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A Comparative Investigation of the Effects of English as a Second Language (ESL) Instruction Transitional Bilingual Education (TBE) and English Submersion upon English Language Proficiency and Achievement of Limited English Proficient (LEP) Students

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A COMPARATIVE INVESTIGATION OF THE EFFECTS OF ENGLISH AS A SECOND LANGUAGE (ESL) INSTRUCTION, TRANSITIONAL BILINGUAL EDUCATION (TBE) AND ENGLISH SUBMERSION UPON ENGLISH LANGUAGE PROFICIENCY AND ACHIEVEMENT OF LIMITED ENGLISH PROFICIENT (LEP) STUDENTS

by

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VITA

The author, Marlene Sue Kamm, is the daughter of Max Kamm and Sylvia (Katzman) Kamm. She was born on January 21, 1953 in Chicago, Illinois.

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Hoover, Todd and Marlene Kamm. "A Guide to Processing Student Information," Bilingual Journal, vol. v, no. 4, 1981.

"So Juan Can't Speak English: The Library's Role in a Multicultural and Multilingual Society," Illinois Libraries, vol. 62, no. 10, December, 1980.

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CHAPTER I

INTRODUCTION

Background and Nature of the Study

Educators are in disagreement over the most effective methodology to be utilized for the acquisition of English as a second language. Approximately 5.35 million school-age children in the United States come from a non-English language background and about 2.4 million have been identified as limited English proficient (LEP) (U.S. Bureau of the Census, 1987; Bennett, 1986). In the state of California, for example, it was estimated that the number of LEP children increased from 326,000 in 1980 to 567,000 in 1986 -- a 73 percent increase.

The median number of years of schooling completed by Hispanics 25 years of age or older was 12.0 in 1987, up from 10.8 in 1982. For the total non-Hispanic population in the same age group, the median number of years of schooling was 12.7 and 12.6 in 1982 (U.S. Bureau of the Census, 1987). There is considerable controversy and contradiction concerning LEP students and what programs should be offered to them so they can have equal access to the educational process. Controversy over LEP students centers primarily on establishing goals and appropriate methodologies for achieving an effective

instructional program to rectify their English language deficiencies. Some legislators and educators have argued that programs should focus on English language instruction so that children might compete more effectively for education and employment in an all English-speaking society (Congressional Digest, March, 1987). Others believe that English submersion is instructionally ineffective and discourages the preservation of the native language and culture of the child (Cummins, 1982). Still others believe that existing bilingual education programs in the United States are poorly designed, inadequately funded and ineptly implemented; the result is that they have little impact on English language acquisition, native language maintenance, or cultural identity (Baker & de Kanter, 1981).

The most controversial of instructional approaches offered to LEP children center around: 1) the bilingual education approach, 2) the English as a Second Language (ESL) approach, and 3) submersion. The main point of contention is whether emphasis should be placed on strictly English language instruction or on bilingual education instruction.

Historically, opportunities for experimentation with bilingual programs were available through school systems and Title VII, (an amendment to the 1965 Elementary and Secondary act). The passage of the Bilingual Education Act of 1968 heralded the official coming of age of the federal role in the education of persons with limited English proficiency.

The primary reason for the spread of bilingual education in the United States came from the famous 1974 decision, Lau v. Nichols, the U.S. Supreme Court case which overturned an earlier decision by the federal district courts in a class action suit brought by Chinese public school students against the San Francisco Unified School District in 1970 (Teitelbaum & Hiller, 1977). The Supreme Court ruled that "there is no equality of treatment merely by providing students with the same facilities, textbook, teachers and curriculum; for students who do not understand English are effectively foreclosed from any meaningful education" (Teitelbaum & Hiller, 1977, p. 7).

This Lau v. Nichols decision provided for expansion of the Bilingual Act which was amended in 1974. It also provided impetus for the passage of state legislation mandating bilingual education (which followed the precedent set by Massachusetts in 1971 and Illinois and Texas in 1973).

Recently, the U.S. Department of Education transmitted to Congress a bill entitled the Bilingual Education Improvements Act of 1984 to amend the Bilingual Education Act -Title VII, and to improve services to LEP children. The proposed legislation will establish a broader range of instructional approaches eligible for support that would include approaches which do not require instruction in the child's native lan-

guage and would give local education agencies increased flexibility in designing effective programs for LEP children.

There has never been a wider breach, as exists presently, between the U.S. Dept. of Education and professionals in the field of bilingual education. Many bilingual researchers and practitioners have accused U.S. Secretary of Education Bennett of ignoring a growing body of evidence documenting bilingual program successes (Crawford, 1987).

President Reagan expressed his opinion on bilingual education to a group of mayors in 1981, stating that "it is absolutely wrong and against the American concept to have a bilingual education program that is now openly, admittedly dedicated to preserving their native language and never getting them adequate in English so they can go out into the job market" (New York Times, 1981, p. 37).

The U.S. English organization, founded by former U.S. Senator S.I. Hayakawa, argued that "at the very least, bilingual education retards the acquisition of English language skills, and the integration of the student into the American mainstream" (Youth Policy, 1983, p. 18).

Bilingual education & ESL approaches to language learning have existed since the early 19th century in various public school systems in the United States and internationally (Schlossman, 1983). Since 1970, research has been conducted comparing the effectiveness of various types of instructional programs for LEP children. In this connection, Paulston

(1978) concluded that "at the world level, the field of research on bilingual education was characterized by dis-parate findings, inclusive results, and a study could be found to support virtually every possible opinion" (p. 187).

Willig (1985) conducted a meta-analysis of selected studies on the effectiveness of bilingual education. She found that study results were less than conclusive due to the following factors which affected statistical analyses: 1) magnitude of the treatment effect sizes that influenced types of programs compared, 2) language of the criterion instruments, 3) academic domain of the criterion instruments, 4) random versus nonrandom assignment of students to programs and 5) methodologies used to calculate findings. She concluded that "the unacceptable quality of the major portion of the research is substantiated not only by the information contained in the studies, but also by that not contained in the students . . . It is imperative that the quality of research and evaluation in bilingual education be upgraded" (p. 269).

In the past, most knowledge about programs for LEP students was based entirely on authority (laws and experts), the personal experiences of educators, and the "common sense" reasoning of program designers and planners. Such information may be important, but is in itself insufficient for making critical educational decisions.

Less than $500,000 has been spent by the nation to research bilingual education programs and ESL approaches, even though $1.8 billion has been spent on funding bilingual programs (Crawford, 1987). Educators, in the past, often looked internationally for research results on the subject. The majority of research conducted in the United States has consisted mainly of descriptive, evaluative and documentative case studies. There have only been a few reported longitudinal and/or experimental studies occurring in the last 10 years that have compared the different approaches to second language learning.

Nationwide, there are more than 5.35 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 (U.S. Bureau of the Census, 1987). The need to offer effective educational programs for these children is one of the most pressing tasks confronting policy makers and educators at federal, state and local levels. The need for more systematic research on the effects of bilingual education and ESL approaches is especially important in light of the proliferation of programs throughout the country and the inadequate funding capacities. In 1978, Troike stated that "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). Today similar statements appear in the literature indicating that our social and educational priorities have not changed.

It is important to clarify here that ESL methodology is viewed as a vital, integral component of bilingual education programs, but is often looked upon as an approach competing with or negating bilingual education (Alatis, 1986). English as a Second Language, an approach developed in the 1930's to teach foreign diplomats and university students English, was extended to language minority children. Typically, "pullout classes" were the most common form of ESL instruction. Students were removed from regular classrooms for 45 minutes a day, 2 to 5 times a week, for compensatory instruction. However, during the 1950's and 1960's many civil rights commissions began to claim that LEP students learned English too slowly through ESL instruction and could not keep up in other subject areas (Schlossman, 1983). An examination of the differential effects of one methodology over the other upon actual acquisition of English language skills is the crucial question to be addressed here.

Proponents of these two methodologies maintain many differing points of view. Some educators maintain that they cannot be separated if effective language results are desired. Spolsky (1978) claimed that "any bilingual education program

in the United States must include an effective ESL component and any ESL program that ignores the children's first language is likely to be ineffective" (p. 327). Monolingual instruction without an ESL component does not provide LEP students with the specialized instruction needed for the acquisition of English language skills (TESOL, 1986).

The Bilingual Education Act defines bilingual education programs as: "the use of two languages, one of which is English, the other is the native language, as a medium of instruction. Both languages are used for the same student population -- not as an isolated effort, but as a key component of a program embracing a total curriculum" (Bell, 1984).

ESL instruction and bilingual education are both designed to change the tradition of monolingualism and bring about mutual respect and understanding among people of diverse linguistic and cultural backgrounds. In short, the main purpose of language acquisition (regardless of the methodology) is to enhance the understanding of people and culture.

Another prevalent point of view that sees bilingual education as the only approach that truly produces dual language abilities and dual culturalism. ESL instruction perpetuates linguistic imperialism and cultural aggressiveness and is not going to produce bilingual/bicultural individuals (Hernandez-Chavez, 1984).

The opposite point of view is that bilingual education will create a subordination of English as the primary language

in the United States and will perpetuate isolation of ethnic groups, cause political unrest, and eliminate assimilation. Children will not master the English language, but instead will use their native language as a crutch to succeed in society (Youth Policy, 1983). Recently, bilingual education has been extremely vulnerable, being the prime target of the burgeoning "English-only" movement which opposes bilingual instruction on ideological grounds and argues that it impedes the assimilation of new immigrants and threatens to divide Americans along language lines (Congressional Digest, 1987).

Statement of the Problem

School systems throughout the country have been trying to meet the needs of their LEP student populations for many years. Currently, over 35 states have been instructed by legislative mandates to provide bilingual education approaches, while in others they have employed ESL approaches, submersion, immersion, or approaches placing the student in the all English instructed curriculum (Bennett, 1986). Many differing views for and against bilingual education and/or ESL instruction exist. Therefore, sound empirical research is needed to address the important questions that these approaches raise; i.e., is one specific instructional method for learning English more effective than another? Is the use of native language instruction an effective strategy for academic development in English? This study was designed to

investigate the comparative effects of three different second language learning approaches and a control group upon oral English language proficiency and academic achievement in math, language and reading for first and third grade students in a sample of public and parochial schools.

Purpose of the Study

The purpose of this investigation is to examine the differential effects of models of bilingual education instruction and ESL instruction on the acquisition of oral language proficiency and achievement in language, reading and mathematics, among groups of Hispanic LEP students in the first and third grades in a sample of public and parochial schools. The major research questions to be addressed are as follows:

1a. What effect, if any, does transitional bilingual education instruction have on the acquisiton of oral English proficiency and academic skills in language, reading and math?

b. What effect, if any, does ESL instruction have on the acquisition of oral English proficiency and academic skills in language, reading and math?

c. What effect, if any, do the combination of these two methods have on the acquisition of oral English proficiency and academic skills in language, reading and math?

d. What effect, if any, does the lack of any specialized English instruction have on the acquisition of oral

English proficiency and academic skills in language, reading and math?

2. What effect, if any, does previous formal schooling experience of students have on the acquisition of English?
3. What effect, if any, does the number of years residing in the U.S. have on the acquisition of English?

In addition, demographic data was collected related to: 1) previous schooling background of the students, 2) the number of years residing in the United States, 3) the language predominantly used at home, 4) the socioeconomic status, 5) age, 6) sex, 7) the number of siblings in the family, 8) the number of parents in the home, and 9) the number of extended family in the home.

Importance of the Study

The analysis of data and conclusions to be drawn from this experimental study should help practitioners in the field and policymakers make important decisions concerning the implementation and use of different instructional approaches in the acquisition of the English language.

The practitioner in the field of bilingual education is confused as to the effectiveness of the various approaches to second language learning. There are studies available that both support and negate the success of bilingual education and

ESL instruction. This study addressed a comparison of methods used in the Illinois area in bilingual settings. It attempted to answer some of the basic questions that practitioners and policymakers have sought answers to for the last decade: Are particular instructional methods for learning English more effective than others with LEP students? Is native language instruction necessary for a student to effectively gain English skills? How many years will it take for a student to acquire English proficiency?

It is hoped that the results of this dissertation will contribute to the field of educating LEP students and assist school districts and policy makers in making sound, pedagogical decisions for future refinement of bilingual programs.

Delimitations of the Study

The following limitations are noted:

1. This study was limited to samples in Waukegan public and parochial schools, Waukegan, Illinois.
2. This study was limited to Hispanic first and third grade students enrolled in the Waukegan public schools and parochial schools.
3. This study was limited to one academic school year.
4. This study was limited to a control group of intact classrooms in the parochial schools. A control group could not exist in the public schools due to the Illinois Legislative Mandate for Bilingual Edu-

cation passed in July, 1976. These rules and regulations of Article 14C of the Illinois School Code state that in every public school with an enrollment of 20 or more LEP students of the same language background, a school district must provide a bilingual education program. (See Appendix A-I).

5. This study represents the predominant instructional approaches for teaching English to LEP students used in the State of Illinois.
6. Due to the nature of the control group, public vs. private schooling effects are a limitation.

Important terms and concepts are defined below and will be used throughout the investigation. These definitions are based on federal guidelines (U.S. General Accounting Office, 1987).

1. L1 - The native language of the student.
2. L2 - The target language of instruction, the second language being acquired by the student -- in the United States, this would mean English.
3. Bilingual Education - A general approach used by a variety of instructional programs in schools in which subjects are taught in two languages, English and the native language of children with limited proficiency in English, and English is taught as a second language.

4. Transitional Bilingual Education (TBE) - Programs of bilingual education with emphasis on the development of English language skills in order to enable students whose proficiency in English is limited to shift to an all-English program of instruction. Some programs include English as a second language. Most programs in the United States are designed around this model: children are taught through their native language (e.g. Spanish) while they acquire English skills. Usually after two to three years (or whatever criteria is established by the school or state), students are exited to an all-English program of instruction.

5. English as a Second Language instruction (ESL) - Programs in which students whose proficiency in English is limited are instructed in the use of the English language. Their instruction is based on a special curriculum that typically involves no use of their native language and is usually taught only in specific school periods. For the rest of the school day, the students may be placed in regular (submersion) instruction, immersion programs or bilingual programs.

6. Submersion (SUB) - Programs in which students whose proficiency in English is limited are placed in ordinary classrooms in which English is the only

language of instruction. They are given no special program to help them overcome their language problems, and their native language is not used in the classroom. Also called "sink or swim", submersion was found unconstitutional in the Supreme Court's decision in Lau v.s. Nichols (Teitelbaum & Hiller 1977).

7. Pull-out approach - An approach in which limited English proficient students are segregated (pulled-out from a mainstream class) for ESL instruction and/or bilingual education instruction.

8. Limited English Proficient (LEP) - A student is identified as LEP if he comes from a non-English background and has been assessed as possessing limited skill development in any of the following linguistic components of the English language: listening, speaking, reading and/or writing.

9. Home language or primary language - The language most frequently used in the home environment and that language which the student has been exposed to for approximately the first five years of his life.

10. Language dominance - The language that a person feels most at ease using for communication purposes. (It does not imply that that person is proficient in the language.)

11. Language proficiency - The specific language skills possessed in a language. This is determined by the degree to which a person controls the syntactic, phonological, lexical and semantic components of that language.

The Research Problems and Hypotheses

This research study analyzed data from Hispanic students in first and third grades in the Waukegan public and parochial schools where four substantially different second language teaching methods were implemented. The results were analyzed in order to determine which method of teaching significantly affected students' success of learning a second language.

Since individual learner characteristics are important determinants of second language attainment, the present study also investigated other factors independent of the mode of instruction that are related to successful language (L2) learning.

The following hypotheses were tested in the investigation:

1. There is no difference in English language acquisition and achievement in reading, language and math for Spanish-speaking students in the first and third grades across treatment conditions.
2. There is no difference between previous formal schooling experience and oral English language

acquisition and achievement in reading and language across the treatment conditions.

3. There is no difference between years residing in the U.S. and oral English language acquisition and achievement in reading and language across the treatment conditions.

Data Collection and Methodology

Data was collected from the Waukegan public and parochial schools on Hispanic students in first and third grades. Sociological, linguistic and instructional variables were collected that included: sex, ethnic background, socio-economic status, years residing in the U.S., years of previous schooling, number of siblings, number of parents and relatives at home, oral fluency in L1 and L2 and data concerning teacher training and attitudes toward second language learners.

At the time of posttesting, there were 160 participants who had been identified as LEP and were randomly assigned to three of the treatments in the public schools. The LEP students participating in the parochial schools were randomly selected from first and third grade intact classrooms and were the control group. All students were pre and posttested on measures of oral English Language Proficiency (LAS-E), oral Spanish Language Proficiency (LAS-S), achievement in Language (CAT), Reading (CAT) and Mathematics (CAT).

Multivariate and univariate analyses of variance, covariance, t-tests on the differences between the pretest and

posttest results and t-tests of the difference in means were used to analyze dependent and independent variable results for hypotheses 1, 2 and 3.

CHAPTER II

REVIEW OF THE LITERATURE

An Overview

The purpose of this chapter is to review the literature and research on English language acquisition and its relationship to the bilingual education approach and the English as a second language approach. The first section is an overview of the current status of research in bilingual education. The second section reviews research relating to the bilingual education approach and the third section describes the research relating to the English as a second language approach. This part of chapter reviews specific studies that favored one or more of the different approaches being examined. The last section focuses on those non-linguistic variables that appear to relate to second language learning.

There is little controversy about the need to provide LEP children with special services to enable them to participate in the regular school program. However, there is disagreement as to how these services should be designed and what specific instructional approaches are most effective. 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, federal government research contracts, small-scale studies and program evaluations. A major portion of these studies were conducted in the 1970's because government funding for research efforts in this vein were plentiful. The main point of contention is whether emphasis should be placed on only English language instruction or on the use of the native language - bilingual education approaches.

Current Status of Bilingual Education Research

Research can help to determine whether or not a bilingual education approach or an ESL approach is the most effective way to teach children English and other academic skills. Studies have been conducted to assess the effects of various instructional models on student achievement as well as on other policy considerations such as student integration, cost, feasibility and the extent to which needy children are served.

Presently, the U.S. Department of Education maintains that the research and evaluation results are too ambiguous to support the current legal requirement that most projects use teaching methods involving children's native language (U.S. General Accounting Office, 1987).

Studies have been conducted comparing programs where instruction is: a) given simultaneously in the child's native

language and in the second language, b) given initially in the home language, until the child is fully functional in the second language and c) given primarily in the second language. The studies have evaluated the effect of these programs on language acquisition. The studies evaluated the effects of these models on language and reading skills, achievement in other subjects, such as mathematics, science, and social studies, and general cognitive development.

Willig (1985) in her meta-analysis of selected studies on the effectiveness of bilingual education, pointed out that diverse conclusions were drawn from the few existing reviews of literature on the efficacy of bilingual education and have provided no ready answers for policy makers and have mainly fueled the arguments both supporting and opposing bilingual education. Lambert and Tucker (1972, 1977) concluded after years of study that it was not possible to select an optimum educational approach for all situations.

Dutcher (1982) in a draft report prepared for the Educational Department of the World Bank concluded that there was not one answer to the question of what language approach to use for primary school, but several answers, depending on the characteristics of the child, of the parents, the local community and the wider community.

Similarly inconclusive results were reported to the U.S. Department of Education in 1978 by the large-scale study by the American Institute for Research (AIR) (Danoff, 1978) and Baker and De Kanter's (1981) synthesis of smaller evaluation studies which evaluated federal Title VII bilingual programs. This study evaluated Spanish/English projects in either their fourth or fifth year of funding. The study compared students enrolled in federal bilingual projects with a control group of students not enrolled in these projects. In general, across grades, federal project students performed slightly lower in English language arts than did non-project students and at about the same level in mathematics. Relative to national norms, project Hispanic students scored at about the 20th percentile in English reading and at the 30th percentile in mathematics. Although unusually large achievement gains were reported in certain classrooms in the AIR evaluation, these gains were found in both federal project classrooms and non-project classrooms. There was also evidence that students in some bilingual classes did not do as well as language minority students in more traditional courses.

Critics of the AIR evaluation (Cardenas, 1977; O'Malley, 1978; Swain, 1979; Gray, 1981 and the Center for Applied Linguistics, 1977) argued that the research unfairly estimated the potential value of transitional bilingual education:

Title VII and non-Title VII students and programs may not have been comparable; students may not have participated in bilingual programs for a long enough time to determine any positive effects; and there were problems with program implementation, teacher training, and the availability of appropriate curriculum.

Many educators outside the second language learning field have also expressed their opinions. Walberg (1986) stated that bilingual education "research is wretchedly planned and executed and little can be concluded from it" (p. 71). Ravitch (1986) asserted that the "research available is too weak, too inconclusive and too politicized to serve as a basis for national policy" (p. 73). Rossell and Ross (1986) concluded that the research did not support transitional bilingual education as a superior instructional technique for increasing the English language achievement of LEP children.

In 1982, the Harvard Education Review reviewed reported findings comparing the effects of alternative instructional approaches on student achievement. It concluded that bilingual programs were neither better nor worse than other instructional methods.

Fairfax County, Virginia, a large district in suburban Washington with LEP students from 50 different language groups, has often been cited as an example of the impracti-

cality of bilingual education. In 1980, Fairfax officials won a four-year battle with the U.S. Office of Civil Rights for approval of a Lau plan that featured only ESL instruction. Federal authorities conceded that children were learning in the well-financed program, where student-teacher ratios averaged 12 to 1 and the district was spending $750 per LEP child in addition to a pre-pupil expenditure of $2,696 (Crawford, 1987). These studies, like many others, have not taken into consideration many other variables affecting student achievement or program characteristics generally associated with program quality. Few studies have shown one theoretical teaching technique to be clearly superior to another. The studies have not shown optimum instructional models, given specified characteristics associated with students, programs and the community. Some of the shortcomings of many of the studies which have been done in the last decade and a half are as follows:

-- No control for socio-economic studies
-- Inadequate sample sizes, improper techniques or excessive attrition rate
-- No baseline comparison data, no control group or non-relevant 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 (Willig, 1985).

It has been especially difficult to draw conclusions and make generalizations based on studies which have been conducted in different settings. All these factors should be taken into consideration.

Bilingual Education Approach and English Language Proficiency

The following studies found instructional learning in the native language to be effective:

In Calexico, California, at the Rockwood School, 95% of the students speak little or no English and nearly 80% come from homes receiving Aid to Families with Dependent Children. In 1983, prior to implementing transitional bilingual education, achievement levels at Rockwood were the lowest among the district's five elementary schools. By 1985, they were the highest. Rockwood's 6th grades are scoring near state norms in English language arts and above the norms in mathematics (Crawford, 1987).

At Bell Garden Elementary School in Los Angeles County, students are overwhelmingly Hispanic and poor. Eighty percent of students enter kindergarten with limited English proficien-

cy. However, when these youngsters are ready to transition from bilingual classes -- around 4th grade -- studies show they are able to achieve at grade level in mainstream classes (Crawford, 1987).

In 1985, Edmund Lee, director of Alhambra's Assessment Center found that 4th, 5th and 6th grade Chinese students who had completed the district's bilingual program performed as well as, or better than, their English-speaking peers from both Chinese and non-minority backgrounds in reading and significantly better in language. In math, both groups of Chinese students scored substantially higher than non-minority students (Assembly Office of Research-California, 1986).

In 1985, Hakuta, a psycholinguist at Yale University, reported on his research at the American Psychological Association Conference. He presented findings to indicate that "children who grow up speaking two languages display superior cognitive abilities...the more a child used both Spanish and English, the greater his intellectual advantage in skills underlying reading ability and non-verbal logic...rather than making children more confused, what was learned in one language seemed to help in their intellectual development in the other...Bilingual children scored higher on tests of mental flexibility, the ability to consider alter-

native solutions to problems, than children who only spoke English" (Goldman, 1985, p. 21).

Krashen (1985) has performed considerable research on learning a second language and sets forth two requirements for learning a second language: 1) understandable instruction and 2) a low anxiety learning situation. Thus, "bilingual programs that combine solid subject matter teaching in the native language and comprehensible input in English as well, are usually better than all-day English programs" (p. 20).

The Association for Supervision and Curriculum Development (A.S.C.D.) convened an independent panel of experts on bilingual education in 1987 and released a report that concluded that there was considerable evidence for the effectiveness of bilingual education and that dual-language instruction improved both academic achievement and English proficiency (Crawford, 1987).

At Rock Point Community School, Navajo kindergarteners get 70% of their instruction in Navajo, and first graders learn to read in Navajo, but by third grade, children use their native language for only about an hour a day. By the end of elementary school, these students lag only three months behind national norms on standardized reading tests (Harvard Education Letter, 1986).

At the Carpenteria School District, Santa Barbara, California, an intensive Spanish-only preschool program exists that has been very successful in raising students' readiness skills for kindergarten. Prior to this experiment, Spanish-speaking students entering kindergarten tended to average about eight points lower than English-speaking students. At the end of one year, students in the experiment scored 23.3 vs. the English-speaking students' score of 23.4 and 16.0 by the Spanish-speaking students in a transitional bilingual preschool (Campos & Keatinge, 1984). Cummins (1986) commented on these results, pointing out the significant power that development in the primary language has for transfer to a second language.

Since many research studies were done in the early 1970's because of the plentiful monies available through the Title VII Bilingual Education Act and government contracts, it is important to review them. Many concluded that bilingual education was an effective tool for second language learners and reported findings which are similar to the studies conducted more recently.

In the St. Lambert Study in Canada, Lambert and Tucker (1981) evaluated an immersion program exclusively in French in kindergarten and first grade, and primarily in French from grades 2 through 4, except for one hour of English language-

arts instruction each day. At the end of the 4th grade, the children read as well in English as the English control group. They also performed extremely well in French when compared with French-Canadian children in a regular French program.

In the Redwood City Study in California, Cohen (1970-75) examined a K-3 bilingual program for Mexican-American children in which reading and other subjects, such as mathematics, science, and social studies were introduced in both Spanish and English. The children were compared with a control group taught exclusively in English, sometimes with ESL instruction. Results indicated that the bilingual groups scored better in Spanish language skills while the control group scored better in English language skills. Results for mathematics were mixed.

In the Rizal Study in the Phillipines, Tucker (1977) studied the children in Tagalog-speaking areas who were instructed in the local vernacular in the early grades. The grades at which English reading and English subject matter instruction were introduced varied. Results indicated that the grade at which English reading was introduced and the sequencing of vernacular and English reading made no difference in English reading achievement. However, English proficiency was directly related to the number of years English had been used

as the medium of instruction. The group taught exclusively in English did best in all content areas.

Brown (1978) conducted a study in Illinois on the effect of language used for early reading instruction with first and third grade Spanish-speaking children. It showed that English proficiency was least fostered by reading instruction in Spanish only, followed by bilingual instruction, with those students receiving instruction only in English becoming most proficient, but still far less so than their English-speaking peers.

A three year study by Rosier (1978) compared two approaches for introducing reading to Navajo children of limited English speaking ability in Arizona. It found that the direct method -- English as a Second Language -- in comparison to the Native Language method did not produce results as effective in developing reading proficiency as did the native language approach. With the latter approach students first developed reading proficiency in the native language and later, at the second grade level, transferred to English reading. It revealed that children who received bilingual instruction scored higher after two years in reading achievement than children instructed in the second language only. Conclusions of this study suggested that students need at

least three or four years of bilingual instruction before the effects of such instruction can be measured.

Dutcher (1975) performed research in Chiapas, Mexico where she found third grade Indian children who learned to read in the vernacular of that area first and then in Spanish scored higher on tests in Spanish reading comprehension after the third grade than Indian students who did not learn to read in their vernacular.

Two studies of Finnish migrant children in Sweden (1976) compared the effects of programs which taught only in Swedish versus instruction given in both Finnish and Swedish. Skutnabb-Kangas, Tove and Toukomaa (1976) found that Finnish achievement was best for students who had some in-struction in Finnish, whereas Swedish achievement was lowest for those who had no instruction in Finnish. The results of the second study also favored bilingual instruction. Children who were taught primarily in Finnish in grades 1 through 3 and in Swedish in grades 4 through 6 achieved well in both Finnish and Swedish.

The following studies favored learning in both the native and second language:

The immersion model, best known in Canada, was based on the premise that English-speaking students could receive the majority of their elementary school education through a medium

of a second language (French) without retardation of first language or scholastic skills. Also, it was hoped that the students would develop positive attitudes towards speakers of the second language (French) while maintaining positive identification as English-Canadians. Results of these programs have confirmed that immersion students do indeed become functionally bilingual, and equal or surpass their monolingual peers in English language development and achievement (Lambert & Tucker, 1972; Lambert, 1982; Swain, 1978; Snow, 1986).

Bilingual immersion programs in the U.S. employ a curricular design which shares the basic assumption of the immersion model that a second language is best learned as the medium of instruction. However, bilingual immersion programs differ in that second language learners are not separated from native speakers of the target language for purposes of instruction, but rather, the two language groups are purposefully mixed. Also, the immersion programs have traditionally been designed exclusively for language majority (English-speaking) students as foreign language enrichment programs, the bilingual immersion program serves the needs of both language majority and language minority students. Thus, the language majority student receives foreign language instruction within the school setting and the language minority student benefits from the

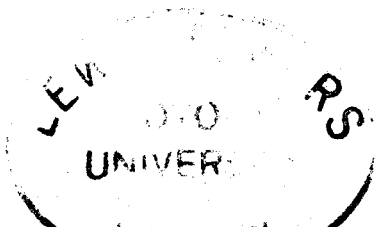
opportunity to maintain the native language while acquiring English (Snow, 1986).

In 1982, Torrance reported the longitudinal results of Spanish-English bilingual immersion programs in the San Diego Unified School District. District evaluations showed that on the average, project students equaled or surpassed established norms for oral language development, reading and mathematics in both languages by the completion of elementary school.

In September, 1987, the Dade County, Florida schools decided to bring before their Board of Education a proposal to implement a bilingual immersion model beginning in kindergarten that would allow non-Hispanic students the opportunity to study Spanish (Gold, 1987).

In the El Paso Independent School District, Spanish-speaking students taught primarily in English are outperforming those taught mainly in Spanish, without sacrificing their native language skills. These 2,500 students in grades 1 through 3 received a modified form of English immersion and scored higher on most standardized tests than those in the state's transitional bilingual education program. At least 60 to 90 minutes a day are spent on Spanish language development (Gold, 1987).

In the first year of a four-year longitudinal study in Texas by S.R.A. Technologies, Inc., limited English proficient



students in bilingual programs consistently outperformed "immersion strategy" students in reading, language arts and mathematics tests conducted in both English and Spanish. This four-year study was designed to compare about 4,000 LEP kindergarteners, first graders and third graders enrolled in immersion classes (Crawford, 1986).

Cohen and Brown (1979) performed an evaluation in moderate-to-small school districts in downstate Illinois that revealed the following: achievement tests scores indicated that students with more years in the bilingual program scored higher in both the productive English skills (reading and writing) and receptive skills (listening and speaking). It appeared that bilingual schooling had enhanced cognitive development. However, bilingual schooling did not appear to enhance native language skill in all areas; it also appeared that attitudes toward self, school and community were negatively influenced by years of bilingual schooling. Language usage in the home also effected the de-velopment of native language proficiency.

Carsrud (1975) performed an evaluation of achievement outcomes in an Austin, Texas five-year Title VII Bilingual Education Project. This project was intended to improve the achievement of elementary students in the following areas: oral language proficiency, knowledge of basic concepts,

reading ability in Spanish and English, and proficiency in mathematics. Results indicated that program participants gained in knowledge of basic concepts at the kindergarten level, and to some extent in Spanish reading ability. Fifth grade students showed greater achievement than their non-project peers in English reading. However, in fifth grade math and fourth grade reading and math, project students and non-project students did not differ in their rate of gains. The gap in achievement between Spanish-dominant or bilingual students and their English-dominant peers remained.

A similar project evaluation conducted in Clovis, New Mexico (1979-80) also attempted to improve student achievement of LEP students in grades pre through sixth. Student achievement was measured in the areas of language arts, math, reading, self-concept and favorable emotional development. Language arts objectives were achieved by grades 3 and 4 and math objectives by grades 3, 4 and 5, but reading objectives were not achieved by any grade level. Projected growth in self-concept did not occur in any level. Grade 6 students showed no significant growth in any measured area.

Based on a review of these and similar studies, researchers have hypothesized that certain conditions may be related to the success of particular program models. Immersion programs that teach initially in the second language may be

more likely to succeed when: 1) children come from middle - or upper-class homes; 2) children's linguistic ability in the native language is highly developed; 3) the home language has high status in the community; 4) there is a strong incentive for the children to learn a second language; 5) there are positive expectations for student success; 6) there is strong community and parent support for the instructional program; and 7) program quality is high and is specifically designed for children who are learning a second language (Cummins, 1982; Paulston, 1982; Tucker, 1981; and Snow, 1984).

Conversely, some observers suggest that initial learning in the native language might be more desirable, both academically and psychologically, for children who come from low-income families and who are not proficient in their native language; in communities where the home language has low status; for students likely to leave school in the early grades; and where teachers are not members of the same ethnic group as the students and may be insensitive to their values and traditions (Cummins, 1986; Wong-Fillmore, 1983).

ESL Methodology and English Language Proficiency

As far back as 1975, as a result of the Lau Remedies, the U.S. Department of Health, Education and Welfare rejected ESL as a remedy for elementary school students who did not speak English (Hakuta, 1986). In 1987, the U.S. Department of

Education is fighting to amend Title VII to allow school districts the flexibility to use alternative methods such as the ESL approach (Bennett, 1987).

Very few studies have investigated the effects of ESL instruction in the elementary grades because of the federal and state laws which have prescribed only transitional bilingual education approaches when students numbered 20 or more from one language background. Consequently, most investigations have been done with the low incidence language groups represented and predominantly with secondary level and adult learners.

The predominant ESL pullout program has often been developed in schools where students come from a number of different language backgrounds or where there is only a small number of LEP students -- that is, in settings where bilingual programs are difficult to implement. Criticisms of pullout programs center on three concerns: 1) the LEP students may be missing important concept development during the time they are absent from the regular classroom; 2) there may be a damaging stigma attached to being pulled-out of class, since this tends to signify the presence of some kind of problem in the eyes of the students; and 3) an ESL component conceived exclusively in terms of pullout instruction may not be sufficient to meet the needs of most LEP students, as there may be an additional need

for second language development to be taking place during regular content-area instruction (Milk, 1985).

In 1983, a study conducted in Des Moines, Iowa, by Weslander and Stephany, with 577 LEP - Southeast Asian students in grades 2 through 10 who received 50 to 100 minutes daily of ESL instruction concluded that more ESL instruction was beneficial during the first year of schooling, but had diminishing effects during the second and third years. These findings were the results of evaluations done for six years in the district.

Williams (1978) traced the progress and problems of Spanish-speaking fourth-graders who had learned to read only in English. Results of the study show a high degree of correlation between oral fluency in Spanish and English, and reading ability in English. These students had high degrees of fluency in Spanish when introduced to English-only instruction.

Stovall (1977) observed and analyzed the communication strategies of Spanish-speaking children enrolled in an elementary ESL program in Austin, Texas. The linguistic strategies she examined revealed errors by students, but these were deemed incidental in the development of communicative ability in a second language.

Legarreta (1979) conducted a longitudinal study investigating the effects of five different program models on both acquisition of English and maintenance of Spanish by native Spanish-speaking kindergarten children. The five program models were: 1) traditional instruction given in English, with no ESL instruction (Sink or Swim); 2) traditional instruction with daily ESL; 3) bilingual instruction, using the concurrent translation approach, and no ESL; 4) bilingual instruction, using the alternate immersion approach and no ESL; and 5) bilingual instruction using the concurrent translation approach, with daily ESL instruction. Interaction analysis data gathered in the bilingual classes indicated that balanced language use (50% Spanish/50% English) occurred in the groups using the concurrent translation approach.

Using planned comparisons on the multivariate analysis of gain scores, the bilingual treatments (4 and 5) produced significantly greater gains in English oral comprehension and communicative competence in Spanish and English. Finally, ESL instruction (2 and 5) did not facilitate English oral communicative competence, but did facilitate English receptive comprehension at initial stages. Treatments without ESL instruction (1, 3 and 4), showed significantly higher gains in Spanish. It appeared that bilingual program models with

balanced language input are most facilitative for both Spanish and English acquisition by children.

Fatham (1976) examined the effect that certain environmental variables had upon learning to speak English as a second language. Approximately 500 elementary and high school students, enrolled in ESL classes in public schools in Washington, D.C., were administered pre and post oral production tests. The scores were used to assess the progress made during the school year by these students in learning to speak English. It was found that all groups of students made significant progress in speaking English during the school year, but that those making the most marked improvement were in school settings where the use of English was encouraged and necessary for effective communication.

A review of several studies by Long (1983) suggest that ESL instruction is effective. In these studies, where students sacrificed exposure to the second language for ESL instruction, such as ESL pull-out at the elementary and secondary levels (Hale and Budar, 1970; Fatham, 1976) there is some indication that instruction helped.

The two studies focusing on the amount of ESL instruction (e.g., 3, 5 or 7 hours per week) revealed ambiguous results. Fatham's (1976) study could be interpreted as showing a positive effect for the amount of instruction. However, this

conclusion depends on the particular interpretation of test score gains because low proficiency students had more ESL instruction.

In two other studies where matched learners experienced the same exposure but different amounts of ESL instruction, Krashen and Seliger (1976) formed positive effects for more instruction. Their findings suggest that more instruction can actually compensate for less exposure to the language.

Several studies reviewed by Long (1981) focused on the effects of varying amounts of instruction and exposure in populations with differing total amounts of instruction plus exposure. (Briere (1978) and Krashen, James, Zelinski and Usprich (1978) found stronger effects for instruction than exposure, Carroll (1976) found a weaker effect, and Chihara and Oller (1978) found no effects for exposure. Since multivariate methods were not used, however, interpretation of the results is problematic because the effects of more ESL instruction, or more language exposure, cannot be distinguished from the effects of more total instruction plus exposure.

In 1979, Ramirez and Stromquist investigated ESL methodology in bilingual education settings with 18 ESL classes. They found that predominant ESL teaching practices that emphasized mechanical language drills and adherence to a specific

sequence of skills were ineffective. Practices that emphasized correction of grammatical errors as opposed to pronunciation errors, and questioning techniques with guided responses were more effective.

Summary of the Literature and Related Research

The review of the literature for the bilingual education approach at the elementary level is more extensive than the ESL approach, mainly because of the existence of politics that maintains the ESL approach as an integral component of bilingual education approaches. ESL instruction in isolation with predominantly Spanish-speaking youngsters is almost non-existent because of the legislation recognizing bilingual education as "the approach." Nevertheless, there is considerable evidence supporting both methodologies as being effective in the acquisition of language proficiency.

On the bilingual education side, much of the research has been evaluative and descriptive in nature (i.e., see Rosier, 1978; Rodriguez-Brown, 1978; Carsrud, 1975; Lambert and Tucker, 1981; Cohen and Rodriguez-Brown, 1979) and generally supportive of the notion that a bilingual education approach is effective in the acquisition of English language skills.

In Willig's (1985) meta-analysis of 23 evaluation studies that Baker and de Kanter (1981) had reported, she found "in every instance where there did not appear to be crucial

inequalities between experimental and comparison groups, children in the bilingual programs averaged higher than the comparison children."

There is little "true" experimental research existing at present that examines the bilingual education approach in comparison to the ESL approach in the same setting. Most studies have only concentrated on the variant methods being used for the bilingual education approach.

ESL researchers, for the most part, have also stayed clear of the issues of bilingual education due to the politics involved. However, in the last eight years there has been an increased generation of studies designed to look at ESL in conjunction with the bilingual education approach and also in isolation (i.e., see Milk, 1985; Wong-Fillmore, 1983; Lambert and Tucker, 1981; Long, 1983; Legaretta, 1979; Ramirez and Stromquist, 1979).

It should also be noted that many of the empirical studies conducted in the area of ESL have concentrated on adults and very little information is available with reference to elementary students (See Cooper, 1978).

Earlier studies on the effects of ESL instruction with elementary students suggested that ESL had little effect on certain aspects of language learning. Dulay and Burt (1973) and Fatham (1975) reported that students enrolled in ESL

classes did not necessarily learn English faster than those not enrolled in ESL instruction.

The results of all these studies should be carefully evaluated, inasmuch as ESL and bilingual education can be operationally defined in a number of ways. Willig reported in her meta-analysis of 23 studies, which echoed the results of others, that much of the research was confounded and inconclusive. Ornstein and Miller (1980) pointed out that a 1977 evaluation of bilingual education programs identified a lack of both research effectiveness and teaching methods as major problems. Baker and de Kanter (1981) examined over 300 documents concerning bilingual education approaches and only 28 were considered adequate methodologically. The status of research represents a level of knowledge about the role of language in education that has already been judged as insufficient for policy analysis (Hernandez-Chavez, Llanes, Alvarez and Arvizu, 1982).

One of the contributing factors to the problems associated with the research on bilingual education and ESL is that, unlike many other federal efforts, this experiment in education was undertaken as an "act of faith" as well as submission to political pressure (Sancho, 1980). There was virtually no existing research upon which to build or refine this educational experiment (Sancho, 1980; Troike, 1978).

Nearly two decades have passed since the passage of the Bilingual Education Act of 1968 and although the quality of research has increased somewhat, it has been surrounded by so much political and academic criticism that results have been declared useless or invalid (Sancho, 1980).

Current research efforts are being aimed at identifying factors, other than pedagogical approaches, which appear to relate to the successful acquisition of the English language. Nevertheless, few efforts are being made to examine these methodologies under "true" experimental conditions or even "quasi-experimental" conditions. The field-based project reported here was designed to compare the bilingual education and ESL instructional approaches.

CHAPTER III

METHODOLOGY

Introduction

The review of the literature reveals that there are few conclusive findings to indicate that an ESL approach is superior to a bilingual approach and vice versa. The research findings appear inconclusive and provide support and nonsupport for both approaches. A majority of the studies have serious methodological shortcomings (Baker & de Kanter, 1981; Willig, 1985; Hakuta, 1986). Various forms of second language approaches are being implemented in schools throughout the country, without having any sound, empirical basis for their implementation.

In the State of Illinois, Transitional Bilingual Education (TBE) has been mandated since July 1976 by the Illinois School Code - Article 14C. It states that in every school attendance center which has 20 or more limited English speaking students, a bilingual education program must be provided. As of 1986, the law was amended to include all those students limited in English in any school attendance center, even when there are less than 20. All such students must now be provided a Transitional Program of Instruction (TPI) to meet their language needs.

In the Waukegan Public Schools, TBE instruction and ESL instruction have been provided since 1971. Students entering the Waukegan Public Schools from a non-English background are immediately screened and tested to determine their oral English language proficiency. These students, according to the test results, are the target population eligible for bilingual education or ESL instructional services. These programs presently serve 1,200 LEP students. Students come from 12 different language backgrounds with Spanish being the majority language background of this population.

The State Board of Education annually examines bilingual education programs in Illinois that receive reimbursement from the state for the excess costs of their programs. A major problem in this process of evaluation is that many different instructional approaches are used throughout the State, so it is virtually impossible to establish comparison groups that are statistically valid.

In the study reported here, the investigator was in a unique position to control for the randomization of participants in the 3 experimental treatment groups, (ESL Pullout, Transitional Bilingual Education and ESL Pullout, and Transitional Bilingual Education), in the Waukegan Public Schools. However, due to legislative restrictions, the fourth treatment group (Control-Submersion) had to be established in the Waukegan community parochial schools. Legal restrictions as well as ethical concerns made it impossible to carry out a true

experimental study because any student identified in a public school district as LEP is eligible for some type of instructional intervention. Thus, in order to find an equivalent group of participants who are LEP and are a truly "zero treatment" control group, a parochial school control group, not bound by this state and federal legislation was used. As previously stated in the Review of the Literature, most of the studies conducted thus far have had numerous methodological weaknesses, the most important ones stemming from the lack of randomization of participants and the failure to include a control group that was equated with the experimental groups (Willig, 1985; Hakuta, 1986).

As a result of the above observations, the major intent of this study was to provide valid, empirical data that would assist practitioners and legislators in the field to make refinements to existing programs in Illinois. In this experiment, particular care was taken for control over randomization and background variables of all participants.

General Statement of the Problem

This study is designed to investigate and compare 4 variate second language learning approaches and their effect on 1) the acquisition of oral language proficiency in English and 2) the acquisition of achievement skills in English as evidenced in language, reading and math. The following questions were addressed:

1. What effect, if any, does TBE instruction have on the acquisition of oral English proficiency and achievement in language, reading and math?
2. What effect, if any, does ESL instruction have on the acquisition of oral English proficiency and achievement in language, reading and math?
3. What effect, if any, does TBE with ESL pullout instruction have on the acquisition of oral English proficiency and achievement in language, reading and math?
4. What effect, if any, does the Submersion Approach have on the acquisition of oral English proficiency and achievement in language, reading and math?
5. What effect, if any, do the factors of years residing in the United States and previous schooling backgrounds have on the acquisition of English skills?

Sociological (sex, age, socio-economic status), linguistic (oral fluency in English and Spanish) and instructional variables (previous formal schooling, special instruction) which appeared to relate to the acquisition of skills among LEP students of grades 1 and 3 were also considered. These variables are depicted in Table 1.

TABLE 1

Sociological, Linguistic and Instructional Variables Relating to the Acquisition of English

Variables		
Sociological	Linguistic	Instructional
Sex	Oral fluency in L1	Years of previous schooling
Ethnic background	Oral fluency in L2	Special program assistance
Socio-economic level		Teacher training
Years in the U.S.		Teacher attitudes toward L2 learners

Description of the Sample

The City of Waukegan, which has a population of approximately 70,000, is located north of Chicago on Lake Michigan. It is an industrial community, and over the years has attracted people of various socio-economic backgrounds and ethnicity.

The Waukegan Public Schools' student population in 1984 was 12,023, with 26% of this population coming from Hispanic origins and language minority backgrounds.

The students participating in the investigation were of Hispanic origin -- Mexican, Puerto Rican, Cuban, South Ameri-

can and Central American, ranging in ages 6 to 10. They attended the first and third grades of 3 elementary Waukegan public and 2 elementary parochial schools.

Teachers in 5 schools were requested to provide lists of Spanish background students in their classrooms. Next to each student's name, teachers were requested to verify the student's birthdate, age and ethnic background. The subjects were all pre-tested for English and Spanish language proficiency with the Language Assessment Scales Test (LAS).

In order to identify an appropriate random sample, all first and third graders of Hispanic origin were administered the Language Assessment Scales Test which determined English and Spanish oral language proficiency. Levels of English language proficiency are defined as follows according to the LAS Technical Manual:

- Level 1 - Minimal Production - At level 1, the student produces only isolated words and expressions.
- Level 2 - Fragmented Production - At level 2, a few isolated phrases and fragmented or very simple sentences are produced. Sentences are normally incoherent and may be difficult to associate with the storyline.
- Level 3 - Labored Production - At level 3, complete sentences are produced with systematic errors in syntax and fact. Sentences are longer and more coherent

than in level 2 and, as in both levels 1 and 2, there may be slight developmental differences.

- Level 4 - Near Perfect Production - At level 4, the student produces coherent sentences with native-like fluency with only an occasional error in either syntax or vocabulary.
- Level 5 - Perfect Production - At level 5, the student produces complete sentences which are coherent, syntactically correct for his/her developmental age and reflect accurate reproductions of language. At level 5, the student is an articulate native speaker. (Language Assessment Scales Test, 1981).

Those students who tested out as oral English proficiency levels 1 - 3 were randomly assigned to one of the three already established treatment groups in the public schools. Those identified as oral English proficiency levels 1 - 3 in the parochial schools were eligible for the control group. Of the 323 students pretested, 250 were eligible for inclusion in the study. The subjects were randomly assigned to one of the three treatments in the public schools -- the ESL Pullout, the Transitional Bilingual Education and ESL Pullout, or the Transitional Bilingual Education treatment. The Control Group-Submersion consisted of those students in intact first and third grade classes in the parochial schools.

Design

A total of 80 first and 80 third grade Spanish background subjects participated in one of the three treatment groups and the control group. A pretest/posttest control group design was used, consisting of the three experimental treatment groups and the control group:

Treatment Group #1 - ESL Pullout Approach:

These students were immersed in a monolingual classroom with English instruction in all content areas, but they were pulled out daily for 60 minutes to participate in ESL instruction. The regular teacher was a monolingual elementary certified individual. They received a structured language acquisition program designed to teach English to students whose native language is not English. These subjects did not receive native language support - Spanish instruction - in any of their daily academic or non-academic school day. All LEP students were in a mainstream classroom with other native speakers of English.

Treatment Group #2 - Transitional Bilingual Education (TBE) and ESL Pullout Approach:

These students were assigned to a bilingual classroom setting consisting of native speakers of English and LEP students. The teacher was an elementary bilingual certified individual. These subjects received 90 minutes of native language instruction in this setting daily and were pulled out of this classroom for 60 minutes daily to receive ESL instruc-

tion. They received all of their native language instructional support from the bilingual teacher in their regular elementary setting. This teacher did not provide any ESL instruction.

Treatment Group #3 - Transitional Bilingual Education Approach:

These students were assigned to a bilingual classroom setting consisting of native speakers of English and LEP students. The teacher was an elementary bilingual certified individual. They received all their native language support as well as their ESL instruction from their bilingual teacher. They received a minimum of 90 minutes daily of native language instruction and 60 minutes of ESL instruction daily.

Treatment Group #4 - Control Group - Submersion Approach:

These students were in the local parochial schools and were identified as LEP. They did not receive any native language or ESL instruction. They participated in a regular elementary classroom with an elementary certified teacher and did not receive any special treatment even though they were language deficient. The parochial schools do not have to conform to the legislative mandate that requires public schools to provide either ESL, bilingual education or other acceptable approaches to meet the needs of LEP students.

In each treatment group, at each grade level, a minimum of 25 students participated. Anticipating a mortality loss of subjects from the time of pretesting to posttesting, this

ensured an N of 160 by posttesting time and cell sizes of 20 students. The researcher initially sampled 250 students. (See Table 2)

A priori, the researcher 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 system, the generalizability of results would not be limited to a particular school, a particular ethnic background or only one socio-economic background. Other decisions were made prior to selecting the schools. First, only those principals and teachers who were willing to cooperate were included and this was based on initial interviews in August. Secondly, the experimental groups were established in those schools which had implemented a bilingual and ESL program for a minimum of three years. This ensured that staff was familiar with the goals, objectives, guidelines of bilingual and ESL programs, and that sufficient instructional materials would be available.

As pointed out above, the control group had to be selected from the parochial schools because of the Illinois School Code - Article 14C, which legislatively mandates bilingual instruction in all public schools. Thus, non-public schools in the Waukegan community were selected to ensure that subjects came from the same community and similar socio-economic levels. This selection of the control group is an obvious limitation of the investigation in that the children

came from the same community, but from a private school setting. Research has shown that school social composition affects student performance and that its positive and negative effects derive from peer influence and parent aspirations (Ornstein, 1978).

TABLE 2

Anticipated Preliminary Design

GRADE	Treatment #1 N	Treatment #2 N	Treatment #3 N	Control N	Total N
1st	25	25	25	25	100
3rd	25	25	25	25	100
TOTAL N = 200					

The cells for the variables of previous formal schooling and years residing in the United States were determined after students were randomly assigned to the treatment groups. Their parents received a questionnaire to complete on previous schooling and years residing in the United States along with parental permission forms to allow students to participate in the treatment.

Table 3 indicates 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 only required a total sample of 200, 250 subjects were included in the pretesting. This was done to anticipate sample mortality at posttesting due to student transfers to other schools or other organizational changes which might alter the initial comparability of the groups.

TABLE 3

Number of Schools, Classrooms and Students Initially Sampled by Grades and Treatment Groups

Grade	Treatment Group	# of Schools	# of Classrooms	# of Students
1	ESL Pullout	3	3	31
	TBE & ESL Pullout	3	3	31
	TBE	3	3	31
	Control-Submersion	2	2	32
3	ESL Pullout	3	3	31
	TBE & ESL Pullout	3	3	31
	TBE	3	3	31
	Control-Submersion	2	2	32

N = 250

Hypotheses

The following null hypotheses were tested:

1. There is no difference in oral English language acquisition and achievement in language, reading and math for Spanish-speaking students in the first and third grades across the treatment conditions. (ESL Pullout, TBE and ESL Pullout, TBE, and the Control Group - Submersion.)
2. There is no difference between previous formal schooling experience and English language acquisition across the treatment conditions. (ESL Pullout, TBE and ESL Pullout, TBE, and the Control Group - Submersion).
3. There is no difference between years residing in the United States and English language acquisition across the treatment conditions. (ESL Pullout, TBE and ESL Pullout, TBE, and the Control Group - Submersion).

The analytic paradigm for this experiment is presented in Table 4. (2 X 2 X 4 Randomized Control-Group Pretest-Posttest Design):

TABLE 4

Analytic Paradigm

	Treatment 1		Treatment 2		Treatment 3		Control	
previous Schooling	Yes	No	Yes	No	Yes	No	Yes	No
1st Grade	Yes	No	Yes	No	Yes	No	Yes	No
3rd Grade	Yes	No	Yes	No	Yes	No	Yes	No

The investigator chose the experimental design of the Randomized Control-Group Pretest-Posttest because of the rigorous control over factors that might affect contemporary history, maturation processes, pretesting procedures, measuring instruments, statistical regression, differential selection of subjects, experimental mortality, and interaction of selection and maturation (Cook & Campbell, 1979).

The interaction of pretesting and treatment -- a concern -- was controlled for by random selection of subjects to treatments and control group and a preliminary analysis of the effects of the interaction of pretesting and treatments by analysis of covariance. The groups were assumed to be equivalent on the basis of random selection and all treatments, including the control group, received pretesting.

Another area of concern was that of interaction of selection and treatment. However, the school sites chosen, the

subjects that participated, their socio-economic levels, previous schooling backgrounds, age and sex were all considered so as not to compromise the generalization.

Data Collected

Two major types of data were collected, data related to students' backgrounds and data related to various measures of English proficiency, native language proficiency and achievement in language, reading and math. Teacher data was also included indicating the background information of each professional conducting a treatment or control group.

Prior to testing the subjects, initial student data were collected through the school district's student data base that included the following: age, language proficiency level, ethnic background, socio-economic status as indicated by Federal Lunch Program criteria, sex, birthdate, birthplace, number of years in the United States, and the number of years of schooling in the United States including preschool and kindergarten experiences.

Background data was collected and pretests of Spanish and English oral proficiency and academic achievement in English were conducted in September, 1983. Posttests of Spanish and English oral language proficiency and academic achievement in English were administered in April, 1984. Parents and teachers received a Student Data Sheet again in April to verify the preliminary data and to indicate any students who

had transferred out between the pretesting and posttesting sessions (See Appendix A-II and A-III for details).

Instrumentation

Recent literature has documented the multitude of problems in selecting reliable and valid instruments to accurately assess language proficiency for a second language learner (De Avila and Havassy, 1974; Moreno, 1970; Ramirez, et al., 1976; Hakuta, 1986). Nevertheless, researchers have continued to examine the effects of different educational approaches on the native and second language development of children from diverse backgrounds.

In the investigation reported here, the researcher chose one of the most widely used instruments for measuring Spanish and English oral language proficiency: The Language Assessment Scales Test of Oral Language Proficiency - (LAS). Following is a description of the instruments used in this study, the rationale for selection, and any modifications made:

I. Test of Oral Language Proficiency - English-Spanish Language Assessment Scales, Level I, Form A and B, 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 tests are totally independent, but each is based on the same

analysis of 4 language subsystems. The LAS Level I is appropriate for LEP students in grades K through 5 and takes approximately twenty minutes to administer individually.

The LAS provides an overall picture of oral linguistic proficiency based on a student's performance across 4 linguistic subsystems. It assesses the students capabilities in the 4 primary subsystems of English: 1) phonemic system (the basic sounds of the language), 2) referential system (the words of the language), 3) syntactical system (the rules for making meaningful sentences), and 4) pragmatic system (the use of language to obtain specific goals) (De Avila & Duncan, 1981).

The five integral subtests of the LAS evaluate: 1) phoneme production, 2) ability to distinguish minimal sound pairs, 3) oral syntax, 4) oral comprehension, 5) vocabulary, 6) oral production, and 7) ability to use language for pragmatic ends.

Reported in the Theoretical and Technical Specifications Manual on the LAS (De Avila, 1981) were 5 studies on the validity and reliability of the test. Table 5 indicates the reliability results of LAS-I.

TABLE 5

Reliability of LAS-I English

LAS Subscale Tests	Test-Retest LAS English	Cronbach's Alpha	Split-Half
Minimal Pairs	.83	.78	.78
Phonemes	.89	.88	.90
Lexical	.92	.89	.77
Comprehension	.72	.64	.76
Oral Production	.71	.92	.92
LAS TOTAL	.88	.94	.85

(Duncan & De Avila, 1981)

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 ranging from .63 to .96. Validity was measured by how well the LAS discriminated the English-speaking group from the limited English-speaking group. The differences were significant beyond the .001 level (Mann-Whitney U Test). Similar differences were found for comprehension and production.

Level I, Form A was administered to all subjects at pretesting and Form B was used at posttesting. Psychometrically, Form A and Form B are equivalent. Both test forms yielded an individual raw score and a corresponding

proficiency level as illustrated in Table 6 (Duncan & De Avila, 1981).

TABLE 6

Normative Interpretation of LAS-Level I Scores

Total Raw Score	Interpretation	Oral Proficiency
85 to 100	Totally fluent in English	5 ***
75 to 84	Near fluent in English	4 ***
65 to 74	Limited English speaker	3 **
55 to 64	Non-English speaker, apparent linguistic deficiencies	2 *
54 & below	Non-English speaker, total linguistic deficiencies	1 *

* = Non-speaker ** = Limited Speaker *** = Fluent Speaker

The LAS Level I versions in English and Spanish, hearafter referred to as LAS(E) and LAS(S), were selected because of their comprehensiveness in assessing more than one linguistic subsystem. All subtests of the LAS(E) and LAS(S) were administered to all subjects at pretesting and posttesting sessions (See Appendix A-V).

II. Tests of Achievement -- Language, Reading and Math - CAT

The research literature has dominated the multitude of problems in selecting valid and reliable instruments to accurately assess second language learners' skill levels in reading, language, content areas and oral pro-

ficiency (De Avila, 1981; Hakuta, 1986). Nevertheless, researchers have continued to examine the effect of different educational approaches on the native and second language development of pupils from diverse cultural backgrounds.

In general, most researchers have chosen to use standardized norm-referenced tests. The California Achievement Test (CAT) battery is designed for students in grades K-12. It was used because it is a standardized, norm-referenced achievement test which measures the areas of prepreading, reading, spelling, language and mathematics. CAT-D is an alternative form of CAT-C which is recommended for posttesting use.

Levels 11 and 13 were given respectively to first and third grade subjects in the areas of language, reading and math. The recommended grade ranges and levels of the tests were followed as indicated in the CAT Technical Manual. The series of tests administered to all groups during pre and post sessions are described in Table 7.

TABLE 7

Contents of CAT C and D Tests - Pre and Post

Contents	Test	Grade 1	Grade 3
READING	Phonic Analysis	X	X
	Structural Analysis		X
	Reading Vocabulary	X	X
	Reading Comprehension	X	X
SPELLING	Spelling		X
LANGUAGE	Language Mechanics		X
	Language Expression	X	X
MATHEMATICS	Mathematics Computation	X	X
	Math Concepts & Applications	X	X

All subtests available in each content area were given to all subjects at pre and post sessions. One modification was made in that all test directions were administered bilingually for all treatments. This was done to ensure that the subjects understood the tasks at hand and to be consistent with the random assignment of subjects to the different treatments. All testing was conducted by bilingual graduate students hired and trained by the investigator. (See Appendix A-VI)

The Technical Bulletin for the California Achievement Test (CTB/McGraw-Hill, 1979) described thorough procedures which were followed to ensure content validity, standardization and norming. For example, the sampling technique described provided proportionate representation of minority groups in the national norms. Several procedures were applied to modify or eliminate test materials that appeared to reflect racial, ethnic or sex bias. To further guard against ethnic bias, the CAT standardization included classification of each participating student as black, Spanish-speaking or other (CTB/McGraw-Hill, 1979).

The choice of the CAT as a measurement in this investigation was purposeful of its reputation for strict adherence to 1) proportionate representation of minority groups in the national norms, 2) statistical requirements based on samples of black and Hispanic students, 3) special reviews for racial and ethnic bias and 4) specific multiethnic publishing guidelines as well as guidelines for equal treatment of the sexes in their publications (CTB/McGraw-Hill, 1979).

This batter of norm-referenced achievement tests yielded raw scores, scale scores and grade equivalents for analyses. All the test instruments used to

collect English achievement data and oral English language proficiency levels are summaried in Table 8.

TABLE 8

Summary of Test Instruments Used in Student Testing Pre and Post for All Groups

Instruments	Grade 1	Subtests Given	Grade 2	Subtests Given
I. Oral Language Proficiency				
A. LASE(E)	X	5	X	5*
B. LAS(S)	X	5	X	5*
II. English Achievement				
A. CAT-Reading	X	3	X	4
B. CAT-Spelling		0	X	1
C. CAT-Language	X	1	X	2
D. CAT-Mathematics	X	2	X	2

*The 5 subtests of the (LAS)E and LAS(S) are: 1) Minimal Pairs, 2) Lexical, 3) Phonemes, 4) Sentence Comprehension and 5) Oral Production (Story Retelling).

Procedures in Collecting Data

Specific procedures were implemented to collect the data, which included student information, student test data, teacher

background information and parent data. (See Appendix A for details.)

Letters requesting permission to collect data in the public and nonpublic schools were written to the respective school officials. When official approval was received by the investigator, local district staff were contacted to confirm individual participation in the experiment.

Written parental permission for each subject to participate in the treatments and receive testing was acquired in late August, prior to their random assignment to treatments. (See Appendix A-IV for details.) The investigator, being bilingual, held an overview meeting with staff and all parents of subjects involved, and thoroughly explained the processes of the treatments that students would be participating in during the school year. Communication with the parents, subjects and staff involved was easily facilitated because the investigator was an administrator in the school district.

Four bilingual graduate research assistants from the University of Illinois - Chicago were employed by the investigator to assist with the administration of oral language proficiency testing and English achievement testing. The research assistants were extensively inserviced on test administration by the investigator in September and again in April prior to the posttesting sessions. The oral language proficiency testing was extremely important for the treatment selection, because only LEP students (levels 1 - 3) were eli-

gible for the experimental treatments. The graduate assistants received general procedures for testing students as well as all the test materials for the sessions. The investigator arranged for testing rooms in each school building and a consistent test schedule for all administrations.

All pretesting was conducted during late September and all posttesting during late April. Teachers received Student Information Sheets prior to the Spring testing so they could update student data. (See Appendix A for details.) All pretest and posttest data were coded to ensure the anonymity of all the participating schools, teachers and students.

Analyses of Data

Pretest data as well as student information data were examined to determine: 1) the extent to which the experimental treatment groups were equivalent prior to treatment; 2) the independent and dependent variables to be selected for further analysis; and, 3) the appropriate statistical analyses.

The initial data, excluding analyses of pretest measures can be categorized into independent and dependent variables as illustrated in Tables 9 and 10. Following these tables is a brief discussion on each of these groups of variables and how and why specific variables were treated, if at all, in further statistical analyses.

TABLE 9

Dependent Variables Description

VARIABLES	DESCRIPTION/CODE
Oral English Proficiency	Total raw & proficiency level scores on the LAS(E) Test; 5 subtests, pre & post
Oral Spanish Proficiency	Total raw & proficiency level scores on the LAS(S) Test; 5 subtests, pre & post
English Reading Achievement	Total raw scores, scale scores & grade equivalents on the CAT; e subtests, pre & post
English Language Achievement	Total raw scores, scale scores & grade equivalents on the CAT; 3 subtests including Spelling for 3rd grade, pre & post
Math Achievement	Total raw scores, scale scores & grade equivalents on the CAT; 2 subtests, pre & post

TABLE 10

Independent Variables Description

VARIABLES	DESCRIPTION/CODE
Grade	Coded: Grade 1 = 1, Grade 3 = 3
Treatment Group	Coded: Group 1 = ESL Pullout Group 2 = TBE & ESL Pullout Group 3 = TBE Group 4 = Control-Submersion
Sex	Female = 1; Male = 2
Age	Range = 6 - 10 years
Years in the U.S. (mainland)	Range = 1 - 6 years
No. of Siblings	Range = 1 - 6
No. of Parents Living at Home	1 = Mother, 2 = Father, 3 = Both Parents
No. of Relatives Living in Home	Range = 1 - 3
Dominant Home Languages	1 = English, 2 = Spanish
Free Lunch Recipients	1 = Yes, 2 = No
Ethnic Origin	Mexican = 1, Puerto Rican = 2, Latin American = 3, Other = 4

Frequency distributions, crosstabulations and analysis of variance were employed to determine if any of the independent variables had any significant differential effects across the treatment programs. In the analyses, the dependent variables

are the scores on the posttest measures of oral English proficiency and language, reading and math achievement.

In the analysis of the differences in English proficiency between the treatment groups, four statistical procedures were used: 1) t-tests of the difference in means utilizing a pooled estimate of variance, 2) t-tests on the difference between the pretest and the posttest, 3) analysis of covariance with the pretest as a covariate and, 4) a three-way analysis of variance.

The t-test of the difference of means is a statistical test designed to evaluate the significance of the differences of the means of independent samples. The null hypothesis is based on the means being equal; therefore, the test evaluates the probability that any observed difference in the means is a true difference or could have resulted through sampling error. The t-test requires that the samples be independent of one another. This requirement is met in the design of this study with the random assignment of subjects to the 3 treatment groups and the control group (Cook & Campbell, 1979).

The analysis of covariance procedure was designed to analyze the dimensions of individual gain and group differences simultaneously. The variance of the dependent variable is decomposed into various components. The first component is the regression component -- the effect of the pretest on posttest results. The remaining variance can be further broken down into between-group and within-group components.

The regression and between-group components are referred to as the explained variance and the remaining within-group component is considered the unexplained variance. The ratio between the explained and unexplained variance yields a statistic known as the f-test, which is used to test the null hypothesis of no difference between pre and posttest scores (Kerlinger, 1973). A multivariate analysis of variance yields information about the main effects of the specific variables by themselves and also about interactions between the variables of investigation. The results will be discussed in light of these statistical analyses and the formulated hypotheses.

CHAPTER IV

RESULTS AND DISCUSSION

As previously stated, this study was designed to address the following questions: 1) which experimental approach to second language learning provides children with a more effective instructional mode for developing oral English proficiency and academic skills in the areas of language, reading and mathematics? and 2) to what extent does previous formal schooling experience and the number of years of residence in the U.S. influence the acquisition of English?

This chapter is divided into four major sections. The first section provides a sociological and demographic examination of the final sample. Results from frequency analyses, crosstabulations, and chi-square analyses and covariance are reported and discussed. The second, third and fourth sections report and discuss the results related to each of the Hypotheses tested. These results are discussed, based on the multivariate analyses of variance, covariance and t-testing performed within the context of Hypotheses 1, 2, and 3.

A Sociological and Demographic Examination of the Final Sample

The sociological and demographic variables examined in the study included age, sex, ethnic origin, number of years residing in the U.S. (mainland), previous formal schooling experience, number of siblings, number of parents living at

home, number of relatives living in the home and the number of subjects receiving free lunch. These variables are depicted in Table 11.

At the time of the posttesting, there were 40 subjects in each of the 4 treatment groups with 80 subjects representative of the first grades and 80 subjects in the third grade. In the first grade, there were 68 six-year-olds, and 12 seven-year-olds. In the third grade, there were 63 eight-year-olds, 16 nine-year-olds, and 1 ten-year-old. These age ranges represented a normal distribution for grades one and three. There were 78 female subjects and 82 male subjects. Frequency analyses and contingency tables were used to determine the relationship among age, sex, and treatment conditions (ESL Pullout, TBE/ESL Pullout, TBE, Control-Submersion). An examination of Tables 11-20 illustrate the presence of a normal distribution within the sample.

TABLE 11

Independent Variables Available for Analysis

Variable	N=160	Mean	Standard Deviation
1.	Age	7.181	1.115
2.	Years in the U.S.	1.9444	0.795
3.	Years of Previous Schooling	1.787	0.788
4.	Number of Siblings	3.938	1.700
5.	Number of Parents at Home	1.750	0.434
6.	Number of Relatives at Home	1.452	0.500

TABLE 12

Frequency Distribution of Subjects by Sex

Sex	N	Relative Frequency %
Females	78	48.7
Males	82	51.2

Total N = 160

TABLE 13

Frequency Distribution of Subjects by Age

Age	N	Relative Frequency %
6 yrs.	68	42.5
7	13	8.1
8	62	38.7
9	16	10.0
10	1	0.6

Total N = 160 X = 7.181 SD = 1.115

Age and sex differences across treatment groups prior to the administration of the treatments were not found to be statistically significant ($p<.05$).

TABLE 14

Frequency Distribution of Subjects by Years in the United States

Years	N	Relative Frequency %
1	49	30.6
2	76	47.5
3	31	19.4
4	3	1.9
5	1	0.6

Total N = 160 X = 1.944 SD = 0.795

Ninety-seven and one half percent of the sample had been residing in the U.S. for only three years or less, which supported the finding of limited English proficiency represented by all subjects across all treatment groups.

TABLE 15

Frequency Distribution of Subjects by Years of Previous Schooling

Years	N	Relative Frequency %
1	69	43.1
2	57	35.6
3	33	20.6
4	1	0.6

Total N = 160 X = 1.787 SD = 0.7888

TABLE 16

Frequency Distribution of Subjects by Number of Siblings at Home

Siblings	N	Relative Frequency %
1 or 2	27	16.9
3	33	20.6
4	36	22.5
5	24	15.0
6+	40	25.0

Total N = 160 X = 3.938 SD = 1.700

TABLE 17

Frequency Distribution of Subjects by Number of Parents at Home

Parents	N	Relative Frequency %
1	40	25.0
2	120	75.0

Total N = 160 X = 1.750 SD = 0.434

It is of particular interest to note that the strong Hispanic cultural belief concerning marriage traditions is strongly represented in this sample. Seventy-five percent of the subjects lived with both parents.

TABLE 18

Frequency Distribution of Subjects by Number of Relatives Residing in the Home

Relatives	N	Relative Frequency %
0	56	35.0
1	57	35.6
2	47	29.4

Total N = 160 X = 1.452 SD = 0.500

TABLE 19

Frequency Distribution of Subjects by Dominant Home Language

Language	N	Relative Frequency %
English	4	2.5
Spanish	156	97.5

Total N = 160 X = 1.975 SD = 0.157

Ninety-seven and one half percent of the sample was clearly Spanish dominant and used it at home with parents, siblings and extended family members.

Socio-economic status has been shown to be significantly related to academic achievement (Brown, 1972; Coleman, 1966; Ornstein, 1972, 1977). Thus, one of the initial concerns in the design was to control for the socio-economic status variable among the subjects across treatment conditions. To control for SES, data was collected on the free lunch program status of each participant. The results revealed that the number of subjects receiving free lunches did not vary significantly across treatments (97% of the 160 students included in the sample were receiving free lunches as prescribed by the federal guidelines and only 3% did not receive assistance).

Subject selection procedures were also aimed at sampling only Mexican and Puerto Rican students since these two groups represented the majority of Spanish background students in the Waukegan community. For the 160 subjects, 52.8% were from

Mexico, 45.1% were Puerto Rican, and only 2.1% were from other Spanish-speaking ethnic backgrounds.

As shown in Table 20, results of chi-square analyses relating English proficiency levels to the remaining independent variables of interest revealed that no relationship existed between English proficiency, the number of parents at home, the number of siblings at home, and the number of other relatives residing at home. The distribution of oral English proficiency and achievement scores and years in the U.S. were also found not to be significant.

TABLE 20

Chi-Square Analyses of English Proficiency and Independent Variables

English Proficiency			
Independent Variables	X2	df	Significance p < .001
Number of parents	6.86	4	.1433
Number of siblings	15.42	16	.4939
Number of relatives	4.87	4	.3002
Years in the U.S.	13.80	16	.6133

N = 160

The obtained chi-square analyses differences were not significant at the p < .001.

In summary, none of the independent variables (number of parents, number of siblings, number of relatives, years in the U.S.) were found to be significantly related to the dependent variable (English proficiency). Therefore these variables were not pursued in further statistical analyses. Only the variables of years of previous schooling and years residing in the U.S. were selected for further examination and analysis with respect to testing Hypotheses 1, 2, and 3 to determine if there were higher order interactions present.

Results Related to Testing Null Hypothesis #1

To test Null Hypothesis #1, two types of inferential statistical procedures were used to analyze the posttest data: analysis of covariance and t-tests of all possible combinations of two group means, i.e., six separate tests involving the four experimental groups. Analysis of covariance compensates for pretest differences when these are caused by change factors.

Analysis of covariance was selected to test Hypothesis #1 relating to whether or not there were differences among students in different treatment groups. 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.

Hypothesis #1 stated that there are no differences in oral English language acquisition and achievement in reading, language, and math for students in first and third grades across the four instructional treatment groups: [ESL Pullout (ESLP), Transitional Bilingual Education and ESL Pullout (TBE/ESLP), Transitional Bilingual Education (TBE), and the Control Group-Submersion (SUB)]. These acronyms will be used henceforth to describe each treatment group. For purposes of reporting and discussing the results, Hypothesis #1 was divided into sub-hypotheses by skill areas and grades as follows:

1.1 Oral English Language Proficiency

1.11 First grade

1.12 Third grade

1.2 English Reading Skills

1.21 First grade

1.22 Third grade

1.3 English Language Skills

1.31 First grade

1.32 Third grade

1.4 English Math Skills

1.41 First grade

1.42 Third grade

Results Related to Testing Sub-Hypothesis 1.1 - Oral English Language Proficiency

Four subtests of the Language Assessment Scales Test, Level I, English version, (LAS(E)), were administered to all subjects as pre and posttests. Following are the a priori results of analysis of covariance, using the pretest scores as covariates and posteriori mean comparisons using t-tests.

1.11 Results Related to Testing Oral English Language Proficiency - First Grade

The analysis of covariance procedure (ANCOVA) indicated significant differences for the main effects across treatment groups, ($F(3,79) = 6.40$, $p \leq .01$). The covariate being the pretest scores of the LAS(E) was also found to be significant, ($F(1,79) = 68.28$, $p < .01$) (See Table 21). The posttest scores of the experimental groups and the control group were found to differ significantly, after adjusting for the pre-test score differences using the covariance procedure.

TABLE 21

Analysis of Covariance of Posttest Scores - (LAS(E) by Pretest Scores and Treatment Group for First and Third Grades

Grade	Source	SS	df	MS	F Value	Sig. F
1	Covariate-Pretest	5139.77	1	5139.77	68.28	0.001
	Treatment	1447.11	3	482.37	6.40	0.001
	Explained	6586.88	4	1646.72	21.87	0.001
2	Covariate-Pretest	5144.70	1	5144.70	131.76	0.001
	Treatment	1140.02	3	380.00	9.73	0.001
	Explained	6284.72	4	1571.18	40.24	0.001

These findings led to rejection of Null Hypothesis #1. Consequently, the investigator performed posteriori t-tests to examine the mean differences among treatment groups. The results were as follows: t-testing failed to indicate significant differences between subjects in treatment groups ESLP and TBE/ESLP, ($p < .05$) and between subjects in groups TBE and SUB ($p < .05$). However, significant differences were found between subjects in treatment groups ESLP and TBE and between subjects in groups ESLP and SUB as reported in Table 22.

TABLE 22

Grade 1 - T-Test Comparisons of Treatment Groups on Oral English Proficiency

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	60.10/ 59.50	0.11	N.S.
ESLP, TBE	20/20	60.10/ 68.90	-2.71	$p < .05$
ESLP, SUB	20/20	60.10/ 70.95	-3.99	$p < .001$
TBE/ESLP, TBE	20/20	59.70/ 68.90	-2.09	$p < .05$
TBE/ESLP, SUB	20/20	59.70/ 70.95	-2.79	$p < .01$
TBE, SUB	20/20	68.90/ 70.95	-0.56	N.S.

ESLP = English as a Second Language Pullout Approach

TBE/ESLP = Transitional Bilingual Education Pullout & ESL Pullout

TBE = Transitional Bilingual Education Integrated Self-Contained

SUB = Control Group = Submersion

For students in the first grade, the results indicated that there was a significant difference for oral English language acquisition depending upon the treatment received. Subjects in the self-contained treatment models (TBE & SUB) did significantly better than the subjects in the pullout models (ESLP & TBE/ESLP). It is interesting to note that there was no difference found between the Control Group - Sub-

mersion Approach and the TBE group even though the subjects in the Control Group received the highest posttest mean score of all treatments on the LAS(E) measure of oral English proficiency.

1.12 - Results Related to Testing Oral English Language Proficiency - Third Grade

As shown in Table 21, the ANCOVA procedure indicated significant differences in oral English skills across the four treatment groups for the subjects in third grade, ($F(3,79) = 9.73$, $p < .001$). The covariate (the pretest scores of the LAS(E)) was also found to be significant, ($F(1,79) = 131.76$, $p < .001$). The scores of the experimental groups and the Control Group were found to differ significantly after being adjusted for by the covariance procedure. These findings led to rejection of the Null Hypothesis #1 for the students in third grade. Again, posteriori t-tests were performed to examine mean differences across the treatments. These results are reported in Table 23.

TABLE 23

Grade 3 - T-Test Comparisons of Treatment Groups on Oral English Proficiency

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	69.50/ 73.75	-1.21	N.S.
ESLP, TBE	20/20	69.50/ 86.05	-4.46	$p < .001$
ESLP, SUB	20/20	69.50/ 77.10	-2.21	$p < .05$
TBE/ESLP, TBE	20/20	73.75/ 86.05	-5.73	$p < .001$
TBE/ESLP, SUB	20/20	73.75/ 77.10	-2.06	$p < .05$
TBE, SUB	20/20	86.05/ 77.10	4.38	$p < .001$

As was the case with the first graders, students receiving the self-contained treatments tended to score higher on the posttest than subjects in the pullout treatments. However, in the third grades, those students who receive TBE did significantly better than subjects receiving all other treatments, including the Control Group subjects.

Discussion of the Results Related to Testing Oral English Proficiency - Hypothesis #1

For grades one and three, students receiving a self-contained treatment (TBE or SUB) attained higher posttest mean scores on the LAS(E) English measure as compared to subjects in the other pullout treatment group approaches. However, the t-test results indicated that in grade one, there was no significant difference ($p < .05$) between subjects in the two

self-contained approaches (TBE vs. SUB) in terms of oral English attainment, while in grade three there were significant differences ($p < .001$) for subjects in the two self-contained approaches (TBE vs. SUB), favoring the TBE approach. It appeared that acquisition of oral skills in English was not influenced for the younger subjects (first grade) if they received one of the self-contained treatments, but was influenced for older subjects (third grade). The third grade subjects performed better in the TBE treatment, probably due to the emphasis on "comprehensible input" and native language support within a self-contained classroom setting (Long, 1981; Krashen, 1982). In contrast, subjects in the Control Group, (SUB), were not exposed to special English teaching strategies that would help develop "bilingual interpersonal communication skills" (BICS) (Cummins, 1981; Wong Fillmore, 1982).

Students scored the lowest when they received one of the pullout treatments (ESLP or TBE/ESLP) in both first and third grades. The differential treatment approach of receiving or not receiving native language support was also found not to be significant in either grade. These findings might be explained by the fact that a social stigma is often reported to be attached to those students being "pulled out" of a mainstream class for a portion of the day in order to receive special help. This can affect the self-concept of the child which influences how well he or she may learn in this schooling environment. Also, it is possible that on-task

instructional time is lost when using a "pullout" model of instruction (Milk, 1985; Tikunoff, 1983; Glass, 1977).

Sub-Hypothesis 1.2 - Results Related to Testing English Reading Skills

All subjects took the California Achievement Test Battery, which included a section on reading skills. Reading was divided into three subtests for first grade and four subtests for third grade. The subtests were designed to measure Phonic Analysis Skills, Structural Analysis, Reading Vocabulary and Comprehension Skills. The subtests also yielded a total reading score. Students were administered pre and posttests.

In analyzing the results related to testing Hypothesis #1 (reading acquisition), analysis of variance for all subtests and totals were performed across treatments. In addition, analyses of covariance were performed using the pretest as a covariate. Follow-up procedures included t-tests.

1.21 - Results Related to Testing Reading - First Grade

Analysis of covariance indicated no significant differences at the .001 level for Total Reading mean scores across treatment groups (See Appendix B-I). Follow-up t-tests also indicated no significant differences between the different treatments. Consequently, the reading mean test scores were analyzed for each subtest score to test for treatment effects. These results are reported below.

The first subtest for first graders measured Phonic Analysis decoding skills in English. This subtest included 25 items and reportedly measures a student's ability to relate the sounds of oral language to the graphic symbols of written language. An ANCOVA was run on the posttest scores on this subtest and the pretest was again used as the covariate. The results of the ANCOVA revealed that there were no significant differences across treatment groups at the $p < .05$ level even though the mean score for the TBE group ($X = 14.35$) was higher than the other groups (See Appendix B-II). Because there were no significant differences indicated, additional t-testing was not necessary.

The second subtest was designed to assess Reading Vocabulary skills, i.e., meaning, category, and multi-meaning words. There were a total of 15 items included in this subtest. The ANCOVA procedure revealed that there were no significant differences across treatment groups at the .001 level of significance, even though the mean score for the Control Group - Submersion ($X = 7.35$) was higher than the three other experimental groups (See Appendix B-III). Consequently, no t-tests were necessary to determine significance between treatments.

The third subtest was designed to measure Reading Comprehension. This subtest includes 20 items that sample literal, interpretive, and critical comprehension skills. The ANCOVA results reported in Table 24 indicated significant differences

for the main effects across the treatment groups ($F(3,79) = 2.79$, $p < .05$).

TABLE 24

ANCOVA of Posttest Scores - CAT - Reading Comprehension by Pretest Scores and Treatment Group for Grade 1

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	26.92	1	26.92	4.41	0.039
Treatment	51.03	3	17.01	2.79	0.043
Explained	77.95	4	19.49	3.19	0.018

These findings related to Reading Comprehension support the rejection of the Null Hypothesis #1. Consequently, t-tests were performed to test for mean differences across the treatment groups. The results are reported in Table 25.

TABLE 25

Grade 1 - T-Test Comparisons of Treatment Groups on Reading Comprehension

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	8.00/ 8.50	-0.74	N.S.
ESLP, TBE	20/20	8.00/ 8.50	-0.63	N.S.
ESLP, SUB	20/20	8.00/ 10.35	-3.27	$p < .01$
TBE/ESLP, TBE	20/20	8.50/ 8.50	-0.00	N.S.
TBE/ESLP, SUB	20/20	8.50/ 10.35	-2.36	$p < .05$
TBE, SUB	20/20	8.50/ 10.35	-2.09	$p < .05$

Students in the SUB group scored significantly higher than those subjects in the three other treatment groups -- TBE, TBE/ESLP & ESLP. According to the research literature, it is not unusual for students in TBE treatments to fall behind academically (Cummins, 1981, Toukomaa & Skutnabb-Kangas, 1977) for a period of time. "It takes considerably longer for immigrant students to develop age-appropriate academic skills in English (five-seven years) than it does to develop certain aspects of age-appropriate English communicative skills (approximately two years)" (Cummins, 1981, p. 9). In summary, the first grade sample revealed no significant differences across treatment groups for total reading skill gain, but there was a favorable significant relationship between Reading Comprehension gains and the SUB treatment group.

1.22 - Results Related to Testing Reading - Third Grade

Analysis of covariance of the Total Reading scores reported in Table 26 indicated that significant differences exist for the main effects across the treatment groups ($F(3,79) = 2.62$, $p \leq .05$). This finding led to rejection of the Null Hypothesis #1 for students in the third grade sample concerning reading skills. Consequently, t-tests were done to analyze the mean differences between treatments. These findings are reported in Table 27.

TABLE 26

ANCOVA of Posttest Scores - CAT - Reading Comprehension by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	4389.87	1	4389.87	58.30	0.000
Treatment	593.82	3	197.94	2.62	0.050
Explained	4983.69	4	1245.92	16.54	0.000

TABLE 27

Grade 3 - T - Test Comparisons of Treatment Groups on Total Reading

Treatment	N	Mean	T Value	Significance
ESLP,TBE/ESLP	20/20	31.50/ 31.85	-0.11	N.S.
ESLP, TBE	20/20	31.50/ 43.55	-3.35	$p < .01$
ESLP, SUB	20/20	31.50/ 41.60	-2.78	$p < .01$
TBE/ESLP, TBE	20/20	31.85/ 43.55	-4.03	$p < .001$
TBE/ESLP, SUB	20/20	31.85/ 41.60	-3.31	$p < .01$
TBE, SUB	20/20	43.55/ 41.60	-0.60	N.S.

Subjects receiving the TBE treatment significantly outperformed the ESLP group and the TBE/ESLP group. Again, as with oral language skills in the third grade, the self-contained treatments outperformed the pullout group approaches in total reading achievement. However, no significant difference was found between the two self-contained groups even though the mean score ($X = 43.55$) of the TBE treatment was higher than the SUB Group ($X = 41.60$). Overall, it appears from the results reported here that students in third grade receiving the TBE treatment in a self-contained integrated atmosphere made better gains in Total Reading achievement. The four subtests of Total Reading achievement were analyzed further to

determine if any other significant relationships existed across treatments. These findings are reported as follows.

The first subtest for third grade subjects included 20 items which measured Phonic Analysis -- decoding skills. An ANCOVA procedure was performed and the table results indicated significant differences across the treatments ($F(3,79) = 2.77$, $p < .05$) (See Table 28).

TABLE 28

ANCOVA of Posttest Scores - CAT - Reading Phonic Analysis by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	256.95	1	256.95	27.70	0.000
Treatment	77.34	3	25.78	2.77	0.047
Explained	334.30	4	83.57	9.01	0.000

This finding led to rejection of the Null Hypothesis #1 for students in the third grade sample with regard to Phonic Analysis gains. Posteriori t-tests were performed to examine mean differences between the treatments. These results are reported in Table 29.

TABLE 29

Grade 3 - T-Test Comparisons of Treatment Groups on Reading Phonic Analysis

Treatment	N	Mean	T Value	Significance
ESLP,TBE/ESLP	20/20	8.75/ 9.30	-0.55	N.S.
ESLP, TBE	20/20	8.75/ 11.55	-2.47	$p < .05$
ESLP, SUB	20/20	8.75/ 12.40	-2.94	$p < .01$
TBE/ESLP, TBE	20/20	9.30/ 11.55	-2.72	$p \leq .01$
TBE/ESLP, SUB	20/20	9.30/ 12.40	-3.20	$p < .01$
TBE, SUB	20/20	11.55/ 12.40	-0.77	N.S.

The TBE and the SUB treatment (the self-contained groups) did significantly better in phonics than the ESLP and the TBE/ESLP pullout treatments. There were no significant differences between the two pullout approaches (ESLP and TBE/ESLP) nor the two self-contained approaches (TBE and SUB). Even though the Sub - Control Group had a slightly higher mean ($\bar{X} = 12.40$) than the TBE approach ($\bar{X} = 11.55$), these groups were not found to be significantly different from each other.

In first grade, Phonic Analysis skills did not appear to be affected by treatment. However, in third grade a significant effect on scores across treatments was found. Decoding skill mastery is considered to be particularly important at the third grade level due to the increased emphasis on compre-

hension. If a student has not mastered decoding skills, comprehension can be negatively affected.

The second subtest for third grade subjects measured 11 items of Structural Analysis, i.e., a student's ability to identify structural clues such as: syllables, base words, affixes, contractions, etc. An ANCOVA procedure was performed. The tabled results (see Table 30) indicated significant differences across the treatments ($F(3,79) = 3.81$, $p \leq .05$).

TABLE 30

ANCOVA of Posttest Scores - CAT - Reading Structural Analysis by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	19195.52	1	19195.52	19.36	0.000
Treatment	11336.55	3	3778.85	3.81	0.013
Explained	30532.12	4	7633.03	7.70	0.000

This finding led to rejection of Null Hypothesis #1 for students in the third grade sample regarding Structural Analysis gains. Posteriori t-tests were subsequently performed to examine mean differences between treatments. These results are depicted in Table 31.

TABLE 31

Grade 3 - T Test Comparisons of Treatment Groups on Reading Structural Analysis

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	5.35/ 5.45	-0.15	N.S.
ESLP, TBE	20/20	5.35/ 8.00	-3.93	$p < .001$
ESLP, SUB	20/20	5.35/ 7.60	-3.35	$p < .01$
TBE/ESLP, TBE	20/20	5.45/ 8.00	-4.13	$p < .001$
TBE/ESLP, SUB	20/20	5.45/ 7.60	-3.50	$p = .001$
TBE, SUB	20/20	8.00/ 7.60	-0.65	N.S.

The self-contained approaches again did better in Structural Analysis than the ESLP and TBE/ESLP pullout approaches. There were also no significant differences found between the two pullout approaches nor between the two self-contained approaches. In the latter case, the TBE group mean ($X = 8.00$) was higher than the SUB group mean ($X = 7.60$). It is interesting to note that the group which received native language support in the pullout versus the group that only received ESL help in the pullout was doing consistently better in subtests -- Phonic Analysis and Structural Analysis. This supports prior research (Hakuta, 1986; Willig, 1986) which indicates that native language support is effective in the acquisition of English.

The third subtest for the third grade reading sample included 15 items which assessed Vocabulary knowledge. An ANCOVA procedure was performed and the results (See Appendix B-IV) did not indicate significant differences at the .001 level across treatments for Vocabulary knowledge.

The final subtest measured Reading Comprehension which consisted of 27 items. An ANCOVA procedure was performed and the results (See Table 32) indicated significant differences across the treatments ($F(3,79) = 2.73$, $p < .05$).

TABLE 32

ANCOVA of Posttest Scores - CAT - Reading Comprehension by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	610.03	1	610.03	30.41	0.000
Treatment	164.71	3	54.90	2.73	0.049
Explained	774.74	4	193.68	9.65	0.000

This finding led to rejection of the Null Hypothesis #1 for students in the third grade sample with regard to Reading Comprehension skills. Posteriori t-tests were done to examine mean differences between treatments. These results are depicted in Table 33.

TABLE 33

Grade 3 - T-Test Comparisons of Treatment Groups on Reading Comprehension

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	11.55/ 11.35	0.11	N.S.
ESLP, TBE	20/20	11.55/ 16.10	-2.71	$p < .05$
ESLP, SUB	20/20	11.55/ 14.60	-1.78	N.S.
TBE/ESLP, TBE	20/20	11.35/ 16.10	-3.19	$p < .01$
TBE/ESLP, SUB	20/20	11.35/ 14.60	-2.14	$p < .05$
TBE, SUB	20/20	16.10/ 14.60	1.07	N.S.

The subjects in the self-contained groups (TBE and SUB) did significantly better than the subjects in pullout groups (ESLP and TBE/ESLP). However, no significant differences were found between the two pullout approaches or between the two self-contained approaches. The TBE group did have a higher mean score ($\bar{X} = 16.10$) than all other treatment groups including the Control Group - SUB ($\bar{X} = 14.60$). It appears that reading achievement is consistently being influenced by 1) a self-contained instructional model and 2) native language support.

In summary, differential treatment efforts were found with respect to subjects' reading skills in English for Total Reading, Phonic Analysis, Structural Analysis and Comprehension in the third grade sample. In all three of the subtests

and the total scores in reading, subjects in the self-contained treatment groups (TBE and SUB) did significantly better than the subjects in the two pullout treatments (ESLP and TBE/ESLP). The TBE treatment group subjects, who were provided with native language support, had higher mean scores in comprehension, structural analysis, vocabulary and reading. Nevertheless, no significant differences were found between TBE and the SUB Group subjects who were provided with no special language assistance.

Discussion of the Results Related to Testing English Reading Skills - Hypothesis #1

For first grade subjects, the results of the statistical procedures indicated no significant differences among the four treatment groups. Findings from follow-up procedures designed to examine the subtest results, indicated that there was a significant difference in comprehension skills for those subjects in the SUB - Control Group. This result could be spurious in that comprehension skills are very limited at the first grade level for all students and not necessarily attributable to the method of instruction. Preliteracy exposure of the subjects was not controlled for in this study and is a contributing factor to students' comprehension skills (Holdaway, 1979; Krashen, 1985). Some researchers explain this finding by suggesting that students who begin learning to read simultaneously in two languages may experience more difficulty

than those learning to read in one language (Cohen, 1976; Modiano, 1973; Thonis, 1981).

In the case of third grade subjects, the results indicated significant differences among the four treatments for total reading ability. Upon follow-up, it was found that three of the four subtests indicated significant differences between the treatments. There were no significant differences indicated for vocabulary across treatments, but subjects in the TBE group and the Control - Submersion group showed significant differences for Phonic Analysis, Structural Analysis and Comprehension when compared with the two pullout treatments, ESLP and TBE/ESLP. Students in the bilingual, self-contained treatment outperformed all other groups in reading, although there was no significant difference between TBE and the Control group. These findings substantiate studies (Troike, 1978; Rodriguez-Brown, 1979; Schon, Hopkins & Davis, 1982) which have shown that a bilingual instructional approach may facilitate learning to read in English. Also, the results indicated that the subjects in the self-contained treatments (TBE and SUB) scored significantly better than the subjects in the pullout treatments (ESLP and TBE/ESLP). The research on effective schools (Edmonds, 1979; Glass & Smith, 1977; Milk, 1985; Tikunoff, 1983) corroborates the detrimental effects of pullout instruction. Glass and Smith (1977) found that the risks of pullout programs far outweigh their gains. Their study showed a consistently negative relationship between the

time pupils spent in pullout classes and their reading and math achievement. Pullout often resulted in the negative labeling of many students who were viewed by their teachers as less capable, with less expected of them. Lower teacher expectations appeared to result in lower levels of student achievement.

Sub-Hypothesis 1.3 - Results Related to Testing English Language Skills

All subjects received the California Achievement Test Battery, which included a section on Language Skills. Language was divided into three subtests for third grade subjects and one test for the first grade sample. The Language exam measured Expression, Mechanics and Spelling for third grade subjects and Expression areas only for the first grade sample. In analyzing the results for language achievement, analyses of variance and covariance were performed for all tests and follow-up procedures including t-testing.

1.31 - Results Related to Testing Language - First Grade

Language Expression consisted of 20 items designed to measure a student's ability to apply his knowledge of language to effective expression. At the first grade level, the basic categories tested are nouns, pronouns, verbs and adjectives.

Analysis of covariance performed indicated no significant differences at the .05 level for Language Expression across treatment groups (See Appendix B-V). Therefore, treatment did

not appear to have an effect on Language Expression in the first grade sample.

1.32 - Results Related to Testing Language - Third Grade

The third grade Language test consisted of Spelling, Language Mechanics and Language Expression. The Spelling test included 20 items designed to measure student recognition of consonants, vowels, morphemic units and common spelling errors. Language Mechanics consisted of 20 items in the areas of capitalization and punctuation. The Language Expression subtest, consisting of 26 items, was designed to assess students' understanding of skills closely related to effective written expression.

Upon examination of the Total Language test results, the analysis of covariance procedure indicated no significant differences among the treatments (See Appendix B-VI). However, the first subtest, Spelling, reported analysis of covariance results which did indicate significant differences ($F(3,79) = 5.23$, $p < .01$) for Spelling across the treatment groups as shown in Table 34. Follow-up t-test procedures were performed and are reported below in Table 35.

TABLE 34

ANCOVA of Posttest Scores - CAT - Spelling by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	14.92	1	14.92	2.68	0.105
Treatment	87.25	3	29.08	5.23	0.002
Explained	102.17	4	25.54	4.59	0.002

TABLE 35

Grade 3 - T-Test Comparisons of Treatment Groups on Spelling

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	12.70/ 10.55	2.87	$p < .01$
ESLP, TBE	20/20	12.70/ 13.10	-0.52	N.S.
ESLP, SUB	20/20	12.70/ 13.15	-0.60	N.S.
TBE/ESLP, TBE	20/20	10.55/ 13.10	-3.42	$p < .001$
TBE/ESLP, SUB	20/20	10.55/ 13.15	-3.54	$p < .001$
TBE, SUB	20/20	13.10/ 13.15	-0.07	N.S.

Subjects in the two self-contained treatment groups (TBE and SUB) did significantly better in Spelling than the subjects in the pullout treatment groups (ESLP and TBE/ESLP). However, there were no significant differences between the

self-contained treatments. On the other hand, among the pull-out treatments, the ESLP group did significantly better than the TBE/ESLP group. Spelling skills require much memorization practice which, perhaps, was emphasized more for subjects in the ESLP treatment than in the other pullout model.

The Language test consisted of two other subtests -- Mechanics and Language Expression -- so both subtests were examined to determine if there were any differences among treatments for these language areas. An analysis of covariance performed indicated significant differences ($F(3,79) = 3.72$, $p < .05$) among treatments for Language Mechanics as shown in Table 36. Follow-up t-tests were performed and are reported in Table 37.

TABLE 36

ANCOVA of Posttest Scores - CAT - Language Mechanics by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	64.60	1	64.60	7.27	0.009
Treatment	99.14	3	33.04	3.72	0.015
Explained	163.74	4	40.93	4.61	0.002

TABLE 37

Grade 3 - T-Test Comparisons of Treatment Groups on Language Mechanics

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	8.95/ 8.05	0.98	N.S.
ESLP, TBE	20/20	8.95/ 10.35	-1.34	N.S.
ESLP, SUB	20/20	8.95/ 6.90	2.67	$p < .05$
TBE/ESLP, TBE	20/20	8.05/ 10.35	-2.05	$p < .05$
TBE/ESLP, SUB	20/20	8.05/ 6.90	1.33	N.S.
TBE, SUB	20/20	10.35/ 6.90	3.45	$p < .01$

The comparisons revealed that there were significant differences among the subjects in the TBE group and the Control group. Subjects in the bilingual treatment group did significantly better. Cummins' research (1981) substantiates this occurrence by explaining the concepts of "BICS" (bilingual interpersonal communication skills) and "CALP" (cognitive academic language proficiency), the latter developing through a bilingual approach to language acquisition. Through "CALP" development there is more effective transfer of skills from the native language to a second language. In this case, the treatment group which provided both native language support and ESL support in a self-contained setting outperformed all other treatments. The Control group did the worst

of all treatments, possibly due to the lack of "CALP" development (Cummins, 1981) and "comprehensible input" (Krashen, 1981, 1985).

The last subtest, Language Expression, consisted of 26 items. Analysis of covariance indicated that there were no significant differences at the .001 level among treatments for Language Expression (See Appendix B-VII). Nevertheless, mean scores for subjects in the TBE and SUB treatments were higher ($\bar{X}$ = 17.05 and 15.25) than the subjects in the ESLP and TBE/ESLP treatments ($\bar{X}$ = 14.15 and 13.25). Type of treatment did not appear to have a significant effect on third grade subjects' acquisition of Language Expression skills, even though the subjects in the TBE treatment group did outperform all others.

Discussion of the Results Related to Testing Language - Hypothesis #1

There were no significant differences found for Total Language acquisition on the CAT for first or third grade subjects. Upon follow-up statistical examination of the subtests given to third grade subjects, the t-test procedure indicated significant differences between the Control - SUB group and the TBE group for Language Mechanics only. The TBE group outperformed all groups, which might be indicative of a "grammar based approach" in a classroom whereby the teacher used methods and materials that were organized around pattern practice and language drills (Terrell, 1981). This would help

the student do well on a test which measured rule-ordered, structural items in the language versus a test measuring communicative strategies.

Sub-Hypothesis 1.4 - Results Related to Testing Math Skills - Hypothesis #1

All subjects took a mathematics section of the CAT which measured Computational skills, Concepts and Applications. The computational section covered basic skills operation for the appropriate grade level. Concepts and Applications focused on concepts, rather than isolated facts. In analyzing the math results, analyses of covariance procedures were performed for all tests and follow-up procedures included t-test comparisons of all treatments.

1.41 - Results Related to Testing Mathematics - First Grade

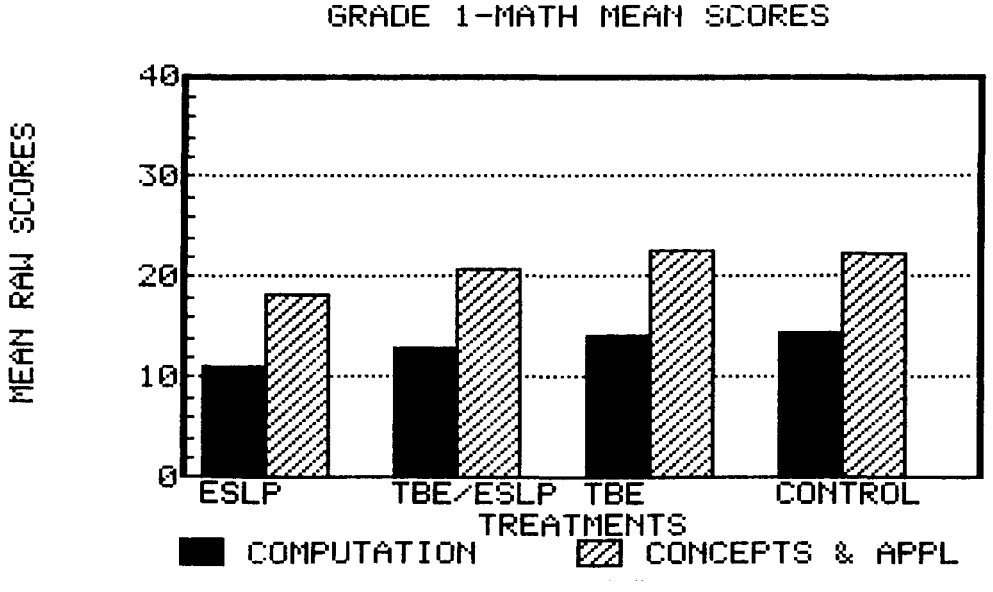
Computation consisted of 20 items which measured students' knowledge of basic addition and subtraction operations.

Analysis of covariance results indicated no significant differences at the .001 level across treatment groups for Computation (See Appendix B-VIII). The subjects in the TBE and SUB treatments did attain the highest mean scores (X = 14.30 and 14.40 respectively) in comparison to the ESLP and TBE/ESLP treatment groups (See Figure 1). The subjects in the

ESLP treatment attained the lowest scores. T-testing procedures indicated significant differences ($t = -2.92$, $p < .01$) between the ESLP and the TBE treatments. Also, there were significant differences ($t = -2.77$, $p < .01$) between the ESLP and the SUB group subjects.

Concepts and Applications consisted of 36 items which measured students' ability to recognize concepts and solve problems. Analysis of covariance revealed no significant differences at the .001 level between the treatments for Concepts and Applications (See Appendix B-IX). However, subjects in the two self-contained treatments (TBE and SUB) did attain the highest mean scores ($X = 22.60$ and 22.35 respectively) in comparison to subjects in the two pullout treatments (ESLP and TBE/ESLP) (See Figure 1).

Figure 1

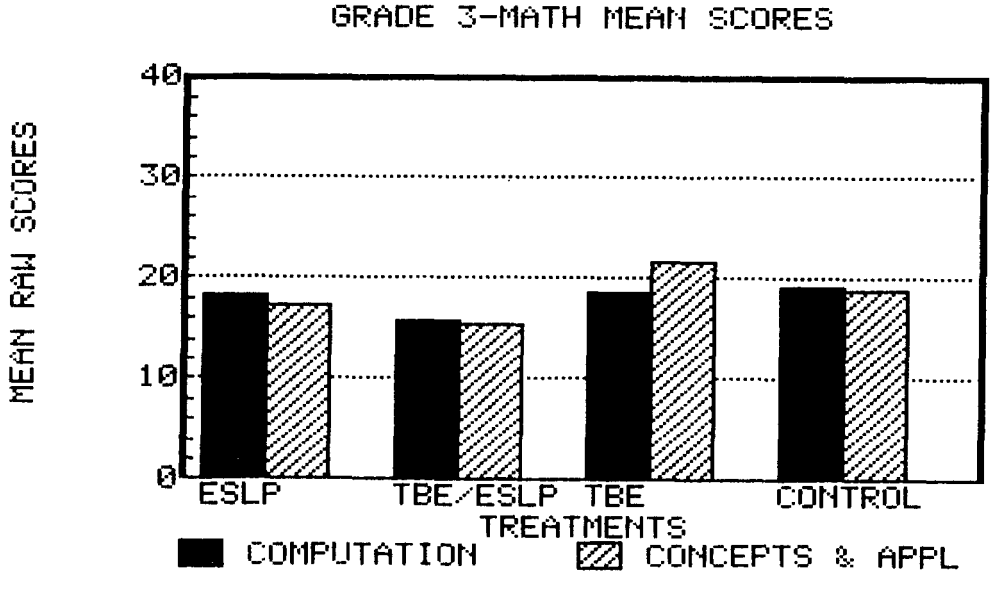


1.42 - Results Related to Testing Mathematics - Third Grade

The Computation subtest consisted of 40 items which measured students' knowledge of basic addition, subtraction, multiplication and division operations.

Analysis of covariance indicated no significant differences at the .001 level across treatment groups for Computation (See Appendix B-X). In addition, follow-up t-test findings also did not indicate any significant differences between treatments. Subjects in the two self-contained treatment groups (TBE and SUB) again attained the highest mean scores (X = 18.70 and 19.15 respectively) in comparison to the subjects in the two pullout treatments (ESLP and TBE/ESLP) (See Figure 2). However, the mean differences were not significant.

Figure 2



The Concepts and Applications test included 45 items designed to measure students' ability to solve problems. Analysis of covariance performed indicated significant differences ($F(3,79) = 2.80$, $p < .05$) across treatments for Concepts and Applications (See Table 38).

TABLE 38

ANCOVA of Posttest Scores - CAT - Mathematics - Concepts and Applications by Pretest Scores and Treatment Group for Grade 3

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	733.83	1	733.83	29.57	0.000
Treatment	208.80	3	69.60	2.80	0.045
Explained	942.64	4	235.66	9.49	0.000

Consequently, follow-up t-test procedures were performed to determine the differences between treatments. These results are depicted in Table 39.

TABLE 39

Grade 3 - T-Test Comparisons of Treatment Groups on Math Concepts and Applications

Treatment	N	Mean	T Value	Significance
ESLP, TBE/ESLP	20/20	17.50/ 15.35	1.17	N.S.
ESLP, TBE	20/20	17.50/ 21.80	-2.15	$p < .05$
ESLP, SUB	20/20	17.50/ 19.05	-0.85	N.S.
TBE/ESLP, TBE	20/20	15.35/ 21.80	-3.81	$p \leq .001$
TBE, SUB	20/20	21.80/ 19.05	1.63	N.S.

Again, subjects receiving the self-contained approaches (TBE and Control - SUB treatments) did better in Concept and Applications than the subjects in the two pullout treatments (ESLP and TBE/ESLP). There was no significant difference found between the subjects in the two pullout treatment groups nor between the subjects in the two self-contained treatment groups. Subjects in the TBE self-contained approach did attain the highest mean score of all treatments.

Discussion of the Results Related to Testing Mathematics Hypothesis #1

In summary, first grade subjects' acquisition of mathematics skills did not appear to be significantly affected by the different treatment conditions. However, the subjects in the self-contained treatments (TBE and SUB) did attain the

highest scores on the posttests. On the other hand, third grade subjects' acquisition of mathematics skills appeared to be significantly affected by treatment conditions for Concepts and Application. Again, subjects in the self-contained treatments (TBE and SUB) scored higher than subjects in the two pull-out treatments (ESLP and TBE/ESLP), but there were no significant differences between subjects in the self-contained treatment groups or the pullout groups. At the first grade level, treatment conditions did not appear to impair or positively influence the acquisition of math subject matter. At the third grade, treatment conditions did have a significant effect on students' Concept and Application skills.

These findings provide support for the differences of opinions among bilingual researchers over the question of language choice for mathematics instructions. For example, Macnamara's research (1967) suggested that when instruction is given in the weaker language of minority students, they may have difficulty dealing with the subject matter, particularly where verbal reasoning (problem solving) is involved. Cazden (1979) points out that word problems are not presented in mathematical terms, but in ordinary language which the learners must convert into precise mathematical expressions before they can be solved. For LEP students, this is a rather advanced level of control of English required for transforming word problems into mathematical terms and operations. Cazden suggests that discussions concerning when to use the second

language in the teaching of math to LEP students should depend at least in part on grade level. In the early years of school, much that is taught in mathematics can be communicated through nonverbal means such as the manipulation of objects and materials. This could provide support for why there were no significant differences found for first grade subjects across the treatment conditions.

On the other hand, Saville-Troike (1971) came to quite a different conclusion concerning the language in which LEP students should be taught math. They advise teaching math to LEP students directly in English rather than in their native language or bilingually, since individuals growing up in this society will be doing whatever advanced mathematics they have to do in English.

Studies comparing math achievement in LEP students generally indicate an advantage for those who are taught mathematics, at least in part, in their language. Students who are taught math exclusively in English do not do as well as those who are taught bilingually, especially in the early primary years (Elizondo De Weffer, 1972; Olesini, 1971; Trevino, 1968). Students who receive math instruction in their L1 may not perform as well when tested in English, suggesting that skills acquired in their L1 may not transfer altogether, or perhaps that the language used in the tests may be difficult for LEP students who have not received mathema-

tics instruction in that language. Skoczylas (1972) found that students who received math in Spanish did not do well when measured in English. Valdez (1984) indicated that in his research in Paraguay, students in experimental groups who were taught math in Spanish and Guarani did not perform better than control group students who were taught exclusively in Spanish, their second language, until the third grade, suggesting that it may take as many as three years for the effects of bilingual instruction in mathematics to be apparent.

Summary of Results Related to Testing Null Hypothesis #1

The Null Hypothesis #1 stated that there were no differences in oral English language acquisition and achievement in reading, language and math for Spanish-speaking students in the first and third grades across four instructional treatment conditions: 1) ESL Pullout (ESLP), 2) TBE and ESL Pullout (TBE/ESLP), 3) TBE, and 4) Control Group - Submersion (SUB). To test this Null Hypothesis, the statistical technique of analysis of covariance was used. Additionally, post-hoc multiple comparison t-tests were used to determine which of the treatment groups differed significantly from the other groups. Rejection of Null Hypothesis #1 was based on the results of the ANCOVA's was performed in the areas of language, reading, math and oral language proficiency. These results are summarized in Table 40.

TABLE 40

Null Hypothesis 1 - Summary of ANCOVA Results

Test	Significance
GRADE 1	
Oral English Language Proficiency	$p \leq .01$
Reading Total	N.S.
Phonic Analysis	N.S.
Vocabulary	N.S.
Comprehension	$p < .05$
Language Expression	N.S.
Math Computation	N.S.
Math Concepts and Applications	N.S.
GRADE 3	
Oral English Language Proficiency	$p < .001$
Reading Total	$p < .05$
Phonic Analysis	$p < .05$
Structural Analysis	$p < .05$
Vocabulary	N.S.
Comprehension	$p < .05$
Spelling	$p < .01$
Language Total	N.S.
Language Mechanics	$p < .05$
Language Expression	N.S.
Math Computation	N.S.
Math Concepts and Applications	$p < .05$

Rejection of Null Hypothesis #1 for first grade subjects was based on the significant differences which existed across treatments for Oral English Proficiency and Reading Comprehension in English. Although there were no significant differences across treatments for Reading Vocabulary, Phonic Analysis and Total Reading, there were significant differences found between treatment groups that revealed subjects attaining higher scores in the two self-contained treatments (TBE and SUB). The same held true for the areas of Language Expression and Mathematics.

Rejection of Null Hypothesis #1 for third grade subjects was based on various significant differences which occurred across treatments for Oral English Proficiency, Total Reading, Phonic Analysis, Structural Analysis, Comprehension, Spelling, Language Mechanics and Mathematics Concepts and Applications.

In the areas of Vocabulary, Total Language, Language Expression and Math Computation there were no significant differences found across treatments, but there were a few differences reported between treatment groups which revealed the same pattern which occurred with the first grade subjects. That is to say the two self-contained treatments (TBE and SUB) did attain higher scores than the subjects in the two pullout treatment groups (ESLP and TBE/ESLP).

At the first grade level, students are just beginning to make cognitive growth in language acquisition and in academic areas. Consequently, it is not surprising that different treatments for English language acquisition failed to reveal significant differences. However, at the third grade level it became more apparent that subjects were exposed to more areas requiring "cognitive academic language proficiency" skills to perform well. Students attaining higher scores were often those who received the self-contained treatment (TBE) which provided instruction in the content areas in their native language and gave them formal ESL instruction in the same classroom setting. This finding is supported by various other studies reported which found similar results (Snow, 1983; Hakuta, 1986; Willig, 1985; Saville-Troike, 1984).

All of the results reported here must be interpreted with caution. First, the design was cross-sectional rather than longitudinal and the cumulative effects of bilingual education or ESL could not be directly examined. Second, the intact classroom groups used in the Control group situation were in a private parochial setting and may not be in fact representative of the subjects in the treatment groups in the public school setting.

Results Related to Testing Null Hypothesis #2

Null Hypothesis #2 stated that there are no differences between previous formal schooling experience in the

U.S. and English language acquisition across the treatment conditions (ESLP, TBE/ESLP, TBE and Control - SUB).

Analysis of covariance was used to examine English language scores of all treatment conditions by previous formal schooling experience. These results were analyzed by grade and described as follows.

Results Related to Testing Null Hypothesis #2 - Language Acquisition First Grade

The first test (LAS(E)) administered was designed to measure Oral English Proficiency. There were no significant differences found for subjects across treatment conditions for previous formal schooling experience and the acquisiton of Oral Language Proficiency at the .05 level of significance (See Appendix C-I).

The second measure used was the CAT Language test which measured Language Expression. There were no significant differences found for subjects across treatment conditions for previous formal schooling experience and Language Expression at the .05 level of significance (See Appendix C-II).

The third measure was designed to assess Total Reading ability and yield individual subtest scores for Phonic Analysis, Vocabulary and Comprehension. No significant differences were found for subjects across treatments for previous formal schooling experience and Reading Ability at the .05 level of significance (See Appendix C-III).

Based on all of the above language measurement results, Null Hypothesis #2 failed to be rejected for grade 1 subjects because there were no significant differences revealed for previous formal schooling experience across the four treatment conditions and language acquisition (See Table 41).

TABLE 41

Summary of Null Hypothesis #2 - ANCOVA of Posttest Scores Language Acquisition by Previous Formal Schooling - First Grade

Test	Previous Formal Schooling MS	F Value	Sig. of F
Oral English Proficiency	38.53	0.50	0.605
Language Expression	11.05	1.90	0.156
Total Reading	51.97	1.18	0.311
Phonic Analysis	12.53	1.19	0.309
Vocabulary	28.11	4.73	0.072
Comprehension	3.61	0.58	0.559

Results Related to Testing Null Hypothesis #2 - Language Acquisiton Third Grade

The first test (LAS(E)) administered was designed to measure Oral English Language Proficiency for third grade subjects. The ANCOVA procedure revealed that there were no significant differences found for subjects across treatment

conditions for previous formal schooling experience and the acquisition of Oral Language Proficiency at the .05 level of significance (See Appendix C-IV).

A second measure was designed to assess Language abilities and included the skill areas of Spelling, Expression and Mechanics. The ANCOVA performed revealed no significant differences for subjects across treatment conditions for previous formal schooling experience and Total Language Achievement at the .05 level of significance (See Appendix C-V). Examination of the subtest scores for spelling, expression and mechanics also revealed ANCOVA results which indicated there were no significant differences found for subjects across treatment conditions for previous formal schooling experience and expression and mechanics at the .05 level of significance.

A third measure assessed total reading ability which included the areas of Phonic Analysis, Structural Analysis, Vocabulary and Comprehension. ANCOVA results indicated there were no significant differences found across treatment conditions for previous formal schooling experience and for any of the above reading areas at the .05 level of significance (See Appendix C-VI).

Based on all of these language measurement results, Null Hypothesis #2 was not rejected for grade 3 subjects because there were no significant differences found across treatment

conditions for prevous formal schooling experience and language acquisition (See Table 42).

TABLE 42

Summary of Null Hypothesis #2 - ANCOVA of Posttest Scores Language Acquisition by Previous Formal Schooling - Third Grade

Test	Previous Formal Schooling MS	F Value	Sig. of F
Oral English Proficiency	50.16	1.30	0.281
Language Expression	4.51	0.21	0.884
Language Mechanics	9.01	0.99	0.401
Spelling	9.50	1.81	0.153
Total Reading	20.15	0.26	0.850
Phonic Analysis	4.72	0.51	0.673
Structural Analysis	5.14	1.31	0.277
Vocabulary	5.12	0.69	0.556
Comprehension	5.65	0.26	0.847

In summary, Null Hypothesis #2 was not rejected for grade 1 and grade 3 subjects because there were no significant differences across treatment conditions for English language acquisiton and previous formal schooling experience. At these grade levels, previous schooling does not appear to have an impact on English language acquisition, probably because of

the basic level of acquisition that goes on in the primary years of schooling. One would expect previous schooling to have an effect at the upper grades where content is cognitively more demanding and the language is context reduced.

Results Relating to Testing Null Hypothesis #3

Null Hypothesis #3 states that there are no differences between number of years residing in the U.S. and English language acquisition across the treatment conditions (ESLP, TBE/ESLP, TBE & Control-SUB).

Analysis of covariance was used to examine English language progress of all treatments by years residing in the U.S. These results were analyzed by grade and described in the following section.

Results Related to Testing Null Hypothesis #3 - Language Acquisition - First Grade

Three measures were used to assess language acquisition of first grade subjects: 1) Oral English Proficiency - (LAS(E)), 2) Language Expression - CAT and 3) Reading - CAT. The Reading test included three individual subtests which also looked at Phonic Analysis, Vocabulary and Comprehension Skills.

The ANCOVA procedures performed for all test scores revealed that there were no significant differences at the .05 level for language acquisiton based on all of the aforemen-

tioned measures across all treatment conditions by the number of years of residence in the U.S. (See Summary Table 43 and Appendices C-I and C-VI).

TABLE 43

Summary of Null Hypothesis #3 - ANCOVA of Posttest Scores - Language Acquisition by Years of Residence in the U.S. - First Grade

Test	M.S.	Years in the U.S. F Value	Sig. of F
Oral English Proficiency	70.63	0.92	0.401
Language Expression	9.66	1.66	0.196
Total Reading	14.73	0.33	0.715
Phonic Analysis	5.88	0.56	0.573
Vocabulary	3.40	0.57	0.566
Comprehension	5.26	0.85	0.430

Based on these findings, Null Hypothesis #3 was not rejected for subjects in grade 1, because there were no significant differences found across treatment conditions for years of residence in the U.S. and language acquisition.

Results Related to Testing Null Hypothesis #3 - Language Acquisition - Third Grade

Three measures of language acquisition were also used to assess the areas of oral proficiency, expression and reading

for third grade subjects. These tests included: 1) Oral Language Proficiency, 2) Language Expression, 3) Mechanics, 4) Spelling, 5) Reading Phonic Analysis, 6) Structural Analysis, 7) Vocabulary and 8) Comprehension.

The ANCOVA procedures performed revealed that there were no significant differences at the .05 level for language acquisition on any of the above tests across all treatment conditions by the number of years of residence in the U.S. (See Table 44 and Appendices C-I and C-VI).

TABLE 44

Summary of Null Hypothesis #3 - ANCOVA of Posttest Scores - Language Acquisition by Years of Residence in the U.S. - Third Grade

	M.S.	Years in the U.S. F Value	Sig. of F
Oral English Proficiency	50.09	1.30	0.279
Language Expression	2.89	0.13	0.967
Language Mechanics	3.41	0.37	0.824
Spelling	7.15	1.36	0.256
Total Reading	74.71	0.98	0.422
Phonic Analysis	6.92	0.75	0.558
Vocabulary	4.46	0.60	0.658
Comprehension	16.97	0.80	0.525
Structural Analysis	6.28	1.60	0.183

Based on these findings, Null Hypothesis #3 was not rejected for third grade subjects because there were no significant differences found across treatment conditions for the number of years residing in the U.S. and language acquisition.

In summary, Null Hypothesis #3 was not rejected for first and third grade subjects because there were no significant differences found in English language acquisition and the number of years residing in the U.S. across treatment conditions. Most likely, subjects are still using their native language outside the school environment regardless of the number of years that they have resided in the U.S. Consequently, the number of years of residence in the U.S. does not appear to have an impact on acquiring the English language.

Chapter Summary

Multivariate and univariate analyses of covariance and t-tests were calculated to test the hypotheses related to differences among three treatment groups and the control group (subjects receiving English as a second language in a pullout setting (ESLP); subjects receiving English as a second language and Transitional Bilingual Education in a pullout setting (ESLP/TBE); subjects receiving Transitional Bilingual Education in a self-contained setting (TBE); and the Control Group, students submerged in a regular self-contained monolingual classroom receiving no special instruction (SUB)). The first hypothesis examined students' English language

acquisiton and achievement and the impact of various treatments. The results of the statistical analyses can be summarized as follows:

1) On a measure of English oral language proficiency, first grade subjects in the Control-Sub group and TBE treatment group performed significantly better than students receiving the ESLP and ESLP/TBE treatments; in third grade, subjects in the TBE treatment group outperformed all other treatment groups and the two treatment groups which performed significantly better than the others were subjects in the self-contained treatment groups (Control-SUB & TBE) in both grades;

2) On measures of English Reading, first grade subjects scored equally well in all treatment groups with the exception of one skill area -- Comprehension. Subjects in the Control-SUB group performed significantly better than subjects in all other treatment groups; in third grade there were significant differences that revealed that subjects in the TBE treatment outperformed the ESLP and TBE/ESLP treatment groups. Subjects in the self-contained treatment groups outperformed subjects in the pullouts. On the Phonic Analysis subtest, the Structural Analysis subtest and the Comprehension test, sub-

jects in the Control-SUB group and the TBE treatment group significantly outperformed subjects in the other two treatment groups;

3) On measures of Language, first grade students did equally well in all treatment groups; in third grade, subjects in the TBE and Control-SUB groups scored significantly better in Spelling and Mechanics than subjects in the other two treatment groups. The TBE treatment subjects did significantly better than all other treatments on the Mechanics test;

4) On measures of Mathematics achievement, first grade subjects did equally well in all treatments in Computation, but t-tests performed indicated significant differences between subjects in the ESLP treatment group and subjects in the TBE group and significant differences between subjects in the ESLP group and the Control-SUB group. ESLP had the lowest attainment of all groups. There were no significant differences reported for the Concepts and Applications subtest; in third grade, there were no significant differences found for subjects across treatments in the area of Computation, but in the areas of Concepts and Applications, subjects in the TBE group and subjects in the Control-SUB group outperformed subjects in the

two pullout treatment groups. The subjects in the TBE group treatment attained the highest mean score.

The second and third hypotheses were designed to examine the relationship of the acquisiton of English to previous formal schooling experience and the number of years residing in the U.S. and their impact across treatment conditions. The results are summarized as follows:

1) Subjects in all treatments performed equally well across treatments regardless of their previous formal schooling for subjects in first and third grades.

2) Number of years of residence in the U.S. appeared to have no impact on any of the treatment condition measures -- students did as well regardless of their exposure time in the U.S.

These results should be interpreted with caution, since a cross-sectional design does not always permit cumulative benefits of bilingual instruction, ESL or other treatments from surfacing.

CHAPTER V

CONCLUSIONS

Summary of Findings

It has only been during the last 15 years that bilingual education programs have been systematically implemented throughout the country. As a result, practitioners have found themselves without a solid empirical data base upon which to make decisions affecting instructional practices for effective acquisition of English as a second language. This investigation was an attempt to provide answers to some of the most pressing questions regarding the acquisition of English language proficiency and basic achievement skills among second language learners.

Three hypotheses were generated with regard to the teaching and learning of English oral language and basic achievement skills among LEP students. The first was related to differences in student performance in oral English language and basic achievement areas among three different experimental, instructional treatment groups and a control group. These three experimental groups were randomly established in the public schools according to the following second language teaching approaches: 1) the ESL Pullout approach; 2) the Transitional Bilingual Education approach in combination with ESL Pullout approach and 3) the self-contained Transitional

Bilingual Education approach. The Control Group, which employed the Submersion approach, was established in the parochial schools with intact classrooms and subjects did not receive any special treatment for English acquisition.

The second and third hypotheses were related to the identification of sociological and demographic variables associated with the acquisition of oral language and basic achievement skills. These variables included previous years of formal schooling experience and the number of years residing in the U.S. Other variables examined included: sex, ethnic background, age, socio-economic status, dominant home language, number of siblings, number of parents in the home and number of relatives at home.

The sample consisted of 160 Spanish background students of limited English proficiency in grades 1 and 3 who were enrolled in 3 public and 2 parochial schools in Waukegan, Illinois. Students were randomly assigned to 3 treatments in the public schools. The Control Group consisted of intact classrooms (first and third grade subjects in the parochial schools). Students were pretested in September, 1983 and posttested in April, 1984 on the LAS - English Oral Language Proficiency Test and the CAT - California Achievement Test. Background information was also collected from teachers and parents.

Data from these samples were analyzed separately through the use of the following statistical procedures: analysis of variance, analysis of covariance and t-tests. The data for the statistical analyses were further subdivided by skill areas (i.e., oral English, language, reading and mathematics). The results from these analyses are summarized as follows.

Effects of the Treatments on Oral English Language Proficiency and Basic Achievement

In oral English proficiency, the findings indicated statistically significant differences among first and third grade subjects. First grade students who received the self-contained, Transitional Bilingual Education treatment and subjects in the Control Group - Submersion treatment outperformed students who received the ESL Pullout treatment and the combination treatment - Transitional Bilingual/ESL Pullout. Third grade students who received the self-contained TBE treatment performed better than subjects in the Control Group and better than subjects in the other two treatments (ESLP and TBE/ESLP).

In Reading achievement, the findings indicated no statistically significant differences among students in the first grade treatment groups with the exception of the subtest - Comprehension. The subjects in the Control Group performed better in Comprehension than subjects in all the other treatments. In third grade, there were significant differences

among treatments for Reading Achievement, which revealed that subjects in the self-contained, Transitional Bilingual Education treatment outperformed the subjects in all other treatment groups. On subtests such as: Phonic Analysis, Structural Analysis and Comprehension, subjects in the TBE group and the Control group outperformed subjects in the other two treatment groups (ESLP and TBE/ESLP).

In Language Achievement, there were no significant differences reported across treatments for first grade students. However, in third grade, the TBE group students performed better in Mechanics than all other students. The TBE students and Control Group students outperformed students in the other two treatment groups in Spelling.

In Mathematics Achievement, there were no significant differences reported for first grade subjects in the areas of Computation and Concepts and Applications. Nevertheless, subjects in the TBE and Control treatment groups attained the highest performances in both areas of math in comparison to students in the other two treatment groups. In third grade, there were also no significant differences found among treatments for Computation skills. However, students in the TBE treatments group and Control group outperformed students in the other two treatment groups in Concepts and Applications. The TBE approach students attained the highest scores.

Throughout these results, subjects in the self-contained, TBE treatment group performed significantly well. However, it

was not anticipated that the Control-Submersion group students would outperform the other two groups who did receive special instructional treatments.

Sociological and Demographic Variables Related to English Acquisition

Based on the results of frequency analyses, crosstabulations, analysis of variance and chi-square analyses performed, no trends were found for many of the independent variables (age, sex, ethnic origin, number of parents, siblings and relatives living at home and free lunch recipients) considered. However, previous formal schooling experience and the number of years residing in the United States were examined to see what effect they had among the various treatment groups.

The statistical findings revealed that subjects in all the treatment groups of first and third grades performed as well in English, regardless of the number of years of previous formal schooling or the number of years they had resided in the United States.

Generalizability of Findings

Upon reviewing the findings, careful consideration must be given to the limitations inherent in this study. The principal delimitation derives from the fact that this investigation was limited to Spanish-speaking minority students in first and third grades enrolled in public and

parochial school settings in Waukegan, Illinois. Consequently, caution should be exercised in interpreting these results as characteristic of all second language learners. Different results might be found among students whose first language is other than Spanish, and whose social, environmental and attitudinal characteristics differ from the students in this study.

Another limitation on the generalizability of the findings arises from the nature of the research design. The Control treatment group involved intact classrooms which were located in a private school setting, as opposed to the treatment groups, which were in a public school setting. The possibility exists that results might be attributable to the unique characteristics of the Control group and not to the lack of treatment. It is possible that the attitudes of students in the parochial schools, and their parents, were different from those of the public school subjects. Although several techniques were used to control for possible unique characteristics, the nature of educational research precludes total elimination of confounding variables. This confounding is difficult to eliminate in that public schools are required to provide special language assistance to children whose dominant language is other than English. Therefore, it is impossible to use a randomization procedure exclusively within the public school setting.

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 treatment 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 results.

Implications for Practitioners

The major objective of this investigation was to provide additional empirical data which practitioners could use in designing, implementing and refining instructional programs for limited English proficient students. Specifically, the question of which is the most effective approach in acquiring English language was addressed. Based on the findings of this study, it remains difficult to make one general statement regarding the superiority of a second language learning approach. Long range benefits which might be attributed to one of the treatments cannot be determined within the scope of this study. However, there were unanticipated findings that have some definite implications for the designing of second language learning classrooms.

Specifically, the findings consistently suggested that

students do better in a self-contained classroom environment instead of a pullout approach, where they are taken out of their regular classrooms and given special instruction. The research on effective schools has substantiated the negative effects of pullout programs in numerous investigations. The negative labeling and the isolation of students needing special support in a pullout program adversely affected achievement performance. One finding revealed that homogenous grouping leads to relatively little use of the weaker language and consequently works against the students obtaining appropriate input for second language development (Milk, 1980).

The findings consistently revealed that the ESLP approach had the lowest performance on all measures. Even though students received specialized instruction from a specially trained teacher, it appears that subjects acquire more English skills in an integrative language learning environment.

Also, the model of transitional bilingual education in which students did the best was one that was a self-contained (TBE) classroom which was purposefully mixed with native speakers of English. This bilingual class allowed the English proficient student an exposure to Spanish as a foreign language, while the language minority student benefited from the opportunity to maintain the native language while concurrently acquiring a second language, English. Wong-Fillmore (1982) also found that the presence of fluent English

speakers as interactive partners for LEP students in herterogeneous classroom settings seem to generate a significant quantity of linguistic input for second language learners. The status quo transitional bilingual education pullout approach did not perform as well as the TBE self-contained model. These findings could imply that a more effective design of bilingual education to implement is the self-contained, two-way immersion approach where both populations of students can have a natural opportunity to interact and be exposed to both languages.

The research on bilingual education and ESL is scanty concerning the differences between self-contained versus pull-out classroom instructional models. The results of this investigation strongly suggest that self-contained approaches perform best.

Current research has suggested that a thorough knowledge of the second language is a prerequisite to the development of reading skills in the target language. If this is the case, it would appear wise to delay reading instruction in English until the student has attained oral competence in English. Results from this study suggest that students receiving reading instruction in their native language in the third grade did better overall in reading, probably due to the transfer of the reading process from Spanish to English. However, it appears that for the younger students, their initial exposure to either language is not sufficient enough to con-

clude that reading in the native language is more effective. Research has shown that LEP students can acquire decoding skills relatively easily, even when they do not speak English (Cziko, 1978). The emphasis on reading in first grade is on decoding skills.

Once again, the Control Group results must be interpreted with caution due to the nature of the group -- intact classrooms in a parochial school setting. It is possible that children in these schools were exposed to more English from peers, teachers and people in their neighborhood of residence than children in schools where both school and neighborhood contained more non-English speakers. Since the control group did well on the measurements, the implications of more English exposure should be investigated in greater detail.

Recommendations for Future Research

While the present study has provided information on the effectiveness of specific second language learning approaches as well as variables associated with acquisition of skills, these are areas which require further investigation. With reference to the effectiveness of the particular second language learning approaches investigated, more longitudinal studies, involving similar subjects of this dissertation, need to be conducted. This would provide information as to the cumulative benefits of participation in a bilingual or ESL education model. Also, this study should be expanded to

higher grade levels to see what the impact of the treatments would be, especially in light of Cummins' (1981, 1984) research which cited evidence suggesting that it takes children about two years to master the oral language skills of the second language, while it takes five to seven years to develop cognitive academic language proficiency skills in the second language.

As a result of the findings reported here, perhaps this study should be replicated with a control group in the same schooling environment and one in which subjects could be randomly assigned. Hopefully, this could be accomplished with special permission from state and federal authorities for research purposes, or in a state where bilingual education is not mandated by law.

More research is needed to investigate the classroom environments and types, (i.e., pullout versus self-contained classes). Perhaps this is the most critical area in need of further research, relating it to the substantial studies on effective schools.

Research should be directed at studying the interdependencies between the native language and the second language. This was not a major consideration in this investigation, but could have bearing on treatment effects. For example, do children who maintain their native language develop higher or lower skills in the second language and subsequently higher

order cognitive skills as opposed to children who do not maintain their native language?

Teaching styles and instructional strategies need to be observed in detail for the various treatments studied in order to determine efficient and positive ways of training teachers in those specific skill areas. Teaching styles need to be matched with learning styles, especially with field dependent learners who are often second language learners.

While this investigation focused on four second language teaching approaches, there are others that warrant further study. For example, only a handful of immersion programs for minority children have been implemented in the U.S. Perhaps the implementation of immersion programs might provide practitioners with a wide range of available alternatives.

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 student, parent, teacher and community attitudes toward the second language and target culture.

Based on the findings of this study, a simplistic statement cannot be made regarding the superiority of one particular second language learning approach as compared to another. However, the answer may lie in the interaction of classroom environments and various instructional treatments. For the particular students in this study, follow-up

procedures are necessary to determine the cumulative benefits of instruction in the different second language learning approaches.

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APPENDIX A

APPENDIX A-I

TITLE 23: EDUCATION AND CULTURAL RESOURCES
SUBTITLE A: EDUCATION
CHAPTER I: STATE BOARD OF EDUCATION
SUBCHAPTER f: SPECIAL COURSES OF STUDY

PART 228
TRANSITIONAL BILINGUAL EDUCATION

Section
228.10 Definitions
228.20 Identification and Assessment
228.30 Establishment of Programs
228.40 General Program Requirements
228.50 Program Plan Approval and Reimbursement Procedures
228.60 Enforcement

AUTHORITY: Implementing Article 14C and authorized by Section 2-3.39(1) of The School Code (Ill. Rev. Stat. 1985, ch. 122, par. 14C-1 et seq. and par. 2-3.39(1)).

SOURCE: Adopted May 28, 1976; codified at 8 Ill. Reg. 5176; Part repealed, new Part adopted at 11 Ill. Reg. 5969, effective March 23, 1987.

NOTE: Capitalization indicates statutory language.

APPENDIX A-I continued

ESL, issued by the State Board of Education pursuant to 23 Ill. Adm. Code 1.780, 1.781, and 1.782 (Public Schools Evaluation, Recognition and Supervision).

"Transitional Bilingual Education Program" means a program which must be provided by a school district when there are within an attendance center 20 or more students of the same non-English language background identified as below average in English proficiency. A student's program can be either full-time or part-time, depending on the level of the student's proficiency in English. The school district's program must meet the standards set forth in Section 228.30(a) of this Part.

"Transitional Program of Instruction" means a program designed by a school district when there are within an attendance center 19 or fewer students of the same non-English language background identified as below average in English proficiency. The school district's program must meet the standards set forth in Section 228.30(b) of this Part.

APPENDIX A-I continued

Definitions

"Bilingual Education Teacher" means a teacher who holds a Transitional Bilingual Certificate endorsed for teaching in a language other than English and issued by the State Board of Education in accordance with 23 Ill. Adm. Code 25.90 (Certification); or a teacher who possesses a valid Illinois certificate issued pursuant to the provisions of 23 Ill. Adm. Code 25 (Certification), and a Statement of Approval issued by the State Board of Education in accordance with the provisions of 23 Ill. Adm. Code 1.780 and 1.781 (Public Schools Evaluation, Recognition and Supervision).

"English as a Second Language (ESL)" means specialized instruction designed to assist students whose home language is other than English in attaining English language proficiency. ESL instruction includes skills development in listening, speaking, reading, and writing. (ESL is not to be confused with English language arts as taught to students whose home language is English.)

"Home Language" means that language normally used in the home by the student and/or by the student's parents or legal guardians.

"Individual Student Language Assessment" means a procedure which determines a student's listening, speaking, reading (including comprehension), and writing skills in English.

"Standard School Program" means the educational program offered by the local school district to the majority of its students.

"Students Of Limited English Proficiency" means students of non-English background whose aural comprehension, speaking, reading, or writing proficiency in English is below the average English proficiency level of students of the same age and/or grade whose first or home language is English.

"Students Of Non-English Background" means students whose native language is other than English or students who come from homes where a language other than English is spoken in daily interaction, either by the students themselves or by their parents or legal guardians.

"Teacher of English as a Second Language" means a teacher who meets the requirements set forth in 23 Ill. Adm. Code 1.782 (Public Schools Evaluation, Recognition and Supervision); a teacher who possesses a Standard Special certificate endorsed for teaching ESL, issued by the State Board of Education in accordance with 23 Ill. Adm. Code 25 (Certification); or a teacher who possesses a valid Illinois certificate and a Statement of Approval for teachers of

WAUKEGAN PUBLIC SCHOOL DISTRICT #60

BILINGUAL/ESL PROGRAM

STUDENT CUMULATIVE RECORD

LANGUAGE CODE

ENTRY DATE — MO | DAY | YR

FIRST NAME | M

LAST NAME

SEX — M | F

BIRTH DATE — MO | DAY | YR

LOC. SEQ. NO.

SCHOOL YEAR
- ( ) 1985-86
- ( ) 1986-87
- ( ) 1987-88
- ( ) 1988-89
- ( ) 1989-90

BIRTH PLACE
- Puerto Rico
- Mexico
- Cuba
- Central America
- United States
- South America
- Other

EXIT DATE — MO. | DAY | YR.

EXIT CODE

OTHER SCHOOL DISTRICTS

DAYS PRESENT

INSTRUCTIONS
A. [illegible]
B. MARK CAREFULLY AND FIRMLY
C. FOR ITEMS WITH ASTERICK (*) SEE INSTRUCTION SHEET.

*TEACHER CODE

*SCHOOL CODE

OPTIONAL INFORMATION — *FIELD ONE | *FIELD TWO | *FIELD THREE | *FIELD FOUR

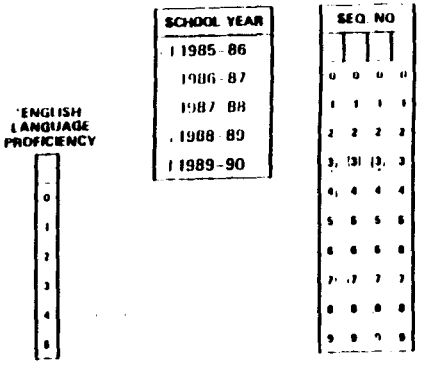
SIDE ONE

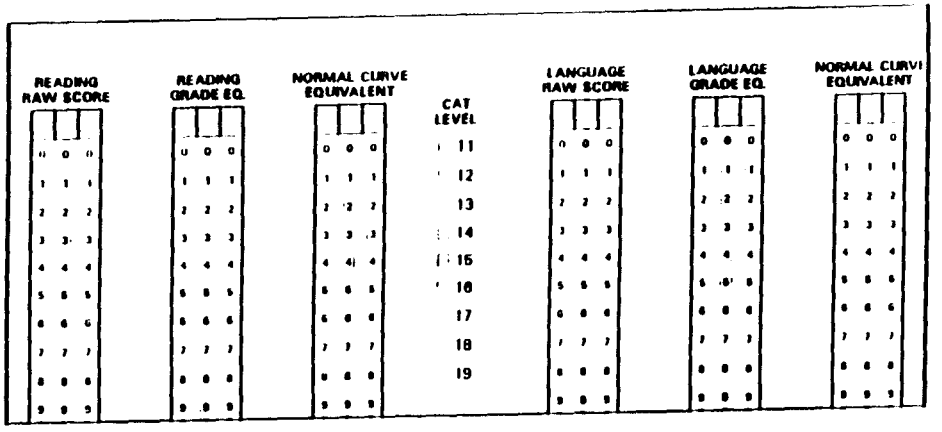
ELEMENTARY	SECONDARY
Preschool	6th
Kindergarten	7th
1st	8th
2nd	9th
3rd	10th
4th	11th
5th	12th

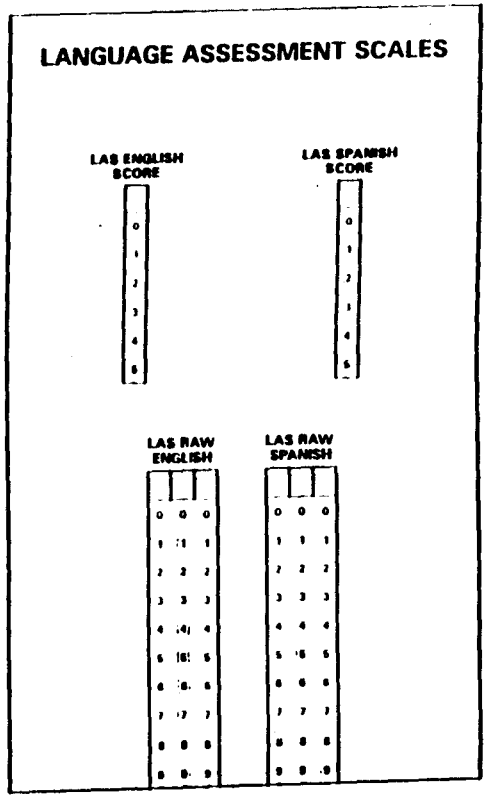
WAUKEGAN PUBLIC SCHOOL DISTRICT #60

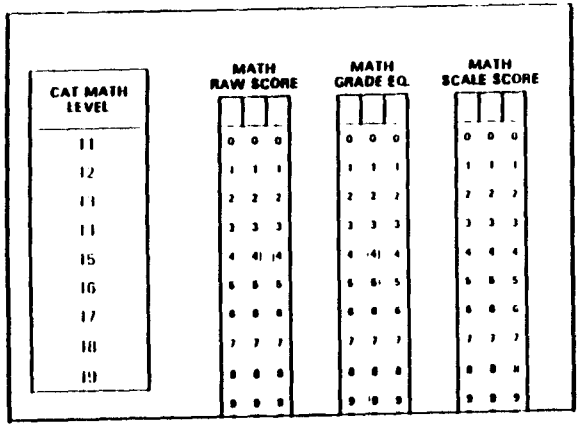
BILINGUAL/ESL PROGRAM

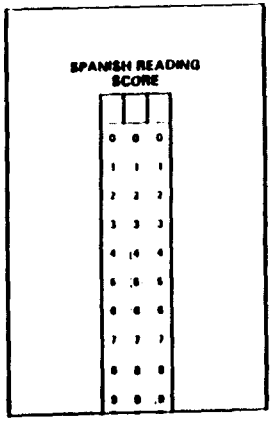
SIDE TWO











APPENDIX A-III

Parent's Questionnaire
Cuestionario para los padres

I. General Information-Información general

1. Student's full name _____

   Nombre completo del estudiante _____

2. Who is answering this questionnaire:
   Quién está contestando el cuestionario:

   [1] Father (Padre)

   [2] Mother (madre)

   [3] Other (Otra persona) Specify (especifique)_____

3. Place of birth: mother _____ father _____ student ___
   Lugar de nacimiento: madre _____ padre _____ estudiante ___

4. How long have you and your family lived on the United States mainland?
   Hace cuánto tiempo viven en los Estados Unidos propios?

   Less than 6 months (menos de 6 meses) [1]

   6 months to 2 years (6 meses a 2 años) [2]

   2.1 to 5 years (2.1 a 5 años) [3]

   5.1 to 10 years (5.1 a 10 años) [4]

   10.1 to 20 years (10.1 a 20 años) [5]

   All our lives (Toda la vida) [6]

5. How long have you and your family lived in Illinois?
   Hace cuánto tiempo viven en Illinois?

   Less than 6 months (menos de 6 meses) [1]

   6 months to 2 years (6 meses a 2 años) [2]

   2.1 to 5 years (2.1 a 5 años) [3]

APPENDIX A-III continued

5.1 to 10 years (5.1 a 10 años) [4]

10.1 to 20 years (10.1 a 20 años) [5]

All our lives (Toda la vida) [6]

6. Where did you live before coming to Illinois. ¿En qué lugar ha de venir a Illi

[1] Mexico
[2] Puerto Rico
[3] Cuba
[4] Texas
[5] Florida
[6] Southwest (USA)
[7] New York
[8] Latin America
[9] Other (otro) Specify (Espec. _____

7. What was the last year of schooling completed by:
Hasta qué año escolar ha estudiado:

A. Mother (La madre)	B. Father (El padre)
[0] None (no escuela)	[0] None (no escuela)
[1] Elementary School (Escuela elemental)	[1] Elementary School (Escuela elemental)
[2] Jr. High School los primeros dos años de educación secundaria o Jr. High School)	[2] Jr. High School los primeros dos años de educación secundaria o Jr. High School)
[3] High School (Escuela secundaria)	[3] High School (Escuela secundaria)
[4] University (Universidad)	[4] University (Universidad)

8. What is the occupation of:
Cuál es la ocupación de:

A. Mother (La madre)	B. Father (El padre)
[0] Deceased (muerta)	[0] Deceased (muerto)
[1] Housewife (Ama de casa)	[1] Laborer (Empleado en fábrica, o el campo)
[2] Laborer (Empleado en fábrica o en el campo)	[2] Maintenance (mantenimiento, limpieza)

APPENDIX A-III continued

[3] Clerical (Oficina, tienda)

[4] Maintenance (Mantenimiento, limpieza)

[5] Sales (Vendedora)

[6] Nurse (Enfermera)

[7] Teacher aid (Ayudante de maestra)

[8] Teacher (Maestra)

[9] Professional (Profesional)

[10] Other (Otro) _____

_____

[3] Clerical (Oficina, tienda)

[4] Construction (Construcción)

[5] Technician (Técnico)

[6] Sales (Vendedor)

[7] Teacher (Maestro)

[8] Professional (Profesional)

[9] Retired (Retirado)

[10] Disabled (Enfermo o incapacitado para trabajar)

[11] Unemployed (Sin empleo)

[12] Other (Otro) _____

9. How many children do you have?
Cuántos hijas e hijos hay en su familia? _____

10. How many of your children attend (or have attended) a bilingual program?
Cuántos de sus niños atienden o han atendido un programa bilingüe?

_____

_____

11. Other than the immediate family (mother, father, and children), does anyone else live in you household?
Fuera de la familia inmediata (madre, padre, hijas e hijos), viven otras personas en su hogar?

[1] Yes (Sí)

[2] No (No)

II. Spanish and English Proficiency (Conocimiento de Español e Inglés)

12. How would each of you describe your Spanish speaking ability? (Circle the appropriate number).
Como describiría cada uno de ustedes su propia habilidad para hablar el español? (Encierre el número apropiado).

mother madre		father padre	
1.	native nativa	1.	native nativo
2.	good bien	2.	good bien
3.	adequate adecuadamente	3.	adequate adecuadamente

APPENDIX A-III continued

4. very little más o menos	4. very little más o menos
5. do not speak at all no lo hablo	5. do not speak at all no lo hablo

13. How would each of you describe your own Spanish reading ability? (circle the appropriate number).
Cómo describiría cada uno de ustedes su propia habilidad para leer el español? (Encierre el número apropiado).

mother madre	father padre
1. native nativa	1. native nativo
2. good bien	2. good bien
3. adequate adecuadamente	3. adequate adecuadamente
4. very little más o menos	4. very little más o menos
5. do not read it at all no lo leo	5. do not read it at all no lo leo

14. How would each of you describe your own English speaking ability? (Circle the appropriate number).
Cómo describiría cada uno de ustedes su propia habilidad para hablar el inglés? (Encierre el número apropriado).

mother madre	father padre
1. native native	1. native nativo
2. good bien	2. good bien
3. adequate adecuadamente	3. adequate adecuadamente
4. very little más o menos	4. very little más o menos
5. do not speak it at all no lo hablo	5. do not speak it at all no lo hablo

APPENDIX A-III continued

15. How would each of you describe your own English reading ability? (Circle the appropriate number).
Cómo describiría cada uno de ustedes su propia habilidad para leer el inglés? (Encierre el número apropiado).

mother madre		father padre	
	1. native nativa		1. native nativo
	2. good bien		2. good bien
	3. adequate adecuadamente		3. adequate adecuadamente
	4. very little más o menos		4. very little más o menos
	5. do not read it at all no lo leo		5. do not read it at all no lo leo

16. How would you describe the student's Spanish speaking ability? (Circle the appropriate number).
Cómo describiría la habilidad del estudiante o de la estudiante. (Encierre el número apropiado).

1. native
   nativo
2. good
   bien
3. adequate
   adecuadamente
4. very little
   más o menos
5. does not speak it at all
   no lo habla

17. How would you describe the student's Spanish reading ability? (Circle the appropriate number).
Cómo describiría la habilidad de la estudiante o del estudiante para leer el español? (Encierre el número appropriado).

1. native
   nativo
2. good
   bien
3. adequate
   adecuadamente

APPENDIX A-III continued

4. very little
   más o menos

5. does not read it at all
   no lo lee

18. How would you describe the student's English speaking ability? (circle the appropriate number).
Cómo describiría usted la habilidad de el (la) estudiante para hablar el inglés? (Encierre el número apropiado).

1. native
   nativo

2. good
   bien

3. adequate
   adecuadamente

4. very little
   más o menos

5. does not speak it at all
   no lo habla

19. How would you describe the student's English reading ability? (Circle the appropriate number).
Cómo describiría usted la habilidad de el (la) estudiante para leer el inglés? (Encierre el número apropiado).

1. native
   nativo

2. good
   bien

3. adequate
   adecuadamente

4. very little
   más o menos

5. does not speak it at all
   no lo habla

III. Language Usage (Uso de los 2 lenguajes)

20. What language do the parents use most of the time at home?
Qué idioma hablan en casa la mayor parte del tiempo?

mother madre			father padre		
	[1]	Spanish		[1]	Spanish
	[2]	English		[2]	English

APPENDIX A-III continued

21. What language do the parents use most of the time outside of the home?
¿Qué idioma hablan más los padres cuando está fuera de su hogar?

mother madre		father padre	
	[1] Spanish		[1] Spanish
	[2] English		[2] English
	[3] Other		[3] Other

22. Do the parents prefer to read in English or in Spanish?
¿Prefieren los padres leer en inglés o en español?

mother madre		father padre	
	[1] Spanish		[1] Spanish
	[2] English		[2] English

23. Do parents prefer to watch English or Spanish programs on television?
Prefieren los padres ver programas de televisión en inglés o en español?

mother madre		father padre	
	[1] Spanish		[1] Spanish
	[2] English		[2] English

24. Do parents prefer to listen to radio in Spanish or in English?
Prefieren los padres escuchar la radio en inglés o en español?

mother madre		father padre	
	[1] Spanish		[1] Spanish
	[2] English		[2] English

25. What language does the student use most of the time at home?
¿Qué idioma habla el (la) estudiante en casa la mayor parte del tiempo?

[1] Spanish

[2] English

26. Does the student prefer to read in English or in Spanish?
El (la) estudiante prefiere leer en español o en inglés?

[1] Spanish

[2] English

27. Does the student prefer to watch English or Spanish programs on television?
¿El (la) estudiante prefiere ver programas de televisión en español o en inglés?

[1] Spanish

[2] English

APPENDIX A-III continued

28. Does the student prefer to listen to the radio in Spanish or English?
¿El (la) estudiante prefiere escuchar radio en inglés o en español?

[1] Spanish

[2] English

IV. Language Interaction Patterns - Patrones de uso del lenguaje.

29. In general, what language do you use most often to speak to each other (mother and father)?
En general, en cuál idioma se hablan uno con el otro (madre y padre)?

[1] Spanish

[2] English

[3] Other

30. In general, what language do parents use to speak to their children?
En general, en cuál idioma le habla a sus hijos?

Father	Mother
[1] Spanish	[1] Spanish
[2] English	[2] English
[3] Other	[3] Other

31. In general, what language do your children use to speak to each other?
En general, en cuál idioma se hablan sus hijos el uno con el otro?

[1] Spanish

[2] English

[3] Other

32. In general, what language do your children use to speak to:
En general, en cuál idioma le habla a usted sus hijos?

Father	Mother
[1] Spanish	[1] Spanish
[2] English	[2] English
[3] Other	[3] Other

33. Are there any regular exceptions to these patterns? (For example, does one child speak Spanish to a younger brother or sister, but mostly English to an older brother or sister)?

APPENDIX A-III continued

¿Hay excepciones regulares a estos patrones? (Por ejemplo, alguno de los niños le habla en español a uno de los hermanos menores, pero inglés en mayor parte a los hermanos mayores)?

Explain
Explique _____

_____

_____

_____

_____

_____

_____

_____

_____

V. Neighborhood and Bilingual Program (Lugar de Residencia) programa bilingüe.

34. Is the neighborhood in which you live primarily Spanish-speaking or English-speaking?
En el barrio en que ustedes y sus hijos e hijas viven, los vecinos hablan generalmente en español o en inglés?

[1] Spanish (español)

[2] English (inglés)

35. What country are most of your neighbors from?
¿De qué país son la mayoría de sus vecinos?

[0] Don't know (no sé)

[1] Mexican (Mejicano)

[2] Puerto Rican (Puertorriqueño)

[3] Cuban (Cubano)

[4] US. Anglo (EEUU blancos)

[5] U.S. Black (EEUU negros)

36. What do you think is the main purpose of the bilingual education program?
¿Cuál piensa Ud. qué es el propósito principal de el program de educación bilingüe? (Marque sólo un número)

[0] Don't understand (no entiendo)

[1] To have pride in Spanish heritage (hacer a los niños orgullosos de su cultura nativa)

[2] To learn basic skills (aprender las destrezas básicas)

APPENDIX A-III continued

[3] To teach kids in their own language (enseñar a los niños en su lenguaje nativo)

[4] To get a better education (recibir una educación mejor)

[5] To learn both languages (aprender los dos lenguajes)

[6] To learn English but maintaining native language and heritage (aprender Inglés pero manteniendo el español y la cultura nativa)

[7] Other (Specify) - Otro (especifique)_____

37. Why do you want your child to receive bilingual education?
¿Porqué quiere Ud. que su niño (a) reciba educación bilingüe?

[0] Don't understand (No entiendo)

[1] So that he knows who he is and have pride in self and culture (para que el niño conozca su origen y se sienta orgulloso de si mismo y su cultura)

[2] So that he/she learn basic skills in Spanish and English (para que pueda aprender las destrezas básicas en Español e inglés)

[3] So that he/she can learn English (para que pueda aprender inglés)

[4] So that the child doesn't have the same problems the parents had when they came to this country. (para que el niño no tenga el mismo problema que los padres tuvieron al venir a este país.)

[5] To have better opportunities in life and a better self-image (para mejorar las oportunidades del niño y guardar una imagen personal más positiva)

[6] To learn Spanish better (para aprender español mejor)

[7] Other (specify) otro (specifique) _____

APPENDIX A-III continued

38. If this is the first year your child is enrolled in a bilingual program, why was he not enrolled previously?
Si éste es el primer año que su niño(a) a sido matriculado en un programa bilingüe, porqué no fue matriculado antes?

[1] The child was too young for school (el niño no estaba en edad escolar)

[2] Never heard of the program before now (no supe del programa antes este año)

[3] Was not living in Illinois (no vivía in Illinois)

[4] Did not realize the value of the program (no me daba cuenta del valor del programa)

APPENDIX A-IV

Dear Parent,

The Waukegan Public School District is interested in finding the most effective instructional approach to meet the needs of limited English proficient students in our schools. Consequently, as Supervisor of Bilingual Education and ESL Programs for the District, I will conduct an experiment with limited English proficient, Hispanic, first and third graders in our schools this year.

Teachers have been asked to volunteer for this project and their classes will be randomly assigned to receive one of the three different approaches to language learning.

I will give students participating in the project pre tests in the areas of Language, Reading and Math in the Fall. In the Spring, these same students will take post tests. We will compare the test results to see the progress they have made and to see if there is a significant difference between the methods.

The results from this experiment will be used in two ways. It will be used to help us improve the instructional program we presently offer limited English proficient students in our District. Secondly, this experiment will be used as a basis for my PhD. dissertation work at Loyola University.

Participation in this project is voluntary. There will be no risk to any student who participates. All test results will be kept confidential and shared with you on an individual basis if so desired. Any child may withdraw from the program at any time without bias, with your permission.

Your child's teacher has volunteered to be part of the study. If this meets with your approval, please complete the attached consent form, signed, to your child's teacher as soon as possible.

I will hold an orientation meeting for all parents with students in the project at a later date, so please watch your mail for this announcement.

If you have any questions concerning the project, please feel free to contact me at the Bilingual Department, 336-3100, x 458.

Sincerely,

Marlene S. Kamm

Marlene S. Kamm
Director of Bilingual
Ed. & ESL Programs

APPENDIX A-IV continued

PARENT CONSENT FORM

Bilingual/ESL Program Experiment

Program Title: "A Comparison of ESL Methodology and Bilingual Education" and "Their Effects on the Acquisition of English Language Proficiency"

I, the parent/guardian of _____,
a minor_____years of age, consent to his/her participation in the first and third grade bilingual/ESL research project being conducted by Marlene Kamm, Supervisor of Bilingual Education and ESL Programs, Waukegan Public School District #60.

I understand that no risk is involved and that I may withdraw my child from participation at anytime without bias.

_____
SIGNATURE OF PARENT

APPENDIX A-IV continued

Estimados Padres:

El distrito escolar de las escuelas publicas de Waukegan, esta interesado en encontrar la mejor manera de ensenar Ingles a los ninos en nuestras escuelas. Debido a esto, como supervisora de los programas de Educacion Bilingue y ESL del distrito, conducire un experimento, este ano, con ninos de primer y tercer grados de nuestras escuelas.

Se les ha pedido a los maestros que cooperen en este proyecto voluntariamente. Sus clases han sido asignadas a recibir uno de tres metodos diferentes para aprender el idioma.

En el otono, todos los estudiantes que participen en este proyecto recibiran un pre-examen en las areas de Lenguas, Lectura y Matematicas. En la primavera, recibiran un post examen. Luego, compararemos los resultados para ver el progreso que han hecho y para ver si hay una diferencia significante entre los metodos usados.

Los resultados de este experimento seran usados de dos maneras. Se usaran para ayudarnos a mejorar el programa de ensenanza que se ofrece presentemente a los estudiantes en nuestro distrito. El experimento tambien se usara como una base para mi tesis para un Doctorado de la Universidad de Loyola.

La participacion en este proyecto es voluntaria. No hay riesgo alguno para los estudiantes que participen. Los resultados de los examenes se mantendran confidenciales y se discutiran con usted individualmente, si usted asi lo desea. Cualquier estudiante puede retirarse del program a cualquier momento sin ningun problema, con su consentimiento por supuesto.

La maestra/maestro de su nino/a ha ofrecido voluntariamente ser parte de este proyecto. Si usted esta de acuerdo con esto, favor de completar y firmar la forma de permiso (adjunto) y enviarla a la maestra de su nino.

Conducire una orientacion para todos los padres con ninos en este proyecto. Este pendiente para el anuncio de la fecha.

Si tiene alguna pregunta con respecto a este proyecto, favor de llamarme, al Departamento Bilingue al 336-3100, EXT. 458.

Atentamente,

Marlene S. Kamm
Directora de los Programas
de Educacion Bilingue y ESL

APPENDIX A-IV continued

AUTORIZACION

Experimento del Programa Bilingue/ESL

Titulo del Programa: "Una Comparacion de la Metodologia de ESL y la Educacion Bilingue" y "Los efectos de la adquisicion de la habilidad del idioma Ingles"

YO, EL PADRE/GUARDIAN DE _____,

MENOR, DE _____ANOS DE EDAD DE PRIMER O TERCER GRADO. AUTORIZO LA PARTICIPACION EN EL PROYECTO CONDUCIDO POR MARLENE KALMM, SUPERVISORA DE LOS PROGRAMAS DE EDUCACION BILINGUE Y ESL DE LAS ESCUELAS PUBLICAS DE WAUKEGAN, DISTRITO #60.

ENTIENDO QUE NO HAY NINGUN RIESGO Y QUE PUEDO SACAR AL NINO/A DE ESTE PROYECTO A CUALQUIER MOMENTO SIN NINGUN PROBLEMA.

_____

FIRMA DEL PADRE/GUARDIAN

SUMMARY OF THE LAS® ADMINISTRATION AND SCORING PROCEDURES

LAS® SUBSCALES	INSTRUCTIONS FOR ADMINISTRATION	SCORING PROCEDURES	DO'S AND DON'TS
General	The LAS® is to be individually administered. Approximately 20 minutes should be allocated for testing each student. The LAS® must be administered in a quiet area. The LAS® may be administered by any school personnel (1) who are qualified to work with students and (2) who speak the language to be tested fluently and as a first language.	**Minimal Pairs** and **Phonemes** are scored simultaneously with the administration of the test. **Lexical, Comprehension** abd **Production** are scored after the test is given. It is extremely important that the individuals who score the **Oral Production** be well trained and have obtained an acceptablelevel of reliability as discussed in the **Scoring and Interpretation Manual.**	**General** DO read **How to Administer the LAS®.** DO practice (with family, friends, etc.) before actually administering the LAS®. DON'T administer the LAS® in a classroom or an area where the student will have heard the taped items previous to being tested. DON'T forget to use the audio cassette... so the test will be fair for everyone. DO make sure that the tape can be heard clearly. DON'T forget to fill in the ID information on the front of the Student Test Booklet.
I. Minimal Pairs	The examiner should say in the appropriate language something like, "you're going to hear two words on the tape and I want you to tell me if they sound the same or different." The examiner should feel free to paraphrase or translate the instructions. At this point the cassette may be turned on, the examples listened to, and testing begun.	**Minimal Pairs** and **Phonemes** - Mark only the items that are failed by entering a check mark adjacent to the item number. After administration of the test the raw score (number correct) will be entered in the raw score box. Converted Scores as shown in the **Scoring and Interpretation Manual**, are entered in the Scoring Calculation Boxes on the back of the Student Test Booklet.	**Minimal Pairs** DO be sure the student understands what is required. DO mark only incorrect responses. DO stop the tape and replay an item if student didn't hear it.
III. Phonemes	When the student is ready say something like, "I want you to say (repeat) exactly what you hear on the tape. For example: if you hear cat, you say "cat." If you hear "It's raining," you say "_____."		**Phonemes** Do score the student only on the underlined phonemes in each item. DO mark the item as incorrect if the student misses one of the two underlined items in the sentence.
II. Lexical	The lexical section should be arranged so the student can easily see the drawings. Explain that the student is to name the object represented by each drawing: "I'm going to point to a picture and I want you to tell me what it is." Write down the student's response under the drawing.	**Lexical** - Score as correct any appropriate response. See examples given in **How to Administer the LAS®** and the **Scoring and Interpretation Manual.** After administration of test, enter raw and converted scores and transfer Converted Score to Scoring Calculation Box on back of Student Test Booklet.	**Lexical** DO probe if the student gives an inappropriate response such as "animal" instead of "dog" or "puppy," "fruit" instead of "melon" or "watermelon," or provides a label in a language other than the one being tested.
IV. Sentence Comprehension	Turn to the Comprehension section and arrange Booklet so student can see the drawings. Say something like: "We have some more pictures here, I want you to listen to the tape and then point to the picture (or put an "X" on the picture) that goes with (or best describes) what you hear." Turn on the tape player. Either examiner or student can mark the "X."	After administration of the entire test, raw score and converted score should be entered in boxes at the end of section, then transfer Converted Score to Scoring Calculation Box on back of Student Test Booklet.	DON'T hesitate to stop the tape or replay an item if it's too fast for the student.
V. Oral Production (Story-retelling)	Turn to the Production section. Arrange Story Picture Sheet so only 4 pictures can be seen. Say something like: We're going to hear a story about these pictures. I want you to listen very carefully because after we listen to it, I want you to tell me what happened." Turn on the tape player. After hearing the story, ask student to retell it in his/her own words. Write down verbatim in the Test Booklet exactly what the student says.	The scoring of the **Oral Production** section should be done by proficient native speakers of the language being tested. The responses are scored on a 5-point scale within each age group. Because of developmental effects on language acquisition, scoring must be done on the bases of comparison within the correct age group. Examples of the five LAS® levels of oral production are given in the **Scoring and Interpretation Manual.** It is essential that an acceptable level of reliability be established between those scoring this section.	DON'T play the story more than once. DO use probe questions if student doesn't produce approximately 50 words. DO write down the responses verbatim. DON'T accept responses given completely in a language other than the one being tested. DO review th instructions and critera for scoring given in the **Scoring and Interpretation Manual.** DO be sure the scoring is done by well trained, proficient speakers of the language being tested. DO be sure an acceptable level of reliability is established between scorers.
VI. Written Production (Optional)	Immediately following the student's retelling of section V, give the student the appropriate pictures and a sheet of lined paper. Tell the student you would like him/her to write down what happened in the story as closely as s/he can remember it. A quiet space should be provided for the student.	**Written Production** is scored according to the same 5-point scale used for Oral Production. The score is not included in the scoring calculation but may be used as a further dimension of the student's over all language proficiency.	
Observations (Optional)	At some point following the testing session, the teacher or some other adult (other than the examiner) should fill out the Observation form contained in the **LAS® Scoring and Interpretation Manual.**	An Observation rating is obtained by adding the number circled and dividing by 10.	

APPENDIX A-V

APPENDIX A-VI

CALIFORNIA ACHIEVEMENT TESTS

Forms C and D

Levels 10-19

Class Management Guide

A Teacher's Guide to Interpreting and Using Test Information

CTB/McGraw-Hill
Monterey, California

(THIS IS AN EXCERPT FROM THE McGRAW HILL GUIDE REPRODUCED FOR RESEARCH REFERENCE ONLY.)

APPENDIX A-VI continued

OVERVIEW OF CAT C AND D

The *California Achievement Tests, Forms C and D* (CAT C and D) combines the important uses of norm-referenced tests with the objectives-based information of criterion-referenced tests. *Norm-referenced* tests are used to determine how well students are performing in relation to other students of a similar age and background; they also give school personnel some assistance in judging the strengths and weaknesses of their curricula. *Criterion-referenced* tests offer information on individual and group mastery of specified objectives.

CAT C and D measures achievement in the areas of prereading, reading, spelling, language, mathematics, and reference skills. CAT C and D also includes a dual standardization of CAT and the *Short Form Test of Academic Aptitude* (SFTAA) to provide anticipated achievement. Because CAT C and D was standardized at two different periods of the year using the same students, realistic normative data for any period of the school year can be provided.

CAT C and D is a series of test batteries designed to measure the achievement of students from the beginning of kindergarten through the twelfth grade. There are ten overlapping levels in Form C (Levels 10-19) and seven in Form D (Levels 13-19). The levels and recommended grade ranges are as follows:

Level 10	K.0 - K.9	Level 15	4.6 - 5.9
Level 11	K.6 - 1.9	Level 16	5.6 - 6.9
Level 12	1.6 - 2.9	Level 17	6.6 - 7.9
Level 13	2.6 - 3.9	Level 18	7.6 - 9.9
Level 14	3.6 - 4.9	Level 19	9.6 - 12.9

Levels 10, 11, and 12 are available only in Form C because students show such rapid growth in the primary grades that successive levels of the same form usually provide better measurement for retesting than alternate forms of the same level.

The numerous levels of CAT C and D provide two important advantages over many standardized achievement tests: (1) they make it easier to use the tests in functional level testing, and (2) they give increased coverage of curricular material at a particular grade level.

APPENDIX A-VI continued

Functional level testing (testing each student with materials of appropriate difficulty) was an important concern in the development of CAT C and D. Test materials were designed so that schools could select the level of CAT/C or CAT/D that would best measure the achievement of each student. It is recommended that Levels 10-13 not be administered simultaneously since most of the material must be read aloud by the examiner. However, all of the other test levels are designed to be administered in any combination that a school finds necessary. This flexibility maximizes the usefulness of test results and minimizes student frustration.

To facilitate functional level testing with CAT C and D, brief, optional locator tests are available. Locator Test 1 is designed to be used in Grades 1 through 6, and Locator Test 2 is designed to be used in Grades 6 through 12. Results from the appropriate locator test can be an aid in selecting the best level of CAT C and D for each student in a class.

Close correspondence between test levels and grades provides greater coverage of the content. The narrow grade range for each level of CAT C and D makes it possible to measure more of the skills taught in a given grade. The items (test questions) within each level were selected and organized according to those skills.

Development of CAT C and D began with the planning and writing of objectives. These objectives were developed by reviewing state and city curriculum guides, major textbooks, and the objectives of two criterion-referenced testing programs produced by CTB/McGraw-Hill: the *Prescriptive Reading Inventory* and the *Diagnostic Mathematics Inventory*.

CAT C and D objectives are called *category objectives* since each objective represents a category of skills. For example, Inferred Meaning is a category objective in the Reading Comprehension test. Items for this objective measure a student's ability to understand main idea, conclusion, and cause and effect.

Once a set of category objectives was established, guidelines were developed concerning the number of items needed to measure each category objective and the kinds of items necessary to cover the specific skills. Vocabulary difficulty was controlled for each level and content area by reviewing "A Revised Core Vocabulary: A Basic Vocabulary for Grades 1-8, An Advanced Vocabulary for Grades 9-13."[1] In reading, the difficulty and length of passages also were controlled by the use of readability formulas (see Part 2).

All textual and other stimulus materials were required to cover a variety of topics to appeal to different student interests at the appropriate levels and to measure a range of skills. There was an effort to represent the types of subject matter materials commonly found in classrooms.

APPENDIX A-VI continued

A staff of professional item writers, most of them experienced teachers, wrote items according to specified guidelines. Entirely new items were written for all levels with the exception of Level 10. This level is a measure of prereading skills and early familiarity with mathematics. Items selected for Level 10 were adapted from the *Comprehensive Tests of Basic Skills, Form S*, Level A.

For the tryout edition, many more items were written than could be used for the final edition in order to give a better selection. All items were reviewed to make sure that the items accurately measured skills in a specified objective. Revisions were made when necessary.

All approved items were published in the tryout edition. Each item was tested in at least three adjacent grade levels to provide information on growth, item difficulty, and appropriate grade level. All teachers who administered the tryout edition were asked to fill out a questionnaire concerning the contents of the test and the instructions. Their comments were an important guide in revising material for the standardization edition.

All items in the tryout were also reviewed for racial, ethnic, and sex bias. Women and men who hold responsible positions in the educational community and belong to various ethnic groups reviewed the items and noted any apparent content bias in language, subject matter, and the overall representation of people. In addition, CTB/McGraw-Hill conducted statistical research to identify any items that appeared to have racial bias and eliminated or revised the items as necessary.

Items were also reviewed to ensure that they met the requirements of the "Guidelines for Equal Treatment of the Sexes in McGraw-Hill Book Company Publications"[2] and McGraw-Hill's "Multiethnic Publishing Guidelines."[3]

Data from the tryout edition were analyzed and items were selected for the standardization edition. Items from the tryout formed a pool for both Form C and Form D. Items selected were required to:

- give good coverage of an objective (A minimum of four items are included for each objective tested at any given level.);
- provide a wide range of difficulty;
- meet the requirements for reducing bias;
- cover a variety of topic areas (As much as possible, materials used within levels are of different types and reflect different subject matter.); and
- demonstrate growth (Items were placed in the grade level that appeared most appropriate based on student performance and improvement from one grade to the next.).

APPENDIX A-VI continued

The standardization of CAT C and D was designed to provide national norms for both fall and spring testing. Standardization testing was done in the fall of 1976 with Form C and in the spring of 1977 with both Form C and Form D. For more discussion of the standardization procedures, see the Test Coordinator's Handbook.

After standardization was completed, the final edition of CAT C and D, including ancillary materials and technical data, was published.

APPENDIX A-VI continued

Table 2

ITEM CLASSIFICATION FOR LEVEL 11, CAT/C

TEST/CATEGORY OBJECTIVE	ITEMS
TEST 1 PHONIC ANALYSIS	
17 Single Consonants	1, 2, 12, 13, 14
18 Consonant Clusters	6-10
19 Consonant Digraphs	3, 4, 5, 11, 15
22 Short Vowels	16, 18, 19, 22, 24
23 Long Vowels/Vowel Combinations	17, 20, 21, 23, 25
TEST 2 READING VOCABULARY	
30 Category (Oral Definition)	1-5
31 Same Meaning (Oral Definition)	6-10
32 Same Meaning	11-15
TEST 3 READING COMPREHENSION	
Literal	
35 Sentence Meaning	1-8
36 Recall of Facts	9, 11, 12, 13, 14, 15, 17
Interpretive	
37 Inferred Meaning/Character Analysis	10, 16, 18, 19, 20
TEST 4 LANGUAGE EXPRESSION	
Usage	
55 Nouns	4, 7, 9, 13, 17
57 Pronouns	2, 5, 6, 14, 15
58 Verbs	10, 12, 16, 19, 20
59 Adjectives	1, 3, 8, 11, 18
TEST 5 MATHEMATICS COMPUTATION	
69 Addition	1-10
70 Subtraction	11-20
TEST 6 MATHEMATICS CONCEPTS AND APPLICATIONS	
73 Numeration	1, 12, 30, 35, 36
75 Number and Set Theory	2, 9, 13, 15, 19, 24, 25, 26, 28, 31
76 Number Sentences	7, 11, 17, 22, 27, 29, 33
80 Common Scales	3, 6, 14, 16, 18, 32, 34
86 Geometry/Measurement/Graphs	4, 5, 8, 10, 20, 21, 23

APPENDIX A-VI continued

Table 3

ITEM CLASSIFICATION FOR LEVEL 12, CAT/C, AND LEVEL 13, CAT C AND D

TEST/CATEGORY OBJECTIVE	ITEMS		
	LEVEL 12 Form C	LEVEL 13 Form C	LEVEL 13 Form D
TEST 1 PHONIC ANALYSIS			
20 Variant Single Consonants	3, 4, 6, 8, 10		
21 Consonant Clusters/Digraphs	1, 2, 5, 7, 9	1-5	1-5
23 Long Vowels/Vowel Combinations	12, 14, 15, 16, 18, 19, 20, 21, 23		
24 Short Vowels/Vowel Combinations	11, 13, 17, 22, 24, 25		
25 Short, Long Vowels/Vowel Combinations		6, 7, 8, 10, 13	6, 7, 9, 10, 14
26 Diphthongs		9, 11, 12, 14, 15	8, 11, 12, 13, 15
27 Variant Vowels/Vowel Combinations		16-20	16-20
TEST 2 STRUCTURAL ANALYSIS			
28 Compound Words/Syllables/Contractions	1-6	1-6	1-6
29 Base Words/Affixes	7-11	7-11	7-11
TEST 3 READING VOCABULARY			
32 Same Meaning	1-8	1-5	1-5
33 Opposite Meaning	9-15	6-10	6-10
34 Multimeaning		11-15	11-15
TEST 4 READING COMPREHENSION			
Literal			
36 Recall of Facts	1, 5, 8, 12, 19, 20	12, 14, 17, 23, 24	11, 12, 18, 21, 23
Interpretive			
38 Inferred Meaning	3, 4, 6, 10, 11, 16, 17, 18	11, 15, 19, 20, 22, 25, 27	13, 14, 17, 19, 22, 24, 26
39 Character Analysis	2, 7, 9, 13, 14, 15	13, 16, 18, 21, 26	15, 16, 20, 25, 27
40 Figurative Language		6-10	6-10
Critical			
41 Real/Unreal Elements		1-5	1-5
TEST 5 SPELLING			
44 Consonant Phonemes/Graphemes	4, 6, 9, 12, 17	4, 10, 14, 18	5, 8, 13, 15
45 Vowel Phonemes/Graphemes	3, 13, 16, 19	2, 5, 8, 13, 16, 20	1, 2, 9, 10, 12, 17
46 Morphemic Units	7, 10, 15, 20	7, 11, 15, 19	4, 6, 18, 20
Correct Words*	1, 2, 5, 8, 11, 14, 18	1, 3, 6, 9, 12, 17	3, 7, 11, 14, 16, 19

APPENDIX A-VI continued

Table 3 (continued)

TEST/CATEGORY OBJECTIVE	ITEMS		
	LEVEL 12 Form C	LEVEL 13 Form C	LEVEL 13 Form D
TEST 6 LANGUAGE MECHANICS			
Capitalization			
47 I/Proper Nouns	2, 3, 7, 9	3, 4, 6, 8, 10	1, 4, 6, 8, 10
49 Beginning Words	1, 4, 6, 8		
50 Beginning Words/Titles		1, 5, 7, 9	2, 5, 7, 9
Punctuation			
51 End Marks	11, 12, 14, 16	12, 15, 16, 19	11, 15, 17, 20
53 Comma	13, 15, 17, 19, 20	11, 14, 17, 18, 20	12, 13, 16, 18, 19
Correct Sentences*	5, 10, 18	2, 13	3, 14
TEST 7 LANGUAGE EXPRESSION			
Usage			
56 Irregular Nouns/Verbs	1, 5, 11, 13, 16		
57 Pronouns	2, 4, 7, 15, 19	2, 5, 7, 12, 16	2, 6, 9, 13, 18
58 Verbs	8, 10, 12, 17, 20	3, 8, 10, 15, 20	7, 11, 15, 19, 20
59 Adjectives	3, 6, 9, 14, 18	6, 11, 14, 17, 19	3, 8, 10, 12, 16
Sentence Structure			
60 Subjects/Verbs		21-26	21-26
61 Modifying Words		1, 4, 9, 13, 18	1, 4, 5, 14, 17
TEST 8 MATHEMATICS COMPUTATION			
69 Addition	1-10	1, 2, 13, 14, 15, 16, 29, 30, 31, 32	1, 2, 13, 14, 15, 16, 29, 30, 31, 32
70 Subtraction	11-20	3, 4, 17, 18, 19, 20, 33, 34, 35, 36	3, 4, 17, 18, 19, 20, 33, 34, 35, 36
71 Multiplication	21-26	5, 6, 7, 8, 21, 22, 23, 24, 37, 38	5, 6, 7, 8, 21, 22, 23, 24, 37, 38
72 Division		9, 10, 11, 12, 25, 26, 27, 28, 39, 40	9, 10, 11, 12, 25, 26, 27, 28, 39, 40
TEST 9 MATHEMATICS CONCEPTS AND APPLICATIONS			
73 Numeration	5, 6, 10, 12, 14, 21, 23, 30, 37	1, 18, 26, 27, 29	1, 8, 22, 33, 42
74 Number Theory		4, 9, 12, 31, 40	3, 10, 20, 27, 34
75 Number and Set Theory	1, 2, 4, 11, 16, 19, 28, 39, 40		
79 Number Sentences/Properties	8, 22, 25, 27, 29, 32, 34	3, 21, 33, 35, 38, 45	12, 18, 28, 29, 35, 43
80 Common Scales	3, 13, 15, 17, 18, 20, 24	13, 15, 34, 36, 37	7, 9, 21, 30, 36
81 Geometry		2, 5, 8, 14, 28	2, 4, 11, 31, 39
82 Measurement		11, 19, 20, 22, 39, 41, 44	13, 14, 19, 23, 26, 40, 41
84 Graphs		6, 7, 16, 17, 24, 25, 42, 43	5, 6, 16, 17, 24, 25, 37, 38
85 Measurement/Graphs	7, 9, 26, 31, 33, 35, 36, 38		
88 Story Problems		10, 23, 30, 32	15, 32, 44, 45

APPENDIX B

APPENDIX B-I

Grade 1 - ANCOVA of Posttest Scores - CAT - Reading Total by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	273.37	1	273.37	6.15	0.015
Treatment	81.74	3	27.24	0.61	0.609
Explained	355.11	4	88.77	1.99	0.104

APPENDIX B-II

Grade 1 - ANCOVA of Posttest Scores CAT - Phonic Analysis by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	0.13	1	0.13	0.01	0.975
Treatment	24.63	3	8.21	8.21	0.531
Explained	24.76	4	6.19	6.19	0.694

APPENDIX B-III

Grade 1 - ANCOVA of Posttest Scores - CAT - Vocabulary by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	27.91	1	27.91	4.28	0.042
Treatment	38.48	3	12.81	1.97	0.126
Explained	66.40	4	16.60	2.55	0.046

APPENDIX B-IV

Grade 3 - ANCOVA of Posttest Scores - CAT - Vocabulary by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	97.25	1	97.25	13.85	0.000
Treatment	24.88	3	8.29	1.18	0.323
Explained	122.13	4	30.53	4.34	0.003

APPENDIX B-V

Grade 1 - ANCOVA of Posttest Scores - CAT - Language by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	1.10	1	1.10	0.18	0.665
Treatment	31.95	3	10.65	1.81	0.152
Explained	33.06	4	8.26	1.40	0.240

APPENDIX B-VI

Grade 3 - ANCOVA of Posttest Scores - CAT - Language by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	557.23	1	557.23	14.73	0.000
Treatment	219.89	3	73.29	1.93	0.131
Explained	777.12	4	194.28	5.13	0.001

APPENDIX B-VII

Grade 3 - ANCOVA of Posttest Scores - CAT - Language Expression by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	290.75	1	290.75	15.41	0.000
Treatment	43.89	3	14.63	0.77	0.511
Explained	334.64	4	83.66	4.43	0.003

APPENDIX B-VIII

Grade 1 ADCOVA of Posttest Scores - CAT - Math Computation by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	173.37	1	173.37	14.16	0.000
Treatment	67.58	3	22.52	1.84	0.147
Explained	240.95	4	60.24	4.92	0.001

APPENDIX B-IX

Grade 1 - ANCOVA of Posttest Scores - CAT - Math Concepts and Application by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	814.14	1	815.14	45.12	0.000
Treatment	92.84	3	30.94	1.71	0.172
Explained	907.98	4	226.99	12.56	0.000

APPENDIX B-X

Grade 3 - ANCOVA of Posttest Scores - CAT - Math Computation by Pretest Scores and Treatment Group

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	460.00	1	460.00	10.99	0.000
Treatment	47.09	3	15.69	0.37	0.771
Explained	507.09	4	126.77	3.03	0.023

APPENDIX C

APPENDIX C-I

Grade 1 - ANCOVA of Posttest Scores - LAS(E) Test - Oral English Proficiency by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	4598.28	1	4598.28	60.32	0.000
Treatment	1461.17	3	487.05	6.38	0.001
Previous Schooling	77.06	2	38.53	0.50	0.605
Years in the U.S.	141.27	2	70.63	0.92	0.401
Explained	6896.33	9	766.25	10.05	0.000

APPENDIX C-II

Grade 1 - ANCOVA of Posttest Scores - CAT - Language Expression by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	5.77	1	5.77	0.99	0.322
Treatment	42.25	3	14.80	2.43	0.072
Previous Schooling	22.10	2	11.05	1.90	0.156
Years in the U.S.	19.33	2	9.66	1.66	0.196
Explained	68.07	9	7.56	1.30	0.250

APPENDIX C-III

Grade 1 - ANCOVA of Posttest Scores - CAT - Total Reading by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	115.55	1	115.55	2.64	0.109
Treatment	56.64	3	18.88	0.43	0.731
Previous Schooling	103.94	2	51.97	1.18	0.311
Years in the U.S.	29.46	2	14.73	0.33	0.715
Explained	627.40	9	69.71	1.59	0.134

Grade 1 - ANCOVA of Posttest Scores - CAT - Phonic Analysis by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	1.88	1	1.88	0.17	0.673
Treatment	11.05	3	3.68	0.35	0.789
Previous Schooling	25.07	2	12.53	1.19	0.309
Years in the U.S.	11.77	2	5.88	0.56	0.573
Explained	121.61	9	13.51	1.28	0.260

APPENDIX C-III cont'd

Grade 1 - ANCOVA of Posttest Scores - CAT - Vocabulary by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	17.13	1	17.13	2.88	0.094
Treatment	24.71	3	8.23	1.38	0.253
Previous Schooling	56.21	2	28.11	4.73	0.072
Years in the U.S.	6.81	2	3.40	0.57	0.566
Explained	139.36	9	15.48	2.61	0.012

Grade 1 - ANCOVA of Posttest Scores - CAT - Comprehension by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	13.94	1	13.94	2.26	0.137
Treatment	33.01	3	11.00	1.78	0.158
Previous Schooling	7.23	2	3.61	0.58	0.559
Years in the U.S.	10.53	2	5.26	0.85	0.430
Explained	103.39	9	11.48	1.86	0.072

APPENDIX C-IV

Grade 3 - ANCOVA of Posttest Scores - LAS(E) Test - Oral English Proficiency by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	3377.63	1	3377.63	87.63	0.000
Treatment	854.23	3	284.74	7.38	0.000
Previous Schooling	150.48	3	50.16	1.30	0.281
Years in the U.S.	200.36	4	50.09	1.30	0.279
Explained	6630.80	12	552.56	14.33	0.000

APPENDIX C-V

Grade 3 ANCOVA of Posttest Scores - CAT - Language Expression by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	156.46	1	156.46	7.54	0.008
Treatment	24.38	3	8.12	0.39	0.759
Previous Schooling	13.53	3	4.51	0.21	0.884
Explained	359.26	12	29.93	1.44	0.169

APPENDIX C-V cont'd

Grade 3 ANCOVA of Posttest Scores - CAT - Language Mechanics Proficiency by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	31.49	1	31.49	3.47	0.067
Treatment	94.73	3	31.57	3.48	0.020
Previous Schooling	27.04	3	9.01	0.99	0.401
Years in the U.S.	13.66	4	3.41	0.37	0.824
Explained	222.85	12	18.57	2.05	0.033

Grade 3 ANCOVA of Posttest Scores - CAT - Language Spelling by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	11.73	1	11.73	2.23	0.139
Treatment	75.51	3	25.17	4.80	0.004
Previous Schooling	28.51	3	9.50	1.81	0.153
Years in the U.S.	28.61	4	7.15	1.36	0.256
Explained	167.46	12	13.95	2.66	0.006

APPENDIX C-VI

Grade 3 ANCOVA of Posttest Scores - CAT - Reading Vocabulary by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	45.38	1	45.38	5.78	0.019
Treatment	33.62	3	11.20	1.52	0.215
Previous Schooling	15.38	3	5.12	0.69	0.556
Years in the U.S.	17.83	4	4.46	0.60	0.658
Explained	157.53	12	13.12	1.79	0.068

Grade 3 ANCOVA of Posttest Scores - CAT - Reading Comprehension by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	403.34	1	403.34	19.20	0.000
Treatment	125.56	3	41.85	1.99	0.123
Previous Schooling	16.95	3	5.65	0.26	0.847
Years in the U.S.	67.87	4	16.97	0.80	0.525
Explained	871.88	12	72.65	3.45	0.001

APPENDIX C-VI cont'd

Grade 3 ANCOVA of Posttest Scores - CAT - Reading by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	2146.97	1	2146.97	28.27	0.000
Treatment	599.67	3	199.89	2.63	0.057
Previous Schooling	60.45	3	20.15	0.26	0.850
Years in the U.S.	298.84	4	74.71	0.98	0.422
Explained	5543.69	12	461.97	6.08	0.000

Grade 3 ANCOVA of Posttest Scores - CAT - Phonic Analysis by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	119.69	1	119.69	13.06	0.001
Treatment	74.15	3	24.71	2.69	0.053
Previous Schooling	14.17	3	4.72	0.51	0.673
Years in the U.S.	27.70	4	6.92	0.75	0.558
Explained	416.05	12	34.67	3.78	0.000

APPENDIX C-VI cont'd

Grade 3 ANCOVA of Posttest Scores - CAT - Structural Analysis by Pretest Scores, Treatment, Previous Schooling and Years in the U.S.

Source	SS	df	MS	F Value	Sig. of F
Covariate-Pretest	0.48	1	0.48	0.12	0.726
Treatment	73.55	3	24.51	6.26	0.001
Previous Schooling	15.44	3	5.14	1.31	0.277
Years in the U.S.	25.12	4	6.28	1.60	0.183
Explained	171.10	12	14.25	3.64	0.000

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The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

12/10/87
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