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Registered Nurses and the Value of Bilingualism*

David E. Kalist

Abstract

Recent research indicates that markets do not value bilingual skills. These results, however, are not robust across all labor markets, and one notable counter-instance is the market for registered nurses. As the Hispanic population grows in the United States, health care providers will encounter increasing numbers of patients who are not fluent in English. To better serve their patients, meet government requirements, and limit legal liability, employers may offer wage premiums to attract bilingual (Spanish/English) registered nurses. Support for this hypothesis comes from wage regressions on data for the year 2000 from the National Sample Survey of Registered Nurses. The estimates indicate that bilingual registered nurses received wage premiums of up to 7%, depending on the fraction of the population that spoke Spanish in the RN's county of employment.

KEYWORDS: registered nurses, bilingualism and wages

*The author thanks Stephen Spurr for many helpful comments on an earlier draft of this paper.

REGISTERED NURSES AND THE VALUE OF BILINGUALISM

DAVID E. KALIST*

Recent research indicates that markets do not value bilingual skills. These results, however, are not robust across all labor markets, and one notable counter-instance is the market for registered nurses. As the Hispanic population grows in the United States, health care providers will encounter increasing numbers of patients who are not fluent in English. To better serve their patients, meet government requirements, and limit legal liability, employers may offer wage premiums to attract bilingual (Spanish/English) registered nurses. Support for this hypothesis comes from wage regressions on data for the year 2000 from the National Sample Survey of Registered Nurses. The estimates indicate that bilingual registered nurses received wage premiums of up to 7%, depending on the fraction of the population that spoke Spanish in the RN's county of employment.

Recent research examining the value of bilingualism has found that speaking a second language does not positively affect wages. That finding, however, may be attributable to data that do not distinguish finely enough among employees' occupations. Unlike most previous examinations of second language proficiency and wages, this study focuses on a detailed occupational class, registered nurses (RNs). Using data from the National Sample Survey of Registered Nurses 2000, I investigate whether registered nurses in the United States receive wage premiums for speaking Spanish in addition to English.

The only published study specifically examining the value of bilingualism is that by Fry and Lowell (2003), who found that the market does not reward bilingual employees with higher wages and concluded that there are no monetary incentives for students and employees to become proficient in another language. As the authors pointed out, however, bilingual skills could very well be important in certain occupations—such as those jobs requiring extensive customer contact—especially in geographic locations where large numbers of people are not fluent in English.¹ Stating the case differently, McManus, Gould, and Welch (1983) wrote, “We are convinced to the extent that production can be organized into segmented clusters and communication between clusters can be mediated

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The data and computer programs used to generate the results are available from the author at Shippensburg University, Department of Economics, Shippensburg, PA 17257; dekali@ship.edu.

¹The authors estimated wage equations for 11 broad occupational categories but could not find evidence that speaking a second language had a statistically significant impact on earnings.

by persons fluent in both Spanish and English, there should be wage premiums for bilinguals.” Indeed, Fritsch (1996) provided evidence that companies pay wage premiums for bilingual skills: (1) Delta Air Lines paid bilingual flight attendants on international routes an extra \$1.50 per hour; (2) MCI Communications Corporation paid a 10% bonus to its employees who were required to speak another language more than half the time on the job; and (3) some U.S. Customs Service agents received 5% wage premiums depending on the second language they spoke. Many government employees at the state and local level are also eligible for bilingual pay differentials. City employees in Petaluma, California, for example, receive an additional \$200 per month if they must speak a second language at work.²

My choice of subject for this study—registered nurses who speak Spanish in addition to English—was to some extent dictated by sheer numbers. According to the U.S. Census Bureau, the Hispanic population in the United States increased by 57.9% from 1990 to 2000, whereas the total U.S. population increased by only 13.2% (Guzmán 2001). In 2002 there were 38.7 million Hispanics living in the United States, slightly more than the black population of 36.7 million, making the former the single largest minority group.³ McGovern and Griffin (2003) estimated that 10.37 million households speak Spanish at home, comprising nearly 10% of all households.⁴ It seems likely that such rising numbers are increasing the demand for Spanish-speaking RNs (those fluent in English and Spanish), and such a development is consistent

with limited evidence that bilingual nurses are commanding higher wages (Costello 2003; Colburn 2004; Vaughn 2003).

Another motivation for this study is the now widely recognized possibility that non-English-speaking patients are disadvantaged in health care markets owing to language barriers. Many studies find that language barriers limit access to care, reduce patient satisfaction, and give rise to disparities in care that may compromise health outcomes. Ruiz (2002) reviewed several studies demonstrating that Hispanic patients are more often misdiagnosed as suffering from schizophrenia and other psychopathologies than are non-Hispanic whites. Sarver and Baker (2000) found that patient language barriers reduced the probability of follow-up appointments after an initial visit to a hospital emergency department. Waxman and Levitt (2000) found that patients with limited English proficiency received inefficient care, such as over-utilization of diagnostic tests. Other studies have found poor adherence to treatment recommendations (Apter et al. 1998; Karter et al. 2000), as well as increased drug complications (Ghandi et al. 2000), for such patients. Fiscella et al. (2002) rejected the hypothesis that, in general, the poor health outcomes of Hispanics stem from cultural differences; they claimed that the disparities in health between non-Hispanic whites and Hispanics result solely from language barriers, not ethnicity. It is therefore important to study whether health care employers value Spanish-speaking employees, because a Spanish-speaking wage premium may elicit an appropriate supply response from health care providers and improve the quality of (and access to) care for patients with limited English proficiency.

Background

In 1994, the U.S. Congress mandated that the Office of Minority Health (OMH) address the issue of language barriers in the provision of health care.⁵ Health care

²A memorandum of the policy is available from <http://cityofpetaluma.net/hr/mou.html>.

³U.S. Census Bureau, Population Estimates, Table 2, “Annual Resident Population Estimates of the United States by Sex, Race, and Hispanic or Latino Origin: April 1, 2000, to July 1, 2002,” available from <http://www.census.gov/popest/>.

⁴Other than English, the top five most spoken languages in U.S. households are Spanish (28.1 million people), Chinese (2.0 million people), French (1.6 million people), German (1.4 million people), and Tagalog (1.2 million people). (Shin and Bruno 2003.)

⁵The OMH, created in 1985, advises the Department of Health and Human Services on matters affecting the health care of minorities.

employers are recognizing the need to provide their patients with qualified health professionals who are fluent in more than one language. Hospitals are sometimes specifically seeking bilingual job applicants. In Georgia, for example, bilingual nurses are being sought in hospital obstetrics wards because of an increasing number of Hispanic births (Bixler 2003). Some employers are hiring full-time qualified interpreters or using non-medical staff who are fluent in Spanish to assist in translation.⁶ The University of Virginia Health System, taking a different approach, created a women's clinic for Spanish-speaking patients, which is staffed by bilingual employees.

The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) has set forth standards assessing and addressing language and cultural needs for patients not fluent in English. According to Kulczycki (2003), the Executive Director of JCAHO's Ambulatory Care Accreditation Program, most accredited organizations have already put into place systems and processes to deal with these issues. Federal regulations known as Limited English Proficiency (LEP) requirements also require health care organizations to provide language assistance and services to patients whose primary language is not English.⁷ LEP requirements stem from Title

⁶A study of a hospital in Bakersfield, California, found that it did not have any interpreters available, but about half of the discharge clerks were bilingual in Spanish (Crane 1997).

⁷These requirements do not explicitly detail a health care provider's obligations to service LEP patients. Instead, providers are required to "take reasonable steps to ensure meaningful access to their programs and activities of LEP persons." Providers must consider four factors in determining the reasonableness of their LEP services: (1) the number or proportion of LEP persons encountered in the service population; (2) the frequency of contact with LEP persons; (3) the importance of the provider's service to LEP persons' lives; and (4) the provider's level of resources. Smaller providers are not expected to provide the same level of language services as larger providers. Once these factors are considered, providers may decide to hire bilingual staff, hire staff interpreters, use volunteer community interpreters, or contract with an outside interpreter service. For more information, see U.S. Department of Health and Human Services (1998).

VI of the 1964 Civil Rights Act and Executive Order 13166 (signed by President Clinton on August 11, 2000) and apply to all recipients of federal financial assistance from the U.S. Department of Health and Human Services, such as hospitals, nursing homes, managed care organizations, and physicians. Moreover, failure to provide translation services, both oral and written, may result in tort liability.⁸ In fact, a civil rights complaint was recently brought before the State Attorney General of New York citing two New York hospitals for failing to provide translation and interpretation services to Spanish-speaking patients (Reuters Health 2002). Therefore, employers may have an incentive to hire bilingual staff (which may lead to higher wages) in order to practice so-called "culturally competent care" and meet LEP requirements.⁹

There is some opposition to LEP requirements. In particular, the American Medical Association (AMA) opposes them, arguing that they place an undue financial burden on physicians, especially those operating out of private offices. According to the AMA, it is common for a physician's cost of providing interpreter services to exceed Medicaid's reimbursement from the patient's office visit—for example, interpreter fees range from \$150 to \$180 per hour in California, while Medicaid's total reimbursement per patient visit is only \$24 (Hawryluk 2002). The American Nurses Association, however, supports the requirements.

The increasing attention by agencies, organizations, and health care firms to the potential problems posed by non-English-speaking patients suggests how quickly the numbers and visibility of such patients have

⁸Lawsuits might result from health care providers' failure to obtain informed consent or to effectively communicate treatment instructions.

⁹Betancourt, Green, and Carrillo (2002) defined cultural competence in health care as "the ability of systems to provide care to patients with diverse values, beliefs, and behaviors, including tailoring delivery to meet patients' social, cultural, and linguistic needs."

been growing. More particularly for purposes of this paper, it is certainly plausible that the pressure to provide bilingual services for these patients could be having sizeable labor market effects, including effects on wages.

Data

I use data from the National Sample Survey of Registered Nurses 2000 (NSSRN) to determine whether health care markets value bilingualism. The NSSRN assists the U.S. Department of Health and Human Services in providing information about the nursing labor market in the United States.¹⁰ Conducted approximately every four years (1977, 1980, 1984, 1988, 1992, 1996, and 2000), the NSSRN is the most comprehensive national survey of RNs and, consequently, an important source of data for many nursing studies (Mennemeyer and Gaumer 1983; Link 1988; Schumacher 1997; Spetz 2002).

The 2000 survey, sampling from a total population of 2,714,671 RNs, contains 35,579 observations; it is the first survey in the series to ask respondents whether they are fluent in a foreign language. The data in this study are restricted to RNs with positive wages in year 2000 (and those without missing observations for key variables), yielding 24,120 observations in the analysis.¹¹ Of these 24,120 observations, 833 RNs reported speaking Spanish and 1,224 reported speaking some other language.

One weakness of the survey is that it does not ask whether an RN is fluent in English, despite numerous studies finding that LEP is associated with lower earnings (see, for example, Grenier 1984; Tainer 1988;

Chiswick and Miller 1995; Geoffrey Carliner 1996; and Chiswick and Miller 2002). This missing factor might not be an important issue for the RN labor market, however, since RNs are more likely to be adequately proficient in English than are, say, low-skilled illegal immigrants. For example, foreign-born RNs graduating from U.S. nursing programs must have been able to understand and synthesize complex English reading materials and lectures. In addition, the national licensing exam for registered nurses (NCELX-RN) is written exclusively in English.

Foreign nurses who are already licensed in their home country must pass the Commission on Graduates of Foreign Nursing Schools (CGFNS) exam, which is written in English, as a requirement for working in the United States. Furthermore, foreign nurses—except those receiving English-only instruction in Australia, Canada (all provinces but Québec), Ireland, New Zealand, United Kingdom, or the United States—desiring to work in the United States must show competence in the English language by receiving a passing score on an English-language exam such as TOEFL. The National Council of State Boards of Nursing, which administers the NCELX-RN and whose members include the boards of nursing in all 50 states, believes that it is vital for both domestic and international nurses to be proficient in English.

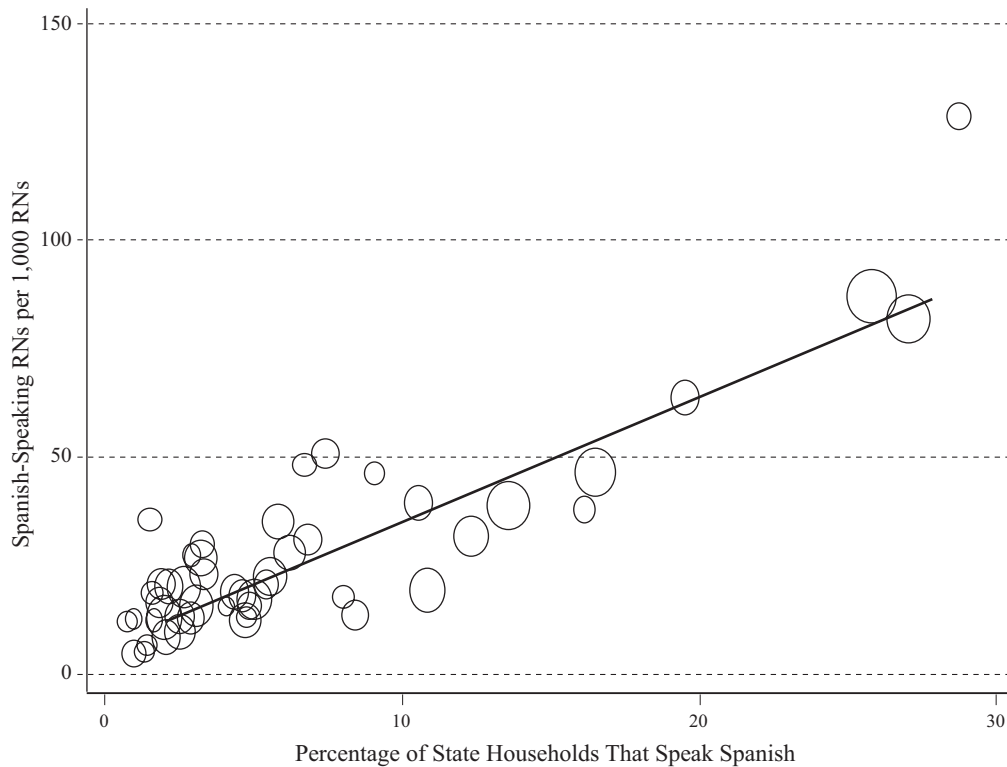
The Supply of and Demand for Spanish-Speaking RNs

For each of the 50 states plus the District of Columbia, Figure 1 plots the relationship between (a) Spanish-speaking RNs per 1,000 RNs in the state and (b) the percentage of the state's population that is Spanish-speaking. As expected, the supply of Spanish-speaking RNs is higher in states where a large percentage of the population speaks Spanish. New Mexico, where 42.1% of the population is Hispanic and 28.8% of the population speaks Spanish, has 128.8 Spanish-speaking RNs per 1,000 RNs, the highest rate found in any state. By contrast, in West Virginia, where only 0.70% of the

¹⁰The U.S. Department of Health and Human Services contracts the survey out to the Research Triangle Institute, North Carolina, which, in turn, administers the survey using a mail questionnaire sent to a sample of RNs with active licenses.

¹¹To help eliminate survey coding errors and anomalous cases, observations with wages less than \$8 or over \$120 an hour were excluded. This had virtually no effect on any of the reported results.

Figure 1. The Supply of Spanish-Speaking RNs and the State's Spanish-Speaking Household Population.



Notes: The fitted line is based on a weighted least squares regression in which the weights represent the state's population. The estimated regression equation is $y = 5.96 + 2.90x$, $R^2 = 0.91$. The slope coefficient (standard error = 0.132) is statistically significant at $p < .01$. The area of the symbol is proportional to the square root of the state's population. Nursing data are the author's computations based on the National Sample Survey of Registered Nurses 2000. Data on the percentage of state households that speak Spanish and states' populations are from the 2003 *Statistical Abstract of the United States*.

population is Hispanic and 1.05% of the population speaks Spanish, there are only 4.8 Spanish-speaking RNs per 1,000 RNs. A population-weighted least squares regression fitted to the data indicates that a one-percentage-point increase in the percentage of the state's Spanish-speaking population increases the number of Spanish-speaking RNs per 1,000 RNs by 2.90. As the Spanish-speaking population increases, it is possible that the supply of Spanish-speak-

ing RNs increases by more than the demand for Spanish-speaking RNs, which will reduce the wage premium for speaking Spanish. The results, which support this hypothesis, are discussed in the next section.

In light of the evidence showing that the relative supply of Spanish-speaking RNs varies directly with the percentage of the state's population that is Spanish-speaking, I explore the demand for Spanish-speaking

Figure 2. The Demand for Spanish-Speaking RNs.

Figure 2a. Careerbuilder.com RN Want Ads

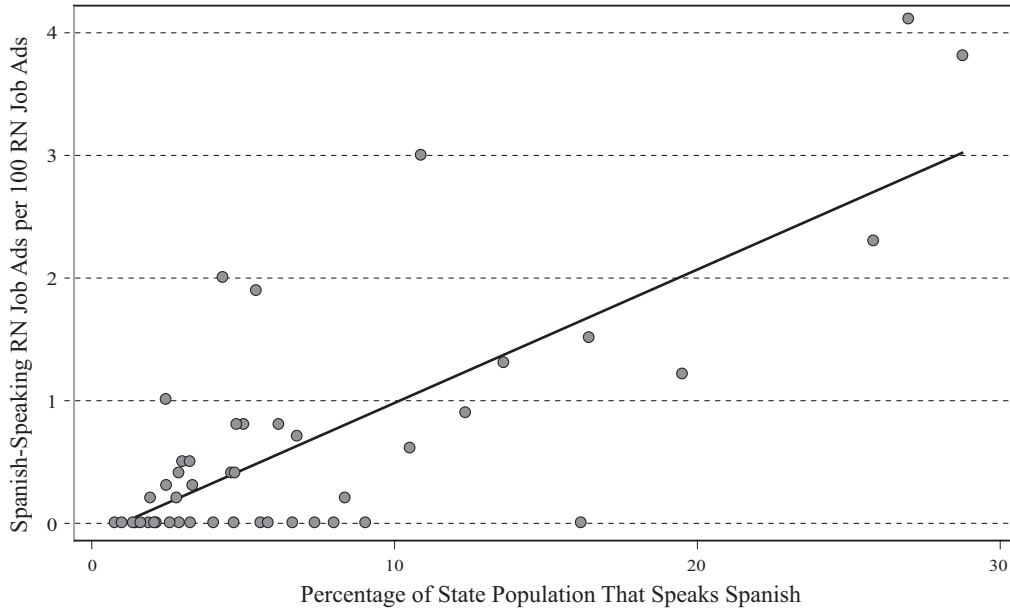
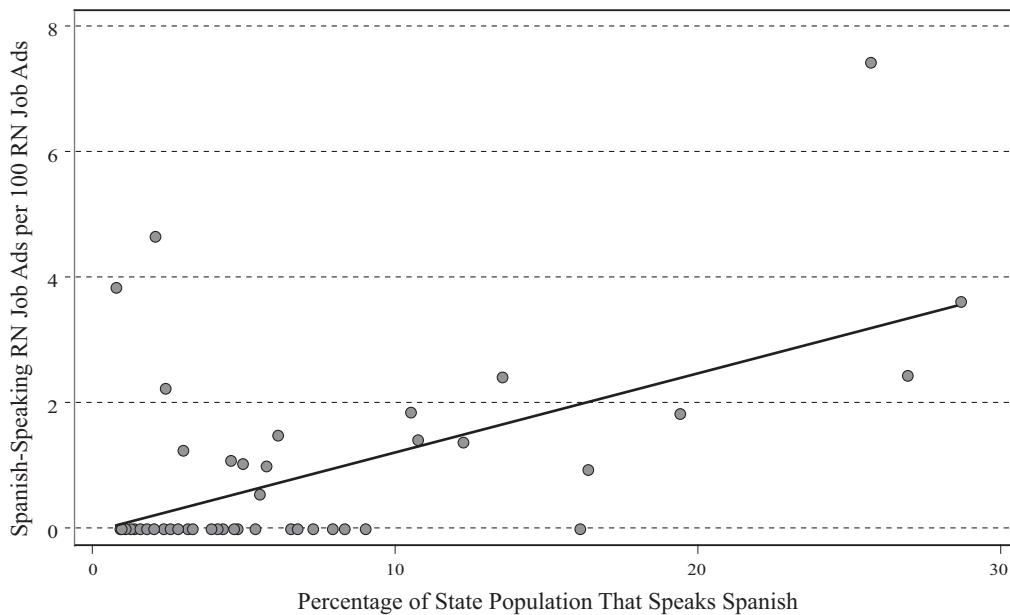


Figure 2b. Monster.com RN Want Ads



Notes: Spanish-Speaking population data are from the U.S. Census Bureau, *Statistical Abstract of the United States: 2003*. Help wanted data are from job searches using Careerbuilder.com on June 18, 2004 (Figure 2a) and Monster.com on June 20, 2004 (Figure 2b).

RNs across states by examining job vacancies.¹² I follow the convention of using help-wanted advertising as a proxy for job vacancies, since there are no direct measures of job vacancies (Zagorsky 1998). Monster.com and Careerbuilder.com—two popular job search Web sites—were used to record the number of help-wanted ads for RNs by state. Next, the search was limited to those ads that either required or preferred Spanish-speaking RNs.¹³ The search of Monster.com turned up 5,108 job

postings, 127 of which requested bilingual skills. The search of Careerbuilder.com yielded 21,796 job postings, with 293 of those requesting bilingual skills, a much smaller fraction than in Monster.com. For Careerbuilder.com, the states for which the largest percentages of ads requested bilingual skills were California (2.2%), Arizona (2.1%), and Florida (1.9%); for Monster.com, the top three states were California (7.4%), Texas (2.4%), and New York (2.4%).

The results of the job searches are presented in Figures 2a and 2b, which show the relationship between the number of Spanish-speaking job postings per 100 RN job ads and the percentage of the state's population that speaks Spanish at home. Clearly, in many of the states there are *no* job postings for bilingual RNs, but these observations are generally limited to states in which Hispanics represent less than 10% of the population. Both figures illustrate that the demand for Spanish-speaking RNs is higher in states with larger Spanish-speaking populations. The correlation coefficients (weighted by the state population) for the Careerbuilder.com and Monster.com data are 0.84 and 0.74, respectively.

Table 1 summarizes the descriptive statistics for variables used in the regression models. The last column gives the results of t tests that compare differences in variable means between Spanish-speaking RNs and non-Spanish-speaking RNs (who were predominantly English monolinguals). Not surprisingly, almost 40% of the Spanish-speaking RNs were Hispanic, while only 1% of the non-Spanish-speaking RNs were Hispanic. The mean wage of Spanish-speaking RNs was \$26.48 per hour, which is statistically different from the mean wage of non-Spanish-speaking RNs of \$23.87. Statistically significant differences between the groups are found for many of the other variables as well. For example, compared to non-Spanish-speaking RNs, Spanish-speaking RNs were more likely to be male, to speak additional languages, to work in public/community health, and to live in a metropolitan statistical area; they also were likely to be better educated and to work in

¹²Zagorsky (1998) wrote, "Job vacancies are an important economic indicator which summarize businesses' hiring plans and reveal future directions in labor market demand. Vacancies complement labor market supply information since most workers leave unemployment by filling a vacant job, not by dropping out of the labor force."

¹³The Monster.com search was conducted on June 20, 2004, and tallied all job postings within the previous 60 days (the upper limit). The Careerbuilder.com search was conducted on June 18, 2004, and tallied all job postings within the previous 30 days (the upper limit). Monster.com charges \$365.00 for one 60-day job posting, while Careerbuilder.com charges \$269.00 for one 30-day job posting. There are two important questions regarding the online search engines. Do job seekers in nursing have access to the Internet so that they can use these search engines? Are the online job advertisements on Monster.com and Careerbuilder.com relevant for nursing? The NSSRN can help address the first question, since it reports that approximately 70% of the survey respondents have access to the Web at home or work, and it is likely that the percentage is even higher today. Of course, not all people who have access to the Web may use it for job search; however, the 30% of the respondents without home or work access could be accessing the Web elsewhere (for example, at a local library or university). As for the relevance of the search engines, the American Nurses Association provides visitors of its Web page (www.ANA.org) the ability to search for nursing jobs using the Monster.com search engine. The search engine of Careerbuilder.com is also available and accessible on the Web sites of many of the nation's leading newspapers (*Arizona Republic*, *Baltimore Sun*, *Burlington Free Press*, *Charlotte Observer*, *Chicago Tribune*, *Cincinnati Post*, *Daily Press (Virginia)*, *Delaware New Journal*, *Democrat Chronicle*, *Detroit Free Press*, *Detroit News*, *Fort Lauderdale Sun Sentinel*, *Forth Worth Star-Telegram*, *Hartford Courant*, *Idaho States Man*, *Indianapolis Star*, *Iowa City Press-Citizen*, *Kansas City Star*, *Los Angeles Times*, *Louisville Courier Journal*, *Miami Herald*, *Newsday*, *Orlando Sentinel*, *Philadelphia Inquirer*, *State (Columbia, SC)*, *Tennessean*, and *USA Today*).

Table 1. Descriptive Statistics.

<i>Variable</i>	<i>Spanish-Speaking RNs (mean)</i>	<i>Non-Spanish-Speaking RNs (mean)</i>	<i>t test</i>
Demographics			
Wage	26.48 (9.88)	23.87 (9.17)	-4.96
Male	0.10	0.06	-5.04
Married	0.69	0.71	1.62
No Children	0.40	0.42	0.95
Work Experience	14.45 (10.06)	16.93 (11.16)	6.33
Race/Ethnicity			
Hispanic	0.38	0.01	-75.6
Asian	0.03	0.04	0.62
Black	0.06	0.06	-0.22
White	0.87	0.89	1.69
Education			
Bachelor's Degree	0.36	0.34	-1.19
Master's Degree	0.16	0.11	-4.60
Hospital Diploma Degree	0.08	0.18	7.73
Miscellaneous			
Speak Other Language	0.10	0.05	-6.23
Non-USA Nursing School	0.05	0.03	-2.84
Rural (Non-MSA Employment)	0.16	0.22	4.31
Percent of County Population That Speaks Spanish at Home	16.79 (17.06)	6.07 (8.43)	-34.3
Practice Setting			
Patient Care	0.55	0.54	-0.51
Hospital	0.57	0.59	1.28
Public Health	0.17	0.13	-3.63
Nursing Home	0.04	0.07	4.00
Ambulatory Care	0.09	0.10	0.86
Nursing Education	0.02	0.02	0.13
Student Health	0.05	0.04	-1.81
Occupational Health	0.02	0.02	0.02
<i>N</i>	833	23,287	

Notes: Standard deviations are reported in parentheses. The last column reports the *t* statistic from a two-sample *t* test that differences in means equal zero. Data are from the National Sample Survey of Registered Nurses 2000.

a county where a higher percentage of the population speaks Spanish. However, the non-Spanish-speaking RNs had approximately two more years of additional work experience and were more likely to work in a nursing home. As for geographic location of employment, which is not reported, 43% of Spanish-speaking RNs worked in either the West South Central region or the Pacific region, compared to only 22% of non-Spanish-speaking RNs.

Analytical Framework

To determine how speaking a second language affected the wages of RNs, I estimate several human capital earnings functions. The cross-sectional data include 24,120 observations. All observations are weighted by their respective sample weights provided with the NSSRN data, and robust standard errors are calculated. The regressions control for the usual demographic

variables. For example, there are dummy variables for race, ethnicity, marital status, educational preparation, graduate of foreign nursing school, rural location, presence of children, practice setting, and state of employment. A quadratic in experience is also included. The main variables of interest, however, are a dummy variable for Spanish-speaking (*Speak Spanish*) and its interaction with the fraction of the population that speaks Spanish in the RN's county of employment (*County*).¹⁴

The interaction term is useful for testing whether the wage premium associated with speaking Spanish is related to the language enclave of the local population. Was the return to speaking Spanish higher in counties with sizable Spanish-speaking populations? Fry and Lowell (2003) found no support for this hypothesis, but the measures they used for language enclave differed slightly from those employed here. Their first measure was a simple dummy variable for residence in one of the twelve high second-language states; their second measure was a dummy variable based on whether the survey respondent used a foreign language at work, information that is not available in the NSSRN.

It should be noted that the NSSRN's measures of language proficiency are probably not ideal. Survey respondents are first asked, "Do you speak any languages fluently other than English?" If the answer is yes, an additional question is asked: "Which languages do you speak?" The choices offered are Spanish, French, and other. One problem with this procedure is that the respondents' language abilities are not determined objectively (that is, by a test) but are instead self-assessed. Furthermore, as mentioned in the last section, the ability to speak fluent English is not measured in the survey. Probably that is not a major issue, since the national licensing exam is

strictly written in English and foreign-born RNs must demonstrate proficiency in English before working in the United States. Nevertheless, if Spanish-speaking RNs on average are less proficient English speakers than are English monolinguals, the results will be confounded by this effect of the variable. To address this issue, I estimate separate regressions for Hispanic and non-Hispanic RNs.

Results: The Effect of Speaking Spanish on Wages

Regression results on the natural log of hourly wages are presented in Table 2. Column (1) reports that speaking Spanish increased the wages of RNs by almost 5.0%, with the effect statistically significant at $p < .01$. For RNs who spoke some other language, the wage effect is positive but statistically insignificant.¹⁵ This result is not too surprising, since few people spoke a second language other than Spanish (see footnote 2); therefore, RNs with these language skills will not have been in high demand by hospitals and other health care providers.

The regression in column (2) controls for the fraction of the population that spoke Spanish in the RN's county of employment. Here the wage premium associated with speaking Spanish is approximately 3.3% and statistically significant, but the coefficient on speaking some other foreign language remains statistically insignificant. The size of the Spanish-speaking population in the county has a positive effect on wages. A 10 percentage point increase in the Spanish-speaking population raises wages approximately 4%.

Column (3) reports the results of including interactions between the fraction of the county's population that speaks Spanish and the dummy variable for Spanish-speak-

¹⁴I also used the percentage of Spanish-speaking people who spoke English less than very well in the RN's county of employment. The results are very similar to those reported herein.

¹⁵The NSSRN survey also asks whether the respondent speaks French. A dummy variable on whether the RN spoke French was added to the regressions shown in Table 2, but the coefficient was far below statistical significance in all cases.

Table 2. Regression Results: Estimated Returns to Bilingualism.
(dependent variable: Natural Log of Wage)

<i>Independent Variable</i>	(1)	(2)	(3)
Hispanic	0.013 (0.016)	-0.005 (0.016)	0.004 (0.016)
Asian	0.058*** (0.015)	0.053*** (0.015)	0.052*** (0.015)
Black	0.066*** (0.010)	0.055*** (0.010)	0.054*** (0.01)
Other Race	0.018 (0.017)	0.022 (0.017)	0.022 (0.017)
Speak Spanish	0.046*** (0.014)	0.033** (0.014)	0.067*** (0.018)
County (Fraction of County That Speaks Spanish)		0.432*** (0.037)	0.465*** (0.040)
Speak Spanish * County			-0.248*** (0.077)
Speak Other Language	0.006 (0.011)	0.001 (0.011)	0.0002 (0.011)
Foreign Nursing School	0.027* (0.014)	0.014 (0.014)	0.013 (0.014)
<i>F</i>	103.93	104.42	103
<i>N</i>	24,120	24,096	24,096
<i>Adjusted R</i> ²	0.256	0.263	0.263

Notes: Robust standard errors are in parentheses. All observations are weighted by their respective sample weight provided with the National Sample of Registered Nurses 2000. All regressions control for sex, marital status, presence of children, educational status, quadratic in experience, employment setting (hospital, nursing home, ambulatory care, public health, nursing education, occupational health, and student health), rural/urban location, and state of employment. Other Race includes Hawaiian, other Pacific, Alaska native, and American Indian.

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

ing. The coefficient on the interaction term *Speak Spanish * County* is negative and statistically significant ($p < .01$). The wage premium for speaking Spanish increases to almost 7%, but this estimate only applies to a county in which 0% of the population spoke Spanish. As the fraction of the county that spoke Spanish increases, the estimated wage premium declines given the negative coefficient on the interaction term. Because of the interaction variable, the interpretation of the wage effect for speaking Spanish becomes slightly more difficult. The marginal effect of speaking Spanish on wages, which is derived by taking the derivative of log wage with respect to *Speak Spanish* and evaluating this expression at

different levels of *County*, is shown in Table 3 along with the levels of significance.¹⁶

Non-Spanish-speaking RNs worked in counties where the mean percentage of the county's population that spoke Spanish was approximately 6%. The Spanish-speaking wage premium in this particular county was about 5%. By contrast, Spanish-speaking RNs worked in counties where the mean

¹⁶An interaction effect between *Hispanic* and *Speak Spanish* was tested by including the interaction term in the regression models in Table 2. In each of the three models, the coefficient on the interaction term was statistically insignificant and had virtually no effect on the other parameter estimates.

Table 3. Effects of Spanish-Speaking Enclave on the Spanish-Speaking Wage Premium.

<i>Fraction of U.S. County Population That Speaks Spanish</i>		<i>Spanish-Speaking Wage Premium</i>	<i>Robust Standard Error</i>
0.0000	minimum fraction	0.0673***	0.0184
0.0013	10th percentile	0.0670***	0.0183
0.0030	25th percentile	0.0665***	0.0182
0.0088	50th percentile	0.0651***	0.0180
0.0347	75th percentile	0.0587***	0.0167
0.1433	90th percentile	0.0318**	0.0138
0.8184	maximum fraction	-0.1357***	0.0523

Notes: Results are generated from the regression results reported in the last column of Table 2.

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

percentage of the county's population that spoke Spanish was 16%. In this case, the Spanish-speaking wage premium was only about 3%. Non-Hispanic Spanish-speaking RNs worked in counties where the mean percentage of the county's population that spoke Spanish was 11.5%; however, for Hispanic Spanish-speaking RNs, this number was 25.5%.¹⁷ It appears, therefore, that the average Hispanic Spanish-speaking RN was not receiving a wage premium for speaking Spanish, while the average non-Hispanic Spanish-speaking RN received a wage premium of approximately 4%.¹⁸ A natural

question arises as to whether Spanish-speaking RNs took advantage of these wage premiums by seeking employment in areas where Spanish speakers were in short supply. This question is addressed in the next section.

An abundance of Spanish-speaking RNs in states with large Spanish-speaking populations will serve to suppress the wage premium, explaining the negative effect on the interaction term. For example, the mean number of Spanish-speaking RNs per 1,000 RNs was 33.1, whereas in California the number was 87.1. (The same pattern probably holds for other hospital staff. In a case study of a California hospital, Crane [1997] found that half the discharge clerks spoke Spanish.) In addition, hospitals may be able to take advantage of division of labor when providing translation services in areas with large Spanish-speaking populations. In other words, it may be beneficial to hire professional language interpreters or use outside contractors when the number of non-English-speaking patients reaches a certain threshold, which incidentally is a practice supported by the U.S. Department of Health and Human Services: "Paid staff interpreters are especially

¹⁷These findings are consistent with Lazear's (1999) cultural model, which found that "the proportion of the majority group that learns the minority language is decreasing in the proportion of the population that speaks the majority language." In Lazear's model, learning another language increases the opportunity to trade with other individuals, and is an explanation for why non-Hispanic Spanish-speaking RNs are typically employed in counties with large Spanish-speaking populations. Furthermore, the individual's cost of learning Spanish may be lower in counties with large Spanish-speaking populations.

¹⁸If RNs who do not speak Spanish have a difficult time finding employment in some markets, there is a possibility of sample selection bias. The NSSRN asks survey respondents why they are not currently working in nursing. Of the 1,598 RNs not reported working, 90 (5.6%) claimed one of the reasons involved difficulty in finding employment, and only 17 of the 90 nurses listed difficulty finding employment as the only factor. In other words, around 1% of the RNs solely attributed their not working to difficulty in finding employment. Therefore, it is unlikely that

selection bias is a problem. Furthermore, the RN experienced unemployment rate (which excludes entrants and reentrants) was 1% in 2000, which was less than the 1.7% of that for all professional workers (Levine 2001).

appropriate where there is a very large LEP presence in a few major language groups" (U.S. Department of Health and Human Services 1998).¹⁹ This, of course, may temper the demand for Spanish-speaking RNs.²⁰

Another factor that helps explain the Spanish-speaking wage differential across counties is the lack of availability of translation services in certain areas (Hawryluk 2002). The AMA claims that translation services are practically nonexistent in rural areas, which are the same locations where only a small percentage of the population is likely to speak Spanish. To offer translation services, physicians in these areas must pay the travel costs of interpreters who may be coming from far away. This provides an incentive for physician offices to employ bilingual staff.

There are several other findings of interest. Men earned about 7% more than women. Race also was an important factor: the wages of both Asians and blacks were about 5% higher than those of whites. Schumacher (1997) suggested that the black wage premium results from the under-representation of low-wage black RNs in the NSSRN. Neither marital status nor the presence of children had a statistically significant effect on wages. As expected, RNs with more years of schooling earned higher wages. For example, baccalaureate RNs and RNs with a master's degree earned about 5% more and over 22% more, respectively, than RNs graduating from a community colleges or hospital diploma nursing school. RNs early in their careers saw their wages rise at about 2% per year.

The location of employment and practice setting also affected wages. RNs working in rural areas earned a negative wage differential of approximately 8% (although

this may only represent differences in the cost of living), and wages were from 4% to 15% higher in hospitals than in other practice settings. Finally, the wage effect of working directly with patients (as estimated by the coefficient on the dummy variable *Patient Care*) was statistically insignificant. It might be expected, however, that RNs who work directly with patients will earn even higher wage premiums if they speak Spanish. The coefficient on the interaction of *Patient Care* with *Speak Spanish* was statistically insignificant. Finding an interaction effect may be difficult because Spanish-speaking nurse administrators, nurse supervisors, and informatic nurses (positions that may not involve day-to-day patient care) could easily step in for non-bilingual staff nurses and provide interpretation services. Therefore, the returns to speaking Spanish are likely to extend to all providers, even those not directly involved in day-to-day patient care.

The returns to speaking Spanish may depend not only on location but also on Hispanic/Non-Hispanic ethnicity. To control for the possibility that the wage premiums are picking up returns to biculturalism²¹ (that is, a situation in which employers value an ethnically diverse work force but are not necessarily concerned whether their employees speak a second language), I reestimated the regressions in Table 2 after excluding all Hispanic RNs. These regression results, which appear in Table 4, may better approximate the native speakers' return to speaking Spanish.

The Spanish-speaking wage premiums estimated in all three models correspond closely to those reported in Table 2, ranging from approximately 4% to over 5%. Although the interaction of *Speak Spanish* and *County* is still negative, it is no longer statistically significant. However, an F test of joint significance between *Speak Spanish* and *Speak Spanish * County* gives a p-value of

¹⁹Health care providers' use of professional interpreters rather than their medical staff may not only increase productivity, but also limit legal liability.

²⁰Consistent with this interpretation, Craig Lentzsch, chief executive of Greyhound Lines Inc., says, "Where we need Spanish, the market base is Spanish, and those employees aren't as difficult to find" (Fritsch 1996).

²¹Lazear (1999) suggested that bicultural employees help facilitate trade between individuals because they reduce mistrust.

Table 4. Regression Results Excluding Hispanic RNs.
(dependent variable: Natural Log of Wage)

<i>Independent Variable</i>	(1)	(2)	(3)
Asian	0.065*** (0.015)	0.059*** (0.015)	0.059*** (0.005)
Black	0.069*** (0.01)	0.057*** (0.01)	0.056*** (0.01)
Other Race	0.023 (0.018)	0.025 (0.018)	0.025 (0.018)
Speak Spanish	0.049*** (0.016)	0.039** (0.016)	0.053** (0.023)
County (Fraction of County That Speaks Spanish)		0.473*** (0.041)	0.479*** (0.042)
Speak Spanish * County			-0.114 (0.123)
Speak Other Language	0.002 (0.011)	-0.002 (0.012)	-0.002 (0.012)
Foreign Nursing School	0.028* (0.015)	0.013 (0.015)	0.013 (0.015)
<i>F</i>	103.73	104.20	102.79
<i>N</i>	23,541	23,517	23,517
<i>Adjusted R</i> ²	0.258	0.264	0.264

Notes: Robust standard errors are in parentheses. All observations are weighted by their respective sample weight provided with the National Sample of Registered Nurses 2000. All regressions control for sex, marital status, presence of children, educational status, quadratic in experience, employment setting (hospital, nursing home, ambulatory care, public health, nursing education, occupational health, and student health), rural/urban location, and state of employment. Other Race includes Hawaiian, other Pacific, Alaska native, and American Indian.

*Statistically significant at the .10 level; **at the .05 level; ***at the .01 level.

0.0358. Thus, there is some evidence for an interaction effect between the variables. In addition, the precision of the interaction term is negatively affected by the small sample of Spanish-speaking RNs who worked in counties with large Spanish-speaking populations. These results have policy implications for the curriculum of nursing programs and medical schools, especially since students may have a monetary incentive to take courses in Spanish and Medical Spanish.

To check the robustness of the Spanish-speaking wage premium for Hispanics, I reestimated the regressions by restricting the data to only Hispanic RNs, which is another way of controlling for bicultural effects. A main shortcoming of this approach is that the number of observations decreases to 579 (of which 315 speak Span-

ish). The results of the regressions, which are not reported, show a pattern similar to that in Table 2 and Table 4: the Spanish-speaking wage premium varies from 4% to over 5%. However, the p-values (which range from 0.149 to 0.237) indicate that these coefficients are not statistically significant, which is unsurprising given the small sample size.

Nurse Mobility and the Spanish-Speaking Wage Premium

It is possible that Spanish-speaking RNs move to areas where the Spanish-speaking wage premium is higher. In the case of zero transaction costs, one would expect the Spanish-speaking wage differential to equalize across all areas, as RNs relocate to jobs across county lines and even perhaps across

state lines. There are, however, barriers and costs that prevent such fluidity of labor resources, including increased travel time, costs of moving (monetary and psychic), and costs of changing jobs. Spanish-speaking RNs would maximize their language wage premium by working in areas where there is less contact with Hispanics and Spanish-speaking patients, but they may prefer not to work in monocultural environments.

While registered nursing is a licensed occupation, it is unlikely that licensing has a large effect on nurse mobility. Since RNs are licensed at the state level, they can practice anywhere in the state, so licensing should not limit intrastate job mobility. Second, RN licenses are transferable across state lines. RNs who desire to practice in another state must only file an endorsement application. This procedure generally requires only verification of an active license, payment of a small fee (ranging from approximately \$30 to \$400), and proof of graduation from an approved nursing school.

However, demographic factors, namely the age and gender distribution of RNs, may also prevent the differential from equalizing across all areas. The benefits of investing in human capital, such as changing jobs or relocating, diminish with age, because of a shorter investment horizon and higher costs of acquiring human capital. RNs tend to be older than workers in other professions, which reduces their job mobility. In 2000, 46% of employed RNs were over the age of 45, compared to only 36% of all employed workers in the United States. The differences in the age distribution are more pronounced for younger workers. In 2000, for example, 2.9% of employed RNs were under 25, compared to 15% of all employed workers in the United States.

For many RNs the decision to migrate will be based on the net benefits to the entire family, since approximately 95% of RNs are female and more than 70% of all RNs are married. A geographic move that is optimal for an RN may not be optimal for the entire family. RNs, therefore, may not be able to take advantage of a Spanish-

speaking wage premium offered in different geographic locations if the family does better by having the husband remain in his current job.

Another factor that may slow the equalization of the Spanish-speaking wage premium is the long-run trend of natives moving away from concentrations of immigrants. Borjas (1999) suggested that natives have “stampeded out of the immigrant-receiving states.” This effect increases the relative supply of Spanish-speakers in the immigrant-receiving areas, reducing the premium to speaking Spanish in these areas.

Fortunately, the NSSRN data provide information on each RN’s state and county of employment in 1999 and 2000, which can shed light on the issue. I examine the mobility of all RNs who were employed in 2000 by comparing their location of employment in each of the two years. Approximately 10% of non-Spanish-speaking RNs were employed in a different county, while almost 12% of Spanish-speaking RNs switched counties.²² Spanish-speaking RNs who changed their county of employment were, on average, employed in counties with a smaller proportion of Spanish-speaking people. The percentage of the county’s population that spoke Spanish was approximately 0.75 percentage points lower in the RN’s new county of employment, with a 95% confidence interval from -3.74 to 2.24. Thus, the majority of Spanish-speaking RNs moved to a county that was quite similar to their previous county of employment, at least in terms of the Spanish-speaking proportion of the population. For non-Spanish-speaking RNs who changed counties, the percentage of the county’s population that spoke Spanish was approximately 0.22 percentage points higher in the RN’s new

²²Of the 962 Spanish-speaking RNs, 113 changed their county of employment between 1999 and 2000. Of the 26,473 RNs, 2,747 changed their county of employment over the same period. By comparison, 7.3% of the employed U.S. population changed their county of residence between 1999 and 2000 (U.S. Bureau of the Census 2001).

county, with a 95% confidence interval from -0.12 to 0.56 .

Figure 3a shows frequency distributions for the percentage change in Spanish-speaking population between the new and old counties of employment. There is little evidence suggesting Spanish-speaking RNs were predominantly moving to counties where the returns to speaking a second language were higher, given that approximately 50% of those moved to counties with larger Spanish-speaking populations. A similar pattern of mobility for non-Spanish-speaking RNs is evident in Figure 3b. The Spanish-speaking wage premium is simply not large enough to induce most RNs to move. For example, Keith and McWilliams (1999) found that the returns to migration for women who voluntarily quit their jobs and engaged in job search ranged from 14% to 20%, which is well in excess of the Spanish-speaking wage premium. This analysis does not imply that the wage premium across counties will never converge. It does suggest, however, that the source of convergence is likely to come not from the geographic mobility of those currently practicing, but rather from the entry of college graduates. Quite simply, the net benefits of learning Spanish will be larger for nursing students because they have a longer investment horizon and the costs of acquiring human capital are usually lower for the young. In fact, some community colleges and universities now require nursing students to take courses in Spanish or Medical Spanish.

Conclusion

The main objective of this paper has been to determine whether Spanish-speaking RNs in the United States receive wage premiums. Given the tremendous growth in the Hispanic population over the past decade, along with mandated government regulations regarding limited English proficiency, health care employers are expected to value, in many instances, the ability of their employees to speak a second language. Thus, it is no surprise that the supply of and demand for Spanish-speaking RNs in a given

state are positively related to the percentage of the state's population that is Spanish-speaking.

This paper, the first investigation of the wage effects of bilingualism to look at a detailed occupational class (an approach that researchers doing further work in this area should consider following, as well), is also the first to find evidence that some bilingual employees command wage premiums. On average, I have found that Spanish-speaking RNs in my sample received a 5% wage premium. The results, however, depend on the percentage of the population that spoke Spanish in the RN's county of employment, with the wage premium falling approximately 0.5% for each 2 percentage point increase in the fraction of the population that spoke Spanish. Thus, while it might reasonably be expected that increases in the demand for Spanish-speaking nurses associated with larger Spanish-speaking enclaves will put upward pressure on wages, the results suggest a dominating supply side effect. It is likely that a larger supply of bilingual employees and professional interpreters reduced the language premium in areas with large Spanish-speaking populations.

The inherent limitations of cross-sectional data prevent a detailed analysis of how the Spanish-speaking wage premium evolves over time, a topic for future research. One hypothesis is that the wage premium will equalize across areas as Spanish-speaking RNs move to places where the premium is higher. Further wage convergence may result from new entrants who have studied Spanish in college. The limited analysis in this paper, and the literature on migration, suggest that the Spanish-speaking wage premiums are too small to induce RNs to move.

The findings in this paper may have implications for colleges and universities—especially schools of nursing and medicine—that are contemplating adding a foreign language requirement to their curriculum. In fact, some nursing programs have already recognized the value of bilingualism and are offering courses in Medical Spanish. With further projected growth

Figure 3. RN Job Mobility.

Figure 3a. Spanish-Speaking RNs

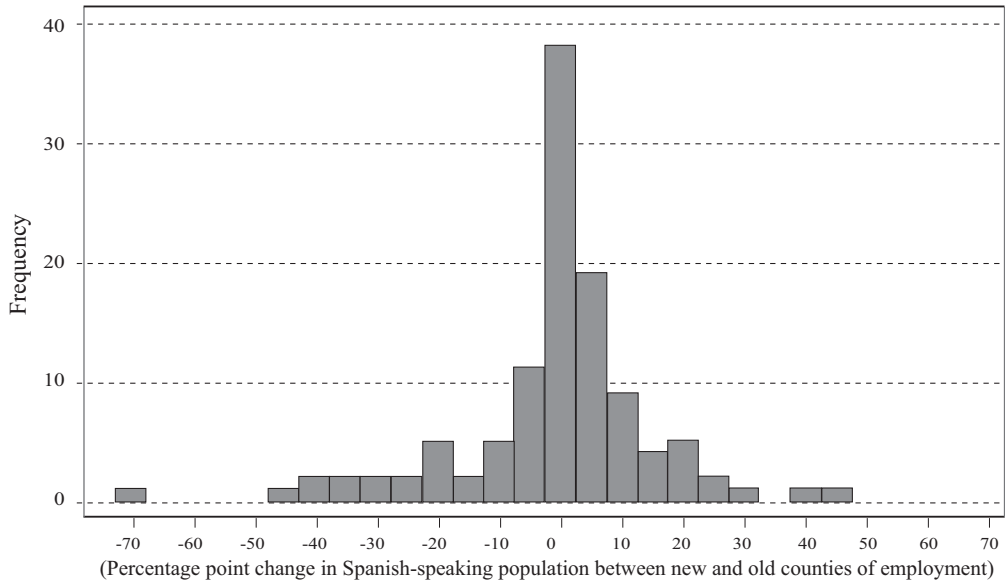
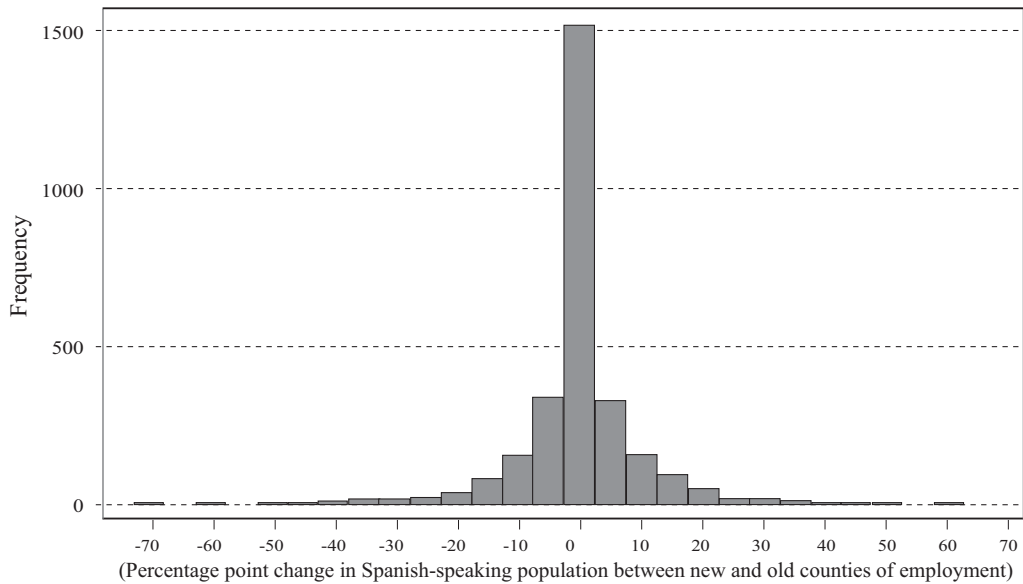


Figure 3b. Non-Spanish-Speaking RNs



Notes: For RNs who were employed in a different country between 1999 and 2000, the frequency distributions show the percentage point change in the Spanish-speaking population between the RNs' new and old counties of employment.

in the Hispanic population, I expect a proliferation of Spanish-speaking courses across campuses. (An extension of this research would be to examine the introduction and growth of Medical Spanish courses around the United States, in rela-

tion to the size of the local Spanish-speaking population.) Graduates of these programs are likely to be in high demand as health care employers continue to seek staff who can provide culturally competent care to diverse patient populations.

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