NO ENTIENDO:
The Effects of Bilingualism on Hispanic Earnings

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Abstract: This paper examines the economic consequences of Spanish/English bilingualism in the United States. Specifically, we explore whether the ability to effectively communicate in English and Spanish is rewarded in labor markets. Using a sample of the Hispanic population in the United States drawn from census data for the year 2000 we find that bilingualism is indeed associated with higher income. The effect is, however, substantively small: on average the income level of bilingual Hispanics is 2.7 percentage points more than the income of those that Hispanics that only speak English after accounting for educational attainment, gender, age, origin, sector and region of employment and occupation. We also find that bilingualism is not rewarded in all segments of the labor market. While the correlation between bilingualism and income is positive among non-supervisory laborers in manufacturing, the association turns negative among those in managerial positions. Moreover, for those employed in the public sector where we would assume that the ability to speak both Spanish and English would be particularly valued, we find a negative correlation between bilingualism and income for all occupation categories. These findings are troubling for several reasons. They suggest that the difference in earnings may be the consequence of discrimination in labor markets. Alternatively, it is plausible that lower wages may reflect the extent to which Spanish-speaking Latinos including those who are fluent in English, receive educational services of lower quality than Hispanics that speak English only, and even non-Hispanic whites despite similar education attainment levels. The results from our tests allow us to evaluate the major contemporary academic debates on minority assimilation and incorporation. Specifically, we contend that they support the theory of segmented assimilation (Zie & Greenman 2005; Portes & Zhou 1993; among others). However, our conclusion is more negative regarding the opportunities available to Hispanic immigrants. Our findings that even when fully bilingual Hispanics' earnings are systematically lower in different segments of the labor market suggest that only few Latinos will be capable of experiencing a conventional path to assimilation. The findings could also be construed as revealing the existence of a deeply institutionalized pattern of discrimination.

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Introduction

This paper examines the economic consequences of bilingualism among Hispanics in the United States. Using census data for the year 2000 we explore whether the ability to effectively speak English and Spanish is rewarded in labor markets. In order to isolate the effect of bilingualism we focus our analysis on the Hispanic population of the U.S.. An earlier study by de la Garza et al. (2000), using a sample drawn from the 1990 Census, found a negative correlation between bilingualism and wages. Given the recent growth of the Hispanic purchasing power and the process of economic integration with countries of the Western Hemisphere, we expected bilingualism to be rewarded in the market place at the turn of the Century. After controlling for education and other individual level characteristics such as age, gender, occupational category, economic sector of employment, region of residence and origin, we find that bilingualism, operationalized as the command of Spanish and the ability to speak English very well, is at best weakly associated with higher income. The positive coefficient on bilingualism is, however, substantively small: On average the income level of bilingual Hispanics, those that speak Spanish at home and English very well,[2] is only 2.7 percentage points higher than the income of our baseline category: Hispanics that only speak English. We also find that income decreases monotonically as the ability to speak English falls, which is consistent

[2] The census codes regarding English ability do not differentiate between the English language ability of monolinguals who speak only English and bilinguals who speak English very well. Consequently, these codes erroneously imply that bilinguals, including the native born who received all their education in the United States, have lower language skill than English monolinguals. There is no way to recode the data to correct for this inaccuracy. Nonetheless, we would argue that knowing a second language as well as being a native English speaker adds to an individual's economically valuable skills, and therefore it is not surprising that bilinguals who speak English very well would earn more than English monolinguals. Indeed, as we will argue, the surprise is that such a skill is so poorly rewarded.

with other findings in the literature on the effect of English proficiency on income, discussed in section 3 of the paper.[3]

Although the aggregate effect of bilingualism in the whole sample is positive, albeit small, we find evidence that suggests that bilingualism is penalized in some segments of the labor market. In manufacturing, for instance, we find a positive correlation between bilingualism and income among non-supervisory laborers; yet the correlation becomes negative among those in managerial positions. Moreover, in the public sector, where we would assume that the ability to speak both Spanish and English would be especially valuable, bilingualism is correlated with lower income in both supervisory and non-supervisory categories.

These findings are troubling for two reasons. First, the difference in earnings could be the consequence of discrimination in labor markets. Alternatively, it could be the case that bilingualism is correlated with uneven access to quality education or with a lack of skill formation opportunities that limit Spanish-speaking Hispanics, even those proficient in English, to lower less lucrative jobs and lower salaries in higher status positions.

Our first set of findings, namely that on average Hispanics that speak English very well and speak Spanish at home earn only slightly more than those who speak only English, is minimally consistent with recent Hispanic demographic and economic trends. Latinos now constitute the largest minority in the United States, and their purchasing power is growing at triple the rate of the overall US population. Their spending power in 2003

[3] As reported in section 3 we also find that individuals that speak Spanish at home and speak English well are associated with earnings that are 1.6 percentage points lower than the baseline category; income is 9.9 percentage points lower for those that speak English not well, and 20.0 percentage points lower for those who do not speak English at all.

was $653 million, a sum that is expected to reach more than $1 trillion in 2008. (The Hispanic Market in 2010, The Conference Board). Further adding to their growing economic clout is the role they may play regarding trade and investment in Mexico and Spanish-speaking Latin America in general.[4]

Our results also show that not speaking English negatively affects earnings, corroborating the argument that English fluency is rewarded in the marketplace. These results are consistent with a key finding in the empirical literature on Latino earnings and socioeconomic achievements.[5] English is the dominant language in US labor markets, and English proficiency is a key determinant of the success in labor markets.[6] This explains why individuals with limited command of English (Spanish monolinguals and those who Speak English poorly) are likely to earn systematically less in all employment sectors and occupational categories.[7] High English proficiency is also associated with high levels of socialization regarding mainstream culture and labor market practices in the United States, which might differ from those in the country of origin of the worker.

[4] Between 1992 and 2003, Latin America was the fastest growing US regional trade partner. Total US merchandise trade with Latin America grew by 154% during that period, compared to 88% for Asia, 89% for the EU, 78% for Africa, and 102% for the world. Mexico was accountable for most of US trade growth with Latin America from 1992 to 2003, as the largest and fastest growing trade partner in that region. By 2003, furthermore, Mexico accounted for two-thirds of the region's trade with the US, and 11.9% of total world trade with the US (Hornbeck, 2004, p. 1-3). On a historical-cost basis, from 1990 to 2000, US direct investment in Latin America increased 265%. (Bureau of Economic Analysis, 2006). The economic trends are reaffirmed by intergovernmental initiatives: the US has signed and enacted bilateral investment treaties (BITs) with the following Latin American countries (the year of signing is in parentheses): Argentina (1991), Bolivia (1998), Ecuador (1993), El Salvador (1999 but pending implementation), Honduras (1995), Nicaragua (1995, pending implementation), Panama (1982, amended in 2000), and most recently Uruguay (2005, pending implementation) (US Department of State, 2006).

[5] See, inter alia, Grenier 1984; McManus, Gould, and Welch 1983; Tainer 1988; Tienda and Neidert 1984; Chiswick 2001; Chiswick & Miller 2002

[6] For those arriving in the U.S. becoming proficient in English is equivalent to acquiring a market-valued skill or human capital, and is likely to be reflected in higher incomes. See footnote 5.

[7] The hypotheses that English proficiency is valued, and that Hispanics that who only speak Spanish earn lower incomes, was verified by de la Garza et al. (2006) in the 1990 census data. The results are confirmed in our analysis of individual data for the year 2000, which we discuss in more detail in section 3.

In other words, the lack of familiarity with mainstream sociocultural including work style could easily lead to lower wages.

Our second set results uncover a negative correlation between bilingualism and income in different occupational categories and industries. These findings cast doubt on a common belief that speaking a second language is a valuable skill. Yet we see no clear economic argument explaining why English and Spanish fluency would diminish an individuals' market value. Even if speaking Spanish per-se were not valued in labor markets, why would *bilingualism* –the ability to speak English well *and* Spanish- be associated with lower wages? To the extent that Latinos are bilingual and speak English fluently and therefore are able to move across labor markets, we should expect them to earn at least as much as those who only speak English. If the pay is lower in jobs where speaking Spanish is a precondition for being hired,, those individuals who also speak English *very well* should be able to move to more rewarding jobs that demand a good command of English. Additionally, bilinguals should have higher incomes if they hold jobs for which English monolinguals are unqualified such as those dealing with Hispanic local and international markets or supervising Spanish dominant staff as is often true in the construction industry and large segments of the service sector. However, the negative association between bilingualism and income in managerial and supervisory positions in manufacturing suggests that there are restrictions to the ability of bilingual individuals to move across labor markets, and up the income ladder. In other words, unless bilingualism is associated with restrictions to sectoral or regional mobility that force Spanish speaking Hispanics to remain attached to lower paying jobs, bilinguals would seek raise their wages by seeking new employment.

In the following section we discuss two plausible explanations for these findings. Both argue that the patterns we have described reflect discrimination. The first suggests that Spanish speakers experience explicit discrimination, while the second emphasizes institutional practices that prevent Latinos from gaining equal access to quality education which results in lower wages.

Language Proficiency, Bilingualism and Earnings

As discussed in the introduction, this paper tries to answer the following question: Is bilingualism rewarded in US labor markets? Or put differently, is the ability to speak English and Spanish fluently associated with higher earnings?

Several studies have looked at the relationship between language proficiency and income. Chiswick (1978) and Mincer (1974), among others, have shown that English proficiency is correlated with human capital and education, and educational attainment is key in explaining earnings.[8] Using U.S. Census data from 1980, Chiswick & Miller (1992) estimate that among foreign men the gap in earnings between those that were proficient English and those that were not was roughly 17%. Fluency in the local language has also been shown to have a positive effect on wages in studies conducted in Canada and Australia (Chiswick & Miller 1995), and Israel (Chiswick 1998; Chiswick and Repetto 2001).

It has also been shown that English proficiency and assimilation leads to a narrowing of the immigrant-native earnings gap over time.[9] Upon arrival immigrants learn English

[8] These studies show that variation of income across individuals in the U.S. immigrant labor market can be explained by schooling and labor market experience. See Chiswick & Miller (2002, pp. 33).

[9] See Chiswick (1978); Chiswick & Miller (2002); Card (2005). Lubotsky (2000), on the other hand, acknowledges that while earnings of immigrants tend to improve over time (about 10-15% over twenty

and have high rates of participation in schooling, which allows them to assimilate into the U.S. labor markets. Yet, an overwhelming majority of those who arrive as adults without a high school diploma will never earn as much as the average native (Duleep & Regets 2002; Card 2005). There are several reasons for the persistence of this gap. Among them, those who do not speak English are subject to additional competition from an ever-increasing pool of migrants arriving in the country. The influx of immigrants has expanded the supply of less skilled workers, exerting downward pressure on the income of those Hispanics who only speak Spanish or who know some English but are Spanish dominant.[10]

In the case of Spanish speakers in the U.S., their lower earnings are likely to be linked to reduced sectoral and regional mobility, and to the effect of migration into the United States, which has increased considerably since the 1970s, and dramatically in the past fifteen years. In recent years a larger proportion of immigrants arriving in the U.S. is less skilled than the average American. This is reflected in their lower level of education attainment: one third of high-school dropouts in the U.S. are foreign born.[11] Hispanics who are not fully proficient in English tend to have similar educational attainment levels and skills as other migrants do, and are hence more likely to compete with them for jobs.

Card (2005) shows that "while immigrants comprised only 13% of the working age population in 2000, they made up 28% of the population with less than a high school diploma, and over half of all those with less than 8 years of schooling" (Card 2005, 302).

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years) this improvement is not enough to offset the original difference in earnings with natives (roughly 35-40%).

[10] Borjas, Freeman and Katz (1997) find that between one fourth and one-half of the drop in relative wages of low skilled workers can be accounted for by immigration; see Blanchflower & Slaughter (1999), pp. 81.

[11] Camarota and Krikoria (1999); Bean, Brown and Rumbaut (2006)

Camarota and Krikorian (1999, pp. 157) document that in the 1990s immigrants tend to disproportionately concentrate in bottom fifth of the labor market. Given that education attainment of immigrants is directly linked to attainment in their country of origin, immigrants coming from Spanish-speaking Latin America have lower average years of schooling than natives (Card 2005, pp. 301).[12] The picture is slightly different at the upper end of income and education distributions, where immigrants are more likely to have an advanced degree (Card 2005, pp. 301).

In principle, bilingualism makes individuals mobile across labor markets. They may either take a job where speaking Spanish is a required part of the job, where it is an advantage, or any other job where Spanish is not required. Unlike English monolinguals, they are not constrained to take jobs in one job market. To the extent that bilingualism is associated with sectoral labor mobility its effect on income should be neutral at a minimum. If speaking a second language is an essential skill or advantageous, then it should be rewarded.

In light of the preceding discussion, and following de la Garza et al. (2000) we posit three hypotheses.

Hypothesis 1: bilingualism has a positive affect on income.

Alternatively, it is possible that there is no reward to being bilingual; i.e., that speaking English and Spanish is not particularly rewarded in labor markets, or that speaking Spanish is only valuable in lower paying activities. In this case there should be no

[12] Additionally, the education in immigrant sending countries is likely to be of lower quality than education in the U.S. (see Card 2005, pp. 316; Bratsberg & Terrell 2002).

relationship between bilingualism and income. However, bilingual individuals should earn no less than monolingual English speakers, since bilingual individuals have the potential to move from the low paying jobs/activities where Spanish is required, to higher paying jobs where speaking English fluently is. This leads to our second hypothesis:

Hypothesis 2: There is no relationship between bilingualism and income.

Hispanics who are Spanish monolinguals or Spanish dominant differ from those who are English dominant in key ways. Most significantly, their educational attainment and related skill levels are lower than that of their English-dominant counterparts, and these skill differentials are likely to affect earnings in two ways: less skills make individuals less productive and also reduces their ability to move across sectors in search for higher paying jobs.[13] Hence individuals who speak Spanish only, or who are not fully proficient in English should be associated with lower earnings, leading to the following hypothesis:

Hypothesis 2b:: There is a positive correlation between ability to speak English and earnings.

Last, it is possible that speaking Spanish is penalized in labor markets. Employers may require employees to speak only English and thus may refuse to hire Spanish dominant Hispanics. Also, Hispanics tend to cluster in areas of the country where they face competition from the large pool of migrants with similar skills who continuously flow into the country. The tendency for Hispanic immigrants to concentrate in historically established communities or in new communities established by new immigrants and the social networks they create such as those recently developed in Georgia and North

[13] Lack of skill is associated with depressed income, and the inability to move to more rewarding jobs.

Carolina (TRPI 200-) reduces the incentives to move across the country in search of more rewarding opportunities. These patterns suggest our third hypothesis:

Hypothesis 3: there is a negative correlation between speaking Spanish and income.

There is reason to believe that the relationship between language abilities and income could vary across sectors and labor markets depending on the combination of workers' skills demanded. To test this, we further break down our sample into different sectors of the economy.

Empirics

To evaluate these hypotheses we conduct a series of statistical tests using the United States 2000 Census five-per-cent Public Use Microdata Sample (PUMS). The five-per-cent PUMS is a random sample containing individual records of the characteristics for a 5 percent of the people in the 2000 U.S. Census data (roughly 14,000,000 million observations). PUMS contains individual weights for each person to ensure that no group in the Census sample is over-sampled.[14]

In order to test the main hypotheses stated above, we estimate the following model:

$$\log(y_i) = \beta_0 + \beta_j X_{ji} + \gamma_k Z_{ki} + \varepsilon_i$$

where $\log(y_i)$ is the natural logarithm of wages and income salary for individual *i*. X_{ji} is a series of indicator variables measuring an individual's language ability, while Z_{ki}

[14] When applied to individual records the weights can be used to expand the sample to the total population in the Census. See U.S. Census Bureau (2003). Census 2000, Public Use Microdata Sample, (PUMS), United States, Technical Documentation. Washington, DC: U.S. Census Bureau, 2003

represents a matrix of educational, sociodemographic, occupational, and regional controls.

The sample is limited to Hispanics[15] between 18 and 64, the group most likely to be in the labor force, and we exclude those who had no wage or salary income in 1999. Limiting the sample to Latinos allows us to focus on the effects of language without having to deal with the effects of racial and ethnic discrimination that would be present if we included non-Hispanic whites and African Americans in the analysis.

The analysis controls for the effects of education using a series of indicator variables to account for different levels of educational attainment[16]: No school - 1st-4th grade, 5th-8th grade, 9th grade, 10th grade, 11th grade, 12th grade no diploma, high school graduate, some college, associate degree, bachelors, masters, professional, and doctorate. We also control for gender (female), age and age squared, citizenship status (whether the individual is a U.S. citizen), sector of employment (Agriculture, mining and construction; manufacturing; service and public sector), occupation (Management, professional, and related occupations; service occupations; sales and office occupations; farming, fishery, and forestry occupations; constructions, extraction, and maintenance occupations; and production, transportation, and material moving occupations), and geographic region of residence (Northeast, Midwest, West, and South). The latter is essential because of wage differences across geographically dispersed labor markets and because of the clustering patterns that characterize Latino settlements. We classify individual into five different

[15] In this paper we use the terms Hispanic and Latino interchangeably to refer to persons in the United States who can trace their origin to the Spanish countries. According to the U.S. Census, origin is ancestry, lineage, heritage, nationality group, or country of birth. People of Hispanic origin may be of any race.
[16] No school and 1st to 4th grade is the baseline category.

categories according to their self-reported language ability (see Table 1 for descriptive statistics):

- Spanish monolingual
- Spanish is spoken at home and respondent speaks English not very well
- Spanish is spoken at home and respondent speaks English well
- Spanish is spoken at home and respondent speaks English very well
- English monolingual.[17]

[Table 1. About here]

As mentioned previously, we face a problem defining bilingualism: The 2000 Census identifies individuals that speak Spanish at home and provides a measure English proficiency based on self-reporting. We created a scale combining the two to define bilingualism. Note that the highest level of English ability for those who speak Spanish at home is "speaks English very well." This seems to suggest that the English abilities of those individuals who describe themselves in this way is lower than that of English monolinguals. However, many native born bilingual Latinos are as fluent in English as are Hispanic English monolinguals. Consequently, our measure of bilingualism could be understating the English abilities of bilinguals.

Another problem in the empirical strategy is that we cannot control for quality of education, and levels of assimilation/acculturation, which are likely to affect earnings.

[17] We create indicator variables for each category. English monolingual serves as the baseline or omitted category in the statistical analyses.

The history of the relationship of Latinos to educational institutions from primary school through college strongly suggests that even if they have the same amount of education as non-Hispanic whites, Latinos do not receive the same quality of education. Their schools are more likely to be overcrowded; they are less likely to offer enrichment programs; and their parents are less prepared to assist with homework and provide assistance in the form of books and computers. Lacking data on such characteristics makes it difficult to determine the validity of the educational data gathered by the census. Nonetheless, years of school are suggestive of educational attainment, and it is the best data available to us. Figure 1 shows the distribution of education by English ability. A general pattern that arises from Figure 1 is that Spanish monolinguals and those bilinguals who speak little English, tend to have less years of schooling (5th-8th grade and 9th grade respectively) than those English monolinguals and bilinguals who speak English well or very well who are high school graduates. Individuals classified as English monolinguals and those that speak Spanish and English well or very well show roughly similar educational attainment levels.

[Figure 1. About here]

Even though the Hispanic population tends to be clustered in specific geographic areas, their English ability seems not to vary substantially by region (see Figure 2). In all four regions the plurality tends to speak English very well while less that 10% are Spanish monolinguals.

[Figure 2. About here]

In terms of sector and occupation, Spanish monolinguals and those who speak little English tend to work in greater proportions in the agricultural, construction, and manufacturing. However, regardless of their English ability, most Latinos work in the service industry (See Figure 3).

[Figure 3. About here]

The type of occupation also varies by English ability. For instance, bilingual Latinos who speak English well and very well are in managerial, professional, service, and sales & office occupations while Spanish monolinguals and those who do not speak English well are in construction, production, and transportation occupations (see Figure 4).

[Figure 4. About here]

Results

Our dependent variable is wage-based income. Transforming the value of income as provided by PUMS into its natural log of income allows us to interpret the coefficients obtained as semi-elasticies: The coefficient on the categorical independent variables (difference in group means) multiplied by one hundred, is approximately equal to a percent change in the dependent variable. Table 2 illustrates the average income for each of our 5 categories of English ability. The trend is clear: the better the command of English the higher the average income.

[Table 2. About here]

Table 3 shows that on average the income level of bilingual Hispanics, those that speak Spanish at home and English very well, is only 2.7 percentage points higher than the

income of those Hispanics who only speak English after accounting for educational attainment, gender, age, origin, sector, region of employment and occupation. Income decreases monotonically as the ability to speak English falls: the income of those who speak Spanish at home and English well, on the other hand, is 1.6 percentage points lower than the baseline category (English monolinguals), 9.9 percentage points lower for those that speak English not well, and 20.0 percentage points lower for those who do not speak English at all.

Tables 4 through 8 report results by sectors. In agriculture, mining and construction bilingualism is associated with higher income: those that speak Spanish and English very well earn on average 4.0 percentage points more than those in the baseline category; those that speak Spanish and English well are associated with 5.4 percentage points more in income. The difference between those who speak English very well and well may be because the former may be overqualified given the characteristics of this particular sector. The sign turns negative for those that speak Spanish and English not well or not at all: -3.0 and -16.2 percentage points lower than those who only speak English (see Table 4).

[Table 4. About here]

In manufacturing the results differ with occupational categories. Among blue collar workers (defined as production occupations except supervisors) the coefficient is positive for those who speak English very well and well. They earn 3.2 and 6.2 percentage points higher income respectively than those in the base category (see Table 5).

[Table 5. About here]

In the sub-sample of those in supervisory and managerial positions in manufacturing the coefficients for those who speak English very well and well turns negative: they are associated with -5.7 and -21.2 percentage points lower income than Hispanics who only speak English (see Table 6).

[Table 6. About here]

The results for the service sector suggest that income of those who speak English very well and Spanish at home is roughly 3.1 percentage points higher than the income of those in the baseline category. Income decreases monotonically with poorer English proficiency: the coefficient is -0.025 for those who speak English well (rougly -3 percentage points), -0.104 for those who speak English not well, and -0.204 for those that don't speak English (-10 and -20 percentage points respectively) (see Table 7).

[Table 7. About here]

In the public sector the results are negative for all categories: when compared with the baseline category those who speak Spanish and English very well earn 2.8 percentage points less; those who speak English well, not well and not at all earn 10.8, 22.1 and 23.6 percentage points less than those who only speak English. The coefficients remain negative and significant when the sample is split between managerial and non-managerial occupations (see Table 8).

[Table 8. About here]

As for the other variables that have a direct effect on income and wages we found that an increase in years of schooling (up to graduate school) is associated on average

with higher wages. However, this monotonic relationship is not always true for all the sectors. For example, the monotonic increase on wages in the manufacturing sector for managerial occupations is true even for those who have a graduate degree. This suggests that different industries require different job skills and those industries that will require more specialized skills will pay for them. The coefficient for age, which can be viewed as a proxy for experience, increases at decreasing rates, that is, it is positive for the linear term and negative for the quadratic term. Finally, as previous research has found, women tend to earn less than men, while, U.S. citizens on average, tend to earn more than those who are not U.S. citizens.

Discussion

Overall our results for the whole pooled sample suggest that bilingualism is no longer penalized as it seems to have been in 1990. Earnings of Hispanics who speak Spanish at home and also speak English very well are slightly higher that those of Hispanics who only speak English. And the positive affect of bilingualism on earnings holds after controlling for educational attainment, region, sector of employment, occupation, age and gender. This pattern supports our expectation that recent U. S and Hispanic social, demographic and economic trends have increased the market value of Spanish/English bilingualism. In the past decade Mexico and the rest of Latin America have become increasingly important to nationional economic life. Additionally, supplying goods and services to the ever-growing Hispanic community in the United States, especially those who are Spanish dominant , and managing workers with minimal English language skills who hardly speak English are also likely to create better paid job opportunities for bilingual Latinos who can communicate with their customers, employees and

subordinates in Spanish, and in English with their supervisors, business owners, and upstream and downstream suppliers.

While these developments help explain the discrepancy between the overall positive albeit small coefficient in our tests and the negative findings for 1990 reported by de la Garza et al. (2000), it is especially noteworthy that our results also show that being bilingual is penalized in several specific labor market segments. That is, while the positive effect for the overall sample is not only substantively small, but bilingualism has a negative impact on wages in key sectors of the economy and within occupational categories of other sectors.

We expected that bilingualism was a skill that the market rewarded. This skill would enable Latinos to serve both Spanish-speaking and English-speaking customers and to have access to trade and investment opportunities in Latin America would give bilinguals an edge over English monolinguals. Yet our results oblige us to reject that perspective and to re-evaluate how the market evaluates bilingualism.

There are sound theoretical reasons to expect English fluency to have a positive effect on earnings, but we had no comparable basis for predicting that bilinguals who know English well would be punished in the labor market as we found to be true in some labor markets and employment sectors. In manufacturing, for instance, we find that bilingual blue-collar workers who speak English well or very well receive higher earnings than similarly situated English monolinguals, but bilingual supervisory and managerial

employees earn less than their monolingual counterparts. These patterns paint a picture that suggests that bilingual Latinos who hold higher status jobs confront a glass ceiling.[18]

More significantly, we find that bilinguals employed in the public sector make systematically less money than those who only speak English. And these results hold for all occupational categories in the sector. Given that the public sector provides a wide range of crucial goods and services to Spanish dominant Latinos it is remarkable that those that speak Spanish seem to be penalized. These results suggest that bilingual Latinos are experiencing systematic discrimination.

One possibility mitigating this argument is that bilinguals may have characteristics that lower their value in labor markets irrespective of their quality and skill as workers. Most specifically, compared to English monolinguals, Spanish speakers are much more likely to speak accented English, a trait employers especially frown on if the accent is heavy (Davila, Bohara and Saenz 1993). Depending on how stringently accented English is evaluated, punishing bilinguals who speak with an accent could be considered discrimination. Moreover, employers could exaggerate the importance they assign to accents as a means to justify discrimination in hiring and wages.

Additionally, it is conceivable that being bilingual is correlated with unobservable characteristics that are negatively valued in the market place. One such trait would be a

[18] An alternative explanation for the negative coefficient on bilingualism found in the sub-sample of managerial and supervisory positions in manufacturing could be traced on a different pattern of regional clustering of these individuals and their penchant for consumption and ability to supply "ethnic goods." If bilingual Latinos in managerial position are mostly employed in small or medium sized firms that supply ethnic goods to Latino customers in markets characterized by low barriers to entry and no economies of scale, then we could expect them to have lower earnings than those employed in firms competing in less competitive markets characterized by higher entry barriers and economies. Still we need to explain why bilingual Latinos are more likely to be employed in the former rather than the latter, given the earnings differentials.

lack of familiarity with mainstream labor practices and other values. Hispanics who speak English only are more likely to be third or even fourth generation Americans, and hence are better assimilated to American labor practices. Another unobserved characteristic which census data do not capture is the quality of education Latinos receive. Given that Hispanics live in areas with high Hispanic concentrations, they are likely to attend similar types of educational institutions wherever they reside, and it has been well documented, the quality of educational services in those schools is lower than that of schools in more integrated schools which are attended by Hispanics who are more likely to be English dominant. To the extent these patterns accurately describe the educational experiences of Latinos, our measure of educational attainment, i.e., years of school completed, may falsely suggest that Latinos and non-Hispanic whites who attended school for the same number of years are comparably educated. Table 9 illustrates the income and wages for non-Hispanic whites and Latinos by educational attainment. On average, Latinos earn 19 percentage points less than non-Hispanic whites with the same educational attainment. This difference is more evident at higher levels of education. For instance, Hispanic professionals earn 46 percentage points less than non-Hispanic white professionals.

[Table 9. About here]

Interpreting the meaning of "years of school" in this way makes our findings less puzzling but no less discomforting since it implies that Spanish speakers are systematically exposed to educational services of lower quality that puts them at a disadvantage in the marketplace.

Conclusion

This paper tries to assess the effect of bilingualism on income among. To isolate the effect of bilingualism we limit our analysis to a sample Hispanics drawn from the year 2000 U.S. Census five-per-cent PUMS. In contrast with earlier research that tested similar hypotheses on census data for the year 1990, we find that in 2000 that bilingual Latinos who speak English very well and speak Spanish at home on average earn at least as much as those who speak only English. Yet we also find that bilingualism is not rewarded in all sectors of the economy. Our results show a negative correlation between bilingualism and income for managerial and supervisory employees in manufacturing, and for all those employed in the public sector.

We point to several possible explanations for these findings: reduced inter-industry and regional mobility and competition; labor market discrimination; and differential access to quality educational services. We acknowledge that our analysis has several shortcomings associated with the validity of our measures of bilingualism and educational attainment. We have no way to overcome these limitations, however.

We suggest two different routes that would help extend our research and help us overcome these limitations. The first would be to analyze the effect of bilingualism within jobs that require certification, such as teachers and nurses. In these cases, the existence of certification requirements would allow us to control for skill regardless of language problems such as accented English. Alternatively, we could look at the difference in performance within groups of individuals graduating from similar institutions, such as Ivy League universities, who have secured jobs in the same industry

or sector. Controlling for quality of education would allow us to further isolate the effect of bilingualism on income.

Our results enhance our ability to evaluate the major contemporary theories on minority incorporation and assimilation, namely segmented assimilation (Zie & Greenman 2005; Portes & Zhou 1993), modified straight line assimilation (Alba and Nee 2003), and the more recent version of the unassimilable ethnic (Huntington 2004). We argue that the results are generally supportive of the theory of segmented assimilation (see Zie & Greenman, 2005; Portes & Zhou,1993, pp. 74-96). However, our findings are more negative than those predicted by segmented assimilation theory because they suggest that few Latinos will be capable of experiencing conventional assimilation. Also, our results portray a level of continuing discrimination that refutess the core of Alba and Nee's (2003) modification of conventional assimilation theory. The monotonic increase in the earnings of Hispanics as their English language proficiency increases also seemingly refutes Huntington's (2004) theory of the unassimilable ethnic.[19] One plausible conclusion suggested by our findings is precisely the opposite to Huntington's argument: the existence of deeply institutionalized patterns of discrimination rather than Latino values prevent Latino incorporation..

Finally, our results suggest the need for several policy interventions. First, state and national governments should reward bilingualism as a skill in those positions where specific second languages are essential to job performance. Thus, bilingual health workers, teachers, border patrol agents, police and fire department personnel should earn

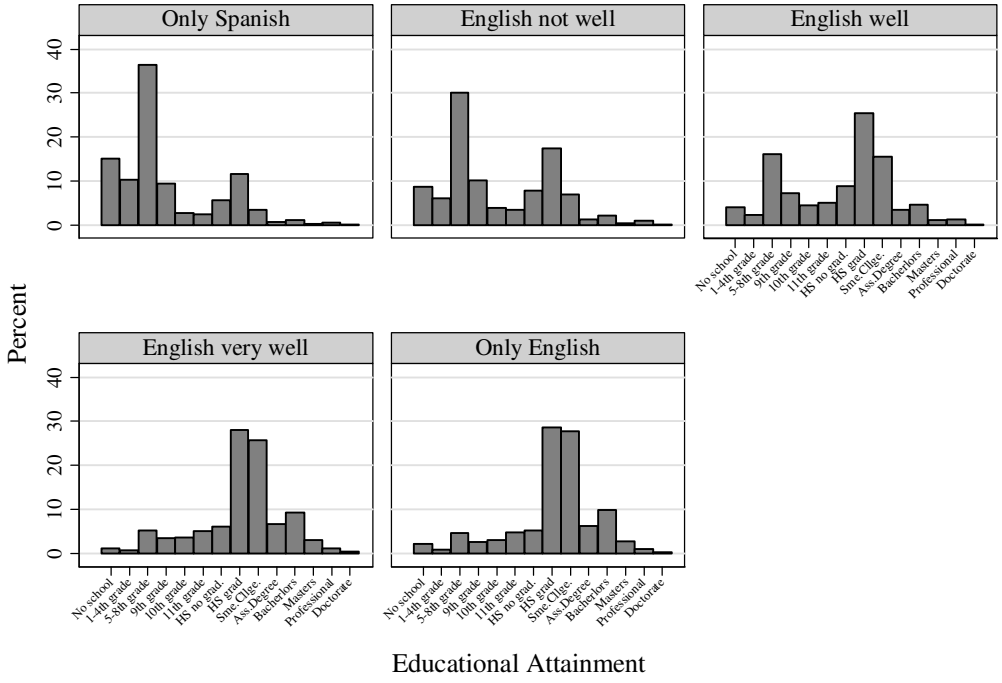
[19] Huntington (2004) denies the existence of discrimination as the condition impeding incorporation and argues that the failure of Hispanics to assimilate is due to innate cultural differences and their rejection of American values, including English.

more than their monolingual colleagues while those whose language skills are not essential to their job such as sanitation workers would not receive additional compensation. Second, Latino educational opportunities should be enhanced so that the value of their education is equalized relative to that of non-Hispanic whites. This could be accomplished by providing increased support to high schools, junior colleges and universities with large proportions of Latino students and by increasing the funds available to Latinos who are accepted to first tier public and private universities. Regretably, the current configuration of our political system makes it unlikely that such policies will be enacted.

Table 1. Descriptive Statistics

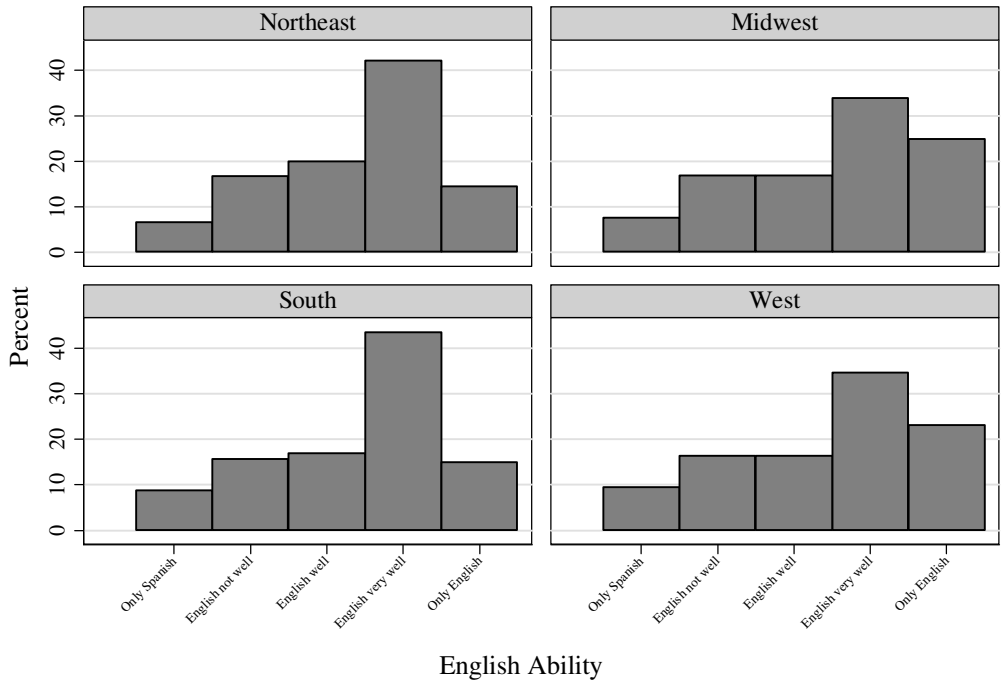
Variable	Obs	Mean	Std. Dev.
Income and Wages	15,152,667	22,849.550	25,897.440
English at home & Only English	15,152,667	0.196	0.397
Spanish at home & English very well	15,152,667	0.386	0.487
Spanish at home & English well	15,152,667	0.171	0.377
Spanish at home & English not well	15,152,667	0.162	0.369
Spanish at home & no English	15,152,667	0.084	0.278
No Schooling	15,152,667	0.042	0.200
1st-4th grade	15,152,667	0.025	0.157
5th-8th grade	15,152,667	0.134	0.341
HS No Diploma	15,152,667	0.204	0.403
High school graduate, or GED	15,152,667	0.245	0.430
Some college, no degree	15,152,667	0.197	0.398
Associate degree, occupational program	15,152,667	0.047	0.212
Bachelors degree	15,152,667	0.071	0.256
Master's, Professional and Doctorate	15,152,667	0.035	0.184
Female	15,152,667	0.580	0.493
Age	15,152,667	3.473	1.113
Age squared	15,152,667	1,329.972	845.851
Native Born	15,152,667	0.466	0.499
Northeast	15,152,667	0.147	0.354
South	15,152,667	0.336	0.472
West	15,152,667	0.423	0.494
Midwest	15,152,667	0.094	0.291
Management, Professional and Related Occupations	15,152,667	0.171	0.376
Service occupations	15,152,667	0.206	0.405
Sales & office occupations	15,152,667	0.231	0.422
Farming, fishing and forestry	15,152,667	0.030	0.172
Construction, extraction and maintenance occupations	15,152,667	0.131	0.338
Production, transportation and material moving occupations	15,152,667	0.227	0.419

Figure 1. Education by English Ability



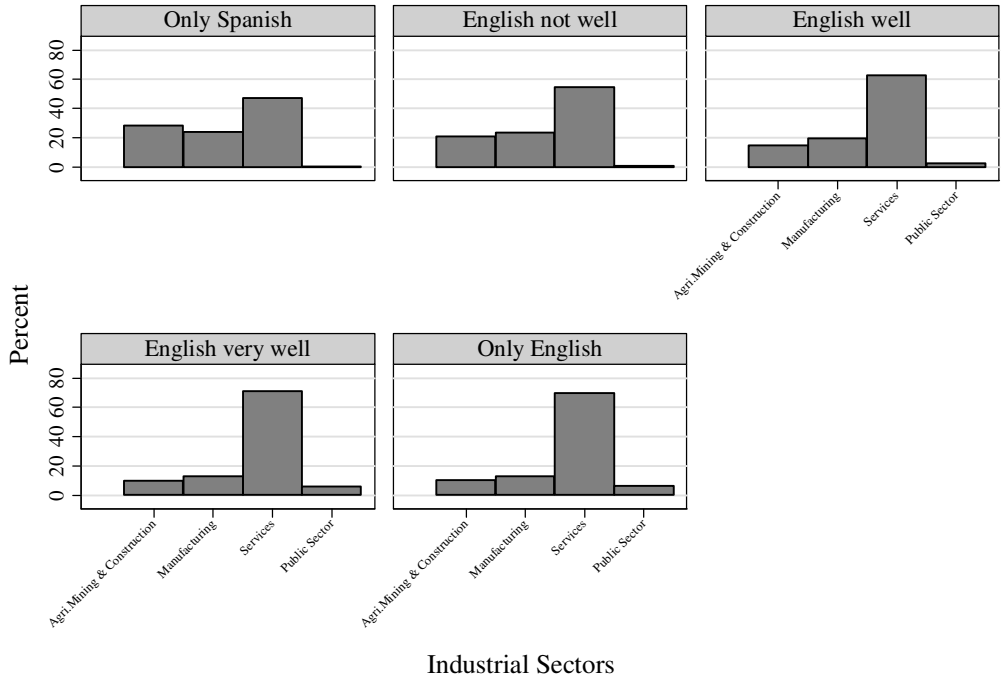
Source: IPUMS 5% 2000

Figure 2. English Ability by Census Regions



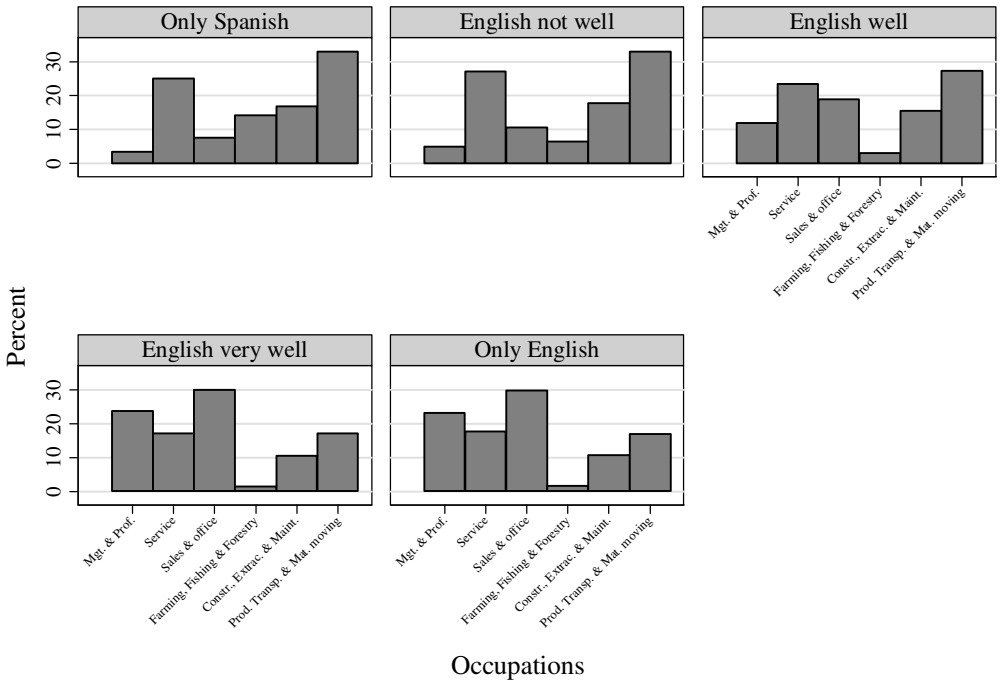
Source: IPUMS 5% 2000

Figure 3. Industrial Sectors by English Ability



Source: IPUMS 5% 2000

Figure 4. Professional Occupations by English Ability



Source: IPUMS 5% 2000

Table 2. Wage and Salary Income by Language Ability 2000

Group	Weighted Observations	Mean $USD	Std. Dev.
Spanish Only	1,277,846	14,747	19,710
English not well	2,455,975	17,894	20,917
English well	2,591,938	22,296	23,550
English very well	5,856,429	25,426	27,858
Only English	2,970,479	25,836	28,417

Source: IPUMS 5% 2000

Table 3. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional, and occupation Baseline Model

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Spanish at home & English very well	0.027	0.001	42.5**	0	0.026	0.029
Spanish at home & English well	-0.016	0.001	-19.8**	0	-0.018	-0.014
Spanish at home & English not well	-0.099	0.001	-109.9**	0	-0.101	-0.097
Spanish at home & no English	-0.200	0.001	-179.66**	0	-0.202	-0.197
5th-8th grade	0.069	0.001	63.53**	0	0.067	0.071
HS No Diploma	0.051	0.001	48.13**	0	0.049	0.053
High school graduate, or GED	0.225	0.001	209.85**	0	0.223	0.228
Some college, no degree	0.300	0.001	264.82**	0	0.298	0.302
Associate degree, occupational program	0.418	0.001	284.11**	0	0.415	0.421
Bachelors degree	0.560	0.001	407.26**	0	0.557	0.562
Master's, Professional and Doctorate	0.655	0.002	399.47**	0	0.652	0.658
Female	-0.447	0.001	-879.47**	0	-0.448	-0.446
Age	1.309	0.001	996.09**	0	1.307	1.312
Age squared	-0.001	0.000	-833.89**	0	-0.001	-0.001
U.S. Citizen	0.042	0.001	69.78**	0	0.041	0.043
Northeast	-0.047	0.001	-48.89**	0	-0.049	-0.045
South	-0.120	0.001	-140.33**	0	-0.122	-0.118
West	-0.063	0.001	-76.01**	0	-0.065	-0.062
Management, Professional and Related Occupations	0.097	0.004	23.35**	0	0.089	0.106
Service occupations	-0.370	0.004	-88.73**	0	-0.378	-0.362
Sales & office occupations	-0.137	0.004	-33.05**	0	-0.146	-0.129
Farming, fishing and forestry	-0.487	0.004	-111.73**	0	-0.495	-0.478
Construction, extraction and maintenance occupations	-0.065	0.004	-15.57**	0	-0.073	-0.057
Production, transportation and material moving occupations	-0.158	0.004	-37.97**	0	-0.166	-0.150
Constant	7.183	0.005	1472.26**	0	7.173	7.192

Number of observations = 15,152,667; F(24,15152642) =. ; Prob > F = 0; Adj. R2 = .2392; Root MSE = .89257;
* significant at 5%; ** significant at 1%

Table 4. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Agricultural, Mining and Construction Sector

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Spanish at home & English very well	0.040	0.002	20.97**	0	0.037	0.044
Spanish at home & English well	0.054	0.002	24.92**	0	0.050	0.058
Spanish at home & English not well	-0.030	0.002	-13.7**	0	-0.034	-0.026
Spanish at home & no English	-0.162	0.002	-66.53**	0	-0.167	-0.157
5th-8th grade	0.064	0.002	31.74**	0	0.060	0.068
HS No Diploma	0.065	0.002	31.11**	0	0.061	0.069
High school graduate, or GED	0.199	0.002	89.25**	0	0.195	0.203
Some college, no degree	0.284	0.003	106.96**	0	0.279	0.289
Associate degree, occupational program	0.400	0.005	88.12**	0	0.391	0.409
Bachelors degree	0.443	0.004	101.85**	0	0.435	0.452
Master's, Professional and Doctorate	0.391	0.007	59.48**	0	0.378	0.404
Female	-0.511	0.002	-231.9**	0	-0.515	-0.506
Age	0.888	0.004	253.69**	0	0.881	0.895
Age squared	-0.001	0.000	-212.36**	0	-0.001	-0.001
U.S. Citizen	0.060	0.001	40.49**	0	0.057	0.063
Northeast	-0.115	0.003	-35.36**	0	-0.121	-0.108
South	-0.173	0.003	-68.76**	0	-0.178	-0.168
West	-0.083	0.003	-33.37**	0	-0.088	-0.079
Management, Professional and Related Occupations	0.365	0.044	8.2**	0	0.277	0.452
Service occupations	-0.308	0.045	-6.9**	0	-0.395	-0.220
Sales & office occupations	0.181	0.044	4.06**	0	0.094	0.268
Farming, fishing and forestry	-0.428	0.044	-9.63**	0	-0.515	-0.340
Construction, extraction and maintenance occupations	-0.014	0.044	-0.33	0.745	-0.101	0.073
Production, transportation and material moving occupations	0.011	0.044	0.24	0.812	-0.077	0.098
Constant	7.976	0.045	177.4**	0	7.888	8.064

Number of observations = 2,053,925; F(24,2053900) =20437.10; Prob > F = 0; Adj. R2 = .1928; Root MSE = .83589;
* significant at 5%; ** significant at 1%

Table 5. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Manufacturing Sector Production Occupations (Except Supervisors)

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Spanish at home & English very well	0.032	0.002	13.57**	0	0.028	0.037
Spanish at home & English well	0.062	0.002	25.01**	0	0.057	0.067
Spanish at home & English not well	-0.043	0.003	-17.36**	0	-0.048	-0.039
Spanish at home & no English	-0.158	0.003	-55.34**	0	-0.164	-0.153
5th-8th grade	0.060	0.002	24.48**	0	0.055	0.064
HS No Diploma	0.078	0.002	31.53**	0	0.073	0.083
High school graduate, or GED	0.211	0.003	82.61**	0	0.206	0.216
Some college, no degree	0.298	0.003	96.6**	0	0.292	0.304
Associate degree, occupational program	0.365	0.006	65.63**	0	0.354	0.376
Bachelors degree	0.185	0.006	31.02**	0	0.173	0.196
Master's, Professional and Doctorate	0.123	0.008	15.67**	0	0.107	0.138
Female	-0.468	0.001	-334.72**	0	-0.471	-0.466
Age	0.831	0.004	209.8**	0	0.824	0.839
Age squared	-0.001	0.000	-169.32**	0	-0.001	-0.001
U.S. Citizen	0.082	0.002	51.11**	0	0.079	0.085
Northeast	-0.191	0.002	-81.15**	0	-0.196	-0.187
South	-0.176	0.002	-85.36**	0	-0.180	-0.172
West	-0.135	0.002	-70.38**	0	-0.139	-0.132
Constant	7.985	0.008	1008.56**	0	7.969	8.000

Number of observations = 1,438,481; F(18,1438462) =15259.89 ; Prob > F = 0; Adj. R2 = .1603; Root MSE = .80684;
* significant at 5%; ** significant at 1%

Table 6. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Manufacturing Sector Managerial Occupations

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Spanish at home & English very well	-0.057	0.003	-16.48**	0	-0.064	-0.050
Spanish at home & English well	-0.212	0.005	-42.82**	0	-0.221	-0.202
Spanish at home & English not well	-0.347	0.007	-49.71**	0	-0.361	-0.334
Spanish at home & no English	-0.435	0.011	-40.74**	0	-0.456	-0.414
5th-8th grade	0.024	0.012	1.96*	0.049	0.000	0.049
HS No Diploma	0.044	0.012	3.73**	0	0.021	0.066
High school graduate, or GED	0.143	0.011	12.65**	0	0.121	0.166
Some college, no degree	0.228	0.011	20.35**	0	0.206	0.250
Associate degree, occupational program	0.322	0.012	27.46**	0	0.299	0.345
Bachelors degree	0.564	0.011	50.12**	0	0.542	0.586
Master's, Professional and Doctorate	0.686	0.012	58.8**	0	0.663	0.709
Female	-0.281	0.003	-90.61**	0	-0.288	-0.275
Age	1.238	0.010	129.24**	0	1.219	1.257
Age squared	-0.001	0.000	-108.07**	0	-0.001	-0.001
U.S. Citizen	0.103	0.004	25.77**	0	0.095	0.111
Northeast	-0.014	0.006	-2.42**	0.016	-0.025	-0.003
South	-0.052	0.005	-10.71**	0	-0.062	-0.043
West	-0.017	0.005	-3.66**	0	-0.026	-0.008
Constant	7.569	0.022	343.15**	0	7.526	7.612

Number of observations = 232,350; F(18,232331) = 5120.44; Prob > F = 0; Adj. R2 = .2840 Root MSE = .68686;
* significant at 5%; ** significant at 1%

Table 7. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Service Sector

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Spanish at home & English very well	0.031	0.001	39.33**	0	0.030	0.033
Spanish at home & English well	-0.025	0.001	-23.89**	0	-0.027	-0.023
Spanish at home & English not well	-0.104	0.001	-87.27**	0	-0.106	-0.102
Spanish at home & no English	-0.204	0.002	-131.78**	0	-0.207	-0.201
5th-8th grade	0.059	0.002	37.17**	0	0.056	0.063
HS No Diploma	0.024	0.002	15.6**	0	0.021	0.027
High school graduate, or GED	0.210	0.002	138.18**	0	0.207	0.213
Some college, no degree	0.265	0.002	168.15**	0	0.262	0.268
Associate degree, occupational program	0.380	0.002	195.66**	0	0.376	0.384
Bachelors degree	0.534	0.002	292.38**	0	0.530	0.537
Master's, Professional and Doctorate	0.656	0.002	314.28**	0	0.652	0.660
Female	-0.429	0.001	-683.24**	0	-0.430	-0.428
Age	1.415	0.002	851.7**	0	1.412	1.418
Age squared	-0.002	0.000	-714.58**	0	-0.002	-0.002
U.S. Citizen	0.015	0.001	19.7**	0	0.014	0.017
Northeast	0.018	0.001	14.29**	0	0.015	0.020
South	-0.077	0.001	-66.9**	0	-0.079	-0.074
West	-0.024	0.001	-21.89**	0	-0.027	-0.022
Management, Professional and Related Occupations	0.060	0.022	2.76**	0.006	0.017	0.102
Service occupations	-0.398	0.022	-18.41**	0	-0.440	-0.355
Sales & office occupations	-0.147	0.022	-6.83**	0	-0.190	-0.105
Farming, fishing and forestry	-0.464	0.022	-21.2**	0	-0.507	-0.421
Construction, extraction and maintenance occupations	-0.070	0.022	-3.25**	0.001	-0.113	-0.028
Production, transportation and material moving occupations	-0.217	0.022	-10.06**	0	-0.260	-0.175
Constant	6.962	0.022	318.4**	0	6.919	7.004

Number of observations =9,905,607; F(24,9905582) = . ; Prob > F = 0; Adj. R2 = .2440 Root MSE = .92578
* significant at 5%; ** significant at 1%

Table 8. Multiple Regression Analysis: log of income and wages on socio-demographic, educational, regional for the Public Sector

Log (Income and Wages)	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Spanish at home & English very well	-0.028	0.002	-13.18**	0	-0.033	-0.024
Spanish at home & English well	-0.108	0.003	-31.55**	0	-0.115	-0.102
Spanish at home & English not well	-0.221	0.006	-38.75**	0	-0.232	-0.209
Spanish at home & no English	-0.236	0.010	-23.53**	0	-0.256	-0.216
5th-8th grade	-0.120	0.012	-10.14**	0	-0.143	-0.096
HS No Diploma	0.055	0.011	5.21**	0	0.034	0.075
High school graduate, or GED	0.433	0.010	43.28**	0	0.413	0.453
Some college, no degree	0.568	0.010	56.92**	0	0.548	0.587
Associate degree, occupational program	0.627	0.010	60.96**	0	0.606	0.647
Bachelors degree	0.783	0.010	77.03**	0	0.763	0.803
Master's, Professional and Doctorate	0.912	0.011	86.14**	0	0.891	0.933
Female	-0.271	0.002	-125.93**	0	-0.275	-0.267
Age	1.543	0.006	268.66**	0	1.532	1.554
Age squared	-0.002	0.000	-228.37**	0	-0.002	-0.002
U.S. Citizen	0.113	0.004	30.72**	0	0.106	0.120
Northeast	0.065	0.005	14.48**	0	0.057	0.074
South	-0.015	0.004	-3.89**	0	-0.023	-0.008
West	0.049	0.004	12.49**	0	0.041	0.057
Management, Professional and Related Occupations	0.082	0.004	19.44**	0	0.074	0.090
Service occupations	0.117	0.004	28.6**	0	0.109	0.125
Sales & office occupations	-0.142	0.004	-33.15**	0	-0.150	-0.134
Farming, fishing and forestry	-0.348	0.018	-18.9**	0	-0.384	-0.312
Construction, extraction and maintenance occupations	0.012	0.005	2.4**	0.016	0.002	0.022
Production, transportation and material moving occupations	-0.081	0.006	-13.86**	0	-0.092	-0.069
Constant	6.394	0.015	428.52**	0	6.364	6.423

Number of observations =627,928; F(24,627903) =12421.91; Prob > F = 0; Adj. R2 = .3219 Root MSE = .73552
* significant at 5%; ** significant at 1%

Table 9. Income and Wages by Educational Attainment by Race/Ethnicity

Years of Education	White	Hispanic	% Difference
No School	$ 13,000	$ 13,800	6%
1 – 4th Grade	$ 13,100	$ 13,000	-1%
Elementary School	$ 14,000	$ 14,000	0%
12th Grade	$ 17,000	$ 15,000	-12%
HS Graduate	$ 21,000	$ 17,000	-19%
Some College	$ 23,000	$ 20,000	-13%
Bachelor's Degree	$ 36,000	$ 31,000	-14%
Masters	$ 45,000	$ 40,000	-11%
Professional	$ 57,000	$ 30,700	-46%
Doctorate	$ 57,000	$ 46,600	-18%
Average	$ 29,610	$ 24,110	-19%

Source: IPUMS 5% 2000