

Language Deficiency and the Occupational Attainment of Mexican Immigrants

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I. INTRODUCTION

“The number of Mexican Immigrants in the United States labor force nearly doubled between 1990 and 2000, increasing from 2.6 million to 4.9 million, according to the results of Census 2000” (Grieco, 2004). Immigration is an important topic in the United States today due to its political, social, and economic influence. It is especially important when discussing the US labor market. Many studies have analyzed immigration trends and focused on Mexican immigrants and the effects of the increase in Mexican immigration. However, while many studies have focused on wage differentials between Mexican immigrants and natives, it is also important to study occupational attainment between the two groups. Occupational attainment may provide insight into how an immigrant comes to earn a certain level of wages and to succeed in the host country. One factor that is important when discussing occupation choice is proficiency in the host country’s language. As other studies have shown, language is a human capital input that can influence the decisions made regarding occupation (Borjas, 1999; Chiswick, 2003; Daneshvary, 1993; Friedberg, 2000; etc.). By studying occupational attainment and language proficiency, it is possible to examine reasons why immigrants enter the industries in which they are employed in the United States and by doing this, immigration policy can be used to select immigrants for entrance into the U.S that will positively affect the economy.

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The following statistics, from the US Census Bureau’s Census 2000 PUMS 5% file, show the difference in occupational attainment between Mexican immigrants, other foreign workers, and US natives in concrete terms.

Over half of all employed Mexican immigrants worked in just two occupational categories. Of the 4.4 million

employed Mexican immigrants, 1.3 million or 29 percent worked in production, transportation, and material moving occupa-

tions, while 1.01 million or 25 percent worked in service occupations. Combined, these two occupation groups accounted for 54 percent of all employed Mexican immigrants while 0.3 million or 8% worked in management, professional and related occupations. (Grieco, 2004)

Also, compared to Mexican immigrants, a higher proportion of foreign –born workers in the United States (28%) work in management, professional, or related occupations and, compared to both Mexican immigrants and all foreign born workers, natives are more concentrated in management, professional, or related occupations (34%) (Grieco, 2004). What exactly causes this difference? Mexican immigrants are a rapidly growing part of the US labor force and they are also an immigrant group with very

low observable skills, specifically English-language skills (Trejo, 1997). This information, along with other literature done on language deficiency and immigration, lead me to expect that language deficiency among Mexican immigrants has an effect on their occupational distribution.

The following sections discuss previous literature on immigration, language proficiency and occupational attainment. Also, human capital theory will be explained as it relates to this topic. Then, I describe the data and research design used in order to test my hypothesis. Finally, I explain the results of my tests and analyze them as they relate to the research topic of language proficiency and occupational attainment and the immigration policy implications that can be made based on the results.

II. THEORY AND REVIEW OF LITERATURE

Human capital is the education, job training, and health embodied in workers, which increases their productivity (Salvatore, 2004). Barry Chiswick (2003) in "The Complementarity of Language and Other Human Capital" says, "Language is a form of human capital. As with other forms of human capital, language skills are a sacrifice of time and other resources, are embodied in the person and are productive". Past literature, including work by Stephen Trejo (1997), Rachel Friedberg (2000), N. Daneshvary (1993), Barry Chiswick (2003), and Alberto Davila (2000) all discuss human capital theory and the portability of human capital to explain the differences between immigrants and natives in the labor market. Human capital theory says that an increase in human capital inputs increases worker productivity. Differences in human capital inputs may not have an effect on occupational attainment, but the differences in language may prevent all human capital, such as education and experience, from being used efficiently. On this, Chiswick (2003) says, "Language proficiency can also have a direct impact on productivity through more efficient communication, orally and in writing, with supervisors, subordinates, peers, suppliers and customers".

Trejo's study (1997), "Why Do Mexican's Earn Low Wages?" discusses the human capital problems specific to Mexican immigrants. These problems include the generally low levels of observable skills such as education and language proficiency and how this compares to US natives. He finds that Mexican immigrants are less successful than natives because they possess less human capital than other workers, and not because they receive smaller labor market awards. Included in this human capital is language proficiency. The question that this study raises is how much of the difference is explained by language skills, and could it be that language deficiency causes Mexican immigrants to enter into industries that need fewer skills.

According to Borjas (Liebig, 2004) the results of human capital problems specific to Mexican immigration could be due to negative self-selection. Because there is a more unequal income distribution in Mexico than in the US, Mexican immigrants in the US may be from the lower tail of that income distribution and have fewer skills. While this should be taken into consideration, there may also be positive selection among

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Mexican immigrants. This means that the more motivated individuals will immigrate to the United States. Also, time spent in the US, education, and language proficiency may still make a Mexican immigrant comparable to a US native in skill levels and employability.

Friedberg's 2000 study focuses completely on the portability of immigrants' human capital. The lack of country-specific skills, including proficiency of the host country's languages, causes differences in wages between immigrants and natives of the host country. This study focused on immigration in Israel; however, the findings directly relate to the research problem of this study. Friedberg says, "The fact that natives receive a higher return lends support to the argument that their country-specific skills, including their superior Hebrew fluency, enable them to extract more productive potential from a year of schooling or experience than can immigrants" (2000). This difference in productivity due to language deficiency may

cause differences between immigrants entering into more professional industries which generally call for more usable experience and education and cause higher concentration in occupations that generally use lower-skilled workers despite the actual skill level of the immigrants.

Daneshvary agrees with this idea of imperfect transferability of human capital. He says, "In general, the literature indicates that due to the imperfect transferability of country-specific human capital to this country, the productivity and earnings of newly arrived immigrants in the US are relatively low but overtake those of US natives within 10 to 15 years of residence in this country" (1993). Specifically dealing with occupations of the Mexican immigrants, Davila finds that that English deficiency among Mexican immigrants influences occupational sorting so that the least proficient tend to work low skilled jobs. He says, "Human capital has a positive impact on the probability of being employed in white collar jobs" (2000). This literature will be compared to the results of this study.

Based on this literature, it is appropriate to base the theoretical framework of this study on the human capital model. With an increase in human capital inputs, worker productivity increases. Language proficiency is a human capital input because it is a skill that must be learned at the expense of increasing other inputs. The increase in language skills thus increases human capital. An increase in human capital will then increase the probability of an individual attaining an occupation that has a need for highly productive workers with a greater amount of human capital, such as professional and management professions. Because of this, higher levels of language ability should be directly related to the occupational attainment of Mexican immigrants.

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I hypothesize that language deficiency decreases the probability of a Mexican immigrant being employed in a favorable occupation such as a professional or management occupation even after controlling for other human capital inputs.

III. DATA

To test my hypothesis, that language deficiency decreases the probability of being employed in occupations requiring higher skill levels, I used data from 1% of the 2000 Integrated Public Use Microdata Series (IPUMS) census database (Ruggles et. al., 2004). My sample consists of 29,901 Mexican immigrants. I have only included males between the ages of 18 and 65 who were employed at the time the census was taken. Females were omitted from this sample because they may have different returns to human capital inputs for various reasons, including choosing to not become employed in order to care for dependent children (Sanford, 2002).

This database includes information on language proficiency that is the focus of this study. English proficiency of immigrants is broken down

**TABLE 1
Occupational Distribution for Total U.S. Population and Mexican Immigrants in the U.S.**

Occupation	% of U.S. Population	% of Mexican Immigrant Sample
Management, Professional, and Related Occupations	33.6%	6.8%
Service Occupations	14.9%	20%
Sales and Office Occupations	26.7%	8%
Farming, Fishing, and Forestry Occupations	0.7%	8.8%
Construction, Extraction, and Maintenance Occupations	9.4%	26.5%
Production, Transportation, and Material Moving Occupations	14.6%	29.7%
Other	0.1%	0.2%
Total	100%	100%

into several classifications: does not speak English, speaks English (meaning has any amount of English language skills), speaks only English, speaks English very well, speaks well, and does not speak well. From this project, the classification of “speaks English” has been omitted because the participant would be double-counted in this category and in the other English proficiency categories. Those that speak only English and those that speak English very well are grouped together to form the omitted variable for my language proficiency dichotomous variables.

Also, this database includes detailed information on occupations in which each participant is employed which is used to form the occupational attainment dependent variable. These occupations are coded from 1 to 983, where lower numbered occupations include management occupations, healthcare practitioners, and education occupations, and higher numbered occupations include food preparation and serving occupations, construction trades, and production occupations. For the purposes of this study, I use 1 to 354 as “favorable” occupations and 360 to 983 as less favorable. I chose this cut-off point because the lower numbered categories tend to be more specialized occupations that may require more human capital inputs. These categories, which are grouped by the census data available through IPUMS, can be seen in Table 1. The “favorable” occupations, 1-354, are grouped as “Management, Professional and Related

Occupations”.

IV. EMPIRICAL MODEL

To test my hypothesis I will use OLS regression by using human capital variables and English language proficiency to measure their effect on the dependent variable. Here, the dependent variable, PROF for professional, is a dummy variable (0 or 1), with the 1 being employed in a higher skilled occupation and 0 being employed in any other occupation. By using a dichotomous variable as a dependent variable, the coefficients on the independent variables can be interpreted as the percent changes in probability of the immigrant obtaining a favorable occupation for each unit increase of the independent variable. It is also possible to use logit or probit models to analyze the effects of the independent variables on the dichotomous dependent variable. This allows the coefficients to be retained to values between 0 and 1 (like the dependent variable); however, for this study, OLS regression will be used in order for the coefficients to be easily interpreted and compared.

Table 2 shows the variables used in this study. Language variables are broken down into four dichotomous variables: does not speak English (NOENG), speaks well (WELL), and does not speak well (NOTWELL). The omitted variables are both “speaks only English” and “speaks very well”. Both were omitted because they are so similar that omit-

TABLE 2
Variables Included and Predicted Signs of Coefficients

Dependant Variable	
PROF	1 if occupation is in professional, managerial, and related occupations, 0 if otherwise
Language Variables	
NOENG (-)	1 if no English, 0 otherwise
NOT WELL (-)	1 if does not speak well, 0 otherwise
WELL (-)	1 if speaks well, 0 otherwise
Omitted Variables	
VERY WELL	Speaks very well
ONLY ENG	Only speaks English
Immigrant Specific Variables	
YEARSUS (+)	Continuous variable for years living in the U.S.
CITIZEN (-)	1 if not a citizen , 0 if otherwise
Control Variables	
EDUC (+)	Continuous variable for years of education attained
AGE (+)	Continuous age variable
AGESQ (-)	Age variable squared
INMETRO (+)	1 if lives in metropolitan area, 0 if otherwise

ting only one makes the other insignificant. The omission of the two variables allows for the remaining variables to show the effects of lower levels of language proficiency on the dependent variable.

The immigrant-specific variables included in this model are “years in the U.S.” (YEARSUS) and “citizenship status” (CITIZEN). YEARSUS is included because there may be differences in human capital that can be accounted for by controlling for time spent in the host country. For example, as mentioned in Daneshvary (1993), human capital acquired in the host country such as labor market experience, may increase an immigrant’s success in the host country and years in the US may increase the acquisition of that human capital. Also, with more time in the United States other factors may affect employability of a Mexican immigrant, such as an increase in networking pool or general knowledge of the labor force in the US. CITIZEN is included because citizenship status may offer more opportunities for favorable occupations than being a non-citizen due to the legal issues in employment.

The control variables included are education (EDUC), age (AGE), age squared (AGESQ), and in metropolitan area (INMETRO). Education is a continuous variable for years of education completed. Years of education, as opposed to grades or degrees completed, were used in order to have a measurable

unit of education for all immigrants. The education system may not follow the grade system that is used in the US in all areas. A more standardized way of measuring the level of education attained by each participant would be preferred, but that information is not available with the IPUMS database.

Age is also a continuous variable that has been restricted in this study to ages 18 to 65. The age range was restricted to these ages in order to capture the majority of working adults. Age squared was included to show the quadratic effect on occupational attainment. This same variable was used in Sanford (2002). The author explains, “Older workers see less opportunity for advancement, because companies will be less likely to invest time and money in training for older workers, from whom they will see fewer years of returns to their investments”.

Living in a metropolitan area is a dichotomous variable with 1 coded as living in a metropolitan area and 0 as living in a non-metropolitan area as classified by the IPUMS information available. This information is included because tighter labor markets exist in more highly populated areas and these labor markets attract individuals with higher levels of human capital (Daneshvary, 1993).

Marital status and number of children have not been included in the empirical model. This is because these variables do not have significant

TABLE 3
Regression Results for Mexican Immigrants
(Dependent Variable= the probability of attaining a favorable career)

Dependent Variable	Coefficients	% Change in Probability	T-Statistics
PROF			
Language Variables			
NOENG (-)	-3.955E-02	-3.955%	-8.234
NOT WELL (-)	-5.744E-02	-5.744%	-14.194
WELL (-)	-4.875E-02	-4.875%	-12.032
Immigrant Specific Variables			
YEARSUS (+)	7.785E-04	0.0779%	3.938
CITIZEN (-)	-2.416E02	-2.416%	-6.879
Control Variables			
EDUC (+)	1.912E-02	1.912%	29.658
AGE (+)	4.530E-03	.453%	5.368
AGESQ (-)	-4.293E-05	.00429%	-3.883
INMETRO (+)	4.995E-04	0.05%	.155

All variables significant at the .01 level except for INMETRO which is not significant
R² = 0.065 and sample size is 28,901

effects on the dependent variable, probability of obtaining a favorable occupation. These variables may have a more significant impact on a sample that includes or is completely composed of women because they have different returns to human capital, as mentioned before. For the purposes of this study, the variables reflecting family characteristics have been omitted from the model.

Also, years of work experience was not included in this model due to a lack of data. It may be possible to formulate a proxy variable for work experience by subtracting five years (the age at which formal education most likely began) and years of formal education from age to estimate experience in the labor force; however, estimating experience in this way will capture experience in both the home country and in the host country for those that have emigrated after age 18. To capture just experience in the host country, it may be possible to subtract the age at immigration from the age at the time of the census, but this may be highly correlated to years living in the US which may have more of an effect, as mentioned before. For the purposes of this study, the preferred data would be years of work experience in the US, which is unavailable in the dataset and difficult to capture without having high correlations with variables already included in the model.

V. RESULTS

The results of this study support the hypothesis that language deficiency decreases the probability of a Mexican immigrant attaining favorable occupations. These results are presented in Table 3. The results come from using regression analysis on a sample of 28,901 male, Mexican immigrants. The coefficients all show the expected sign and all are highly significant (at the 1% level) except for the results for living in a metropolitan area, which is an issue that will be discussed later on. This model yielded an adjusted R-squared value of 0.065. This value may be improved with the inclusion of proxy variables for labor market experience and a proxy for living within an ethnic enclave.

The coefficients for the language proficiency variables yielded the correct sign and also had the greatest impact on the changes in probability of attaining a favorable occupation; however, the coefficient values are interesting. Speaking no English actually decreases the probability by an amount less than speaking not well or well. Speaking no English

decreases the probability of attaining a favorable occupation by 3.955% while speaking well decreases it by 4.874% and speaking not well decreases it by 5.744%. Like Borjas (1994), one may assume that a higher level of proficiency in the host country's language would open up employment opportunities. This was not the expected result, but it can be explained. One possibility is that the towns along the border of Mexico where there are many factories or "maquiladoras" and other Spanish-speaking ethnic enclaves do not present a need for an immigrant to learn or use English. There are an increasing number of Mexican immigrants in the U.S, so it can be assumed that niches exist for Spanish-speaking professionals within an ethnic enclave. Also, in this sample there may be such a small number of people in professional occupations that don't speak English that this category of language deficiency has a different value for the change in probability.

Participants with the other language classifications, well and not well, have English skills so it is more likely that they will try to obtain employment outside of an ethnic enclave, and therefore have to compete with native English speakers. Davila (2000) reaffirms this idea in "English Skills, Earnings, and the Occupational Sorting of Mexican Americans Along the U.S.-Mexico Border" when he says, "[results] confirm the existence of an occupational distribution differential between certain border cities and the rest of the country" and "workers in regions with a strong minority-language presence are caught in a 'mobility trap', a condition serving to lower English proficiency returns".

The results pertaining to language proficiency are consistent with results in previous literature. The deficiency in language skills decreases the probability of obtaining certain occupations, which is consistent with Trejo's 1997 study. The lower levels of this human capital input cause a decrease in the level of success that can be attained, all other things held equal. Here, success can be measured by the ability to obtain the more favorable occupations because with these more favorable occupations come higher wages and other desirable outcomes.

The immigration variables included had equally unexpected coefficients although the signs were all as predicted. Years in the US positively affects the probability of attaining a favorable occupation by 0.0779% per year. One would assume that this percentage would be greater because with each

year spent in the US, US labor force experience, communication skills, and other important factors that affect employability increase. This can be explained because the most recent cohorts of immigrants are young and may choose to stay in the lower-skilled occupations that they enter into upon arrival. Citizenship status also had a coefficient that was expected to be greater because citizenship opens many employment opportunities.

These results are also consistent with previous literature, specifically to Friedberg's 2000 study.

Each year spent in the United States increases the probability of obtaining employment in certain occupations because each year enables an immigrant to learn more country-specific skills. These

country-specific skills in turn allow the immigrant to use other human capital inputs more efficiently. This relates to the way that immigrants in Israel had differences in economic success due to low portability of human capital inputs and the inability to work as efficiently as the natives in that study.

Education, as expected, has a large impact on the probability of attaining a favorable occupation. For each year of education completed, the probability increases by 1.912%. This shows that education is one of the leading factors that explain why immigrants obtain employment in certain occupations. Obviously, the more education an immigrant has attained, the higher the likelihood that they are capable of performing a task that requires higher skill levels.

Age does not seem to have as great of an effect due to the measure that is used. Age does increase the probability by 0.453% per year, but here the age variable does not seem to fully reflect the experience and skills gained with time (which may be captured in the YEARSUS variable). Also, age does not improve mobility between occupations. Age squared also has the correct sign and shows a 0.00429% decrease per year. This means that, as predicted, there is even less mobility into favorable occupations as a Mexican immigrant gets older.

The variable for living in a metropolitan area is interesting due to its insignificance to this model. As mentioned previously, a metropolitan area may attract higher skilled workers to its tighter labor market. However, the results show that this effect may be somewhat overcome by other factors. Some such factors may be a higher concentration of professional occupations in the area or the presence of increased competition from native English-speakers.

To further this research and to obtain results that offer more information that is relevant to the

research problem of occupational attainment of immigrants, a proxy variable for US labor market experience should be included in order to capture the effects of increased human capital acquired in the host country.

Also, it may be beneficial to take into further consideration the effects of negative selection theory discussed by Borjas (1987) as it relates to Mexican immigrants in recent cohorts.

VI. CONCLUSION

The results of this study show that language deficiency does decrease the probability of an immigrant attaining a favorable occupation such as a professional or management occupation. The variables included do not completely explain the factors that affect this probability, but they are important to the topic of immigration in that some of the factors and their respective impacts have been identified.

Language proficiency explains a good deal of why an immigrant becomes employed in occupations that are considered favorable or more professional. Not speaking any English decreases the probability of attaining a favorable occupation by 3.955% while speaking well decreases it by 4.874% and speaking not well decreases it by 5.744%. Education also is a prominent factor. Each year of education increases the probability by 1.912%.

This information can be used to analyze immigration policy. As Borjas states in Heaven's Door, it is important to decide what kind of immigrants and how many immigrants should be allowed

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to immigrate to the United States (1973). If education and language proficiency increase the probability of attaining certain occupations, immigration policy can take that into account when determining the criteria for acceptance in order to fill shortages in those occupations.

The results show that human capital inputs may need to have more bearing in the immigrant selection process. Now, many factors are taken into consideration when potential immigrants are being selected. One is the presence of a family member in the United States. Family reunification is an important topic, as has been discussed in the course "The Economics of Gender, Race, and Immigration" taught by Dr. Michael Seeborg, Illinois Wesleyan University. Success of an immigrant in the United States is difficult to predict; however, analyzing an applicant's human capital inputs may allow for a better prediction of economic success than other factors, such as the residency of an applicant's family member in the country (Borjas, 1999). These results imply that language training *after* the immigrant enters the US may be beneficial. There are English as a second language (ESL) classes offered in many areas, but these classes may need to be advertised and their benefits emphasized to immigrants upon arrival.

The economic success of immigrants in the United States is an important topic to discuss due to the growing numbers of immigrants entering the country, especially from the bordering country of Mexico. It is necessary to analyze how immigrant groups will affect the existing labor market and predict how the labor market can change if certain criteria are met in order to gain acceptance.

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