DOCUMENT RESUME

ED 307 820 FL 018 036

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TITLE Evaluation of an "Exemplary" Bilingual Immersion Program.
INSTITUTION California Univ., Los Angeles. Center for Language Education and Research.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO TR13
PUB DATE 88
CONTRACT 400-85-1010
NOTE 35p.
AVAILABLE FROM School of Education, San Jose State University, San Jose, CA 95192-0074.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Bilingual Education Programs; Communicative Competence (Languages); *Demonstration Programs; Elementary Education; English; English (Second Language); FLES; *Immersion Programs; Limited English Speaking; Longitudinal Studies; Native Speakers; Program Effectiveness; Second Language Instruction; Spanish; Spanish Speaking; Student Evaluation
IDENTIFIERS Content Area Teaching; *San Diego City Schools CA

ABSTRACT

The results of a longitudinal evaluation of an innovative educational program in bilingual immersion at the San Diego City Schools are presented. The program's goals emphasized the acquisition of communicative proficiency, in English and Spanish, for both native-English-speaking and native-Spanish-speaking students. Using a quasi-experimental longitudinal design, the evaluation investigated the effectiveness of the San Diego program on the academic achievement, in both Spanish and English, of 78 fluent-English-proficient students (FEPS) and limited-English-proficient students (LEPS) in grades 2 through 6. As expected, both groups of students demonstrated achievement gains in reading and math (on both Spanish- and English-language tests), and performed at or above national norms in all subject areas by the end of elementary school. These findings are discussed in terms of their conceptual and evaluative significance, and with respect to ongoing debates in the scholarly and policy-making communities. 36 references. (Author/DJD)

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The project presented, or reported herein, was performed pursuant to a contract from the Office of Educational Research and Improvement/ Department of Education (OERI/ED) for the Center for Language Education and Research (CLEAR). However, the opinions expressed herein do not necessarily reflect the position or policy of the OERI/ED and no official endorsement by the OERI/ED should be inferred.

Center for Language Education and Research
University of California
1988

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OERI Contract #400-85-1010

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Abstract

This paper reports the results of a longitudinal evaluation of an innovative educational program in bilingual immersion. The program, in the San Diego City Schools, was piloted in 1975 and widely regarded as an "exemplary" program. Bilingual immersion education combines bilingual education instruction for language minority students, and second language immersion education for language majority students. Thus, language minority and language majority students are integrated for content instruction in a program that provides a graduated mix of instruction in Spanish and English. Using a quasi-experimental longitudinal design, the evaluation tracked the academic achievement of 78 fluent English proficient children (FEPs) and limited English proficiency students (LEPs) in grades two through six. As expected, both groups of students demonstrated achievement gains in reading and math (in both English and Spanish language tests), and performed at or above national norms in all subject areas by the end of elementary school. These findings are discussed in terms of their conceptual and evaluative significance, and with respect to ongoing debates in the scholarly and policy making communities.

The increasing cultural and linguistic diversity in the United States has mandated a number of changes in education policy. In 1974, tne Supreme Court's Lau decision led to the interpretation that the equal educational opportunity provisions of the U.S. Constitution required offering instruction in the native language of children who had limited proficiency in English. The nation has since grappled with a variety of programmatic efforts, under the rubric of "bilingual education," in order to meet this constitutional mandate.

In the past decade, a number of studies have examined the effectiveness of bilingual education programs (see Baker & de Kanter, 1983; Swain & Lapkin, 1985; Troike, 1986; and Willig, 1985, 1987, for reviews of the literature). These evaluation studies have stimulated a lively debate in educational research (cf. Baker, 1987; Secada, 1987; Willig, 1987), with findings and interpretations of this voluminous literature ranging from very negative (i.e., bilingual education hampers the academic achievement of its participants) to very positive (see Willig, 1985).

Part of the reason for the negative findings was purely methodological: The lack of random assignment, and the use of comparison groups with pre-existing differences, contributed to the negative assessment of bilingual education (Secada, 1987; Willig, 1985). In addition, bilingual education was less effectively implemented when linguistic minority children were "pulled out" of their classrooms for special English language instruction (Barrera, Martinez & Erftmier, 1987); when their native language was "replaced" by English (see Hakuta & Gould, 1987); when non- or limited-English-

proficient students were "submersed" in English-only classrooms (see Hernandez-Chavez, 1984); and when instructional staff had negative attitudes toward the program (Troike, 1981). Other evaluation studies showed that language minority students achieved at higher levels in bilingual education programs than in English-only programs (Ramirez, Yuen, Ramey, & Merino, 1986).

More recently, some bilingual education programs have evolved away from the above features, to incorporate a variety of "immersion" models (see Lindholm, 1987, for a directory of bilingual immersion programs in the U.S.). Bilingual immersion is a marriage of the programmatic features of bilingual education for language minority children and immersion education for language majority children (Lindholm, 1987).

Bilingual immersion is based on the premise that a second language is best acquired by language minority students after their first language is firmly established (cf. Hakuta & Gould, 1987), and that a second language is best developed by language majority children through immersion in that language (Genesee, 1985). It is felt that the immersion of fluent English proficient (FEP) students in non-English instruction is beneficial for their acquisition of true communicative proficiency in the second language. Their English language skills, meanwhile, develop unimpeded due to the dominance of English in their social/cultural environment. For limited English proficient (LEP) students, immersion in their native language provides the necessary linguistic foundation for the later acquisition of English and the further development of full proficiency in both languages.

The rationale for this apparent inconsistency is two-fold (Lindholm & Dolson, 1988). First, English is the dominant societal language (in the U.S.A.), whereas non-English languages are in jeopardy of attrition without early intensive exposure. Second, a critical theoretical distinction between additive and subtractive bilingualism is made where additive bilingualism refers to a form of enrichment where children can acquire one or more foreign languages without fear of native language loss. In contrast, in subtractive bilingualism the learner acquires the dominant language at the expense of his or her native language (Lambert, 1987).

Research indicates that additive bilingualism is associated with high levels of proficiency in the two languages, whereas subtractive bilingualism is associated with lower levels of second language attainment and scholastic performance.

Thus, while language minority children are taught primarily in their native language for the first few years of schooling (in bilingual immersion programs), language majority children are instructed primarily in their second language (Genesee, 1985; Snow, 1987). Students from the two language communities serve as peer tutors for their mutual language development. Bilingual immersion programs are therefore equally concerned with the language and academic development of both language minority and language majority children (Snow, 1987). Thus, another major assumption underlying bilingual immersion education is concerned with the relationship between language and thought: It is expected that knowledge learned through one language paves the way for knowledge acquisition in the second

language. Students who learn content in one language are expected to demonstrate content knowledge in the second language once they acquire the language skills to express that knowledge (Cummins, 1987).

Finally, anotner underlying premise is built on the threshold hypothesis (Cummins, 1987), which states that students need to reach a certain level of native language proficiency in order to facilitate second language development. Furthermore, long-term cognitive advantages of bilingualism do not accrue until the student has sufficiently developed both languages.

Although bilingual immersion programs vary in terms of the proportion of instruction in one language or the other, the duration of the immersion, and the subject matter that is taught in the two languages (Lindholm, 1987), all bilingual immersion programs offer fluent English proficient (FEP) and limited English proficient (LEP) students the opportunity to share the first years of elementary school primarily immersed in the non-English language. This integrative approach is expected to improve intergroup attitudes, and attitudes toward the target language and culture, of both language minority and language majority children (Baecher & Coletti, 1986; Lindholm, 1987).

Methodologically sound evaluations of immersion programs indicate solid advances in academic achievement, the development of language skills, and positive intergroup attitudes for language majority students (Campbell, 1984; Genesee, 1985; Lambert, 1987; Swain & Lapkin, 1985). Similar findings accrue for language minority children (Troike, 1981; Willig, 1985, 1987).

Because of the newness of bilingual immersion programs, however, evaluative data have been scant. Moreover, we are aware of no studies that have examined the longitudinal growth in academic achievement among participants in bilingual immersion programs. Only a few studies have examined the effectiveness of these programs after even one or two years of program implementation (Baecher & Coleti, 1986; Lindholm, 1988). The purpose of the current report is to report the results of a quasi-experimental longitudinal evaluation of an "exemplary" bilingual immersion program in San Diego, California.

The San Diego Program

In 1975, the San Diego City Schools launched a pilot two-way bilingual immersion program in six of its elementary schools. The program's goals emphasized the acquisition of communicative proficiency, in English and Spanish, for both native English speaking and native Spanish speaking students (see ESEA Title VII Demonstration Project, 1982; Genesee, 1985; Snow, 1987).

Classrooms, with Spanish-speaking (about 60%) and English-speaking (about 40%) students, were taught primarily in Spanish from preschool through grade 3 (see Herbert, 1986; Snow, 1987). During these years, English was limited to 20 minutes a day in preschool, 30 minutes a day in Kindergarten, and 60 minutes a day in grades 2 and 3. In grades 4, 5, and 6, the proportion of instruction in English increased to approximately one-half. During these final grades, content subject areas (e.g., math, reading, social studies) were taught using both languages (although the languages were separated during any

particular lesson). Other important components of the program were the use of cross-language peer tutoring, and the involvement and support of parents (see Genesee, 1985; Snow, 1987).

This program, with strong anecdotal evidence of success, inspired a number of replications across the country (Harvard Education Letter, 1986). The program was designated as an "exemplary" program by the California State Department of Education, and was prepared for presentation to the Joint Dissemination and Review Panel of the U.S. Office of Education for approval as a program of excellence (Herbert, 1986). The only evaluative data on the program, however, has been in unpublished school district reports (e.g., Herbert, 1986), and these focussed on the non-statistical description of trends.

The purpose of this investigation was to investigate the effectiveness of the San Diego Program on students' academic achievement in English and Spanish. It was hypothesized that students would show achievement gains in consonance with the changing emphases of the program (i.e., stronger Spanish language reading and math scores in the first three years, stronger English-language reading and math scores in grades 4, 5, and 6). Because of the reported cognitive advantages of bilingualism (Cummins, 1987; Hakuta, 1986; Padilla & Lindholm, 1984; Peal & Lambert, 1962), it was further hypothesized that FEP and LEP students would demonstrate academic achievement levels that would parallel national norms.

Methodology

Subjects

The sample consisted of 78 students from six schools who had participated in the bilingual immersion program since preschool, kindergarten, or first grade. The database was developed through two Title VII demonstration grants to the school district. The database included grade level at entry, and language proficiency and academic achievement test scores (in both Spanish and English) for each year of participation in the program. The 78 students represented three cohorts who entered the program at different grade levels: 6 FEP and 14 LEP children had participated in the program since preschool, 11 FEP and 12 LEP children since kindergarten, and 15 FEP and 20 LEP children since first grade. The 78 students represented the number of students who completed the program (through grade 6), and who had comparatively small amounts of missing data.

Design

The overall design for the analysis was a 2 (language group: FEP, LEP) x 3 (entry cohort: preschool, kindergarten, first grade) x 2 (test language: Spanish, English) x 5 (grade level: grades 2, 3, 4, 5, 6) mixed factorial, with language group and entry cohort as between subjects factors, and the remaining two factors (test language and grade level) as repeated measures.

Measures

Comprehensive Tests of Basic Skills, Forms S and U (CTBS-S and CTBS-U). The CTBS-S and CTBS-U are a series of norm-referenced tests for grades K-12 (Comprehensive Tests of Basic Skills: Examiner's

Manual, 1981). They measure achievement in English in the basic skills normally found in U.S. curricula (i.e., reading, spelling, language, mathematics, reference skills, science, and social studies). Only two CTBS domains, reading and mathematics, were available for the current evaluation. National norms were readily available for both forms of the CTBS.

Comprehensive Tests of Basic Skills-Español (CTBS-Español). The CTBS-Español is a Spanish language adaptation of the English CTBS-S Reading and Mathematics achievement tests for grades 1-8 (Comprehensive Test of Basic Skills-Español: Examiner's Manual, 1978). Developed by the Norwalk-La Mirada Unified School District in Southern California, the CTBS-Español assesses achievement in reading and mathematics. Norms on the CTBS-Español were based on the national norms for the CTBS-S (the norm tables provided an estimate of the raw score that a student would have obtained on the CTBS-S, based on his or her raw score on the CTBS-Español, assuming basic competency in English and Spanish).

Procedures and Data Reduction

Children were tested at the end of each school year. From kindergarten (for those entering the program in preschool or kindergarten) or first grade (for those entering the program in first grade), students were also given reading and math achievement tests in both English and Spanish.

Because of test availability problems during the longitudinal study, students were assessed with different achievement measures over the years. Because of the different tests and lack of standardization,

only data from grades two through six were used in the analyses. For this period of time, most students were administered the CTBS and the CTBS-Español. Because the version of the CTBS changed from CTBS-S to CTBS-U in one of the years of data collection, all data were converted from raw scores to normal curve equivalents.

Normal curve equivalents (NCEs) comprise an equal-interval scale ranging from 1 to 99, with a mean of 50 and a standard deviation of approximately 21. The use of NCEs allows meaningful comparisons between different achievement test batteries and between different tests within the same test battery. Thus, all analyses are based on normal curve equivalents.

Results

Cohort Effects

The first step in the analysis involved determining whether the three cohorts who entered the program at different grade levels (preschool, kindergarten, first grade) varied in math and reading achievement--tested in both English and Spanish--at the end of sixth grade.

A multivariate analysis of variance (MANOVA) was performed separately for math and reading achievement with entry cohort (preschool, kindergarten, first grade) and language group (FEP, LEP) as the between subject factors. In both sixth grade reading and math achievement, the three groups did not differ significantly, $F(2,45) = 1.35$ and $F(2,44) = 1.80$, respectively, and there was no significant entry cohort by language group interaction for either reading or math [$F(2,45) = 0.65$ and $F(2,44) = 0.11$, respectively]. The remaining

analyses, therefore, collapsed subjects across the entry cohort variable.

Reading Achievement

Table 1 presents the mean scores for the FEP and LEP students in reading achievement in both languages over the five grade levels, and Figure 1 provides a graphical representation of these data.

Attention to the percentile ranks in Table 1, and the students' achievement relative to the norm-line in Figure 1, indicates that the FEP and LEP students were performing near or above the norm in both English and Spanish. The FEP students' sixth grade percentile rankings were 74% in English reading, and 72% in Spanish reading. The LEP students also scored near or above national norms, with their lowest percentile rank, 46%, close to average in English reading, but above average, 69%, in Spanish reading.

Figure 1 shows that the reading scores (in NCE's) generally increased over time for the students in both English and Spanish. The growth across grade levels was revealed by a significant main effect for grade level in the MANOVA for reading achievement in English and Spanish, $F(4,40) = 13.71$, $p < .0001$. Even in grades 4, 5, and 6, where the percentage of Spanish instruction dropped from 80% to 50%, students continued to progress in Spanish reading (although year-to-year differences were generally small and not significant).

Performance in English increased for both FEP and LEP students across the years (year-to-year differences were again small, and somewhat uneven) with a dramatic increase for FEP students at third grade (when formal instruction in English reading was initiated).

Table 1

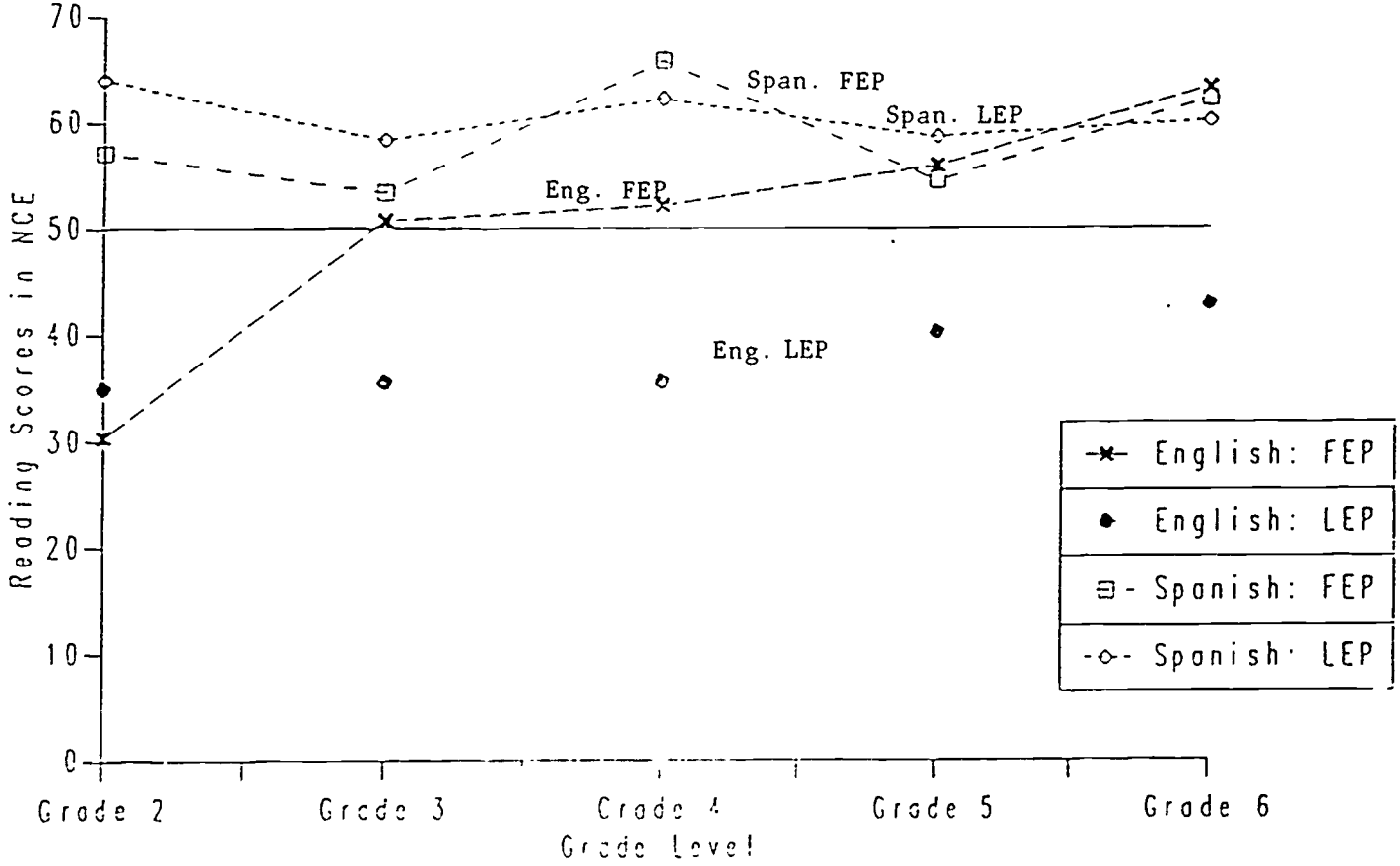
Means and Standard Deviations for Math and Reading Achievement* in Spanish and English for FEP and LEP Students in Grades Two Through Six

	Grade 2 Mean(SD)	Grade 3 Mean(SD)	Grade 4 Mean(SD)	Grade 5 Mean(SD)	Grade 6 Mean(SD)	Grade 6 Percentile Rank
Reading: English						
FEP	30.4(21.9)	50.7(22.1)[1]	52.1(16.2)[2]	55.9(14.1)[3]	63.3(13.1)[4]	74%
LEP	35.0(19.1)	35.6(18.3)	35.6(19.0)	40.2(14.5)	42.9(10.7)	46%
Reading: Spanish						
FEP	57.1(18.0)	53.3(17.1)	65.9(21.7)	54.5(16.4)	62.2(17.6)	72%
LEP	64.1(20.6)	58.4(19.5)	62.3(24.0)	58.7(16.4)	60.1(17.5)	69%
Math: English						
FEP	53.4(13.2)	55.5(18.7)[5]	58.3(15.8)[6]	61.4(15.0)[7]	70.2(17.9)[8]	83%
LEP	42.1(21.1)	43.9(14.4)	48.8(19.0)	53.0(15.9)	56.3(19.9)	62%
Math: Spanish						
FEP	72.9(19.0)	59.4(19.9)	63.9(18.9)	69.0(19.1)[9]	68.7(15.1)[10]	81%
LEP	58.0(14.4)	61.0(21.6)	55.1(19.5)	58.3(15.7)	58.8(14.3)	66%

* Based on NCE scores.

[1] $F(1,68) = 9.7$, $p < .01$.
[2] $F(1,76) = 15.8$, $p < .001$.
[3] $F(1,67) = 19.7$, $p < .0001$.
[4] $F(1,50) = 37.1$, $p < .0001$.
[5] $F(1,66) = 8.2$, $p < .01$.
[6] $F(1,73) = 5.2$, $p < .05$.
[7] $F(1,66) = 4.7$, $p < .05$.
[8] $F(1,50) = 6.2$, $p < .05$.
[9] $F(1,67) = 6.4$, $p < .05$.
[10] $F(1,51) = 5.8$, $p < .05$.

Figure 1: Reading Achievement in English and Spanish for FEPs and LEPs



Overall, though, students obtained higher scores in Spanish than in English, $F(1,10) = 72.55$, $p < .0001$. Further, the differential growth in reading across the two languages was demonstrated by a significant grade level by test language interaction, $F(4,40) = 5.41$, $p < .001$. Here, reading scores in Spanish were comparatively stable for grades 2 through 6 (despite a drop in scores from grades 2 to 3, mean scores were consistently above the fiftieth percentile), but reading scores in English showed more of a gradual improvement across the grade levels. In addition, the slopes for English reading from grade 3--when formal reading instruction began--to grade 6, were fairly parallel for FEP and LEP students.

Given the small sample size for the MANOVAs, year-by-year analyses of variance (ANOVAs) were conducted to determine group differences with the maximum number of students at each grade level.

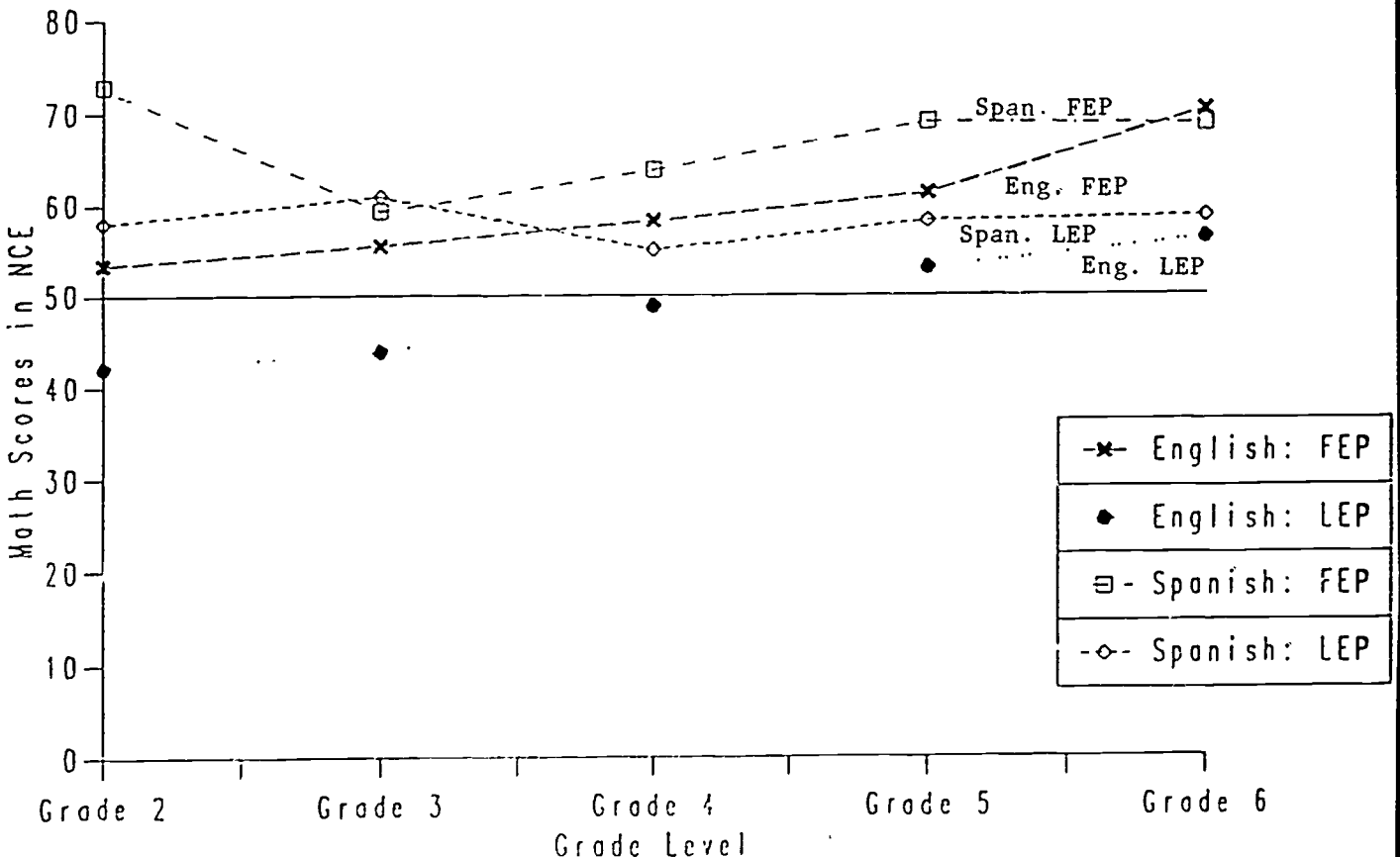
Results from the year-by-year ANOVAs are also presented in Table 1. These results indicated that FEP students significantly outperformed LEP students when tested in English from grades three through six. In Spanish reading, however, there were no significant differences between FEP and LEP students.

Mathematics Achievement

Table 1 presents the mean scores in mathematics in Spanish and English for the FEP and LEP students over the five grade levels, and Figure 2 graphically displays these test scores.

Attention to the percentile ranks presented in Table 1, and the students' achievement relative to the norm-line in Figure 2, shows that the FEP and LEP students performed well above the norm in mathematics

Figure 2: Math Achievement in English and Spanish for FEPs and LEPs



achievement by sixth grade when tested in both English and Spanish. The FEP students' sixth grade percentile rankings were 83% in English math and 81% in Spanish math. Similarly, the LEP students scored well above the norm, with sixth grade percentile rankings of 65% in English math and 66% in Spanish math.

Whereas the students scored higher in Spanish math than in English math, $F(1,9) = 5.40$, $p < .05$, math achievement in Spanish was greater initially, with a drop in performance in grade three (for FEP students) or grade four (for LEP students), followed by an increase (for both FEP and LEP students) to grade six. In English math, a steady increase for both FEP and LEP students across the grades was clearly evident. This differential gain in achievement in the two languages was shown in a significant test language by grade interaction, $F(4,36) = 4.25$, $p < .01$. Although the three-way (language group by test language by grade) interaction was not significant [$F(3,36) = 1.10$], Figure 2 indicates some differential progress across the grades according to test language and language group.

According to Figure 2 and Table 1, the scores for FEP students were higher than those for LEP students, although LEP students scored higher than FEP students in Spanish math at grade three. Although there were no overall significant language group differences according to the MANOVA, $F(1,9) = 1.19$, the year-by-year ANOVAs demonstrated that the FEP students outperformed the LEP students in English math at grades three through six, and in Spanish math at grades five and six (see Table 1 for F values).

Discussion

The current findings offer modest support for the potential of bilingual immersion to produce above average achievement, in two languages, in groups of students who differed in their initial language background. Although the LEP students were slightly below the norm for English reading, they were well above the norm in Spanish reading and in English and Spanish math. The FEP students scored in the upper 25% of students in reading and math achievement in English and Spanish. Both groups made continual gains in math and reading achievement (tested in English and Spanish), despite a drop in the percentage of Spanish instruction in grades four through six (from 80% Spanish in grades 2-3 to 50% Spanish in grades 4-6). Also, achievement in one language did not appear to hinder achievement in the other language, as steady progress was made in both languages.

The occasional year-to-year fluctuations in achievement are difficult to interpret given the use of different testing instruments and the small sample size. In any event, year-to-year contrasts seldom yielded significant differences. In addition, although the overall grade effects are partially due to maturation, it is noteworthy that both FEP and LEP students were near or above average in their standardized achievement scores when compared to national norms.

The high achievement, relative to national norms, of the language minority students supports the proposition underlying bilingual education that initial instruction in the native language facilitates achievement in English. Similarly, the high achievement of the FEP students, who were immersed in Spanish, demonstrates that the rationale

for second-language immersion is also well-grounded. Further, the parallels in English and Spanish achievement support the premise that the acquisition of knowledge may occur simultaneously in more than one language (Cummins, 1987).

One interesting result was the lack of a cohort effect for students in sixth grade; that is, achievement in reading and math (in Spanish and English) did not vary according to whether the students entered the bilingual immersion program in preschool, kindergarten, or first grade. Two possible explanations can be offered for this result. Either the sample was too small to detect a significant cohort effect, or it was not important whether students entered a bilingual immersion program in kindergarten or first grade, as they received the same achievement benefits by the end of the sixth grade. However, immersion research indicates that achievement of students in early immersion programs (beginning in early elementary grades) is superior to achievement of students in late immersion.

Although the current evaluation was not a true experiment (raising the potential of selection biases as threats to internal validity), and was limited in sample size (especially in the longitudinal analyses), it pointed to trends which were consistent with other evaluation studies. The present study offered comparisons with national normative data derived from school children who were, for the most part, not enrolled in a bilingual immersion program. These results were consistent with studies conducted by the San Diego City Schools involving comparison groups of English speakers enrolled in a typical mainstream program, and of Spanish speakers enrolled in a

bilingual education program. In math achievement, reading achievement, and language proficiency assessments, the bilingual immersion FEP and LEP students significantly outperformed their non-bilingual immersion peers who were enrolled in programs that the bilingual immersion students would have entered had they not been in the bilingual immersion programs. These results were consistent with other evaluations of bilingual immersion programs (see Lindholm, 1987, for a review). Further, the results for the FEP students were similar to those reported for English-speaking students enrolled in Spanish immersion programs in the United States (Campbell, 1984; Genesee, 1985).

The significant group differences between LEP and FEP students in English reading for grades 3 through 6, in English math for grades 3 through 6, and in Spanish math for grades 5 and 6, is important to understand. Some would attribute the differences to genetic differences, others to the failure of the bilingual immersion program, and still others to the possible social class or other home environment differences between the FEP and LEP students.

These differences represent several different possibilities. First, the group differences were not significant on the MANOVA and were only marginally significant in the ANOVAS. Thus, the differences do not reflect large achievement differences between the LEPs and FEPs. Second, there were probably clear home environment differences between the groups. Socioeconomic status, particularly parental educational background, are important considerations in predicting academic achievement of students (Cortés, 1986). Unfortunately, this

study did not have access to information on the home environment factors that could have mediated the bilingual immersion program's effect on the achievement outcomes.

Third, the FEP students may have been more academically prepared for school, with a richer academic knowledge of English than was true for the LEP students' academic knowledge base in Spanish. As Spanish (and other non-English languages) is not reinforced and supported as a societal language, children entering school speaking Spanish may be in the process of language loss because they do not have the social-cultural inputs that are available in a Spanish-speaking country (Lindholm & Dolson, 1988). As a consequence, the academic language resources of the LEP students may have been less well developed than those of the FEP students at the time of school entry, and the LEP students may have spent more time "catching up" to the academic language proficiency base in their native language, which was the starting point for the native language proficiency of the FEP students.

Fourth, according to the threshold hypothesis, the LEP students would need to develop a fairly high level of native language proficiency in order to promote second language development. They would then require proficiency in the two languages in order for long-term cognitive advantages to accrue. Perhaps data from the seventh or eighth grade would have demonstrated greater growth for the LEP students in English reading.

A fifth reason for the differences may reflect the relative amount of Spanish versus English instruction. The LEP students received less second language (i.e., English) instruction than did the FEP students

in their second language (i.e., Spanish). Thus, it is not surprising that the FEPs performed better in their native language (English), than the LEPs did in their second language (English).

In another sense, these findings may be considered quite impressive. For native Spanish speaking students, national trends have pointed to their severe academic underachievement, relative to national norms, on measures of reading and writing proficiency (see Fairchild, 1984; Hakuta & Gould, 1987; Prewitt Diaz, 1981). Indeed, these achievement disparities typically worsen with increases in grade level. According to one analysis, by the eighth grade, 39.9% of Mexican American children were two or more years behind in reading compared to 12.8% of Whites (Carter & Segura, 1979). Some have concluded that these data indicate that "...the United States public school system is failing with regard to the achievement of minority children" (Kagan, 1986, p. 223). In the current analysis, native Spanish speaking students were performing above national norms in Spanish-language math, Spanish-language reading, and English-language math. In English-language reading, they averaged only slightly below national norms. More importantly, all students made gains on the national norms, on all achievement measures, thus reversing the national trends of increasing between-group achievement disparities at higher grade levels.

These findings also contradict a long-standing myth concerning bilingualism: that bilingualism contributes to cognitive confusion and intellectual handicaps (see Hakuta & Gould, 1987, for a review of this literature). Instead, the development of full proficiency in two languages--that is, true bilingualism--appears to offer a number of

cognitive advantages (e.g., Cummins, 1979, 1987; Padilla & Lindholm, 1984). The evaluation of the San Diego bilingual immersion program is consistent with this latter conclusion: both FEP and LEP children were near or above mean percentiles, based on national norms, in reading and mathematics achievement in two languages.

Further research would benefit from an examination of the effects of bilingual immersion on a much larger scale. It would be ideal to implement such programs in an entire school district, where students could be randomly assigned to a variety of bilingual immersion models. Such a procedure would remove much of the tentativeness tied to the conclusions drawn from quasi-experimental methodologies. In addition, the necessity of conducting longitudinal designs in educational evaluations would be best met with a much larger number of student participants, in order to protect from subject attrition. Future studies would also benefit from an exhaustive cataloging of a variety of "subject variables" that are related to achievement: SES, parental education, initial achievement levels and aptitude, etc.

The above research recommendations, however, are probably unrealistic. Current policy initiatives, in California and elsewhere, suggest a reduction in funding for all forms of bilingual education, including bilingual immersion. The San Diego City Schools' "exemplary program," for example, has not been immune to difficulties in obtaining funding for program expansion. Thus, instead of obtaining expanded research opportunities of the sort described above, the most likely future scenario is that comprehensive evaluations of bilingual immersion programs will be increasingly difficult to perform.

In conclusion, the implementation of bilingual education, in whatever form it takes, will ultimately be based on the nation's values concerning ethnic and linguistic diversity (cf. Harvard Education Letter, 1986). Much of the public's attention is currently directed toward "English-only" legislation and emphases on "subtractive bilingualism."

Recent research, however, including the current report, indicate that "additive bilingualism," or full proficiency in more than one language, is a cognitive asset. Others have pointed to the economic benefits to the nation of having a populace that can compete in international markets (R. V. Padilla, 1982); and to the social benefits of citizens who have respect for alternative linguistic and cultural forms (Lambert, 1987).

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Authors' Notes

This research was completed at the UCLA Center for Language Education and Research. Appreciation is extended to Mrs. Eunice Lear, who compiled the data for this study, and to Mr. Tim Allen, who helped coordinate data collection efforts. The authors wish to acknowledge the useful feedback of Amado Padilla, Concepción Valadez, Russell Campbell, Eduardo Cascallar and José Galván to an earlier draft of this manuscript. Address correspondence and requests for reprints to Dr. Kathryn J. Lindholm, School of Education, San Jose State University, San Jose, CA 95192-0074.

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