	2,46	9.67**		
8	8	48	SDRTWC	SDRTWC pre	47**		54	10	58	33
				FLS	1.03		18	82	81	37
Test of Significance										
					Regression MS	Residual MS	df	F		
					92699.2**	7647.3188	3,43	12.15**		
9	10	37	CRS(E)	CRS(E) pre	34**		09	.53	26	
				FLS	30*		13	.58	34	
				CPI	-1.28**		27	.78	81	
				SEX	-11.81**		23	5.60	81	
Test of Significance										
					Regression MS	Residual MS	df	F		
					3912.7174	250.5225	4,32	15.62**		
10	10	38	SDRTP	SDRTP pre	49**		59	09	80	72
				FLS	38		20	22	86	74
				SPECTRNG	43.04**		37	12.28	87	76
				EB MEX	51.93**		52	15.76	90	80
				EB PR	38.71*		35	17.78	91	83
Test of Significance										
					Regression MS	Residual MS	df	F		
					12814.4810	411.4018	5,32	31.15**		
11	10	38	SDRTWC	SDRTWC pre	70**		94	12	83	69
				FLS	81		13	94	83	70
Test of Significance										
					Regression MS	Residual MS	df	F		
					277838.2096	6940.9422	2,35	40.03**		
12	6	99	Spanish Reading CRS(S)	CRS(S) pre	47**		59	06	59	35
				LAS(S)	24**		32	06	65	43
				RIG CON	5.31**		27	1.49	70	49
				Test of Significance						
					Regression MS	Residual MS	df	F		
					1302.8519	42.2253	3,95	30.85**		
13	6	93	PRUEBA	LAS(S) pre	16**		39	03	37	14
				PRUEBA pre	04		05	07	37	14
				SPECTRNG	6.12**		56	88	66	44
Test of Significance										
					Regression MS	Residual MS	df	F		
					412.60	17.83	3,89	23.41**		

Table 14 (continued)

Table 14 continued

Equation #	Age Group	N	Dependent Variable	Independent Variables ^a	Raw B	Std B	Std Err B	Multiple R	R ²	Constant
14	8	47	CRS(SI)	CRS(SI) pre	.80**	.102	.06	.85	.72	
				LAS(SI)	.33*	.22	.13	.85	.72	
				RIG CON	.15 .49**	.33	3.26	.90	.81	
				SEX	.3 .49*	.13	1.68	.90	.82	
				CPI	.23*	.18	1.10	.91	.83	
				EB MEX	.3 .94	.15	2.10	.92	.84	
<i>Test of Significance</i>										
			Regression MS	Residual MS	df	F				
			1113.6069	31.1246	6.40	35.78**				
15	8	44	PRUEBA	PRUEBA pre	.54**	.54	.11	.56	.34	
				LAS(SI)	.50**	.26	.22	.87	.45	
				SPECTRNG	.10 .91**	.28	4.41	.72	.52	
<i>Test of Significance</i>										
			Regression MS	Residual MS	df	F				
			1890.6264	130.1439	3.40	14.53**				
16	10	40	CRS(SI)	CRS(SI) Pre	.37**	.49	.06	.85	.72	
				LAS(SI)	.38**	.34	.08	.91	.83	
				EB PR	.6 .12**	.26	1.75	.93	.86	
				SEX	.3 .43**	.17	1.21	.94	.89	
<i>Test of Significance</i>										
			Regression MS	Residual MS	df	F				
			892.3366	12.6473	4.35	70.56**				
17	10	33	PRUEBA	PRUEBA Pre	.62**	.72	.09	.87	.78	
				LAS(SI)	.23	.16	.18	.90	.82	
				YRSENRL	.2 .24*	.26	.91	.91	.83	
				RIG DM	-.10 .20*	.27	4.77	.92	.85	
<i>Test of Significance</i>										
			Regression MS	Residual MS	df	F				
			1315.0723	32.2061	4.28	40.83**				

^a RIG = Reading Instruction Group (CON = Concurrent Approach, DM = Direct Method), EB = Ethnic Background (PR = Puerto Rican, MEX = Mexican), SPECTRNG = Special Training, TLAS = Teacher Language Attitude Score, CPI = Community Poverty Index, YRSENRL = Years Enrolled in a Bilingual Program

* p .05
** p .01

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2.13 Oral English skills - 10 year olds

Equation 3 indicated that 67% of the variance in oral English post-test scores among 10 year olds was explained by the following variables: the pretest, *LAS(S)*, and Community Poverty Index (CPI). The multiple correlation = .67, $F(3, 35) = 9.54$, $p < .01$ (see Table 14).

Paralleling the results for 6 and 8 year olds, initial skills in L2 predicted higher scores on the posttest measure of L2 oral skills. Whereas, L1 was a significant, positive predictor of L2 skills for 6 year olds, results indicated that for 10 year olds, L1 was a negative predictor of L2. In other words, the higher the score in Spanish, the lower the score in English, and vice versa.

With reference to Community Poverty Index (CPI), there was a negative effect on student performance in oral English skills, indicating that the higher the CPI, i.e., the poorer an attendance area, the lower the posttest score.

Discussion of results on oral English skills. For the regression analyses on oral English skills, among groups of 6, 8, and 10 year olds, students who performed well on the pretest performed well on the posttest. Membership in an English-only reading group was also associated with higher posttest scores for 6 and 8 year olds. This finding is consistent with results of the analyses of covariance (see Table 11).

Perhaps the most interesting finding was the relationship between L1 and L2 orals skills. Results indicated that as age increases, there is a definite trend established, with L1 having a positive association with the L2 for 6 year olds, little association for 8 year olds, and negative association for 10 year olds.

In interpreting these findings, one might assume that the acquisition of L2 skills, at least for younger children, is a function of the skills already present in the L1. In fact, this theory was proposed by Cummins (1979) in his developmental interdependence hypothesis which stated that "the level of L2 competence which a bilingual child attains is partially a function of the type of competence the child has developed in L1 "at the time when intensive exposure to L2 beings" (p. 233). The implications of this hypothesis include developing and maintaining the L1, which would aid the child to attain competence in the L2, and subsequently contribute to further cognitive and academic growth in the L2.

With reference to older children, it might be assumed that some of the limited English-speaking 10 year olds in this study had developed

fairly adequate skills in their L1 as a result of their age and previous school experiences in Spanish-speaking countries. For those who were recent arrivals, one would anticipate higher scores in the L1 to be related to lower scores in the L2. This is, in fact, what the results indicated.

While all of the 10 year olds in this study were limited English speakers, some of them had been in the Chicago school for a number of years. For those students, lower scores in the L1 might have been a result of negative attitudes toward the target language or even negative school experiences which minority children often face. Additionally, one might conclude that it is simply more difficult for older children to acquire a second language, as compared to younger children. First, the intermediate and upper grade curriculum is not as conducive as the primary curriculum, in promoting oral language development. Second, motivational differences as well as cognitive and affective factors might explain the inability of older children to learn the L2 as quickly as younger children.

Other variables included in the regression equations were: for 6 year olds, Ethnic Background - Puerto Rican; for 8 year olds, Special Training and Teacher Language Attitude Score; and for 10 year olds, Community Poverty Index. Although these variables contributed to the significant prediction of posttest scores on the measure of oral English proficiency, no trends could be established among the three age groups and the extent to which their contribution was unique to this particular study cannot be accurately determined. Nevertheless, these variables are worthy of further investigation in future research studies.

Subhypothesis 2.2 - English Reading Skills

In determining the independent and combined effects of statistically significant predictor variables on student performance in English reading, regression analyses were computed on two dependent variables for 6 year olds and three dependent variables for 8 and 10 year olds. Following the appropriate pretest, a measure of English language proficiency (*FLS*) was entered into the equations to investigate the relationship between L2 oral language and L2 reading skills.

2.21 English reading skills - 6 year olds

Two regression equations were computed: one for dependent variable *CRS(E)* and another for *SESAT* (see Table 14).

On the *CRS(E)* posttest, 11 predictor variables were entered initially into the stepwise regression analysis (see Appendix G-4). On equation 4, six variables jointly accounted for 71% of the variance in English reading posttest scores: the pretest; scores on the *FLS*; Special Training among teachers; student membership in Reading Instructional Group DM; Community Poverty Index; and ESL instruction. The multiple correlation = .84, $F(6, 91) = 36.22$, $p < .01$ (see Table 14).

Students who scored high on the pretest scored high on the posttest; the pretest independently accounted for 59% of the variance. The *FLS* measure of oral English proficiency, although contributing to the significance of the overall equation, was statistically insignificant in predicting English reading performance. Higher posttest scores on English reading were more likely to be associated with students who received reading instruction exclusively in English, who had low community poverty indices, who received ESL instruction, and whose teachers had special training in ESL and/or bilingual education.

On the *SESAT* posttest, the following variables jointly accounted for 51% of the variance on English reading skills: the pretest; scores on the *FLS*; membership in Reading Instructional Groups—CON and DM; and Special Training. The multiple correlation = .72, $F(5, 97) = 2.041$, $p < .01$ (see Table 14).

Students who scored high on the pretest also scored high on the posttest; the pretest independently accounted for 31% of the variance. As was the case with the *CRS(E)* measure of English reading, oral English proficiency (as measured by the *FLS*) contributed to the significance of the equation but, independently, was not statistically significant.

Students who received reading instruction either in English and Spanish, or exclusively in English were more likely to attain higher posttest scores on English reading as compared to students receiving initial reading instruction in Spanish only. Similar to the results of the analyses of covariance (Appendix G-2), these findings are justifiable, given that students in the Spanish reading groups were only exposed to formal English reading instruction during the last few months of the school year.

Special training among teachers in ESL and/or bilingual education was also found to have a positive effect on student posttest scores.

2.22 English reading skills - 8 year olds

For 8 year olds, regression equations were computed on three dependent variables: *CRS(E)*, *SDRTP*, and *SDRTWC*.

On the *CRS(E)* posttest, three variables jointly accounted for 53% of the variance: the posttest, scores on the *FLS*, and ESL instruction (The *FLS* measure of oral English proficiency was not independently significant.) Thus, high scores on this measure of English reading were associated with high scores on the pretest and with students who received ESL instruction.

On the *SDRTP* and *SDRTWC* measures of English reading, the respective pretests accounted for the greatest proportion of the variance on posttest scores and each was significant at the .01 level. The *FLS* was entered into the final equations, but as was the case with 6 year olds, it was not a statistically significant predictor.

On the *SDRTWC*, one other variable associated with higher posttest scores was positive teacher attitude toward L2 learners.

All three regression equations were significant at the .01 probability level (see Table 14).

2.23 English reading skills – 10 year olds

The same dependent variables for 8 year olds were used in the regression analyses for 10 year olds. On the *CRS(E)*, four variables jointly accounted for 66% of the variance: the pretest, the *FLS*, Community Poverty Index, and student Sex. Thus, higher posttest reading scores were associated with students who scored high on the pretest, who scored high on the *FLS* measure of oral English, who had lower poverty indices, and who were female. The multiple correlation = .81. $p < .01$ (see Table 14).

On the *SDRTP*, five variables jointly accounted for 83% of the variance: the pretest, the *FLS* (independently insignificant), Special Training, and Ethnic Background. High scores on the posttest more likely were associated with students who had high pretest scores and who were of Mexican or Puerto Rican background (as opposed to students from other Spanish-speaking backgrounds). Special Training was also a significant predictor, but in the case of 10 year olds, less training was associated with higher posttest scores. According to Table 12, students in instructional group DM had higher adjusted mean scores, and their teachers (nonpublic), as a group, had less special training in ESL and bilingual education methodology.

On the *SDRTWC*, the pretest score and the *FLS* accounted for 70% of the variance. The *FLS*, however, was not statistically significant predictor of posttest reading scores.

Discussion of results on English reading skills. For the eight regression analyses (equations 4-11) on English reading skill among groups of 6, 8, and 10 year olds; the pretest scores consistently accounted for large proportions of the variance. Following the pretest, the *FLS* measure of oral English proficiency was entered into the equations. Generally, the *FLS* measure was not a significant predictor of English reading for any of the age groups, with the exception of equation 11 for the 10 year olds. Perhaps this lack of a relationship between L2 oral skills and L2 reading skills was a function of the *FLS* instrument rather than the particular constructs in question.

In terms of membership in Reading Instructional Group, the findings were consistent with multivariate and univariate analyses of covariance; younger students receiving English reading instruction were associated with higher posttest scores on measures of English reading while students receiving bilingual instruction were associated with higher posttest scores on measures of Spanish reading. It is possible, however, that some of the students, particularly those in the public school bilingual programs, had not achieved the necessary "threshold" level of competence in English to benefit from English reading instruction (Cummins, 1979). In other words, although many of these students might have developed some degree of competence in English, albeit "surface fluency," they might have failed to develop the degree of competence necessary to perform the complex, cognitive operations required in the area of reading.

Among 6 year olds, the results suggest that teachers who had Special Training in ESL and/or bilingual education, promoted greater student learning of English reading. Instruction in English as a second language (ESL) was also a significant predictor of higher posttest reading scores (see equation 4 in Tab. 14). These two variables were probably significant because the teachers of primary children generally create an environment conducive to language learning. This environment may not be as dependent on language as much as it is on the development of cognitive skills that foster growth in reading as well as in other academic areas.

Again, in the case of 10 year olds, something else appeared to be happening, for the results indicated that Special Training had a significant negative effect on English reading skills; ESL instruction had no effect. Perhaps the acquisition of English reading skills among older children is a much more complex process than for younger children and is a function of a combination of factors including educational

treatment, affective variables (including motivational level), and cognitive processes and strategies involved in second language learning.

Community Poverty Index (CPI), as a measure of socioeconomic status, was a significant predictor in the case of 6 year olds (equation 4) and 10 year olds (equation 9). Positive Teacher Language Attitudes only surfaced as a significant predictor among 8 year olds (equation 8). Since these two predictor variables were not related consistently to student performance for all age groups, and since trends could not be discerned, the extent to which the significance was unique to this study cannot be accurately determined.

However, all of the variables that appeared to be significant predictors, either consistently or as isolated cases, are worthy of further investigation and include: ESL, Special Training, Teacher Language Attitudes, L1 and L2 Oral Fluency, and Community Poverty Index as a measure of socioeconomic status.

Subhypothesis 2.3 - Spanish Reading Skills

In determining the independent and combined effects of statistically significant predictor variables on student performance in Spanish reading, six regression analyses were computed on two dependent variables: the *CRS(S)* and the *PRUEBA*. Following the appropriate pretest, a measure of Spanish language proficiency (*LAS(S)*) was entered into the equations to investigate the relationship between L1 oral language and L1 reading skills.

2.31 Spanish reading skills - 6 year olds

On the *CRS(S)* posttest, three variables accounted for 49% of the variance: the pretest, *LAS(S)*, and membership in Reading Instructional Group - CON. The multiple correlation = .70, $p < .01$ (see Table 14). The results indicated the higher posttest scores were associated with higher pretest scores, higher scores on the measure of oral Spanish proficiency, and membership in an instructional group receiving reading in English and Spanish (as opposed to a group receiving reading instruction exclusively in Spanish or exclusively in English). This particular finding was also obtained in the follow-up procedures to the analysis of covariance which indicated higher adjusted posttest means for the concurrent group.

On the *PRUEBA*, the following variables accounted for 44% of the variance: the pretest, the *LAS(S)*, and Special Training. Of all 17

regression equations, this was the only situation in which the pretest was not a significant predictor of posttest scores. This finding could be explained by the insignificant correlation between the *PRUEBA* pretest and posttest for 6 year olds ($r = .05$), which might have been due to the fact that one-third of the sample did not receive any Spanish reading instruction.

2.32 Spanish reading skills - 8 year olds

On the *CRS(S)*, six variables jointly accounted for 84% of the variance: the pretest (72% of the variance), the *LAS(S)*, membership in Reading Instructional Group - CON, Sex, CPI, and Ethnic Background - Mexican (see Table 14). For two of the predictor variables, negative relationships were found. The results indicated that the lower the score on the measure of oral Spanish proficiency, the higher the score on the Spanish posttest reading measure, a finding inconsistent with the other regression analyses on Spanish reading for 6, 8, and 10 year olds. Membership in the instructional group receiving reading instruction in Spanish and English (as opposed to English only) was associated negatively with higher scores on the Spanish reading measure. The latter finding also contradicts the results of the univariate analysis of covariance (Appendix G-2) and reported adjusted mean scores (Table 12).

These contradictory findings might be explained by missing data ($N = 44$ for the regression analysis, $N = 75$ for the multivariate data, and $N = 86$ for the univariate data) that could have caused the data used in the regression analysis to be skewed.

On the *PRUEBA*, three variables jointly accounted for 52% of the variance: the pretest, the *LAS(S)*, and Special Training (see Table 14). Thus, higher posttest reading scores in Spanish were associated with higher pretest scores, higher scores on the measure of oral Spanish, and less teacher training in ESL and/or bilingual education.

2.33 Spanish reading skills - 10 year olds

On the *CRS(S)*, four predictor variables accounted for 89% of the variance. Higher posttest scores for 10 year olds on this measure of Spanish reading were associated with higher scores on the pretest, higher scores on the measure of oral Spanish, students of Puerto Rican background, and female students. The multiple correlation = .94, $F(4, 35) = 70.56$, $p < .01$ (see Table 14).

On the *PRUEBA* four predictor variables accounted for 85% of the variance. Higher posttest scores for 10 year olds on this measure of

Spanish reading were associated positively with higher scores on the pretest. Years enrolled in a bilingual program was related negatively to higher posttest scores but this could be explained by the fact that older children, who had recently come to this country, probably had previous school experience in Spanish and could thus read better in Spanish than students who had been here longer.

Membership in an instructional group receiving reading in English, as compared to a bilingual instructional group, was related negatively to higher reading scores in Spanish. Similar findings were also established in the analyses of variance tests (see Table 13 and Appendix G-2).

Summary discussion of Spanish reading skills. As was the case with all of the other regression analyses, pretest scores were significant predictors of higher posttest scores (with the exception of equation 13).

Higher scores on the measure of L1 oral proficiency also were generally good predictors of L1 reading skill. This finding further confirms a basic assumption that oral language skills are indeed related to reading skills. In other words, oral competence in a language provides the learner with the necessary tools to efficiently predict information from the printed page and subsequently, develop fluent reading skills.

With reference to membership in Reading Instructional Group, the expected results were obtained, in that, students who received reading instruction in Spanish attained higher posttest scores than students who received reading instruction in English only.

Other isolated variables contributed to the prediction of Spanish reading scores but no observable trends could be discerned. Included among these significant predictors were Special Training, Sex, Ethnic Background, Community Poverty Index, and Years Enrolled in a bilingual program.

Summary Results of Regression Analyses

In investigating variables related to the acquisition of oral language and reading skills, only a few trends were observed. L1 oral language proficiency did appear to be associated with the acquisition of L2 skills and L1 reading, especially among 6 year olds. Additionally, teacher attitudes, ESL instruction, and special training had an effect on performance among young children.

As to why the variables selected in this study were not strong predictors of performance among older children is open to speculation. Perhaps other variables focusing on student attitudes, motivation, and the school environment might be more revealing in future studies. Nevertheless, the fact that several of the variables selected for investigation were significant predictors, either consistently or in isolated cases, indicates that further study is warranted:

Chapter Summary

Multivariate and univariate analyses of covariance were calculated to test the first hypothesis related to differences among three reading instructional groups: students receiving reading instruction in the L1 (the native language approach); students receiving reading instruction in the L1 and L2 (the concurrent approach); and students receiving reading instruction in the L2 exclusively (the direct method). The results of the statistical analyses can be summarized as follows:

1. On a measure of oral English proficiency, 6 and 8 year olds receiving reading instruction exclusively in English performed significantly better than students receiving bilingual reading instruction; groups of 10 year olds performed on a comparable basis regardless of reading instructional approach.
2. On measures of English reading, 6 year old students receiving reading instruction exclusively in English did significantly better; for 8 and 10 year olds, students receiving bilingual instruction performed as well as students receiving instruction exclusively in English.
3. On measures of Spanish reading, 6, 8, and 10 year olds who received reading instruction in Spanish and English performed significantly better than students receiving reading instruction exclusively in English.

The results should be interpreted with caution since a cross-sectional design does not always permit the cumulative benefits of bilingual instruction from surfacing.

Regression techniques were used to test the second hypothesis relating to independent variables associated with the acquisition of oral language and reading skills. The results can be summarized as follows:

1. Among young children, L1 fluency was a good predictor of L2 oral skills.
2. For all age groups, L1 oral skills were consistent predictors of L1 reading skills.

3. For younger children, ESL instruction, teacher training, and teacher attitudes were positively associated with the acquisition of skills.
4. No definitive trends were observed with respect to other variables such as sex, ethnic background, and socioeconomic status.

Chapter 5

IMPLICATIONS OF RESULTS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Summary of Findings

Only during the past ten years have bilingual education programs been implemented systematically throughout the country. As a result, practitioners have found themselves without a solid data base upon which to make decisions affecting instructional practices. This study was an attempt to provide answers to some of the most pressing questions regarding the acquisition of oral language and reading skills among L2 learners.

Two hypotheses were generated with regard to the teaching and learning of oral language and reading skills among limited English-speaking students. The first was related to differences in student performance among reading instructional groups. The groups were established according to the following bilingual reading approaches: the native language approach with reading instruction in the L1; the concurrent approach with reading instruction in the L1 and L2; and the direct method with reading instruction in the L2 exclusively. The second hypothesis related to the identification of sociological, instructional, and linguistic variables associated with the acquisition of oral language and reading skills. Variables included: sex, ethnic background, socioeconomic status, years enrolled in a bilingual program, ESL instruction, teacher training in ESL and/or bilingual education, teacher attitudes toward second language learners, and fluency in the L1 and L2.

The sample consisted of 306 Spanish background students of limited English-speaking proficiency, ages 6, 8 and 10, who were enrolled in eight public and five nonpublic schools in Chicago. Students were pretested in October 1977 and posttested in May 1978 on a number of L1 and L2 oral proficiency and reading tests. Background information was also collected on teachers and their attitudes toward second language learners.

Data from the three age samples were analyzed separately through the use of the statistical procedures of analysis of covariance and regression analysis for hypothesis 1 and 2, respectively. The data for the statistical analyses were further subdivided by skill area, i.e., oral English, English reading, and Spanish reading.

The results from the statistical analyses are summarized in the following sections.

Effects of Reading Instructional Approach on Oral Language and Reading Skills

In oral English skills, the findings indicated statistically significant differences among groups of 6 and 8 year olds. Students receiving reading instruction exclusively in English performed better than students receiving bilingual instruction. Gains in oral English however, were evident for the bilingual program participants. Among groups of 10 year olds, the bilingual program participants performed on a comparable basis with English-only program participants.

In English reading, the findings indicated statistically significant differences only among groups of 6 year olds. Again, students receiving reading instruction exclusively in English performed better than students receiving bilingual instruction. Among 8 and 10 year olds, the bilingual program participants performed equally with nonbilingual program participants.

These findings, especially for the younger children, should be interpreted cautiously inasmuch as cumulative benefits of bilingual education usually do not surface in cross-sectional designs.

In Spanish reading, the anticipated results were obtained. Student who received reading instruction in Spanish and English performed better than those who received reading instruction in English only.

Variables Related to the Acquisition of Oral Language and Reading Skills

Based on the results of the regression analyses, only a few independent variables appeared to relate to the acquisition of skills. For example, proficiency in Spanish (L1) was a positive predictor of oral English (L2) proficiency among groups of 6 year olds ($p < .05$) and a negative predictor among 10 year olds ($p < .05$). This is in support of findings from other studies which suggest that, at least for younger children, a firm base in the L1 may facilitate acquisition of the L2

While other variables were associated with the acquisition of oral English skills, no trends could be discerned. These other variables included: ethnic background (Puerto Rican as opposed to Mexican) among 6 year olds; teacher training and positive teacher attitudes among 8 year olds; and higher socioeconomic status among 10 year olds.

Only a few variables, however, were associated with the acquisition of reading skills. Specifically ESL instruction and teacher training appeared to be significant predictors of English reading scores among younger children. With reference to Spanish reading, oral proficiency in Spanish was a consistent predictor for all three age groups. In isolated cases, other variables contributed to the prediction of reading scores in English and Spanish but no trends could be discerned. The extent to which these variables' contribution was unique to this study cannot be accurately determined.

Before discussing the implications of these findings, the limitations of their generalizability should be noted.

Generalizability of Findings

Upon reviewing the findings, careful consideration must be given to the limitations inherent in this study. The principal limitation derives from the fact that this study was limited to an investigation of oral language and reading skills among Spanish-speaking minority students, ages 6, 8, and 10, enrolled in inner-city schools. Therefore, caution must be exercised in interpreting these results as characteristic of all second language learners. Different results might be found among students whose first language is one other than Spanish, and whose social, environmental, and attitudinal characteristics differ from the students in this study.

A further limitation to the generalizability of the findings arises from the nature of the research design. The nonequivalent control group design used in this study involved intact groups such as classrooms. In that students were not randomly assigned to the different reading groups, the possibility exists that results might be attributable to the unique characteristics of each group and not to the treatment.

Although several techniques were used to control for possible unique characteristics, the nature of educational research precludes total elimination of confounding variables. In the case of this study, uncontrolled variables include student and parent attitudes with specific

regard for motivational differences, attitudes toward the target language, and attitudes toward school and bilingual education. Although not within the scope of this study, research indicates that these variables affect both academic and L2 progress. Additionally with reference to the control group in this study, it is possible that the attitudes of students and parents of the nonpublic schools were different from those of the public school participants.

Finally, it should be noted that a cross-sectional study has inherent weaknesses. Research has shown that there may be initial lags in student performance among those who participate in bilingual programs. But these lags are often short-term in nature and the benefits of program participation can be determined more conclusively through longitudinal studies.

To determine whether or not the above-cited limitations affect the generalizability of the findings, additional research must be conducted. Nevertheless, there are several implications which can be drawn based on the available findings.

Implications for Practitioners

The major objective of this study was to provide additional empirical data practitioners could use in designing, implementing, and refining reading instructional programs for limited English-speaking students. Specifically, the question of sequencing the languages of instruction was addressed. Based on the findings of this study, it remains difficult to make one general statement regarding the superiority of a particular bilingual reading approach. For example, 6 year olds who received reading instruction exclusively in English did better in oral English and English reading as compared to bilingual program participants. However, long-range benefits, which might be attributed to participation in a bilingual education program, cannot be determined within the scope of this study.

A simple answer to selection of a reading approach may not even exist. Perhaps a more complex solution can be found with reference to student characteristics interacting with approach. For example, the concurrent or immersion approach may be more appropriate for students whose motivation is high and who have developed competence in their first language. For others, whose motivation is low and who have not developed competence in the first language, the native language approach may be more appropriate.

Current research has suggested that a thorough knowledge of the L2 is a prerequisite to the development of reading skills in the L2. If this is the case, it would appear wise to delay L2 reading instruction until the student has attained oral competence in the L2. Results from this study suggest that younger children exposed to initial reading instruction in the native language, as opposed to both languages concurrently, were more successful in acquiring oral L2 skills. This suggests that young children might be more apt to acquire L2 oral skills if they do not receive reading instruction in the two languages concurrently.

The introduction of initial reading skills in the native language prior to the second language might also foster the development of those higher cognitive skills needed in proficient reading. Once acquired in the L2, those higher order skills could then transfer to the L2. While it is conceivable that higher cognitive skills are transferrable from one language to another, a question remains as to the extent of transfer of more basic reading skills. For example, how is transfer of skills from Korean to English comparable to transfer from Spanish to English? To what extent do children learning to read from right to left, e.g., Arabic, become confused when learning to read English from left to right?

Because there is very little research available in this area, program planners must be careful not to select arbitrarily one reading approach for all limited English-speaking students. Perhaps for some linguistic groups, an immersion or concurrent approach should be considered and for others, a native language approach where reading instruction in the L2 is delayed.

Also to be considered are parental expectations in the area of bilingual education. While many parents may wish their children to become proficient speakers and readers in the L1, others are not concerned with this. Some parents send their children to private schools in the later afternoon and on weekends to teach them to be biliterate. While parents may want the public school to employ bilingual teachers to facilitate communication with their children, the degree or form of bilingual education preferred varies among groups. This variation in parental aspirations is bound to have an effect on student performance and should be seriously considered as one of the factors in program planning.

Results from this study have also shown that younger children's competence in the first language is related to competence in the second

language. An obvious implication is that younger students, whose L1 skills are less than adequate, should receive further instruction emphasizing those L1 skills in order to facilitate acquisition of L2 skills. The level to which the L1 skills should be developed, however, is still an unknown, given the current state of the art. Nevertheless, program administrators should give consideration to the expansion of bilingual education programs for preschool and kindergarten children—programs which generally emphasize oral language development. With reference to older children, the findings suggest that perhaps less instructional time be spent on native language arts.

Findings of this study also suggest that ESL instruction does make a difference, especially for younger children. If this is so, then school administrators should make appropriate provisions to ensure that such instruction is a component of every bilingual education program. School administrators should continue to train bilingual and monolingual staff in ESL methodology through continuing staff development and inservice education programs. Furthermore, management procedures should be designed to give specific responsibility for ESL instruction to particular teachers.

Although this study did not deal with program evaluation, it appears that it would be the next logical step for consideration in overall program planning and refinement. If this be the case, more observational techniques should be used so that actual teaching techniques and interactions among teachers and students can be analyzed qualitatively and quantitatively. Additionally, research designs should be selected that promote investigations of salient student and teacher characteristics interacting with a variety of educational treatments.

In conclusion, the number of issues discussed clearly indicates a need for additional research on the teaching and acquisition of L2 oral language and reading skills among second language learners. In the following section additional research is suggested, particularly in the area of longitudinally based studies concentrating on approaches, affective variables, psycholinguistic-oriented research, transfer, and teaching strategies.

Recommendations for Future Research

While the present study has provided information on the effectiveness of specific bilingual reading approaches, as well as variables associated with acquisition of skills, there are areas requiring further

investigation. With reference to the effectiveness of the particular reading approaches investigated, a longitudinal study needs to be conducted involving the subjects of this dissertation. This would provide information as to the cumulative benefits of participation in a bilingual education program.

As a result of this study, perhaps the most critical area in need of further research relates to the identification of minimum competencies needed in the L1 (both oral and reading) to facilitate the development of competence in the L2. Additionally, the minimum oral competencies needed in the L2, to enhance reading instruction in the L2, require further investigation. Specifically, these levels of competence, in both the L1 and the L2, should be identified across ages to determine which skills are needed for students to benefit optimally from instruction in the various grade levels.

Additionally, research should be directed at studying the interdependencies between the L1 and L2. Do children who maintain their L1 develop higher or lower skills in the L2 and subsequently higher order cognitive skills, as opposed to children who do not maintain their L1? Concurrently, is there an optimal level of proficiency in each of the two languages children should attain in order to avoid academic failure?

Findings indicated that ESL was a viable instructional component for younger children even though specific methodologies and teacher competencies had not been investigated in this study. Consequently, observation-type studies should be conducted, which identify specific methodologies, and teacher competencies, which contribute to the learning of English. There is also the question of identifying the type of ESL instruction required by older children; perhaps a different curriculum is needed.

As evident from this study, more research is needed to investigate processes and strategies involved in the transfer of reading skills from one language to another. Specifically, does transfer occur in lower level reading skills (directionality and word attack skills) to the same extent as in higher level skills (comprehension and interpretation skills), and are the processes and strategies universal or language specific? In other words, how does transfer compare from Korean to English with Spanish to English?

The findings of this study also indicated that favorable teacher attitudes toward L2 learners and teacher preparation in the area of ESL

and bilingual education were positively associated with acquisition of skills among younger children. As a result, further research should be conducted to determine the most efficient ways of promoting positive teacher attitudes toward L2 learners and to identify those specific skill areas in which teachers require additional training.

While this study focused on three bilingual reading approaches, there are others which warrant further study. For example, few immersion programs for minority children have been conducted in this country. Perhaps the implementation of an immersion program might provide practitioners with a wider range of available alternatives. Program guidelines as described in the Canadian studies would include some of the following: homogeneous grouping of target students; permitting students to speak in the L1 until they are ready to communicate in the L2; staffing programs with bilingual teachers; and following the scope and sequence of the general curriculum.

While not specifically related to this study, there are other relevant areas of needed research relating to second language reading; these include psycholinguistic studies on inferencing processes, decoding and encoding strategies, the use of contextual clues, and the role that interference plays in L2 reading. Further investigation might identify specific teacher behaviors and curriculum approaches that promote strategies leading to the acquisition of proficient reading skills.

Although not within the scope of this study, current research has suggested that affective variables play a significant role in second language learning. More research needs to focus on investigating and identifying specific affective variables which interact with various bilingual reading approaches. Specifically, student, parent, and community attitudes toward the L2 and target culture, toward school, and toward bilingual education, need to be investigated further.

Research is also needed to explore the effectiveness of various pedagogical practices employed within the context of different bilingual education programs. These include skill area emphasis such as: listening, speaking, reading, and writing; the use of particular language development techniques; and the sequencing of the two languages in content area instruction. Observational techniques could serve as a test of theoretical research and offer additional insights into teacher and learner strategies.

Concluding Remarks

Based on the findings of this study, a simplistic statement cannot be made regarding the superiority of one particular reading approach as compared to another. The answer may lie in the interaction of student characteristics with approach. For the particular students in this study, follow-up procedures are necessary to determine the cumulative benefits of instruction in the different reading approaches.

However, several of the findings permit statements to be made regarding implications for practitioners. First, consideration should be given to implementing alternative approaches for students with different characteristics. Consideration should also be given to designing programs for limited English-speakers which provide a firm base in the L1 and the L2, prior to introducing reading and content area instruction in the L2.

Program administrators should also make provisions for staff development activities to prepare teachers in ESL and bilingual methodologies. Finally, program evaluation should begin using classroom observation techniques in order to identify teacher and student strategies and behaviors that promote academic growth.

Recommendations for future research include: studies to assess longitudinally particular educational approaches; studies focusing on affective variables; psycholinguistic-oriented research, including transfer; studies focusing on the relationship between L1 and L2, including identification of minimum levels of competence; and finally, studies identifying specific teaching techniques that contribute to the academic success of second language learners in all areas of the curriculum.

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