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Language Deficiency and the Occupational Attainment of Mexican Immigrants

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The number of Mexican immigrants that have entered the U.S. has greatly increased over the past decade. The occupational attainment of these immigrants provides insight into how successful they are in the host country and language deficiency has an effect on this occupational attainment. By controlling for language proficiency, human capital characteristics and other variables from the IPUMS database, this project uses probit analysis to predict the probability that an immigrant will be employed in a favorable occupation in the U.S. Results show that language deficiency reduces the probability of attaining a favorable occupation, but having no English language skills decreases the probability by a lesser amount than if the immigrant had any English language skills. This information is important to the analysis of immigration policy and to language training for immigrants in the United States.

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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 U.S. 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 occupations in which they are employed in the United States.

The following statistics, from the U.S. Census Bureau's Census 2000 IPUMS 5% file, show the difference in occupational attainment between Mexican immigrants, other foreign workers, and U.S. 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 occupations, 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 other foreign–born workers in the United States (28%) work in management, professional, or related occupations and, compared to both Mexican immigrants and all other foreign born workers, natives are more concentrated in management, professional, or related occupations (34%) (Grieco, 2004).

What exactly causes these differences in occupational attainment between male, Mexican immigrants and other groups? Mexican immigrants are a rapidly growing part of the U.S. 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 deficiency 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 discuss the immigration policy implications that can be drawn from the results.

II. Theory and Literature Review

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." It is assumed that people choose human capital investments that maximize the present value of lifetime earnings (Borjas, 2000). In this case, acquiring higher levels of English proficiency allows an immigrant to be better off because they are better able to obtain occupations in the United States that have higher average earnings.

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. 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." In addition, language proficiency can have an indirect impact on productivity by making it difficult for immigrants with low language proficiency to apply skill acquired through education and training in their native country.

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 U.S. 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 occupations 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 U.S., Mexican immigrants in the U.S. 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 Mexican immigrants. This means that the more motivated individuals from a given socioeconomic group will immigrate to the United States.

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 U.S. are relatively low but overtake those of U.S. natives within 10 to 15 years of residence in this country" (1993).

Specifically dealing with occupations of Mexican immigrants, Davila finds 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).

All of this literature relates to various forms of the human capital model and the human capital model also forms the theoretical framework for my study. The basic idea is that 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 a cost to increasing other inputs. Since high language proficiency increases the individual's potential productivity, it should increase his probability of attaining a favorable 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.

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 use data from 1% of the 2000 Integrated Public Use Microdata Series (IPUMS) census database (Ruggles et. al., 2004). My sample consists of 28,902 Mexican immigrants. I include males between the ages of 18 and 65 who were employed at the time the census was taken. Females are 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 for this project is broken down into several classifications based on self-classification criteria from IPUMS: speaks only English, speaks English very well, speaks English well, does not speak English well, and does not speak English. To form these classifications, first participants classify themselves into two groups: does not speak English or speaks English. Then the group that speaks English are asked to classify themselves into speaks only English, speaks English very well, speaks English well, and does not speak English well.

Those that respond "speaks only English" and "speaks English very well" are grouped together in this project to represent the highest level of English proficiency. Thus, for the purpose of my study each individual is grouped into one of the following four language proficiency categories:

- Speaks English Very Well
- Speaks English Well
- Does Not Speak English Well
- Speaks No English

A more detailed explanation of the way in which the language proficiency variables is formed can be found in Appendix A.

Also, this database includes detailed information on occupations in which each participant is employed. This information is used to form the occupational attainment dependent variables. These occupations are coded from 1 to 983 in IPUMS, where lower numbered occupations include more professional occupations such as management occupations, healthcare practitioners, and education occupations, and higher numbered occupations include less professional occupations such as 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". In the model they are referred to as PROF1 and NOTPROF, respectively. These general categories, which are grouped by the census data, are available through IPUMS, and their distribution for both Mexican immigrants and for the entire U.S. population can be seen in Table 1. The favorable or professional occupations are grouped as "Management, Professional and Related Occupations."

Less favorable or non-professional occupations are also grouped in as "Non-Professional" occupations in Table 1.

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**
Professional		
Management, Professional, and Related Occupations	33.6%	6.8%
Non-Professional		
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%**

Source: 2000 Census Summary File, U.S. Census Bureau American FactFinder.

I separate the occupations into these two groups because the Professional Occupations group tends to be more specialized occupations that may require more human capital inputs compared to the Non Professional Occupation group. Similar classifications are seen in Grieco's 2004 study. This can be seen in Table 2 which lists the specific occupations that make up the general categories and the distribution of the language proficiencies for each occupation.

Table 2: Language Proficiency Distribution by Specific Occupations

	n	% No English Skills	% "Not Well	% Well	% Very Well/ Only English	Total %
Professional Occupations	**1902**	8.57	24.50	15.14	51.79	100
Non-Professional Occupations	**24944**	19.63	23.95	31.93	24.49	100
Specific Professional Occupations						
Management Occupations	896	9.49	26.00	17.52	46.99	100
Business Operations Specialists	118	4.24	33.90	22.88	38.98	100
Financial Specialists	79	7.60	20.25	11.39	60.76	100
Computer and Mathematical Occupations	102	2.94	20.59	9.80	66.67	100
Architecture and Engineering Occupations	159	5.03	25.79	7.55	61.63	100
Life, Physical, and Social Science Occupations	63	17.46	22.22	7.94	52.38	100
Community and Social Services Occupations	80	10.00	26.25	12.50	51.25	100
Legal Occupations	22	4.55	4.55	9.09	81.81	100
Education, Training and Library Occupations	154	3.25	18.18	5.19	73.38	100
Art, Design, Entertainment, Sports, Media	144	18.75	22.92	27.08	31.25	100
Healthcare Practitioners and Technical Occupations	85	4.70	21.18	10.59	63.53	100
Specific Non-Professional Occupations						
Healthcare Support Occupations	62	6.45	22.58	19.36	51.61	100
Protective Service Occupations	183	8.74	18.58	12.57	60.11	100
Food Preparation and Serving Occupations	2595	18.30	25.70	34.72	21.28	100
Building and Grounds Cleaning and Maintenance	2853	22.99	22.64	36.35	18.02	100
Personal Care and Service Occupations	158	14.56	24.05	24.05	37.34	100
Sales Occupations	1126	11.01	26.65	20.60	41.74	100
Office and Administrative Support Occupations	1192	9.98	26.76	21.06	42.20	100
Farming, Fishing and Forestry Occupations	2550	34.90	14.94	33.53	16.63	100
Construction Trades	6019	21.40	23.03	33.89	21.68	100
Extraction Workers	59	20.34	16.95	38.98	23.73	100
Installation, Maintenance and Repair Workers	1585	11.86	29.21	27.45	31.48	100
Production Occupations	5143	19.17	23.60	33.92	23.31	100
Transportation and Material Moving Occupations	3440	16.42	27.53	30.87	25.18	100
Military Specific Occupations	35	5.72	28.57	8.57	57.14	100

Source: 2000 IPUMS 1% Data Sample

IV. Empirical Model

To test my hypothesis I use the probit model with the marginal effects option from Stata (STATA, 2003). The purpose is to determine the effect of language deficiency on the occupational attainment of Mexican men after controlling for a number of human capital related variables. Probit analysis is used here because the dependent variable is a dichotomous variables. PROF1, for professional occupations, assumes the value of one if the individual attains a favorable occupation and zero if he does not. Probit is generally known to be a better tool than OLS regression when the dependent variable is dichotomous (Woolridge, 2003). By using a dichotomous variable as a dependent variable and a marginal effects probit model, the coefficients to the independent variable can be interpreted as the percentage point change in probability of the immigrant attaining a favorable occupation for each level of language proficiency. The marginal effects are taken at the mean values of the independent variables.

The research design involves running 13 probit models for various definitions of the dependent variable. The base model mentioned above includes all working Mexican men between 18 and 65. The dependent variable, PROF1, indicates whether the individual is employed in professional occupations, broadly defined. The subsequent probit runs include men who are included in more narrowly defined professional occupations. In each case, the sample included in the probit is all nonprofessional workers plus the workers in the professional category under consideration. Since the professional category changes for each probit run, the sample size also changes. The following list defines the samples used in the first 12

probits.

1. Professional plus non-professional (n=28902)
2. Managerial Occupations plus non-professional (n=27896)
3. Business Operations Specialists plus non-professional (n=27118)
4. Financial Specialists plus non-professional (n=27079)
5. Computer and Mathematical Occupations plus non-professional (n=26393)
6. Architecture and Engineering Occupations plus non-professional (n=27159)
7. Life, Physical, and Social Services Occupations plus non-professional (n=26354)
8. Community and Social Services Occupations plus non-professional (n=27080)
9. Legal Occupations plus non-professional (n=26313)
10. Education, Training, and Library Occupations (n=27154)
11. Art, Design, Entertainment, Sports, Media and non-professional (n=27144)
12. Healthcare Practitioners and Technical Occupations plus non-professional (n=26376)

Table 3: Variables Included and Predicted Signs of Coefficients

Dependant Variables	
PROF	1 if occupation is in professional, managerial, and related occupations, 0 if otherwise
MANAGERIAL	1 if occupation is in managerial, and related occupations, 0 if otherwise
BUSINESS OPERATIONS	1 if occupation is in business operations and related occupations, 0 if otherwise
FINANCIAL SPECIALISTS	1 if occupation is in financial specialists and related occupations, 0 if otherwise
COMPUTER AND MATH	1 if occupation is in computers, mathematics and related occupations, 0 if otherwise
ARCHITECTURE AND ENG	1 if occupation is architecture, engineering, and related occupations, 0 if otherwise
LIFE, PHYS, SOCIAL	1 if occupation is in life, physical, social services and related occupations, 0 if otherwise

COMMUNITY AND SOCIAL	1 if occupation is in community and social services and related occupations, 0 if otherwise
LEGAL	1 if occupation is legal and related occupations, 0 if otherwise
EDUCATION TRAINING	1 if occupation is in education, training, library, and related occupations, 0 if otherwise
ART, DESIGN, MEDIA	1 if occupation is in art, design, entertainment, sports, media and related occupations, 0 if otherwise
HEALTHCARE	1 if occupation is in healthcare practitioners, technical, and related occupations, 0 if otherwise
Independent Variables	
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.
NOCITIZEN (-)	1 if not a citizen , 0 if otherwise
Other Control Variables	
EDUC (+)	Continuous variable for years of education attained
AGE (+)	Continuous age variable
NOMETRO (+)	1 if does not live in metropolitan area, 0 if otherwise

Table 3 shows the main variables used in this study. Language variables are does not speak English (NOENG), does not speak well (NOTWELL), and speaks well (WELL). The omitted variables are both "Speaks Only English" and "Speaks

Very Well." Both are omitted because they both measure very good proficiency in English. The omission of the two variables allows for the remaining variables to show the effects of language deficiency on the dependent variable in comparison to individuals who have very good proficiency in English. I expect that any level of language deficiency (no English, not well, and well) will have a negative effect on the probability of attaining a professional occupation.

The immigrant-specific control variables included in this model are "years in the U.S." (YEARSUS) and "citizenship status" (NOCITIZEN). 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 U.S. 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 U.S. I expect that this variable will yield a positive coefficient for the probability of attaining a professional occupation. NOCITIZEN is included because citizenship status may offer more opportunities for favorable occupations than being a non-citizen due to the legal issues in employment. Here, not being a citizen is coded as 1 and being a citizen is 0. I expect that this variable will have a negative effect on the probability of a Mexican immigrant attaining a professional occupation. One shortcoming of this variable is that it does not take into consideration permanent residency, which may also affect the dependent variable; however, a lack of

information in IPUMS prevents me from including that information.

The other control variables included are education (EDUC), age (AGE), and not in metropolitan area (NOMETRO). Education is a continuous variable for total years of education completed whether the education is completed in Mexico or the United States. Years of education, as opposed to grades or degrees completed, are used in order to have a measurable unit of education for all immigrants. The education system in Mexico may not follow the grade system that is used in the U.S. For example, there are likely differences in length of the school year and possibly qualitative differences. 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. I expect education to be positively related to the probability of attaining professional occupations.

AGE is also a continuous variable that measures the individuals' actual age in years. Recall that the sample has been restricted in this study to individuals who are 18 to 65 years in order to capture the majority of working adults. I expect that age will have a positive effect on the probability of attaining a professional occupation because most individuals accumulate human capital from on-the-job training as they age.

Not living in a metropolitan area is a dichotomous variable with 1 coded as not living in a metropolitan area and 0 as living in metropolitan area as classified by the IPUMS. 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). Also, there are generally more professional

occupations in metropolitan areas. Therefore, I expect that not living in a metropolitan area (coded as 1) will have a negative effect on attaining a professional occupation.

Also, years of work experience is not included in this model due to a lack of specific data and because information that may be used to formulate a proxy variable (such as age and education) is already included in the model.

V. Results

The results come from using probit analysis on a sample of 28,901 male, Mexican immigrants. The coefficients to all of the probit runs are highly significant with a probability value of less than 0.001 for all coefficients according to the z statistic which is used for the probit procedure.

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 the appendix in Tables 1A. In order to make the probit coefficients easier to interpret, I used the "marginal effects" option in STATA (STATA, 2003).

The coefficients can be interpreted as "marginal effects" because they show the percentage point change in the probability of achieving a specific occupational outcome given that level of language proficiency. It shows, for example, that "Speaking no English" causes the probability of achieving a professional management occupation to decrease by 1.63 percentage points.

The results reported in the appendix table are generally as expected. The control variables and the immigrant specific variables are almost always statistically significant and have the hypothesized signs.

Most importantly, the language proficiency variables are almost always statistically significant with the correct sign. Since the purpose of this paper is to focus on the effects of language proficiency on occupational attainment, most of the discussion in this section will focus only on the coefficients to the language proficiency variable which are reported in Table 4. Only the coefficients are reported in this table and the interested reader is referred to the appendix table for the significance tests (z-statistics) and for the complete set of probit results. The coefficients can be thought of as the effects of language proficiency on occupational attainment after the effects of educational attainment, age and the other variables on occupational attainment have been taken into account. These are the marginal effects of language proficiency on occupational attainment.

In addition to reporting marginal effects, Table 4 reports what I define as proportional effects. The proportional effect can be interpreted as how a change in the language proficiency variable affects the probability of attaining a certain occupation. The proportional effect is the marginal effect divided by the proportion of the total sample that is in the occupation. For example, Table 4 shows that the proportional effect of "Speaking no English" for a professional and management occupation is -48.84%. This means that this group is 48.84% less likely than the highly proficient English-speaking group to attain a professional occupation. This is determined by dividing the marginal effect of "Speaking no English" (-1.63%) by the percent of the total sample that makes up the occupation (3.34%). The important reason I include proportional effects is because they standardize for the size of occupations and, therefore, we can compare proportional effects across different occupations.

The majority of the coefficients for the language deficiency variables yielded the correct sign: a negative sign for the professional occupation group and the specific professional. An exception for the professional occupation group is seen in the Art, Design, Entertainment, Sports, and Media occupation group where the participants speak no English. This may be because there are only approximately 20 participants in this group that speak no English and these participants may work for a predominately Spanish-speaking company or for a Spanish-speaking population.

Also, for the majority of the coefficients, speaking no English actually decreases the probability of attaining a professional occupation by an amount less than speaking not well or well. The proportional effects show that those who do not speak English are 38.6% less likely to attain professional occupations than those who are highly proficient in English, those who do not speak English well are 55.5% less likely, and those who speak English well are 34.1% less likely.

Like Borjas (1994), one may assume that a higher level of proficiency in the host country's language would open up employment opportunities. This is 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. This is an interesting idea to further develop in future research. It may be possible to actually form a study to see if immigrants with different language skills actually seek out labor markets within an ethnic enclave.

Table 4: Marginal Effect and Proportional Impact of Language Variables
Note: % of sample is the percent of total sample (n=28902)

Professional Occupation	% of sample	Marginal Effect -- No English	Proportional Impact-- No English	Marginal Effect-- Not Well	Proportional Impact-- Not Well	Marginal Effect-- Well	Proportional Impact-- Well
Professional Occupations (general)	7.10%	-2.75%	-38.60%	-3.94%	-55.50%	-2.42%	34.10%
Management Occupations	3.34%	-1.63%	-48.84%	-2.00%	-59.92%	-1.12%	-33.56%
Business Operations Specialists	0.44%	-0.20%	-45.50%	-0.13%	-29.58%	0.00%	-0.91%
Financial Specialists	0.29%	-0.01%	-3.40%	-0.03%	-10.19%	-0.02%	-6.80%
Computer and Mathematical Occupations	0.38%	-0.01%	-2.63%	-0.02%	-5.26%	-0.01%	-2.11%
Architecture and Engineering Occupations	0.59%	-0.15%	-25.33%	-0.25%	-42.21%	-0.11%	-18.57%
Life, Physical, and Social Science Occupations	0.23%	-0.02%	-8.52%	-0.14%	-59.66%	-0.07%	-29.83%
Community and Social Services Occupations	0.30%	0.0009%	0.30%	-0.07%	-23.49%	-0.03%	-11.07%
Legal Occupations	0.08%	N/A	N/A	N/A	N/A	N/A	N/A
Education, Training, and Library Occupations	0.57%	0.0020%	0.3486%	0.0040%	0.6973%	0.0020%	0.3486%
Arts, Design, Entertainment, Media Occupations	0.54%	0.15%	27.96%	-0.01%	-1.86%	-0.06%	-11.19%
Healthcare Practitioners and Technical Occupations	0.32%	-0.04%	-12.63%	-0.07%	-22.11%	-0.05%	-15.79%

* marginal and Proportional Effects not reported when sample size for occupation is less than 8.

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".

Because these results show that language deficiency decrease probability of attaining a professional occupation, they prompted me to question whether language deficiency would *increase* the probability of attaining a non-professional occupation. After running probits for non-professional occupations in general and then for specific non-professional occupations compared to the entire professional occupations group, I find that results pertaining to language deficiency are consistent for both professional and non-professional occupations with results in previous literature. Language deficiency increases the probability of attaining a non-professional occupation. These results, which can be seen in Appendix Table 2A, continue to support the hypothesis that language deficiency decreases probability that a Mexican immigrant will attain a professional occupation.

That deficiency in language skills decreases the probability of obtaining certain professional occupations 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 attain the more

favorable occupations because with these more favorable occupations come higher wages and other desirable outcomes.

Next, I discuss briefly the effects of the immigration specific variables and control variables on occupational attainment. The coefficients to these variables are found in Appendix Tables 1A. The immigration variables included are not always consistent with my expectations. The most discrepancies are seen in the Years in the U.S. variable results. For professional occupations, most of these coefficients are positive as expected, but there are exceptions. For Financial Specialists, Computer and Mathematics occupations, and for Architecture and Engineering occupations, the coefficient sign is negative, but in both cases is not statistically significant. Therefore, the negative sign could be due to chance. However, from the results, it can be seen that this variable is more significant for professional occupations that need more interpersonal communication skills, such as managerial occupations. The other immigrant specific variable, citizenship status, has results that were all as expected. Not being a citizen decreases the probability of attaining a professional occupation for all specific professional occupations.

These results are also consistent with previous literature, specifically with 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. Almost all coefficients for this variable are highly significant and the signs are all positive as expected. 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. The age variable also has the effect that is originally expected. Age does increase the probability of attaining a professional occupation and the coefficients are mostly significant.

The variable for not living in a metropolitan area is interesting due to its insignificance to this model. It is only highly significant for one of the specific non-professional occupation probits, Farming, Fishing, and Forestry occupations, which are not occupations existing in a metropolitan area. 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. Another factor may be the increased presence of ethnic enclaves in metropolitan areas.

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 and increase the probability of attaining most non-professional occupations. The variables included do not completely explain the factors that influence

occupational attainment, but they are important.

Language proficiency explains a good deal of why an immigrant becomes employed in certain occupations. The proportional effects show that those who do not speak English are 38.6% less likely to attain professional occupations than they are to attain non-professional occupations, those who do not speak English well are 55.5% less likely, and those who speak English well are 34.1% less likely.

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 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 one important topic discussed in immigration literature. 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 U.S. 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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Appendix A: Formation of Language Deficiency Variables

From the IPUMS database, the variable SPEAKENG was used to form the language deficiency variable for this project. SPEAKENG indicates whether or not the respondent was able to speak English, and if the respondent does speak English, it also describes how well he is able to speak English.

The variable is generated using the responses to one interviewer question consisting of three parts:

a.) Does this person speak a language other than English at home?
    a. Yes
    b. No→Skip to next question
b.) What is this language
    a. [ ]
c.) How well does this person speak English
    a. Very Well
    b. Well
    c. Not Well
    d. Not At All

After the respondents submit their answers, the responses are coded in this way in IPUMS:

Does Not Speak English	0
Yes, Speaks English	2
Speaks Only English	3
Speaks Very Well	4
Speaks Well	5
Speaks, but Not Well	6

There are zero responses for "Yes, speaks English" (code 2). Instead, it is only used as a means of classifying responses into codes 3, 4, 5, and 6. In this project, the classifications of responses (excluding "Speaks English") are used as dichotomous variables with the omitted variable being the combine responses of "Speaks Only English" and "Speaks Very Well", which represent the highest level of English language proficiency.

Table 1A: Specific Professional Occupation Probit Results

Note: Each sample includes the indicated professional group and all nonprofessional workers.

Independent Variable	Managerial Occupations	Business Operations Specialists	Financial Specialists	Computer and Mathematical Occupations	Architecture and Engineering Occupations	Life, Physical, and Social Services Occupations
No English	-.0162***	-.0020**	-0001	-.0001**	-.0001**	.0002
	(-5.90)	(-2.83)	(-1.18)	(-2.54)	(-2.62)	(0.41)
Not Well	-.0200***	-.0013*	-.0002**	-.0002***	-.0025***	-.0014**
	(-8.55)	(-1.64)	(-2.92)	(-3.36)	(-2.62)	(-3.08)
Well	-.0112***	-.0001	-.0002*	-.0001**	-.0011**	-.0007*
	(-5.27)	(-0.05)	(-2.75)	(-3.36)	(-2.95)	(-1.89)
Years in U.S.	.0004***	.0001	-.0001	-.0001	-.0000	.0001
	(3.54)	(0.19)	(-1.08)	(-0.51)	(-1.07)	(0.21)
Not Citizen	-.0048**	-.0004	-.0001	-.0002**	-.0018***	-.0001
	(-2.10)	(-0.49)	(-0.76)	(-2.97)	(-3.59)	(-0.28)
Education	.0044***	.0008	.0003***	.0002***	.0011***	.0006***
	(10.51)	(5.80)	(8.74)	(9.63)	(10.59)	(6.54)
Age	.0042***	.0001***	.0001**	-.0001	.0001**	.0001
	(3.61)	(0.19)	(2.51)	(-0.51)	(3.12)	(1.12)
Married	.006**	.0017**	.0001	-0.0001*	.0001	.0002
	(2.99)	(2.54)	(0.40)	(-1.88)	(0.27)	(0.51)
No Metro	-.0008	-.0020	.0001	N/A	-.0006	N/A
	(-0.13)	(-1.04)	(0.42)		(-0.53)	
Sample Size	27896	27118	27079	26393	27159	26354
LR chi^2 value	492.39	83.90	230.79	312.43	325.74	89.22
Prob. Value	0.000	0.000	0.000	0.000	0.000	0.000

* indicates significance at 10% level
** indicates significance at 5% level
***indicates significance at 1% level
Numbers in parenthses indicate the z value. N/A indicates that the variable was dropped for this sample.

Table 1A (continued): Specific Professional Occupation Probit Results

Note: Each sample includes the indicated professional group and all nonprofessional workers.

Independent Variable	Community and Social Services Occupations	Legal Occupations	Education, Training, and Library Occupations	Art, Design, Entertainment, Sports, Media	Healthcare Practitioners and Technical Occupations
No English	-.0001	-.0001	-.0001**	.0015	-.0004
	(-0.02)	(-0.29)	(-2.69)	(1.12)	(-1.04)
Not Well	-.0007**	-.0001	-.00004***	-.0001	-.0007
	(-2.22)	(-1.45)	(-4.96)	(-0.07)	(-2.57)
Well	-.0003	-.00001**	-.00002***	-.0006	-.0005
	(-1.28)	(-2.46)	(-4.05)	(-0.65)	(-2.36)
Years in U.S.	.0000	.0000	0.0001	.0000	.0000
	(0.28)	(0.65)	(1.12)	(0.04)	(0.86)
Not Citizen	-.0003	-.0001	-.0001	-.0001	-.0009
	(-0.91)	(-0.56)	(-0.86)	(-0.12)	(-3.14)
Education	.0006***	.0001***	.0001***	.0012***	.0005
	(8.34)	(5.30)	(1.12)	(7.00)	(8.02)
Age	.0001***	.0000	-.0000	.0001**	.0000
	(4.48)	(0.75)	(-0.20)	(2.79)	(3.03)
Married	-.0003	-.0000	-.0000	-.0025**	-.0001
	(-1.23)	(-0.29)	(-0.88)	(-0.07)	(-0.65)
No Metro	-.0003	N/A	.0000	-.0030	N/A
	(-0.36)		(0.01)	(-1.26)	
Sample Size	27080	26313	27154	27144	26376
LR chi^2 value	170.02	94.87	603.4	72.6	216.26
Prob. Value	0.000	0.000	0.000	0.000	0.000

* indicates significance at 10% level
** indicates significance at 5% level
***indicates significance at 1% level
Numbers in parentheses indicate the z value. N/A indicates that the variable was dropped for this sample.

Table 2A: Specific Non-Professional Occupation Probit Results

Note: Each sample includes the indicated non-professional group and all professional workers.

Independent Variable	Healthcare Support Occupations	Protective Services Occupations	Food Prepration and Serving Occupations	Building and Grounds Cleaning/ Maintenance	Personal Care and Service Occupations	Sales Occupations	Officed and Administrative Support Occupations
No English	-.0141	.0332	.1053***	.1804***	0.0062	.0132	-.0066
	(-1.06)	(1.17)	(3.76)	(7.16)	(0.30)	(0.37)	(-0.18)
Not Well	.0027	.0095	.2087***	.2346***	.0179	.0626**	.0732**
	(0.23)	(0.45)	(9.52)	(11.25)	(1.03)	(2.21)	(2.62)
Well	-.0013	-.0095	.1460***	.1394***	.0055	.0472**	.0552**
	(-0.14)	(-0.59)	(7.12)	(6.98)	(0.38)	(2.04)	(2.40)
Years in U.S.	-.0004	.0028***	-.0095***	-.0056***	-.0002	.0021*	.0023
	(-0.86)	(3.81)	(-8.37)	(-5.50)	(-0.33)	(1.87)	(2.01)
Not Citizen	-.0098	-.0221	.0891***	.0899***	.0208	.0425	.0158
	(-1.10)	(-1.53)	(4.23)	(4.60)	(1.60)	(2.21)	(0.75)
Education	-.0019	.0010	-.0606***	-.0748***	-.0117***	-.0288***	-.0318***
	(-1.15)	(0.32)	(-16.90)	(-22.16)	(-4.99)	(-7.11)	(-7.71)
Age	-.0009*	-.0023**	-.0063***	-.0008	-.0001	-.0058***	-.0093***
	(-1.87)	(-3.02)	(-6.17)	(-0.82)	(-0.18)	(-5.22)	(-8.13)
Married	-.0162*	-.0256*	-.0661***	-.0241	-.0390**	-.0400	-.0489**
	(-1.89)	(-1.89)	(-3.79)	(-1.40)	(-3.09)	(-2.01)	(-2.49)
No Metro	N/A	.0064	-.1828**	.0020	.0018	-.0444	-.1019
		(0.13)	(-2.53)	(0.03)	(0.04)	(-0.63)	(-1.40)
Sample Size	1935	2085	4497	4755	2060	3028	3094
LR chi^2 value	18.10	34.16	1241.98	1384.60	58.23	133.76	194.55
Prob. Value	0.021	0.000	0.000	0.000	0.000	0.000	0.000

* indicates significance at 10% level
** indicates significance at 5% level
***indicates significance at 1% level
Numbers in parenthses indicate the z value. N/A indicates that the variable was dropped for this sample.

Table 2A (continued): Specific Non-Professional Occupation Probit Results

Note: Each sample includes the indicated non-professional group and all professional workers.

Independent Variable	Farming, Fishing, and Forestry Occupations	Construction and Trades	Extraction Workers	Installation, Maintenance, and Repair Workers	Production Occupations	Transportation and Material Moving Occupations	Military Specific Occupations
No English	.2613***	.0968***	.0202	.0327	.1098***	.1072***	-.0042
	(10.26)	(6.51)	(1.46)	(.095)	(6.37)	(4.50)	(-0.92)
Not Well	.2248***	.1345***	.0313**	.1574***	.1587***	.1775***	-.0043
	(9.68)	(10.92)	(2.65)	(6.07)	(11.40)	(9.50)	(-1.05)
Well	.0483**	.0817***	-.0006	.1101***	.0865***	.1294***	.0014
	(1.97)	(7.06)	(-0.07)	(4.93)	(6.57)	(7.66)	(0.39)
Years in U.S.	-.0034**	-.0036***	.0001	.0020*	-.0020**	.0000	.0000
	(-2.96)	(-5.63)	(0.21)	(1.83)	(-2.80)	(0.02)	(0.06)
Not Citizen	.1077***	.0788***	-.0030	.0633**	.0403**	.0434*	-.0085*
	(4.75)	(6.26)	(-0.43)	(3.06)	(3.07)	(2.59)	(-2.41)
Education	-.1042***	-.0506***	-.0060***	-.0542***	-.0538***	-.0656***	-.0003
	(-27.82)	(-23.86)	(-4.72)	(-14.22)	(-22.56)	(-21.43)	(-0.43)
Age	-.0040***	-.0039***	-.0002	-.0031**	-.0025***	-.0055***	-.0012***
	(-3.65)	(-6.35)	(-0.58)	(-2.72)	(-3.62)	(-6.28)	(-4.95)
Married	-.0134	.0066	.0067	.0294	.0053	.0053	-.0011
	(-0.69)	(0.63)	(1.04)	(1.49)	(0.44)	(0.35)	(-0.36)
No Metro	.2726***	-.0549	-.0030	.0455	.0661*	.0866*	.0037
	(6.84)	(-1.33)	(0.46)	(3.06)	(1.94)	(1.97)	(0.32)
Sample Size	4452	7921	1961	3487	7045	5342	1937
LR chi^2 value	2076.90	1655.55	60.30	397.64	1243.24	985.25	55.41
Prob. Value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

* indicates significance at 10% level
** indicates significance at 5% level
***indicates significance at 1% level
Numbers in parenthses indicate the z value. N/A indicates that the variable was dropped for this sample.