

**BILINGUAL EDUCATION AND LABOR MARKET EARNINGS AMONG HISPANICS:
EVIDENCE USING HIGH SCHOOL AND BEYOND**

Mark Hugo López
Assistant Professor

School of Public Affairs
University of Maryland
College Park, MD 20742-1821
e-mail: mlopez@puafmail.umd.edu

and

Marie T. Mora
Assistant Professor

Department of Economics & International Business
New Mexico State University
Las Cruces, NM 88003-8001
e-mail: mmora@nmsu.edu

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Abstract

During the past few decades there has been a rapid increase in the number of limited-English-proficient individuals in the U.S. If language deficiencies inhibit educational progress and labor market outcomes, schooling programs like bilingual education have long term economic implications. We first explore the link between English proficiency and earnings for Hispanic workers using 1990 U.S. Census data. Then, utilizing data from High School and Beyond, we find that first generation and (to a lesser extent) second generation Hispanics who attended a bilingual education program appear to earn significantly less than otherwise similar English-immersed peers who received monolingual English instruction, *ceteris paribus*.

JEL Codes: I21, I28, J15

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INTRODUCTION

Recent growth of the language minority population has shifted the linguistic distribution in the United States. For example, the U.S. decennial censuses report that the population share of residents aged five years and older who speak a non-English language at home rose from 11 to 13.8 percent (approximately from 23 million to 31.5 million individuals) between 1980 and 1990. Moreover, the portion of language minorities who report speaking English either “not well” or “not at all” increased from 18.3 to 21 percent during this time (U.S. Department of Commerce 1984, 1993). The increase in the number of immigrants from non-English-speaking countries as well as the relatively high fertility rates of U.S.-born language minorities account for most of this shift.

While social scientists have consistently shown that English proficiency enhances schooling attainment, earnings, and occupational sorting in the U.S.,¹ less empirical attention has focused on the educational vehicles by which limited-English-proficient (LEP) students acquire English skills. The changing linguistic demographics indicate that U.S. schools face the task of instructing larger numbers of children with poor English fluency. Indeed, recent estimates suggest that LEP students represent at least five percent of all K-12 public school children (Han et al. 1997).

Schools have responded to the growing numbers of LEP children by instituting a variety of bilingual education programs. Such programs, however, are costly. Recent data report that between eight and ten billion dollars are spent per year on special educational services for LEP students at the state and local level in this country (ALEC Foundation 1994). Additionally, despite the fact that the U.S.

¹ See for example McManus, Gould & Welch 1983; Chiswick 1991; Dávila, Bohara & Sáenz 1993; Mora 1998; and Mora and Dávila (forthcoming).

Department of Education receives federal on-budget funds for bilingual education programs, widespread disagreement exists over its relative effectiveness. Some analysts argue that bilingual education efficiently provides LEP children the opportunity to learn English and the course material simultaneously, while others argue that such programs delay the English skill acquisition and subsequent socioeconomic positions of these students.

In what follows, we first discuss some of the key issues regarding the bilingual education debate. An overview of the English proficiency of Hispanic workers is next provided using the 1% Public Use Microdata Sample (PUMS) of the 1990 U.S. Census. We then empirically analyze some of the labor market implications of bilingual education for Hispanic LEP students utilizing the 1980-1992 longitudinal surveys from the Restricted-Use High School and Beyond (HSB) data files. Policy implications are also explored. We focus on Hispanics because they comprise the vast majority of the language minority population in the U.S., and are expected to become this nation's largest racial/ethnic group in less than a decade.² Moreover, Hispanics represent the largest share (nearly three-fourths) of bilingual education recipients in the U.S. (Fleischman & Hopstock 1993).

DEBATE OVER BILINGUAL EDUCATION

Because English proficiency has been found to positively affect educational attainment and labor market outcomes (see Note 1), schooling programs designed to promote English fluency clearly have long-term value. Consider two mainstream methods to educate language minority students: (1)

²In 1996, Hispanics comprised 10.5 percent of the total population in the U.S. By 2005, their projected population share is 12.6 percent, compared to the projected 12.4 percent share of non-Hispanic African Americans in this country (U.S. Bureau of the Census 1996).

monolingual instruction in English, and (2) a hybrid approach using both English and the minority language, i.e., bilingual education.³

States and school districts have traditionally designed and implemented bilingual education (henceforth BE) programs, at times with the help of the federal government. While most BE programs are funded at the state and local levels, federal funding has been made possible through the *Bilingual Education Act* (Title VII of the *1968 Elementary and Secondary Education Act*) (U.S. Department of Education 1992). Despite federal aid, the type of BE program, as well as the selection of students who receive BE, lacks conformity across states and even within school districts. Many schools use a combination of screening methods to select BE students, including teacher observations and referrals, home language surveys, students' academic records, parent recommendations, oral interviews, language exams, and achievement tests (Han et al. 1997).

As with most publicly funded programs, BE is not without debate. Individuals in favor of BE assert that instruction in two languages allows for cognitive skill development in the minority language; these skills eventually transfer to the English-speaking domain of the student (see Ovando 1983, 1989). Moreover, this view contends that BE serves as an integral ingredient for increasing LEP students' educational attainment and achievement.⁴ Finally, BE supporters contend that monolingual English instruction denies LEP students their opportunity for equal education, given that class material is presented in an unfamiliar language. Legally, *Lau vs. Nichols* (1974) provides support for this view: the

³ Although we use the rubric of "bilingual education" to refer to any schooling program that utilizes both the minority and majority languages [including English as a Second Language (ESL) programs], the reader should be aware that a tremendous amount of heterogeneity exists among these programs (see U.S. Department of Education 1992). Most programs (80 percent) in this country are the one-way (transitional) program, in which students are taught the class material in both the minority and majority languages; the use of the minority language is discontinued once students learn the majority language. ESL is a special form of the "one-way" program, in which students attend English-only classes for part of the day, and receive English instruction in the minority language during the rest of the day. A "two-way" (bilingual/bi-cultural) program integrates both language-minority and language-majority students in the same class; each group learns the other's language and cultural characteristics. The technical definition of bilingual education used by policy makers and educators for funding purposes actually excludes ESL programs.

⁴ See Ovando 1983, 1989; Curiel, Rosenthal & Richek 1986; Rodgers 1995; López 1996; and Mora 1996, 1997.

Supreme Court ruled that school districts failing to provide understandable instruction for LEP students obstruct these students' rights to equal educational opportunity (e.g., Meier & Stewart 1991; Donato, Menchaca & Valencia 1991).

Proponents of monolingual English instruction argue that English immersion is the most efficient method to integrate LEP students into an English-oriented society. One primary concern of the BE opponents includes the segregation of LEP students into separate classrooms or schools, which limits the contact with English fluent students and hence decreases the likelihood of assimilation into predominately English-speaking environments.⁵ Public school segregation has been outlawed since *Brown vs. Board of Education* (1954).

Finally, an alternative view of BE posits that despite possible *theoretical* benefits, BE programs are not effective in practice (see Mora 1997; Glenn 1997; Headden 1995). Much of this conviction arises because many teachers do not receive appropriate training for instructing LEP students (e.g., Han et al. 1997), and may teach students that speak a language outside of the realm of the BE course.⁶ This view also notes that the placement of recent immigrants into advanced BE classes with students in the same age group may delay the English progress of the other children because teachers must revert back to a strong usage of the minority language to accommodate the new students (Glenn 1997).

The long-standing debate over BE is far from being resolved. Empirical methods, however, may be utilized to investigate the effectiveness of BE *vis-a-vis* English immersion programs. We seek to add insight into the potential labor market consequences of these programs throughout the rest of this paper.

ENGLISH PROFICIENCY IN THE LABOR MARKET

⁵ The reader is referred to Glenn 1997; Porter 1996; Chavez 1991; López 1997a; Mora 1996, 1997; Headden 1995; Meier & Stewart 1991; Donato et al. 1991; Crawford 1989; and Ovando 1983.

⁶ For example, some Chinese-speaking students in San Francisco have been placed in Spanish-English bilingual classes (Headden 1995).

Employing data from the 1% Public Use Microdata Sample (PUMS) of the 1990 U.S. Census, we next illustrate some of the labor market facets associated with English fluency for Hispanic workers. While other national data sets include similar labor market information, the PUMS has the advantage of providing categorical information on how well individuals report speaking English, which consists of “n/a; only English is spoken at home”, “very well”, “well”, “not well”, and “not at all”. Our PUMS sample contains both immigrant and U.S.-native Hispanic workers aged 16-64 years who speak English or Spanish (or both). We drop from our sample individuals reporting self-employment, work outside of the U.S., military status, work without pay, enrollment in school, zero earnings, zero usual hours worked, or zero weeks worked. Finally, we exclude workers with allocated (imputed) earnings, weeks worked, and usual hours worked per week.

PUMS Sample Summary Statistics

Table 1 presents some demographic statistics of Hispanic workers within the different English proficiency categories. Note that immigrants comprise a larger segment of the less proficient categories than Hispanics born in the U.S. Moreover, hourly earnings (last year’s annual earnings divided by weeks worked times usual weekly hours worked) and education⁷ monotonically relate to English skills. Finally, Table 1 reaffirms the relationship between English fluency and occupational status (see Note 1), where a higher share of English proficient workers are employed in white collar jobs than in the less fluent categories.

(TABLE 1 ABOUT HERE)

English Proficiency and Earnings

⁷ We use the translation presented by Park (1994) to measure years of completed schooling. The 1990 PUMS does not provide the actual number of schooling years; instead, it categorically presents the highest education level attained. These categories closely parallel the schooling coding presently utilized by the Current Population Survey (CPS); in February 1990, the CPS provided education both continuously and categorically. Because the same individuals gave information for both schooling codes, Park (1994) estimates schooling years using the educational categorical coding.

Further insight into the link between English proficiency and earnings is presented in Table 2, which displays the empirical results obtained from estimating a basic Mincer (1974) earnings function: the dependent variable is the natural logarithm of hourly earnings, and the right-hand side variables include the English skill categories, education, experience (age-education-5), and experience-squared.

(TABLE 2 ABOUT HERE)

Note that English proficiency significantly enhances earnings as expected (with the exception of the statistically insignificant “very well” category for immigrant women). Also, Hispanic men appear to be penalized more than women via lower earnings for speaking English poorly; this finding reaffirms extant research suggesting that the male/female earnings gap narrows when taking into account English proficiency (Mora & Dávila 1997). The remaining results in Table 2 are standard.

Correlates of English Proficiency

Because our study involves the labor market outcomes associated with the education of LEP students in the U.S., it is of interest to analyze whether immigrant workers who completed some schooling in the U.S. have a better command of English than their peers who were solely educated abroad. We thus estimate an ordered logit by gender using our Hispanic sample, with the English skill categories as the dependent variable (ranked from 0 = “no English is spoken” to 4 = “only speaks English at home”). A binary variable equal to one if an immigrant acquired all schooling abroad is entered as a covariate.⁸ Moreover, because other studies have shown that the English skills of workers in U.S. labor markets incorporate a host of confounding influences (e.g., McManus, Gould & Welch 1983; Stevens 1992; Espenshade & Fu 1997; Espinosa & Massey 1997; Mora 1998; and Mora and Dávila, forthcoming), we include additional control variables for education, potential experience, marital status,

⁸ While the PUMS does not specifically provide this information, we obtain a proxy by comparing the individual's estimated age when completing school (education + 5) with the estimated age at arriving to the U.S. (using the means of the PUMS-provided migration-time-interval categories). If the worker migrated to the U.S. at a younger age than completing school, we assume the individual acquired at least some education in this country. Foreign experience is constructed in a similar manner.

Hispanic ethnicity, immigrants= time in the U.S. (depicted by the ten migration-time intervals in the PUMS), and foreign experience. Table 3 presents the results from this empirical exercise.

(TABLE 3 ABOUT HERE)

Table 3 indicates that Hispanic immigrants who were educated abroad are significantly less proficient in English than their otherwise similar U.S.-schooled counterparts, *ceteris paribus*. Such a result reaffirms other studies noting that the educational system influences English skill acquisition beyond immigrants' tenure in the U.S. (e.g., Mora and Dávila, forthcoming).

Other findings are consistent with conventional wisdom. For example, educated workers are more fluent in English than their less educated peers. Workers with labor market experience, particularly immigrants with foreign training, are less English proficient. Moreover, note the monotonic relationship between the time-intervals of migration and English skills, where recent immigrants are the least fluent in English. Finally, ethnicity (and for women, marital status) significantly relate to English proficiency.

With respect to the aim of our paper, Tables 1-3 provide at least three effects to speculate potential benefits or downfalls of BE. First, if BE directly enhances [hinders] English fluency, workers should reap higher [lower] labor market earnings. Second, BE may influence educational attainment directly or indirectly (through its impact on English proficiency), which in turn affects future labor market outcomes. Third, BE may affect the assimilation of recent immigrants in U.S. schools, potentially stimulating or depressing involvement in the national labor market.

BILINGUAL EDUCATION AND THE LABOR MARKET

One method to gauge the potential benefits or shortcomings of BE on socioeconomic outcomes is to investigate its direct influence on labor market income. Using surveys from the Restricted-Use High School and Beyond (HSB) data set, we now compare the earnings between Hispanic workers who took

BE at some point during their educational careers and their otherwise similar peers who received monolingual English instruction.⁹

HSB Data

In 1980, the National Center for Education Statistics (NCES) sponsored HSB to obtain a national longitudinal data set of high school students who were either sophomores or seniors. Follow-up surveys have since been conducted in 1982, 1984, 1986, and 1992. HSB contains a wealth of information on students' background and language use, academic and high school characteristics, and work experience.

The advantage of using HSB over other national education data sets stems from the fact that labor market outcomes are observed at least one decade after high school completion. For example, NCES also conducted the National Education Longitudinal Study of 1988 (NELS:88), in which the base-year survey includes eighth graders. Although longitudinal, the recency of NELS:88 prevents observing the labor market outcomes for many of the surveyed students because they have not yet entered the formal labor market. One disadvantage with HSB, however, includes the selection group of the base-year survey: high school sophomores and seniors. Educational attainment and labor market results analyzed using HSB may be affected by a censoring-bias associated with the fact that many minorities, such as Hispanics, drop out prior to the tenth grade.

Defining the Sample of Analysis

We focus on Hispanic workers in the 1992 restricted-use follow-up survey who had been high school sophomores in 1980, and include additional information from each subsequent follow-up survey. Out of the 2,292 Hispanics in the 1992 survey who reported earnings, we exclude 1,041 from our analysis who are not "at risk" for receiving BE. The non-"at risk" students would not necessarily have qualified for a BE program, and hence it would be inappropriate to directly compare them to BE

⁹ We have also conducted the analysis to follow on the non-Hispanic population of HSB's language minority students. We found no large or statistically significant links between bilingual education participation and earnings.

participants (see So 1983). Thus, we analyze the subset of individuals who could have been classified as LEP at some point during their schooling careers, and hence were potential candidates for participating in BE. In all, our sample includes 1,251 individuals, the majority of which were 28 years old when completing the 1992 follow-up survey.

To define the “at risk” group, we attempt to follow guidelines used by many states to select which students qualify for BE. While the determination of BE enrollment varies between states and school districts, all states (except Colorado, Hawaii, and Mississippi) use a home language survey as part of their BE evaluation process (U.S. Department of Education 1992; and Henderson et al. 1994). The home language survey typically asks parents and/or students about the household language as well as the first language of the student. After completing this survey, minority language students are assessed on their native language and English proficiency through examinations and/or teacher evaluations. Recommendations for BE generally depend on these assessments, with the parents generally (but not always) consulted on the enrollment decision.

While HSB does not contain data on students’ English fluency at the time of initial enrollment in the U.S. school system, it provides information that is loosely equivalent to a home language survey. Specifically, students were asked a series of five questions related to language usage in the base year (1980) questionnaire:

1. What is the first language you spoke?
2. What other first language did you speak?
3. What language is spoken in your home today?
4. What other language is spoken in your home today?
5. What language do you speak most often today?

If a student reported speaking a non-English language in at least one of these questions, we define the individual as being “at risk” for BE selection.¹⁰ HSB further includes in the 1980 survey a series of questions answered by the “at risk” students related to language acquisition, proficiency, and prior BE course work in grades 1-6, 7-9, and 10-12.

We define BE participation by using the information on whether students took English classes for non-English speakers, or if they had received instruction in other academic subjects (such as mathematics) in a non-English language in grades 1-6, 7-9, and 10-12.¹¹ We realize this measure of bilingual education may not be perfectly defined because of its broad scope; however, this is the closest approximation for BE participation given the information in HSB.

HSB Sample Summary Statistics

Table 4 contains demographic information on the “at risk” Hispanic sample in HSB. We also include summary statistics for the BE and non-BE participant samples. Note that over 39 percent of the “at risk” sample participated in BE, with the vast majority of BE participants first exposed in grades 1-6. Moreover, it is interesting to note that the log of average earnings is slightly higher for the BE participants than the non-BE sample (9.6 versus 9.5); we estimate earnings as the average of an individual’s earnings in 1990 and 1991.¹² Also of note, BE participants on average have more months of labor market experience and slightly less education than non-BE students. This may result from BE

¹⁰ This sample may not truly represent all at risk students. Consider a student residing in a household in which English is the primary language, but some Spanish is also spoken; our sample specification would define this student as at risk. Unfortunately, since school districts have different means beyond the home language survey to determine both LEP status and BE selection, we are unable to obtain the actual selection criteria, and hence are limited to our at risk definition in our analysis.

¹¹ While HSB also provides information on the ability to read and write in a non-English language, we do not include the responses in our definition of BE because it is unclear if the respondent is answering about foreign language classes or some aspect related to BE (So 1983).

¹² For individuals with only information on one year, we use the single year as the individual's average earnings measure. We avoid using income reported in 1992 because the survey was conducted in the spring of that year 1992 annual earnings will either be estimates or truncated depending on how the individual interpreted the question.

students dropping out at higher rates than non-participants (16.3 percent versus 12.7 percent) and not obtaining further education beyond high school (see López 1997a). Yet, BE participants may acquire greater labor market training since they leave school earlier and most likely enter the work force.

(TABLE 4 ABOUT HERE)

Other characteristics of interest include that, compared to the non-BE sample, BE participants are more likely to: (1) be first generation immigrants;¹³ (2) reside in lower socioeconomic status (SES) households; (3) score in the lower quartiles of the standardized exams administered by HSB; (4) drop out of school after the tenth grade; and (5) have been held back a grade at some point during their schooling careers. These summary statistics reaffirm other work on the profiles of students in BE.¹⁴

Empirical Framework

To model the effect of BE on earnings using HSB, we control for an extensive list of observed personal and school characteristics from the 1980 survey. Using these control variables, we estimate an ordinary least squares (OLS) model for the log of average earnings from 1990 and 1991 (y_i^*) as:

$$y_i^* = X_i\beta_1 + HS_i\beta_2 + BE_i\gamma_o + \epsilon_i \quad (1),$$

where X_i denotes personal characteristics including years of education, experience, and experience-squared from the 1992 survey;¹⁵ and gender, immigration status (generation and immigrants' time in the U.S.), family income, family size, parental education, home ownership status, region, and urban status from the 1980 survey. HS_i represents a vector composed of general high school attributes, such as the

¹³ We define the immigrant generation as first (in which both the student and parents were born abroad), second (student was born in the U.S. and the parent(s) born abroad), and third (both the student and parents were born in the U.S., and includes many students whose families have been in the U.S. for many generations). The “second/third” category in Table 4 denotes missing information regarding whether the student is second or third generation.

¹⁴ For example, see López 1997a; Mora 1997, 1996; Han et al. 1997; Henderson et. al. 1994; Board of Education of the City of New York 1993; and McArthur 1993.

¹⁵ Unfortunately with HSB we are unable to observe the educational experience of students outside of the U.S., and thus cannot control for the years of education individuals may have received in other countries.

pupil-teacher ratio, percent of the student body which is Latino, African American, Native American, and Asian American, total level of enrollment, and public/private school status. Finally, BE_i is a binary variable which equals one for those who participated in a bilingual education program, with γ_0 representing the BE treatment effect.

If Equation (1) captures all of the characteristics that are correlated with BE selection, the outcome of interest (γ_0) will represent a consistent estimate of the effect of BE on earnings, *ceteris paribus*. We realize, however, there may be some unobservable factors that determine BE participation omitted from Equation (1), such that γ_0 may be biased; the direction of the bias is unclear. On the one hand, many times parents decide whether or not to place their children into a BE program, and in some school districts, BE participation begins through the parents' initiative (e.g., Crawford 1989). In this case, one might expect positive selection (and hence an overestimate of γ_0) because children in BE have parents who are more involved in their education. On the other hand, recall from Table 4 that a higher share of the BE students reside in low SES households, drop out of school, and fall into lower test quartiles than the English-immersed students. These findings suggest negative selection into BE, such that γ_0 will be biased down. Our choice of the additional control variables attempts to reduce the extent of the BE selection bias.¹⁶

Empirical Results

Table 5 presents the results from estimating Equation (1) for Hispanics using different sets of control variables. Concentrating on Columns (2) through (5), the coefficient on BE is negative but statistically indistinguishable from zero. In Column (6), we present results for the effect of BE on income by the timing of a student's first exposure to such programs. There, we observe statistically

¹⁶ In other estimations of Equation (1), we have further attempted to address the issue of selection using an instrumental variables and a Heckman approach. However, we do not report these results here since they do not significantly alter the basic findings reported below. Moreover, the validity of the specific instruments is in question (see López 1997a, 1997b).

insignificant coefficients on the three BE variables, although taken at face value, students first exposed to BE during high school may have better labor market outcomes than their earlier exposed counterparts.

(TABLE 5 ABOUT HERE)

Closer scrutiny of the sample, however, indicates that these results mask large differences in the measured effect of BE programs for students born outside of the U.S. When dividing our Hispanic sample by generation of immigration, some very surprising and striking results appear [see Columns (7) through (9)]. In Column (7), we find that first generation students who participated in BE programs earn significantly less (approximately 37 percent less) than their otherwise similar English-immersed peers.¹⁷ Continuing with Column (8) that focuses on second generation students, we observe a similar negative (but smaller in magnitude) and statistically significant coefficient for BE participants. Among third generation students in Column (9), we observe a statistically insignificant BE effect similar to that reported in the first six columns. These results are alarming since newly arrived immigrants may be placed in BE; yet, conditional on a host of background characteristics, our findings suggest that first and second generation Hispanic students who went through BE appear to earn significantly less than their English-immersed counterparts.

We realize that the results presented in Table 5 may not be perfect in light of the issue of self-selection discussed above. However, if future research reaffirms our findings, the labor market implications of bilingual education programs are not positive. For example, given that Hispanic immigrants tend to earn relatively less than their U.S.-born peers in this country, the results presented here indicate that BE programs may compound this earnings gap. Moreover, BE may indirectly influence income via its impact on other forms of human capital or through the assimilation of

¹⁷ We calculate this difference using a method suggested by Kennedy(1981) for binary variables in semi-logarithmic equations. To estimate the percentage change in earnings associated with BE participation, we calculate:

$$e^{(\gamma - \frac{1}{2}(\text{var}(\gamma)))} - 1.$$

immigrants; some studies have found that BE participation is associated with lower educational attainment, English skill acquisition, and academic progress (e.g., Rossell 1996; Board of Education of the City of New York 1994; Curiel et. al. 1986). Extrapolating these results into the labor market suggests that BE programs may indirectly relate to lower earnings, further widening the earnings gap between English fluent and English deficient workers. In all, future analysts cannot afford to ignore the potential long-term consequences when designing educational policies for LEP children.

CONCLUSION

In this paper we have discussed some of the potential labor market outcomes associated with bilingual education. Our findings suggest that when examining “at risk” Hispanic students, individuals who receive BE at some point during their schooling careers do not appear to earn significantly more or less than their otherwise similar peers who were English-immersed, *ceteris paribus*. However, further exploration of the impact of BE programs on immigrants’ labor market income suggests an entirely different picture. The more recent a student’s generation of immigration, the worse off Hispanic BE participants appear to be with respect to earnings. This is a disturbing finding in that immigrants from non-English-speaking countries *conceptually* have the most to gain from BE programs. These results warrant further investigation, such as testing whether non-Hispanic immigrants experience the same trends. If our results can be convincingly replicated, schooling programs like BE may widen the socioeconomic gap between LEP and English proficient populations over time.

The story regarding the long-run impacts of BE is far from being over. We note that because of the strong link between earnings and human capital (such as education and English proficiency), BE programs may indirectly impact future labor market outcomes. Moreover, our sample only includes working individuals; future research may wish to explore the link between BE and labor force participation. Another aspect that should be addressed is whether or not BE creates an earnings gap as

workers mature in the labor market. The average age of the 1992 HSB sample is 28 years, which may be relatively young to fully witness the long-term labor market effects of BE.

Schooling programs designed for LEP students have become increasingly important, given the current demographic shift away from monolingual English populations in this country. Also, because Hispanics (particularly recent immigrants) have been well documented to earn less than non-Hispanics whites on the basis of relatively low human capital investments, insights into the determinants of educational attainment and English skill acquisition have greater implications for the U.S. as a whole as this group becomes the largest racial/ethnic minority population. Policymakers should be aware that schooling policies designed for limited-English proficient students enacted today will affect the economic opportunities of increasing segments of the population far into the 21st Century.

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Table 1--Summary Statistics of Hispanic Workers by English Proficiency: 1990

Characteristic	Only Speaks English at Home	Very Well	Well	Not Well	Not at All
<i>Hispanic Men:</i>					
Born outside of U.S.	0.136	0.433	0.754	0.940	0.987
Natural log. of hourly earnings	2.330 (0.686)	2.243 (0.643)	2.103 (0.606)	1.888 (0.574)	1.705 (0.548)
Education	12.711 (2.567)	12.003 (3.104)	10.010 (3.832)	7.749 (4.167)	6.016 (4.059)
<i>Occupation Shares:</i>					
Prof., Exec., Manager.	0.186	0.164	0.071	0.023	0.013
Tech, Sales, Adm supp.	0.224	0.203	0.125	0.053	0.038
Service	0.121	0.130	0.162	0.195	0.184
Farm, Fishing, Forestry	0.024	0.043	0.075	0.145	0.266
Precision Production	0.211	0.209	0.224	0.209	0.163
Oper., Fabric., Laborer	0.234	0.251	0.344	0.375	0.335
Number of obs.:	5,463	10,606	5,367	4,524	1,978
<i>Hispanic Women:</i>					
Born outside of U.S.	0.104	0.389	0.707	0.908	0.980
Natural log. of hourly earnings	2.054 (0.608)	2.031 (0.628)	1.890 (0.594)	1.694 (0.574)	1.590 (0.598)
Education	12.771 (2.377)	12.414 (2.714)	10.848 (3.448)	8.158 (4.095)	6.262 (3.968)
<i>Occupation Shares:</i>					
Prof., Exec., Manager.	0.235	0.219	0.111	0.028	0.018
Tech, Sales, Adm supp.	0.488	0.475	0.329	0.121	0.068
Service	0.148	0.164	0.283	0.314	0.268
Farm, Fishing, Forestry	0.009	0.011	0.023	0.062	0.145
Precision Production	0.022	0.027	0.051	0.070	0.045
Oper., Fabric., Laborer	0.097	0.104	0.207	0.406	0.457
Number of obs.:	4 530	8 950	3 164	2 433	1 322

Notes: Standard deviations for log earnings and education are given in parentheses; the means and standard deviations are weighted.

Source: 1% Public Use Microdata Sample of the 1990 U.S. Census. See text for sample restrictions.

Table 2--Earnings Function Coefficients on the English Skill Categories for Hispanic Workers in 1989
(Dependent Variable = Natural Logarithm of Hourly Earnings)

Category	Men		Women	
	All	Immigrants	All	Immigrants
Very well	-0.093 (0.011)	-0.034 (0.026)	-0.029 (0.011)	0.005 (0.031)
Well	-0.180 (0.013)	-0.162 (0.026)	-0.125 (0.014)	-0.155 (0.032)
Not well	-0.276 (0.014)	-0.304 (0.027)	-0.188 (0.017)	-0.295 (0.033)
Not at all	-0.363 (0.018)	-0.407 (0.029)	-0.187 (0.024)	-0.319 (0.037)
Education	0.056 (0.001)	0.047 (0.001)	0.058 (0.002)	0.040 (0.002)
Experience	0.045 (0.001)	0.040 (0.002)	0.028 (0.001)	0.022 (0.002)
Experience ² /100	-0.058 (0.003)	-0.050 (0.003)	-0.039 (0.002)	-0.028 (0.004)
Adjusted R ²	.228	.221	.150	.156
Number of obs :	27 938	15 299	20 399	9 528

Notes: Huber standard errors are given in parentheses, using the statistical weights for the sample selection probability provided by the 1990 PUMS. The base group of comparison contains workers who only speak English at home. These coefficients were obtained by estimating a Mincer (1974) earnings function, where the dependent variable is the natural logarithm of the hourly wage, and the explanatory variables include education, experience, experience-squared, and the English proficiency categories.

Source: 1% Public Use Microdata Sample of the 1990 U.S. Census. See text for sample restrictions.

Table 3--Ordered Logit Results for the Correlates of the English Deficiency of Hispanics: 1990
 {Dependent Variable = English Def. [ranging from 0 (only speaks English) to 4 (no English is spoken)]}

Variable	Men		Women	
	Coefficient	Std. Error	Coefficient	Std. Error
Acquired all education abroad	0.674	0.037	0.893	0.047
Years of education	-0.163	0.004	-0.188	0.005
Years of potential job experience	0.028	0.002	0.022	0.002
<i>Immigrant Migration Time-Intervals:</i>				
1987-1990	3.637	0.071	3.444	0.096
1985-1986	3.221	0.068	3.163	0.081
1980-1984	2.657	0.067	2.709	0.088
1975-1979	2.538	0.060	2.590	0.075
1970-1974	2.019	0.053	2.033	0.065
1965-1969	1.778	0.052	1.865	0.061
1960-1964	1.500	0.055	1.444	0.061
1955-1959	1.234	0.061	1.181	0.070
1950-1954	0.876	0.065	0.997	0.075
Before 1950	0.553	0.116	0.602	0.140
Foreign exp. years of immigrants	0.009	0.003	0.008	0.003
Married	-0.043	0.030	0.036	0.035
Divorced or separated	-0.045	0.046	-0.156	0.046
Widowed	0.138	0.158	-0.097	0.096
Puerto Rican	-0.335	0.040	-0.148	0.045
Cuban	-0.145	0.055	0.201	0.060
Other Hispanic	-0.652	0.031	-0.548	0.035
CHI ² :	19,695.99		13,548.76	
Pseudo R ² :	.238		.235	
Number of observations:	27,938		20,399	

Notes: The results were obtained from estimating a weighted ordered logit using the statistical weights provided by the 1990 PUMS.

Source: 1% Public Use Microdata Sample of the 1990 U.S. Census. See text for sample restrictions.

Table 4--Demographics of “At Risk” Hispanics in the Restricted-Use High School and Beyond Data Files

	All	Bilingual Ed Non-Participants	Bilingual Ed Participants
Bilingual Education	0.396	0.00	1.00
BE 1st exposure: Grade 1-6	0.304	0.00	0.768
BE 1st exposure: Grade 7-9	0.061	0.00	0.154
BE 1st exposure: Grade 10-12	0.029	0.00	0.073
<i>Immigrant Generation:</i>			
First	0.134	0.095	0.193
Second	0.148	0.152	0.141
Second/third	0.128	0.144	0.103
Third	0.436	0.467	0.384
Lowest SES quartile in 1980	0.447	0.406	0.509
Second SES quartile in 1980	0.230	0.230	0.229
Third SES quartile in 1980	0.163	0.198	0.109
Highest SES quartile in 1980	0.118	0.133	0.095
Lowest 1980 exam quartile	0.319	0.223	0.466
Second 1980 exam quartile	0.233	0.259	0.193
Third 1980 exam quartile	0.184	0.241	0.097
Highest 1980 exam quartile	0.107	0.136	0.062
Log of avg. 1990-91 earnings (standard deviation)	9.546 (1.021)	9.502 (1.105)	9.614 (0.873)
Months of experience by 1991	62.033 (16.850)	60.522 (18.212)	64.335 (14.244)
Years of education	12.877 (1.674)	13.045 (1.076)	12.621 (1.493)
School dropout after 10th grade	0.141	0.127	0.163
Held back a grade	0.098	0.080	0.126
Number of observations:	1,298	827	471

Notes: These summary statistics are weighted. Some categories do not sum to one because of missing observations or rounding error. Earnings are calculated as the average of an individual’s real earnings in 1990 and 1991; see text for a discussion of the construction of this variable.

Source: Authors’ tabulations from the Restricted-Use High School and Beyond (HSB) base year (1980), first follow-up (1982), and fourth follow-up (1992) surveys. See text for sample restrictions and “at risk” definition used in this study.

Table 5--OLS Results for the Effect of Bilingual Education on Earnings (weighted)
 (Dependent variable = Logarithm of Average Earnings from 1990 and 1991)

Variable	All "At Risk" Hispanics						Immigration Generation Status		
	(1)	(2)	(3)	(4)	(5)	(6)	First	Second	Third or More
Bilingual Education	0.049 (0.100)	-0.034 (0.046)	-0.028 (0.072)	-0.036 (0.071)	-0.025 (0.073)		-0.445 (0.145)	-0.306 (0.131)	-0.041 (0.102)
<i>Other BE measures:</i>									
1st exposed to BE in grades 1-6						-0.032 (0.075)			
1st exposed to BE in grades 7-9						-0.203 (0.127)			
1st exposed to BE in grades 10-12						0.255 (0.169)			
<i>Other controls:</i>									
Potential experience		yes	yes	yes	yes	yes	yes	yes	yes
Personal variables			yes	yes	yes	yes	yes	yes	yes
1980 High school				yes	yes	yes	yes	yes	yes
Academic variables					yes				
Number of obs.:	1,298	1,298	1,298	1,298	1,298	1,298	216	253	645
R ² .	0.0311	0.3876	0.5239	0.5461	0.5514	0.5495	0.6191	0.8876	0.5340

Notes: The above models are estimated using OLS with the log of average earnings in 1990 and 1991 as the dependent variable. The "Third or More" immigration generation column includes individuals classified as "second/third" in Table 4. See text for a discussion of the construction of the bilingual education participation variable. Other controls include job market experience (in months) and experience-squared, personal variables (marital status, gender, years of education, region and urban status of high school, 1980 family income level as eight binary variables, parental education level, and whether or not the family owns a home in 1980, categorical variables for immigrant generation and years since arrival), 1980 High school general characteristics (racial composition of the high school, starting teacher's salary, per pupil district expenditures, the pupil/teacher ratio, and whether or not the school is private, public, or catholic), and a set of academic characteristics representing the quartile a student placed in on academic achievement in 1980.

Source: Restricted-Use High School and Beyond (HSB) base year (1980), first follow-up (1982), and fourth follow-up (1992) surveys. See text for sample restrictions and "at risk"

definition used in this study.