

Biliteracy and the Educational Achievement of Latino High School Students*

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Abstract

As children of immigrants have an increased presence in U.S. school systems, a growing literature has begun to uncover the relationship between their language proficiencies and educational development. Little research has focused specifically on English-speaking Latinos/as, who make up the bulk of the Latino/a population, and the impact that Spanish maintenance might have on their educational outcomes. This research addresses the relationship between Spanish maintenance and academic achievement for Latino/a high school students who possess high levels of English proficiency. The findings reveal that biliteracy --the ability to read and write in both English and Spanish-- is associated with significantly higher achievement test scores in math and reading compared to English monolingualism. Oral proficiency in Spanish (without literacy), whether substantial or limited, appears to neither benefit nor hinder the academic achievement of English-speaking Latinos/as.

Keywords: Achievement, Bilingualism, Latino, Hispanic, Education, Spanish, High School

1. Introduction

As children of immigrants, particularly Latinos, have an increased presence in U.S. school systems, a growing literature has begun to uncover the relationship between their language proficiencies and educational development. This research addresses the relationship between Spanish maintenance and academic achievement for Latino high school students who possess high levels of English proficiency. The findings reveal that biliteracy --the ability to read and write in both English and Spanish-- is associated with significantly higher levels of achievement in math and reading compared to English monolingualism. Oral proficiency in Spanish, whether substantial or limited, appears to neither benefit nor hinder the academic achievement of English-speaking Latinos.

Little research has focused specifically on English-speaking Latinos, who make up the bulk of the Latino population, and the impact that Spanish maintenance might have on their educational outcomes. That proficiency in English is positively associated with educational achievement is well established (Rumbaut, 1997). A large body of research has investigated the academic problems associated with limited English proficiency --such as low levels of achievement, placement into lower grade levels or educational tracks, and high levels of dropout (Bean and Tienda, 1987; Clifton et al., 1986; Donato, Menchaca & Valencia, 1991; Eckstrom et al., 1986; Fligstein & Fernandez, 1985; Ready, 1991; Roscigno, Vélez and Ainsworth-Darnell, 2001; Rumbaut, 1997; Warren, 1996). However, the Spanish proficiency levels of Latino students who possess high-level English proficiency may also have important impacts on their educational achievement.

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For example, a great deal of research (Gans, 1992; Baral, 1979; Matute-Bianchi, 1991; Suarez-Orozco, 1991; Valverde, 1987; Zhou, 1997; Baral, 1979; Valverde, 1987; Matute-Bianchi, 1986) associates language loss in an ethnic mother tongue with the phenomenon of “second-generation decline,” that is, lower academic performance of U.S.-born students compared to their immigrant co-ethnics.

Research on the impact of bilingualism on academic achievement has generated mixed results. Several recent studies (Fernandez and Nielson, 1986; Nielson and Lerner, 1986; Zhou and Bankston, 1998; Portes and Rumbaut, 2001; Glick and White, 2003) find a positive association between bilingualism and enhanced educational achievement. Utilizing a measure based on Spanish use, understanding, speaking, reading, and writing, Nielson and Lerner (1986) find greater Spanish language proficiency to be positively related to higher grades and educational expectations among high-school seniors. In a sample of California middle school students, Rumberger and Larson (1998) find that Mexican Spanish-speakers who are also fluent in English experience higher grades and completion of coursework than limited English proficient or English monolingual Mexican students.

However, the impact of second-language maintenance on academic achievement does not appear to be straightforward (Rumbaut, 1995). Evans and Anderson (1973) find that Mexican-American students who speak Spanish at home score lower on standardized tests of educational achievement than both Anglos and Mexican Americans who speak English at home. However, using class grades as a measure of achievement, these researchers find no effect of language background for the Mexican-American students. Kennedy and Park (1994) find that for Asian students, using an immigrant language at home has a positive effect on grades but a negative effect on standardized achievement test scores, while for Mexican-American students speaking a language other than English at home has no effect when controlling for socioeconomic background, hours of homework, self-concept, sense of control over life, and educational expectations. Portes and Rumbaut (1990), in their research on children of immigrants in San Diego and Miami, find that for Asian and Cuban students, bilingualism is positively associated with higher grades, while for Mexican students it is not. Mouw and Xie (1999) find that bilingualism is associated with higher educational achievement only for those students whose parents do not speak English, suggesting that language offers a temporary advantage in that it allows for enhanced social capital between immigrant parents and their American children. In short, the literature presents an unclear picture of the impact of mother tongue maintenance on the academic achievement of children of immigrants.

2. Theoretical Perspectives on Language Skills and Achievement

Theoretical perspectives on ethnic incorporation also vary in their perspectives on the impact of language skills on academic achievement with some theoretical models suggesting that only English is associated with high levels of academic achievement, and others positing that bilingualism offers a greater advantage.

2.1 Bilingualism as a Disadvantage: Assimilation and Internal Colonialism

The assimilation perspective theorizes English monolingualism to be positively associated with educational achievement. Assimilation theory assumes a rapid transition to only English over generations (Fishman, 1972), with a shift to English only meaning increased incorporation into American institutions such as the educational system (Gans, 1979/1996). As such, English monolingualism is viewed as the key to academic success in the US educational context and educational success is linked to future social mobility. Likewise the internal colonialism perspective suggests that knowledge of Spanish is not an asset in the U.S. educational system. Despite high proficiency in English, intense discrimination toward members of colonized groups based on Spanish maintenance is associated with blocked educational achievement because Spanish is seen to “mark” racialized status, as do phenotypical racial characteristics, in essence blocking speakers from educational opportunities.

2.2 Segmented Assimilation

The segmented assimilation perspective posits that for children of immigrants, bilingualism enhances educational achievement, while linguistic assimilation puts them at risk for assimilation into an “underclass” (Portes and Zhou, 1993; Portes and Rumbaut, 2001). Segmented-assimilation theory posits that inner-city cultural norms devalue educational success, associating it with “acting white” (Fordham and Ogbu, 1986), as a result of experiences with discrimination and poverty (Zhou, 1997; Portes and Zhou, 1993; Fernandez-Kelly, 1995; Fernandez-Kelly, 1998) (For a critique of this aspect of the theory, see Bennett and Lutz, 2009). Shifting to “only English” makes students more susceptible to participating in peer cultures that devalue educational achievement.

Thus, language is used in ethnic families and communities to influence younger members into working toward educational success. This allows other family and community members, who may not know English well, to exert social control aimed at ensuring that children succeed academically so they can live out their parents' hopes for social mobility (Portes and Zhou, 1993; Portes 1995; Zhou and Bankston, 1998). The maintenance of language over generations can allow elder members of the community to utilize social networks to socialize children into cultural norms valued by educational institutions and promote academic success.

Segmented assimilation suggests that living in a neighborhood of coethnics provides an incentive for bilingual children to work harder in school and spend more time on schoolwork because of social pressure exerted by coethnics in the immigrant language. Because the segmented assimilation perspective emphasizes the importance of social capital networks maintained through the ethnic mother tongue in enhancing persistence in the educational system (Zhou and Bankston, 1996; Fernandez-Kelly, 1998), we might anticipate that enhanced educational achievement associated with dual language skills would accrue both to those who maintain substantial oral proficiency in addition to those who are literate in Spanish, because these social networks are maintained largely through speech and oral communication rather than written directives. As such both students with high levels of oral proficiency and biliterate students should benefit from co-ethnic social pressures to spend more time on schoolwork, which in turn, should lead to greater achievement.

2.3 Cognitive Aspects of Bilingualism

A good deal of research finds that high-level competence in two or more languages is beneficial to cognitive development, particularly through the process of establishing multiple codes for concepts (see for example Peal and Lambert, 1962; Cummins, 1976; Bain, 1974; Duncan and De Avila, 1979; Bialystok, 1988; Willig, 1985). The cognitive benefits associated with "multicompetence" defined as "knowledge of two or more languages in one mind" (Cook 2003, p. 2) (see also Cook, 1991; 1992; 1993) may enhance students' academic abilities in ways that go beyond language. Kecskes' (1998), work suggests that the studying of grammar and writing, in particular, is "crucial for the mental development of the child because these two help children rise to a higher level of speech development by making them become aware of what they are doing with language" (p. 324). According to Kecskes, the process of mental development associated with acquiring literacy in one's first language transfers to a second language, such that it also builds one's capacity in the first language. This may occur in cases where and extensive use and proficiency in two languages allows for the formation of a Common Underlying Conceptual Base (CUCB) that governs an individual's understanding in both languages. Kecskes and Papp (2003) note that "cognitive functioning and school achievement may be fed either through one language or through two languages if both are well developed" (p. 249). This enhanced mental development established through gaining literacy in two languages may provide advantages to students in learning other academic subjects.

2.4 Bilingualism, Cultural Capital, and Tracking

Children may learn a heritage language in a community center or religious institution after school or on weekends. This means additional time in a school-like environment beyond the regular school day. In this sense, language learning is the pursuit of an academic subject as an extracurricular activity and provides children with a form of cultural competency that may be rewarded by teachers. Alexander and Cook (1982), for example, have found that students who study foreign language in the ninth grade have a significantly greater likelihood of being placed in a college-track curriculum in high school. They note "foreign language represents one of the few avenues for implementing one's preference for an academically rigorous program of study" (1982, 633). While most of the work on focuses on the ways in which Latino/a students, particularly language minorities educational experiences are often subtractive (see Valenzuela, 1999), some optimistic possibilities for the ways in which Spanish maintenance may impact students experience also exist. Based on findings that Latino students who are biliterate in English and Spanish have higher levels of educational attainment than those who are English monolinguals in previous research, Lutz (2004) argues that bilingualism may be increasingly viewed a form of cultural capital in the United States; students with high-level early bilingual competencies may be interested in enrolling in foreign (whether heritage or other) language classes in high school and thus may signal to teachers an interest in college track courses through participation in courses traditionally linked to college-track curriculum.

2.5 Bilingualism and Parental Involvement

Finally, bilingualism may be associated with achievement because it is reflective of investments in children's human capital by their parents (Coleman, 1988).

In this sense, the maintenance of high levels of proficiency in an immigrant language may be indicative of parental commitment to and participation in children's educational endeavors in general. Parent-child interaction is clearly an important factor in children's educational development, and segmented assimilation theorists view childhood bilingualism as an indication that children are maintaining strong ties to the family and ethnic community, a strategy that is seen to prevent their entry into adversarial cultural activities. However, based on the results of their study of first- and second-generation Asian students, Mouw and Xie (1999) argue that "the academic benefits of maintaining bilingual proficiency are transitional and gradually diminish as the parents of immigrant children develop English language proficiency" (p.233).

Thus, according to Mouw and Xie, the benefits of bilingualism are accrued from the ability of children to interact with their parents in a meaningful way, rather than directly from cognitive advantages or cultural capital associated with language skills or from ethnically based social capital networks in the community maintained through immigrant languages.

In this sense, children may benefit from bilingualism in the same ways that they benefit from other elements of parental involvement, such as regular help with homework; teaching children language skills represents a transfer of knowledge (i.e. human capital resources) from parents to children (Coleman, 1988). An immense amount of time and commitment is required for children to gain high levels of proficiency in an immigrant language, particularly literacy. Given that most children of immigrants do not gain these skills at school, those who learn, not just to speak, but to read and write in an immigrant mother tongue from their parents may benefit from unusually high levels of parental involvement. Parents who put the requisite time and effort into a child's literacy in a second language are likely to be highly involved and invested in the child's educational life in general. A great deal of research has indicated that high levels of parental involvement are associated with greater educational success for children¹ (Milne et al., 1986; Sui-Chu Ho and Willms, 1996; Singh et al., 1995; Keith et al., 1993; Astone and McLanahan, 1991; Fehrmann, Keith, and Reimers, 1987). In this sense, bilingualism may reflect a great deal of parental contact with the child, and conceivably high expectations and involvement in the child's academic pursuits. As such, both high-level bilingualism and academic achievement may be products of extraordinary levels of parental involvement in their children's development.

In summary, the segmented assimilation perspective, the cognitive perspective, the cultural capital perspective and parental involvement perspective all anticipate that Spanish maintenance, in addition to English, acts to enhance educational achievement. In contrast, the assimilation perspective and the internal colonialism perspective, albeit based on different criteria, anticipate that English monolingualism is associated with the greatest educational achievement.

3. Data and Methods

The data used in this research are from the National Education Longitudinal Survey (NELS:88). NELS:88 is a longitudinal, nationally representative dataset that follows the academic trajectories of youth from their pre-high school years through their mid-twenties. It includes rich data on home language use and multiple indicators of proficiency in English and Spanish, as well as social, demographic, and education-related information. NELS:88 was administered in 1988 to 24,599 eighth graders and to their parents, teachers, and principals, and it provides individual, family, and school-level data. Surveys were again administered to the same students in 1990, 1992, 1994, and 2000. Students identified as "Hispanic" were over-sampled.

Selecting only those students who speak English well regardless of Spanish ability and who remained in the study from 1988 to 1994, I utilize OLS regression to examine the impact of dual language proficiencies and ethnicity and the control variables on academic achievement in math and English. For each of the dependent variables, a series of models were estimated to examine the impacts of the independent variables net of the effects of the other variables. All analysis are weighted and the standard errors presented here are robust to address design effects in NELS:88 (National Center for Education Statistics, 2003).

3.1 Measuring the Dependent Variables

High School Achievement Test Scores (in Centiles)

High school achievement in math and reading are measured by the student's score in centiles on achievement tests taken in their senior year of high school. Possible scores range from 1-99.

3.2 Measuring the Independent Variables

Dual Language Proficiency variables reflect the student's overall language proficiency in speaking, understanding, reading and writing in English and Spanish in the eighth grade. Student's responses of self-rated proficiencies in English and Spanish from nine questions were used to create five categories of dual language proficiency: English only, English dominant, Oral Bilingual, and Biliterate.ⁱⁱ In so doing, this research is not limited by what Portes and Hao (2002) have described as "a dualistic framework where foreign monolingualism is opposed to full assimilation into English" in much of the research on language proficiencies (p. 891). Further, the distinctions between oral proficiency and literacy in Spanish can allow me to address the advantages of language as a form of social capital (implying oral proficiency and literacy) versus cultural capital or cognitive issues (implying literacy).

Based on self-reports of language proficiency in English and Spanish by Latino/a students, I utilize the following typology for the various measures of language proficiencyⁱⁱⁱ:

English Only- refers to an individual who speaks, reads, and writes only in English.

English Dominant- refers to an individual who has high proficiency in English, limited oral proficiency in Spanish, and no Spanish literacy

Oral Bilingual- refers to an individual who has high proficiency in English and high oral proficiency in Spanish, but limited reading and writing abilities in Spanish.

Biliterate- refers to an individual who has high proficiency in English and is also highly literate in Spanish.

These distinctions are useful in that they allow for different dimensions of language skills in Spanish, namely oral proficiency and literacy similar to Portes and Rumbaut's (1996) notion of folk versus fluent bilingualism. Except for a very few cases, those students classified as biliterate were also highly proficient in oral Spanish. Because this research focuses on the impact of Spanish retention (in addition to high overall levels of English proficiency), those with limited English are not included in the sample. In this sample of English speaking Latino students, 17.9% speak only English, 21.1% are English dominant, 21.8% are bilingual, and 37.3% are biliterate. In the regression analysis, English only serves as the reference (or omitted) category, indicating that the achievement outcomes of students in all other categories of language proficiency are compared to the outcomes of students in of the English only category. Additional variables in the regression models are described in table 1 and means and standard deviations for all variables used in the multivariate analysis are presented in table 2.

Ethnicity	<i>Ethnicity</i> is measured by a series of categorical variables based on the student's response to the question, "Which of these best categorizes your background?" There are four possible Latino responses: 1) Mexican, Mexican-American or Chicano, 2) Cuban, 3) Puerto Rican, or 4) Other Hispanic. "Mexican, Mexican-American or Chicano" is the reference (omitted) category.
Race	Students were asked to identify racially as well as ethnically. <i>Race</i> is measured by a series of categorical variables based on the student's response to the question, "What is your race?" The three race categories used here include Hispanic, White and Other.
Immigrant Generation	<i>Generation</i> is measured by a series of categorical variables constructed from questions on student and parent birthplaces for the base year (eighth grade): ^{iv} first generation (children born outside of the United States), second generation (U.S.-born children with at least one foreign-born parent), third and later generations (U.S.-born children of native-born parents). In addition I include a fourth generational category called unknown generation. A relatively large portion of the sample cannot be adequately identified by generation because of missing data on parent and child birthplace questions (Both children and parents are have not responded to the place of birth question). Indeed, nearly 13% of the English-proficient Latino sample is missing data only on generation status. Upon further analysis I have found that children whose generation cannot be identified because of missing data differ significantly and systematically from children of other generational status across a variety of criteria, most notably socioeconomic status. I therefore include them in a separate category because they potentially reflect the US- and foreign-born children of immigrants with undocumented or ambiguous legal status. "Third and later generations" is the reference category.
Gender	<i>Gender</i> is a dichotomous variable measured by the student's self-report of sex, either male or female where female is the reference category.
Time Spent on Homework	<i>Time Spent on Homework</i> is a variable derived from two ordinal scales indicating the child's self report of the number of hours spent on homework per week, at home and school. The scales were recoded to their midpoints and added together.
Family Status	<i>Single-Parent Status</i> is a dichotomous variable which indicates if the child's parents are not married or married (or in a marriage-like relationship): Married is the reference (omitted) category. <i>Number of Siblings</i> is a variable measuring the student's or parent's base-year report of the number of brothers and sisters the student has, including any stepbrothers or stepsisters who live in the same home. Values range from "0" to "6 and above."
Socioeconomic Status	<i>Socioeconomic Status</i> is measured using a standardized scale created by the National Center for Education Statistics (NCES), which includes parents' income, occupation, and education. The range for the variable is -2.97 through 2.56.
School Type	<i>School Type</i> is a series of dichotomous variables indicating whether the student attends a public, Catholic, or private high school.

Table 2. Descriptive Statistics for Variables Used in the Regression Analysis (N=1190)

Variables	Mean	Std Dev
Reading Achievement test score (in Centiles)	41.355	25.763
Math Achievement test score (in Centiles)	40.001	26.054
Dual Language Proficiency		
English Only	0.179	0.383
English Dominant	0.211	0.408
Oral Bilingual	0.218	0.413
Biliterate	0.373	0.484
<i>Ethnicity</i>		
Mexican	0.655	0.475
Cuban	0.044	0.204
Puerto Rican	0.101	0.302
Other Hispanic	0.188	0.391
<i>Race</i>		
Black	0.038	0.191
White	0.626	0.484
Other Race	0.312	0.463
<i>Generation</i>		
Second Generation	0.385	0.487
First Generation	0.158	0.365
Ukn. Generation	0.118	0.322
Male	0.477	0.499
Time Spent on Homework	6.769	5.723
<i>Family Status</i>		
Single Parent	0.152	0.359
Number of Siblings	2.701	1.645
Socioeconomic Status	-0.582	0.741
<i>School Type</i>		
Catholic High School	0.071	0.256
Private High School	0.016	0.127

4. Results

The results of five OLS regression models address the impact of dual language proficiency on math achievement (table 3). The baseline model (Model 1) includes individual-level characteristics, and the other models add to the baseline time spent on homework (Model 2) family structure (Model 3), socioeconomic status (Model 4), and school type (Model 5). Relationships that are statistically significant, indicating that the relationship is highly likely not to be due to chance, are identified with one or more asterisks (*). The results indicate that there are academic benefits of Spanish maintenance on math achievement, mainly driven by the effect of English/Spanish biliteracy, which has a very strong positive effect on academic achievement for Latino/a students. Compared to those who speak only English, English-dominant students, and students who are bilingual (but not biliterate) are not statistically different. Compared to English monolinguals, biliterates are significantly more likely to have higher scores in math. Net of the effects of other variables (Model 5), English/Spanish biliteracy is associated with scoring nearly 12 percentage points higher in math. Other important effects on overall math achievement for Latino/a students include time spent on homework, parents' socioeconomic status, racial identification, gender, and Catholic school attendance.

Models 1 and 2 indicate significantly lower scores for students who identify as racially “other” although the significance disappears when family status variables are included in the models (Model 3). Models 1-3 indicate significantly higher math achievement for those who identify ethnically as “Other Hispanic” as well as a significant 3 ½ point lower scores in math achievement per additional sibling. However these differences disappear when socioeconomic status is included in the model indicating that these differences in math achievement relate to differences in socioeconomic status (Model 4). Models 1-3 indicate that Cuban ethnicity is associated with significantly higher scores in math achievement. This difference in achievement drops to a nearly 7 point advantage when socioeconomic status is included (Model 4), and becomes insignificant when school type is entered in the model (Model 5), suggesting that higher math achievement among Cubans is related to attendance in private or Catholic schools. Generation, which has been shown in other research to have a substantial impact on language proficiencies, does not appear to have a significant effect on academic achievement except for those whose generation status is unknown (models 1-3). As mentioned earlier, this category may reflect ambiguous legal status and the relationship disappears when socioeconomic status is included in the model.

Table 3. OLS Regressions. Impact of Dual-language Proficiencies and other Variables on Achievement Test Scores in Math (N=1190)

	Bivariate Estimate	SE	Model 1 Estimate	SE	Model 2 Estimate	SE	Model 3 Estimate	SE	Model 4 Estimate	SE	Model 5 Estimate	SE
<i>Dual Language Proficiency</i>												
English Only (omitted)												
English Dominant	1.262	3.088	3.18	2.815	3.311	2.873	3.283	2.867	3.958	2.748	3.337	2.496
Oral Bilingual	-2.439	2.961	-0.027	2.884	-1.118	2.873	-0.854	2.892	1.756	2.729	1.02	2.544
Biliterate	6.78**	2.593	9.477***	2.43	9.541***	2.677	9.532***	2.702	12.216***	2.378	11.924***	2.221
<i>Ethnicity</i>												
Mexican (omitted)												
Cuban	17.554**	5.499	16.915***	4.393	15.291***	3.768	14.032***	3.764	6.807*	3.28	5.176	3.143
Puerto Rican	5.091	4.315	4.073	3.886	4.803	3.167	4.646	3.186	1.414	3.167	0.713	3.167
Other Hispanic	8.745**	2.926	8.394**	2.905	9.455***	2.772	9.18***	2.756	4.795	2.602	4.012	2.362
<i>Race</i>												
White (omitted)												
Black	-14.905***	3.681	-17.069***	3.73	-15.158***	3.741	-14.57	3.86	-11.403***	3.353	-11.492***	3.375
Other Race	-4.468*	1.989	-3.954*	1.767	-3.566*	1.702	-2.897	1.678	-0.939	1.653	-1.219	1.617
<i>Generation</i>												
Third Generation (omitted)												
Second Generation	1.352	2.548	-2.855	2.444	-1.593	2.477	-1.022	2.455	1.999	2.358	1.59	2.246
First Generation	0.72	3.293	-3.506	3.091	-0.931	2.809	-0.094	2.915	3.226	2.929	3.368	2.823
Ukn. Generation	-9.052***	2.794	-9.478***	2.46	-6.944**	2.519	-6.909**	2.548	-3.587	2.759	-3.952	2.734
Male	7.17**	2.257	7.946***	1.992	8.149***	2.135	7.928***	2.136	6.819**	2.211	6.624**	2.204
Time Spent on Homework	1.219***	0.23			1.247***	0.186	1.249***	0.185	1.001***	0.183	0.992***	0.178
<i>Family Status</i>												
Single Parent	-3.537	2.701					-3.476	2.392	-0.234	2.404	-0.343	2.322
Number of Siblings	-1.648	0.57					-1.087*	0.5	-0.254	0.474	-0.264	0.459
Socioeconomic Status	12.408***	1.375							10.761***	1.425	10.007***	1.389
<i>School Type</i>												
Catholic High School	19.775***	4.898									10.923**	3.569
Private High School	-3.061	14.222									-3.622	11.143
Constant			33.929***		23.991***		27.037***		29.712***		29.724***	
R2			0.102		0.174		0.18		0.245		0.256	

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

Table 4 presents the results of five OLS models address the impact of dual language proficiency on reading achievement.^v As in the previous case, the baseline model (Model 1) includes individual-level characteristics, and the other models add to the baseline time spent on homework (Model 2) family structure (Model 3), socioeconomic status (Model 4), and school type (Model 5). Similar to math achievement, these results indicate a strong positive effect of biliteracy on achievement test scores in reading (in English). Net of the effects of other variables (Model 5), English/Spanish biliteracy is associated with scoring nearly 11 percentage points higher in reading. English dominant and students with oral proficiency in Spanish did not score significantly differently than English monolinguals. As in the case of math achievement, students who spent more time on homework scored significantly higher in reading as did those with higher socioeconomic status. Students who identified as racially “other” scored significantly lower in reading than students who identified as white. In Models 1-3, students who identified as “other Hispanic” scored significantly higher in reading than Mexicans, although (as in the case of math achievement) this advantage disappears when socioeconomic status is included in the model (Model 4). Also as in the previous case, generation has little impact on achievement except for unknown generation status, which, again falls from significance when socioeconomic status is included in the model.

Table 4. OLS Regressions. Impact of Dual-language Proficiencies and other Variables on Achievement Test Scores in Reading (N=1190)

	Bivariate Estimate	SE	Model 1 Estimate	SE	Model 2 Estimate	SE	Model 3 Estimate	SE	Model 4 Estimate	SE	Model 5 Estimate	SE
<i>Dual Language Proficiency</i>												
English Only (omitted)												
English Dominant	-0.168	2.683	2.161	2.598	2.266	2.576	2.3	2.572	2.814	2.432	2.725	2.326
Oral Bilingual	-3.508	2.579	0.052	2.897	-0.824	2.834	-0.575	2.868	1.412	2.796	1.283	2.677
Biliterate	5.697*	2.464	8.834***	2.715	8.886**	2.836	8.948**	2.876	10.991***	2.644	11.132***	2.589
<i>Ethnicity</i>												
Mexican (omitted)												
Cuban	9.446	6.891	7.573	6.209	6.27	5.943	5.252	5.993	-0.251	5.764	-1.603	5.732
Puerto Rican	1.593	3.546	1.921	3.336	2.507	3.26	2.274	3.343	-0.187	3.404	-0.39	3.407
Other Hispanic	5.18*	2.553	5.284*	2.548	6.136*	2.466	5.881*	2.417	2.541	2.114	2.246	2
<i>Race</i>												
White (omitted)												
Black	-12.806*	6.575	-13.566	7.124	-12.031	7.183	-11.735	7.234	-9.323	6.421	-9.127	6.379
Other Race	-6.842***	1.702	-6.38***	1.656	-6.068***	1.724	-5.646***	1.755	-4.154*	1.901	-4.169*	1.892
<i>Generation</i>												
Third Generation (omitted)												
Second Generation	-0.189	2.246	-3.463	2.408	-2.45	2.468	-2.064	2.43	0.237	2.364	0.005	2.309
First Generation	-2.075	2.954	-5.272	2.966	-3.204	2.865	-2.558	2.932	-0.03	2.921	-0.049	2.873
Ukn. Generation	-7.405**	2.578	-8.321***	2.5	-6.285*	2.474	-6.174*	2.487	-3.643	2.473	-4.132	2.41
Male	-1.882	2.027	-1.084	1.861	-0.921	1.929	-1.061	1.931	-1.905	2.017	-1.821	2.027
Time Spent on Homework	1.005***	0.172			1.001***	0.159	1.003***	0.16	0.814***	0.159	0.824***	0.158
<i>Family Status</i>												
Single Parent	-1.828	2.71					-1.408	2.55	1.061	2.368	1.12	2.342
Number of Siblings	-1.275*	0.536					-0.835	0.517	-0.2	0.51	-0.188	0.508
Socioeconomic Status	9.186***	1.281							8.197***	1.525	7.624***	1.435
<i>School Type</i>												
Catholic High School	11.53*	5.109									6.255	4.549
Private High School	11.783*	5.552									9.78	5.279
Constant			42.239		34.257		36.409		38.446		37.642	
R2			0.059		0.107		0.11		0.148		0.154	

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

5. Discussion and Conclusion

This research is generally supportive of the theoretical perspectives that suggest that bilingualism offers an achievement advantage to Latino/a students, although the mechanisms by which this advantage accrues requires further investigation. These results suggest that in terms of the academic achievement of Latino/a students, the benefits of Spanish proficiency only accrue to those who are literate in Spanish. Spanish literacy offers a significant advantage to students both in terms of grades and achievement scores as biliterate students are more likely to receive high marks and less likely to receive failing marks compared to students who speak only English.

Given higher levels of achievement associated with bilingualism (including, but not specifying biliteracy) in other research, some researchers question whether there is a causal effect of language proficiency on achievement. Many researchers question whether early bilingualism/biliteracy produces enhanced cognitive capabilities, or whether those with higher cognitive capabilities are more likely to have high dual language abilities (see for example Macnamara, 1966). The maintenance of biliteracy requires significant investments of time and effort and it may be the case that biliteracy is maintained only among the most diligent students, or students with high aptitudes for language. Such students would also be likely to do well in academic pursuits. It is possible then, that both academic achievement and biliteracy are effects of higher cognitive ability or of personal traits such as diligence or perseverance. However, because Spanish acquisition generally occurs in the home, it likely reflects family and cultural considerations, as well as the parental and child interest in maintaining the language rather than the cognitive abilities of the child.

While the results indicate that the benefits of Spanish proficiency accrue only to those with high literacy skills, the results also indicate another less obvious, but important finding; there appears to be no significant cost associated with bilingualism for Latino/a students. While those who maintain high and low levels of oral proficiency through use of Spanish at home or with extended families may not derive benefits from their language proficiencies in the form of academic achievement, the results indicate that their bilingualism is not subtractive in nature, meaning that skills associated with one language are not compromised with the addition of another language. That is, the maintenance of what Portes and Rumbaut (1996) refer to as “folk bilingualism” --oral proficiency that enables communication within families and ethnic communities-- is not associated with lower academic achievement compared to English monolingualism. This is a substantial finding insofar as many young Latinos/as maintain a largely oral proficiency in Spanish, a proficiency that may have important family, cultural and personal meanings that go beyond academic pursuits.

Thus, the main findings of the analysis of the effect of language proficiencies in English and Spanish on academic achievement of Latino/a students can be summarized as follows. Spanish proficiency *in addition to English proficiency* is also significantly associated with academic achievement. When different aspects of language proficiency are taken into account, however, the results indicate that those who maintain only oral proficiency in Spanish are not significantly different in their academic achievement than their coethnics who are English monolinguals. The real benefits of Spanish proficiency in terms of academic achievement are accrued to English/Spanish biliterates who score over 11 percentage points higher on standardized achievement tests in reading and nearly 12 points higher on standardized achievement tests in math than English monolinguals.

6. Future Research

Further research is needed on this topic. While biliteracy offers advantages in terms of achievement among Latino/a students, further investigation is warranted to see how Latino/a students, and biliterate students in particular, fare when compared to other students. Additionally, further research is needed to understand the nature of the achievement advantage of biliterate students.

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ENDNOTES

ⁱ A notable exception is a high level of parental contact with schools because of child disciplinary or other school-related problems (See Milne et al 1986).

ⁱⁱ For the English proficiency measures, students were asked four questions: How well do you do the following? How well do you... a. Understand spoken English b. Speak English c. Read English d. Write English? Students could respond very well, pretty well, well or not very well. Items were coded as follows: Very well=4, Pretty well=3, Well=2, Not very well=1. In the NELS:88 survey, these questions were asked of students who responded “yes” to the question “Is any language other than English spoken in your home?” The value assigned to the response “very well” is imputed for monolingual English speakers.

Spanish proficiency is measured using NELS:88 survey questions. To determine Spanish proficiency, the following questions were used: With regard to THAT LANGUAGE, how well do you do the following? How well do you...a. Understand that language when people speak it b. Speak that language c. Read that language d. Write that language? This time students could respond very well, pretty well, well, not very well, or not at all. The responses are coded as follows: Very Well=4, Pretty Well=3, Well=2, Not very well=1, Not at all=0. Students were asked these four questions if they answered “yes” to the screening question “Is any language other than English spoken in your home?” Only those who responded “Spanish” to the follow-up question “What language, other than English, do you currently use most often?” were selected for inclusion in this analysis. A score of “0” reflecting a response of “not at all” on the home language proficiency measure was assigned to those who indicated that only English is used in their home.

Those who report high overall English proficiency (at least “well” or an average of 2 or above across the four categories) and some limited oral proficiency in Spanish (less than “well” on average), but no reading or writing abilities are categorized as English dominant. Those who report high overall English proficiency, high oral proficiency in Spanish (at least “well” on average), but low proficiency in reading and writing (less than “well”) in Spanish are categorized as oral bilingual. Those who have high overall proficiency in English and can also read and write well in Spanish (at least “well”) are categorized as biliterate. Those who report low levels of English proficiency are categorized as Spanish dominant/limited English proficient.

ⁱⁱⁱ The size of the Spanish-dominant/limited English proficiency population in NELS:88 is too small to include in the multivariate analysis.

^{iv} See also Oropesa and Landale 1997 for a similar identification of immigrant generation.

^v Models were also estimated with science and history scores and show similar results to the math and reading results.