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ABSTRACT

A study investigated the relationship between the 1982 native language proficiency of 4,700 newly-enrolled Spanish-speaking, limited-English-proficient (LEP) kindergarten through seventh grade students and their success rates in acquiring English proficiency in the following 4 years. Findings of the study, and the implications derived from the study, were examined for instructional program design. Results revealed that, for Spanish speakers, English acquisition is strongly related to native-language proficiency, and that, for the smaller proportion of students who become English proficient in one year, English proficiency at the time of enrollment is the best predictor of their subsequent second-language development. Based on these results, it is suggested that (1) educators make provisions for differences in first-language proficiency when they design bilingual programs for Spanish-speaking students; and (2) studies be undertaken to determine whether this relationship holds true for native speakers of other languages. (MSE)

Native Language Proficiency as a Predictor of LEP Students' Growth in English

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ABSTRACT

This report: (1) examines relationships between the 1982 native-language proficiency of 4,700 newly enrolled Spanish-speaking, limited English-proficient (LEP) kindergarten through seventh-grade students and their success rates in acquiring English proficiency in the following four years; and (2) points out the implications of these relationships for the design of instructional programs.

It reveals that, overall, native language proficiency and success rates in learning English are correlated for both kindergarten through third graders and fourth through seventh graders. Native-language proficiency is a stronger predictor of English growth for the upper-grade group and for those who take two to four years to lose entitlement. For those who lose entitlement within one year, English proficiency at the time upon entering a program is most predictive of the students' pace of English acquisition.

On the basis of these results, the report suggests that: (1) educators would do well to make provisions for differences in first-language proficiency when they design bilingual programs for Spanish-speaking students; and (2) studies be undertaken to determine if this relationship holds true for native speakers of other languages.

NATIVE LANGUAGE PROFICIENCY AS A PREDICTOR OF STUDENTS' GROWTH IN ENGLISH

I. INTRODUCTION

Contrary to the popular belief that bilingual education confuses the mind of the child and retards the development of academic achievement, researchers have consistently documented that being bilingual is a cognitive asset. Hakuta (1986) reported that more than 30 studies replicated the finding that bilingual children are better able to think flexibly and abstractly than monolingual children. This "metalinguistic ability" seems to contribute to the early development of reading skills and academic achievement, suggesting that, if anything, bilingual children should have an advantage over their monolingual peers.

In an attempt to explain the mechanism by which bilingualism promotes academic achievement, Cummins (1979) proposed the "developmental hypothesis" to refer to the relationship between native language proficiency and second language acquisition. According to this model, there are underlying proficiency skills common to both native language and second language literacy. These underlying skills will promote the "transfer" of proficiency skills of the first language to the second language. Further, learning a second language is easier and faster when a child is literate in the native language. Thus, for the development of literacy skills in a second language, there must be a minimal level of proficiency in the first language (Cummins, 1987).

On the basis of this model, it could be predicted that children who are highly proficient in their native language are more likely to achieve proficiency in a second language than those less literate in their native language.

Several researchers have been able to document the relationship between native language proficiency and second language acquisition. In an early review of the literature, Cummins (1979) reported that not only are native language and second language reading scores highly related (Greaney, 1977; Skutnabb-Kangas & Toukomaa, 1976) but that students enrolled in bilingual programs that emphasize native language instruction achieve reading skills in the second language similar to those of native speakers within a few years.

More support for the developmental interdependence hypothesis comes from studies that demonstrate that maintaining the first language does not interfere with achievement in the second language. Studies by Hebert (1976) and Ramirez and Politzer (1976) cited by Cummins (1979) found that programs promoting students' native language improved these skills without having any negative effects on second language achievement. In fact, when students switched to using the second language at home, first-language skills deteriorated without any improvement in the second language.

The results of recent studies are consistent with these early findings and provide considerable evidence that literacy skills in the first language promote achievement in the second

language (Cummins, 1984; Hakuta and Gould, 1987; Nadeau and Miramontes, 1988), skills learned in the first language "transfer" to the second language (Cummins, 1981; Collier, 1987; Hakuta and Gould, 1987), and bilingualism contributes to cognitive flexibility and to improved thinking skills rather than negatively affecting cognitive and academic development (Hakuta, 1986; Collier, 1987; Hakuta and Gould, 1987).

Studies by the Office of Educational Assessment and the U.S. Department of Education note that there is a positive correlation between limited English-proficient (LEP) students' mastery of their native language and their achievement in English.* Moreover, they point out that this correlation holds true even after controlling for grade and length of time in an English-language school system. No one, however, has examined how this relationship holds up over a several-year period. This study seeks to answer that question. Specifically, it

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*J.S. Torres and R.A. Irizarry, An Educational Profile of Language-Minority Students in the New York City Public Schools - Report Number 1 (New York: Office of Educational Assessment, N.Y.C. Board of Education, January 1984). New York State Incentive Grant Number 5001-48-35-405.

J.S. Torres and others, An Educational Profile of Language Minority Students in the New York City Public Schools: A One-Year Follow-Up. (New York: Office of Educational Assessment, N.Y.C. Board of Education, October 1986), New York State Incentive Grant Number 5001-40-55415.

G.R. Tallmadge, T.C.M. Lam, and N.N. Gamel, The Evaluation of Bilingual Education Programs for Language-Minority, Limited-English-Proficient Students: A Status Report with Recommendations for Future Development - Phase I Report (Washington, D.C.: U.S. Department of Education, September 1987).

examines the relationship between the native-language proficiency of 4,700 Spanish-speaking LEP students from kindergarten through seventh grade when they first entered the New York City schools and their English proficiency four years later.

This report is the second of three longitudinal studies that track various aspects of Spanish-speaking LEP students' achievement during the period spring 1982 to spring 1986. The first one examines how long it took these students to lose their entitlement to bilingual services; the third examines the English reading achievement of language-minority students who have recently lost entitlement to bilingual/E.S.L. services.

All three of these studies use a comprehensive data base that was begun in 1982. It contains biographical and academic achievement information on the New York City public school system's large and diverse population of language-minority students.*

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*A language-minority student is one whose home language is other than English. All language-minority students who score at or below the twentieth percentile on the English version of the Language Assessment Battery (LAB) -- a Board of Education-developed test of listening, speaking, reading, and writing abilities -- are classified as limited English proficient (LEP). Bilingual/E.S.L. instruction is legally mandated for all non-Hispanic LEP students. For those Spanish speakers whose Spanish LAB score exceeds their English LAB score, both E.S.L. and bilingual content-area classes are mandated. For those whose Spanish LAB score is less than their English score, E.S.L. classes are legally mandated and bilingual content-area classes are optional.

II. METHODOLOGY

As a first step, all Spanish-speaking students in grades K-7 who were enrolled in the New York City public schools in 1982 and who scored below the twenty-first percentile on the English LAB were culled from the data base.* From this group, all of those who had one year or less of experience in an English-language school system and were still enrolled in a New York City public school in the spring of 1986 were selected. These students' percentile scores on the spring 1982 Spanish LAB were then grouped by quartile. Those whose scores fell into the lower (i.e., non-Spanish proficient) or the upper quartiles (Spanish proficient) were the ones whose growth in English, as measured by changes in their percentile score on the English LAB, was traced over a four-year period.

Put differently, the students whose English achievement is examined in this study were: entitled to bilingual services in the spring of 1982, and newly enrolled in an English-language school system, in grades K-7. In addition, they scored in the upper or lower quartiles on the Spanish LAB, and were

*Since students in grades 8-12 have high attrition and mobility rates, the LAB scores of those who remain in the system are not likely to be representative of their peers. Consequently, to ensure the reliability of the findings only lower-grade students were selected for analysis.

continuously enrolled in the New York City public schools from spring 1982 to spring 1986.

A student's most recent LAB percentile score determined his or her final entitlement status. Three entitlement statuses were possible: entitled, unentitled, or not retested during the 1985-86 school year. Although all entitled students were supposed to be retested each spring, for one reason or another, some were not. An entitled student was tabulated as "not retested" when he or she was on record as still enrolled in a New York City school, a year had passed since the last LAB score was recorded, and no subsequent LAB score could be matched to the student's record.

Step-wise regression analyses were also computed to determine if English language acquisition could be predicted using the following variables: Spanish LAB scores, first English LAB scores, the number of years students were enrolled in an English-language school system, and the number of years students were overage for their grade. These variables were used to predict students' most recent English LAB score; i.e., the point at which students lost entitlement to bilingual services by scoring at or above the twenty-first percentile.

Consistent with the first part of the study, analyses were computed by grade group (K-3 and 4-7). Since all students were first tested on the English LAB in 1982, the analyses start with scores in 1983 (after one year) and end with scores in 1986 (after four years).

III. OUTCOMES

Results of the first part of the study are presented in Tables 1 and 2 which show the respective entitlement statuses over a four-year period of kindergarten through third-grade and fourth- through seventh-grade students who scored at the upper or the lower quartile on the Spanish LAB.

As Table 1 indicates, a larger proportion of the kindergarten through third graders who scored at the upper quartile on the Spanish version of the LAB (i.e., those who were Spanish-proficient) lost their entitlement to bilingual services than did students scoring at the lower quartile (i.e., those who were neither English nor Spanish-proficient).

TABLE 1

Entitlement Status for Students in Grades K-3 who Scored at the Upper and Lower Quartiles on the Spanish LAB, by Year

Year Ending	Lower Quartile			Upper Quartile		
	Entitled		Unentitled	Entitled		Unentitled
Spring	N	(%)	(%)	N	(%)	(%)
1982	1254	100.0	0	2100	100.0	0
1983	1219	83.4	16.6	2043	67.4	32.6
1984	1177	66.4	33.6	2006	43.8	56.2
1985	1084	51.4	48.6	1952	29.1	70.9
1986	1084	36.3	63.7	1952	15.8	84.2

Specifically, by spring 1983, 32.6 percent of the Spanish-proficient kindergarten through third graders lost their entitlement, while only 16.6 percent of the non-Spanish-proficient ones lost theirs. And from spring 1984 to spring 1986, the proportion of Spanish-proficient kindergarten through third graders who lost entitlement rose from 56.2 percent to 84.2 percent. By contrast, the percentage of non-Spanish-proficient students who lost their entitlement from spring 1984 to spring 1986 only rose from 33.6 percent to 63.7 percent.

A similar pattern was found among fourth- through seventh-grade Spanish-proficient students. (See Table 2.) In addition, the proportion of non-Spanish-proficient fourth through seventh graders who lost entitlement between spring 1983 and spring 1986 was substantially smaller than it was for the lower-grade students.

TABLE 2

Entitlement Status for Students
in Grades 4-7 who Scored at the
Upper and Lower Quartiles on the Spanish LAB, by Year

Year Ending	Lower Quartile			Upper Quartile		
Spring	N	Entitled (%)	Unentitled (%)	N	Entitled (%)	Unentitled (%)
1982	262	100.0	0	802	100.0	0
1983	246	97.2	2.8	756	81.7	18.3
1984	222	91.9	8.1	717	59.0	41.0
1985	187	78.6	21.4	670	35.4	64.6
1986	187	66.3	33.7	670	18.8	81.2

Specifically, while the proportion of Spanish-proficient students losing entitlement rose from 18.3 percent as of spring 1983 to 81.2 percent as of spring 1986, the proportion of non-Spanish-proficient students who lost entitlement during the same period only rose from 2.8 percent to 33.7 percent.

Tables 3 and 4 present the result of the regression analyses for grade groups K-3 and 4-7, respectively. Interestingly, first English LAB is the best predictor of achieving the cutoff for those exceptional students who reach the exit criterion after one year, regardless of grade. Although only seven percent of the variability is accounted for by first English LAB for the youngest group, it increases to 32 percent for grades 4-7.

For those students who take two to four years to reach the criterion, the data indicate that overall, Spanish LAB is the best predictor of English proficiency. The proportion of variance accounced for by the Spanish LAB ranges from two percent to 20 percent. This indicates that since these students probably know little, if any English, their native language proficiency can best predict how long it will take them to lose entitlement. (The only exception is for students in grades K-3 who achieved proficiency after three years. In this case, years overage for grade emerged as the best predictor. This may be an anomaly since this was an isolated finding and the observed correlation was quite small.)

TABLE 3

HIERARCHICAL CORRELATION MATRIX OF PREDICTORS OF
ENGLISH LANGUAGE ACQUISITION IN GRADES K-3, BY YEAR

Number of years between first and last English LAB test	N	Order of Predictor Variables in the Regression Equation							
		1 Variable	R^2*	2 Variable	R^2	3 Variable	R^2	4 Variable	R^2
1 (1983)	2,674	English LAB	.072	Spanish LAB	.083	Yrs. Education	.087	Yrs. Overage	.089
2 (1984)	1,793	Spanish LAB	.022	Yrs. Overage	.037	English LAB	.049	Yrs. Education	.051
3 (1985)	1,471	Yrs. Overage	.047	English LAB	.072	Spanish LAB	.092	Yrs. Education	.095
4 (1986)	2,285	Spanish LAB	.044	Yrs. Overage	.074	English LAB	.095	Yrs. Education	.095

*R^2 represents the proportion of variance accounted for by the predictor variables.

TABLE 4

HIERARCHICAL CORRELATION MATRIX OF PREDICTORS OF ENGLISH LANGUAGE ACQUISITION IN GRADES 4-7, BY YEAR

Number of years between first and last English LAB test	N	Order of Predictor Variables in the Regression Equation							
		1 Variable	R^2*	2 Variable	R^2	3 Variable	R^2	4 Variable	R^2
1 (1983)	546	English LAB	.322	Spanish LAB	.372	Yrs. Overage	.377	Yrs. Education	.378
2 (1984)	477	Spanish LAB	.181	English LAB	.277	Yrs. Overage	.249	Yrs. Education	.249
3 (1985)	496	Spanish LAB	.199	English LAB	.237	Yrs. Overage	.267	Yrs. Education	.275
4 (1986)	689	Spanish LAB	.128	Yrs. Overage	.162	English LAB	.177	Yrs. Education	.178

*R^2 represents the proportion of variance accounted for by the predictor variables.

Further inspection of the tables indicate additional interesting trends. Across the grade groups, the relationship between the main predictor and the outcome variable is most robust when students lose entitlement in one year; i.e., when the time between first and last English LAB was one year. In addition, stronger relationships were observed for the upper grades as compared to the younger grades.

Finally, additional analyses were computed to determine if the relationships among the variables were linear or curvilinear. Results indicate that a linear model most adequately describes the relationships, suggesting that a direct relationship exists between losing entitlement and first English LAB, initial Spanish LAB, and the student background variables selected.

One caveat is in order, however. While there may be a concern about how well the variables predict English acquisition for grades K-3 because the observed values are small, the fact that the proportion of variance increases substantially for the other grade groups and that the patterns are virtually identical across the grades attests to the validity of the data. Concerns may also arise about the appropriateness of the statistical model employed since the predictor variables are correlated, thus violating the assumption that predictor variables should be independent. However, the correlations were quite small and the model is robust enough to ensure our model's validity.

IV. CONCLUSIONS

Our analyses support the contention in the studies cited above that being fluent in one's first language increases the probability of becoming proficient in a second. The data indicate that, in general, for Spanish speakers, English acquisition is strongly related to native-language proficiency -- a factor which predicts not just the likelihood of becoming proficient in English but how long it will take for this to happen as well. The results also indicate that, for the smaller proportion of students who become English proficient in one year, English proficiency at the time of entry is the best predictor for subsequent second-language development. This suggests that these students had entered an English-language school system with some command of English. For those who take longer to achieve the twentieth-percentile cutoff, and whose initial English skills are presumably weaker, initial native-language proficiency is the best predictor of their subsequent acquisition of English.

The findings cited in the literature have important policy implications for developing educational programs for limited English-proficient students, and suggest that programs for these students should include continued instruction in the native language so that the first language is developed rather than replaced. Specifically, the literature suggests that programs

that build upon and maintain children's native-language skills are most likely to promote academic achievement among language-minority students.

The results of the present study also suggest educators and funding sources would do well to make provision for differences in native-language proficiency when they design bilingual programs for language-minority students. In particular, this consideration must guide the choice of such design features as program duration, time devoted to native-language skills and E.S.L. instruction, and the criteria for exiting a bilingual program.

Finally, since the New York City schools serve native speakers of a wide variety of languages other than Spanish, it is important to determine if native-language proficiency predicts the acquisition of English skills for these students as well as it does for Spanish-speakers.

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