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I. Introduction

Since the early 1980s, the importance of English language skills has significantly increased for language minority workers in the United States. For example, the 1980s witnessed (1) an increase in the English deficiency earnings penalty, (2) the passage of the 1986 Immigration Reform and Control Act (IRCA) that seemingly made it more costly for those who were deficient in English to find and keep employment, and (3) the flourishing ''English-only'' legislation at the state level aimed at mitigating the value of non-English languages. Extant research suggests that Hispanics in 1980 subsequently responded to these English-fluency incentives,[1] but this work does not address whether immigrants arriving after 1980 also reacted to these changes.

To what extent did these rewards affect the English-language-skill acquisition of Hispanic immigrants migrating in the 1980s? The policy importance of this question is not trivial. First, if recent Hispanic immigrants possess greater English fluency, this proficiency may affect the earnings and occupational distributions in Hispanic labor markets. Second, evidence that recent Hispanic immigrants respond to growing English premiums may allay political and xenophobic fears that immigration yields a deterioration of linguistic identity in this country. Third, if immigrants arriving from Latin America possess better English language skills than those who migrated in the past, the design and cost of special schooling programs for limited-English proficient (LEP) children, such as bilingual education, may dwindle over time. Finally, evidence of Hispanic immigrants' rationality to react to increasing skill incentives

may be useful to the ongoing debate over the ''quality'' of recent immigrants.

In this article, we investigate whether Hispanic immigrant workers who entered the United States during the latter part of the 1980s, relative to their counterparts who arrived 10 years earlier, possessed stronger English language skills at entry or intensely acquired them within 5 years of migrating. Our study also analyzes the influence of English proficiency on the earnings distribution of Hispanic immigrant workers who arrived after 1985. We focus on Hispanics because of this population's prominence in U.S. demographic profiles.[2] We use data from the Public Use Microdata Samples (PUMS) of the 1980 and 1990 U.S. decennial censuses in our empirical exercises.

Our findings indicate that Hispanic immigrant workers arriving in the late 1980s reported higher English fluency within 5 years of entering this country than their otherwise similar peers who migrated in the late 1970s. However, the English-language-skill gap between recent Hispanic immigrants and U.S.-born Hispanics widened between 1980 and 1990, suggesting that U.S.-born workers reacted at a more pronounced pace to the increasing incentives to acquire English fluency during this time. A labor market extension further indicates that if all recent Hispanic immigrant workers become at least moderately proficient in English, the average wage as well as the share of workers earning above average would increase, although the lower end of the earnings distribution may not be affected.

II. Background

This section highlights three related incentives for acquiring English proficiency in the 1980s: (1) an increase in English proficiency earnings rewards, (2) the potentially perverse impact of immigration reform on Hispanic workers, and (3) the growing tendencies for states to enact ''English-only'' legislation. We also explore the potential for an uneven English-language-skill acquisition between low- and high-skilled workers.

Increasing Returns to English Skills
During the past couple of decades, many studies have illustrated the positive link between English fluency and earnings in the Unites States.[3] Moreover, recent work finds that the earnings premium associated with English proficiency rose for skilled workers during the 1980s,[4] mirroring the well-documented increase in returns to other forms of human capital in this country.[5]

Two implications emerge from the enhanced English skill rewards. To reap the benefits from these growing incentives, immigrants arriving after 1980 would be expected to invest in English fluency prior to or im-

mediately after arrival vis-à-vis their counterparts from previous decades. One would also expect a change in the self-selection of immigrants in favor of those with higher fluency or with broader linguistic aptitudes.[6] In either case, the rising English skill rewards imply that immigrants arriving during the 1980s should have reported higher English proficiency than recent immigrants in earlier years.

Immigration Reform and English Fluency
A salient feature of immigration reform, as embodied in the Immigration Reform and Control Act of 1986 (IRCA) and subsequent immigration legislation, includes fining employers who hire undocumented labor. The employment penalty for hiring illegal alien workers can be as much as $2,000 for first offenders and may carry significant criminal penalties for repeat violations of this provision of the act. To account for the compliance of this law, IRCA also afforded increasing resources to the Immigration and Naturalization Service (INS). Arguably, these immigration reform features have created an increasingly uncertain labor market for undocumented and ''undocumented appearing'' workers.[7]

To the extent that the employer-fine provision of IRCA threatens risk-averse employers, these employers would be expected to scrutinize more carefully whether a worker can legally work in the United States. Because of the proliferation of fraudulent documentation, employers might now rely on alternative characteristics, such as English fluency, to better determine the immigration status of workers.[8] Following this logic, the rational immigrant would invest in English skills to secure employment opportunities.

''English-Only'' Legislation and English Skills
During the 1980s Congress considered several (unsuccessfully) constitutional amendments to mandate English as the national language.[9] While such an amendment has yet to pass, many states enacted at the same time ''English-only'' legislation, reflecting the growing intolerance of voters to linguistic pluralism. To illustrate, only a few states recognized English as their official language in 1980; by the late 1990s, about half of the states had passed such legislation.[10]

The intention of the ''English-only'' state laws seems to be to mitigate the value of minority languages. Also, some of the mandates specify that certain services (such as election information, drivers' tests, welfare applications, and state university financial aid forms) be available solely in English. Thus, nonsojourner immigrants who either wish to assimilate into mainstream American culture or who desire access to public services are likely to face a growing incentive to acquire English fluency prior to or soon after migrating.

Marginal Benefits and Marginal Costs of Acquiring
English Language Skills

These recent events promote our hypothesis that the immigrants of the 1980s should have been more proficient in English shortly after migration than their earlier counterparts. We suspect, however, that greater fluency may not be proportional across all immigrants because of differences in overall human capital skills. In particular, while the 1980s witnessed an expansion in pecuniary and nonpecuniary benefits associated with obtaining English proficiency, the marginal benefits of acquiring proficiency are likely higher for the least skilled individuals. For example, because many illegal aliens lacking English fluency also have low human capital levels, these less skilled workers would additionally benefit from learning English by becoming less likely targets of INS officials. Moreover, although English fluency investments negatively relate to cost, the marginal cost of mastering English would be relatively less for low-skilled workers because skill acquisition possesses convexity properties.

Both the marginal benefit and marginal cost considerations predict that the largest difference in English facility between pre- and post-1980 immigrants should have developed among the least skilled populations, ceteris paribus. This conceptual observation will guide us in interpreting the following analysis in which we test for changes in the English skill distribution of recent Hispanic immigrants that have occurred between 1980 and 1990.

III. PUMS Data

Using data from the well-known 1% Public Use Microdata Samples (PUMS) of the 1980 and 1990 U.S. decennial censuses, we explore the English proficiency levels of Hispanic immigrants who arrived within 5 years of each census date. The PUMS include the usual information provided by most large data sets as well as categorical information on English proficiency. Specifically, the PUMS questionnaire asks how well individuals speak English; the responses consist of ''n/a, only English is spoken at home,'' ''very well,'' ''well,'' ''not well,'' and ''not at all.'' We use the convention of combining the ''very well'' and ''n/a'' categories to indicate the highest English fluency level because fewer than 4% of our recent Hispanic immigrant sample report residing in monolingual-English households in both PUMS. Other work additionally contends that 1989 Current Population Survey (CPS) data show little difference between immigrants who speak English ''very well'' and those who speak only English at home.[11]

Our PUMS samples contain both recent immigrant and U.S.-born Hispanics 25–64 years old who speak English and Spanish, who report an occupation, and who were not enrolled in school during the census

TABLE 1

PERCENTAGE ENGLISH LANGUAGE SKILL DISTRIBUTIONS
OF HISPANICS BY EDUCATION

ENGLISH SKILL CATEGORY	RECENT IMMIGRATION		BORN IN THE UNITED STATES	
	1980	1990	1980	1990
Entire sample:				
Speaks no English	34.50	32.55	1.18	.46
Speaks English not well	34.47	33.84	4.13	2.75
Speaks English well	17.71	15.27	17.62	11.66
Highest English fluency	13.32	18.34	77.06	85.12
Pearson χ^2-test	40.97*		519.48*	
Less than 12 years of education:				
Speaks no English	43.70	44.29	2.71	1.38
Speaks English not well	36.76	33.09	8.57	6.86
Speaks English well	11.64	8.75	28.19	22.01
Highest English fluency	7.90	11.50	60.53	69.74
Pearson χ^2-test	57.42*		147.41*	
12 years or more of education:				
Speaks no English	13.28	16.19	.17	.15
Speaks English not well	29.19	34.88	1.20	1.36
Speaks English well	31.72	24.36	10.66	8.15
Highest English fluency	25.82	24.57	87.96	90.33
Pearson χ^2-test	24.68*		58.39*	

NOTE.—Puerto Ricans are not included. See text for the sample selection.
* Statistically significant at the 1% level.

year. The recent Hispanic immigrant sample includes those individuals who migrated within 5 years of the census date, so that our 1980 PUMS immigrant sample solely consists of those who arrived between 1975 and 1980, while the 1990 sample contains only the 1985–90 arrivals. Our focus is on individuals with an occupation because the incentives to acquire English fluency should be strongest for those with a commitment to labor market activity. We note that a Pearson χ^2-test does not reveal a statistical difference between the two PUMS in the share of recent Hispanic immigrants without occupations. Finally, Puerto Ricans are excluded from our analyses because the migration-coding change between the two PUMS prevents a consistent analysis of the migration patterns of island-born Puerto Ricans.[12]

Table 1 provides the English skill distribution of recent Hispanic immigrants and U.S.-born Hispanics, and table A1 in Appendix A lists additional sample means. Table 1 indicates that Hispanic immigrants who entered the United States between 1985 and 1990 reported higher proficiency in English than those who migrated a decade earlier; the two English skill distributions statistically differ from zero. Consistent with our hypothesis, immigrants arriving from Latin America in the late

1980s reacted to the growing incentives to acquire English fluency. Moreover, the largest observable gains in English fluency occurred for individuals with less than 12 years of schooling, as expected. Hispanic natives, particularly those with less than a high school degree, similarly reported greater English proficiency in 1990 than did their 1980 counterparts. These findings agree with our conceptual discussion above.

IV. Empirical Framework and Results on English Proficiency

While table 1 indicates that Hispanic immigrants in 1990 reported significantly higher English fluency levels than those in 1980, these distributions do not account for changes in other demographic characteristics (see table A1). To compensate, we now empirically test whether the pattern holds net of confounding factors by estimating an ordered logit model with English fluency as the dependent variable. The ordered logit technique suits this exercise because the dependent variable contains categories that can be ranked in a systematic pattern. We rank or ''order'' the English-skill categories in terms of whole numbers from 0 to 3, where a value of 0 denotes the lowest proficiency level (no English spoken) and 3 represents the highest fluency (the individual speaks English ''very well'' or speaks only English at home).[13]

Guided by our conceptual discussion, we estimate a model that includes an interaction term between education and a binary variable (90PUMS) that equals 1 if the individual is in the 1990 PUMS. Moreover, we fully interact the remaining covariates with 90PUMS to account for changes in the English-skill distribution that may be explained by transformations in additional attributes.

Our model assumes the form of

English Proficiency =

$$f(\text{Immigrant, Immigrant} * 90\text{PUMS}, X, X * 90\text{PUMS}), \qquad (1)$$

where Immigrant equals 1 for recent Hispanic immigrants; and X represents a vector of socioeconomic characteristics including years of education,[14] potential labor market experience (age − education − 5), gender, ethnicity, marital status, presence of children at home, geographic region, the share of limited-English proficient (LEP) Hispanic adults in the individual's standard metropolitan statistical area (MSA),[15] and residence outside of an MSA. Immigrant * 90PUMS and X * 90PUMS both represent vectors where all variables in Immigrant and X interact with the 90PUMS binary variable. Our selection of the control variables parallels that of other research (see n. 13 above).

Table 2 presents two different sets of results from estimating equation (1). The first contains only recent Hispanic immigrants, such that the base group of comparison consists of individuals in the 1980 PUMS

TABLE 2

ORDERED LOGIT RESULTS FOR ENGLISH LANGUAGE SKILLS
OF RECENT HISPANIC IMMIGRANTS

CHARACTERISTIC	BASE = 1980 RECENT IMMIGRANT		BASE = U.S.-BORN HISPANIC	
	Coefficient	SE	Coefficient	SE
1985–90 immigrant in 1990	.604**	.272	−.518***	.062
Recent immigrant	...	...	−3.241***	.049
1990 PUMS	...	...	.812***	.157
Education	.143***	.009	.219***	.005
Education in 1990	−.027**	.011	−.046***	.007
Potential experience	−.018***	.004	−.006***	.002
Experience in 1990	.001	.005	−.008***	.002
Cuban	.085	.224	−.203	.146
Cuban in 1990	−.417	.277	.075	.185
Other Hispanic	.350***	.093	.325***	.048
Other Hispanic in 1990	.039	.113	−.130**	.064
Female	−.123*	.073	−.013	.033
Female in 1990	−.084	.090	.047	.045
Single	−.137	.090	−.315***	.053
Single in 1990	.156	.108	.302***	.067
Divorced, widowed, separated	.236**	.118	.061	.048
Divorced, widowed, separated in 1990	−.224*	.145	−.035	.064
Children at home	.060	.074	−.031	.037
Children in 1990	−.117	.091	−.066	.049
% MSA LEP share	−2.288***	.432	−2.650***	.189
% MSA LEP share in 1990	−1.062*	.546	.580**	.260
Threshold parameters:				
T_1	−.599		−3.421	
T_2	1.063		−1.704	
T_3	2.065		−.123	
Pseudo R^2	.068		.289	
χ^2	1,599.4		28,945.0	
Number of observations	8,874		55,672	

NOTE.—Dependent variable = English fluency ranked from 0 (no English) to 3 (highest fluency). The threshold parameters (cut-points) absorb the constant term; for more information, see StataCorp, *Stata Statistical Software,* Release 5.0 (College Station, Tex.: Stata Corporation, 1997). Other variables included in the analyses (available from us) account for geographic location (New England, Middle Atlantic, North Central, South Central, South Atlantic, Mountain, Pacific [excluding California], and California [base]). These results are weighted using the 1990 PUMS-provided statistical weights (the 1980 PUMS data are self-weighted), although the number of observations is unweighted. Puerto Ricans are excluded. See text for additional sample restrictions.

    * Statistically significant at the 10% level.
    ** Statistically significant at the 5% level.
    *** Statistically significant at the 1% level.

who migrated between 1975 and 1980. The second estimation designates U.S.-born Hispanics as the base group. The use of the two different samples hinges on the assumption that while 1990 Hispanic immigrants may be more proficient than their 1980 peers, the same pattern may not hold relative to U.S.-born Hispanics. Recall that table 1 suggested that both populations experienced an increase in English fluency during the 1980s; therefore we test whether the English skill differential between recent Hispanic immigrants and U.S.-born Hispanics converged or diverged over the decade.

Because the results on the backdrop variables conform to extant research, we discuss here only the primary results that are of interest to this article. Table 2 indicates that the coefficient on the 1985–90 Hispanic immigrant cohort is positive and statistically significant, favoring those migrating in the latter part of the 1980s vis-à-vis their past counterparts. This finding reaffirms the English-skill profiles shown above in table 1 and further supports the hypothesis that Hispanic immigrant workers responded to the growing socioeconomic and political incentives to acquire English fluency discussed above. Relative to the U.S.-born Hispanic population, however, table 2 suggests that the English skill gap between recent Hispanic immigrants and U.S.-born Hispanic workers significantly diverged during the 1980s. That is, while English proficiency levels increased for both U.S.-born Hispanics and recent Hispanic immigrants, the U.S.-born population had a relatively larger gain.

We offer three explanations for this phenomenon. First, Hispanics born in this country tend to exhibit a stronger preference for blending into the English-dominant society if their cultural attachment fades and U.S. attachment intensifies over time. Second, Hispanics who could be misidentified as undocumented may have considerable incentives (such as reducing potential labor market discrimination consequences) to distance themselves from the undocumented by investing more intensely in English fluency.[16] Finally, Hispanic natives, by virtue of established American networks, might be able to enjoy a comparative advantage in English attainment, at least in the short run. In any of these cases, relative increases in the English proficiency of U.S.-born Hispanics can be expected.

The coefficient on education in table 2 reaffirms conventional wisdom: educated Hispanic workers possess greater English language ability than their less schooled counterparts. The negative coefficient on the interaction between 90PUMS and education, however, reinforces our conceptual discussion and findings in table 1 because the relative increase in the English skills of Hispanic workers between 1980 and 1990 was smaller for those with higher levels of education, ceteris paribus. One interpretation is that the greatest increases in proficiency levels occurred among populations with the greatest incentives to learn English.

V. Extension: Implications for the Earnings
of Hispanic Immigrants

Our findings above lend support to Hispanic immigrants' responses to the growing incentives associated with acquiring English proficiency. For example, we provide evidence that Hispanic immigrants who had arrived in the United States in recent years are more fluent in English than their prior counterparts. If incoming Hispanic immigrants continue to acquire English skills, what implications will this have on their earnings?

Answers to this question may be sought by employing the following three procedures: (1) estimating a simple earnings function accounting for English proficiency, (2) utilizing a wage-decomposition method, and (3) analyzing kernel density estimates of the earnings distribution of recent Hispanic immigrants. In this extension, we use these procedures to analyze the 4,646 recent Hispanic immigrant workers in our 1990 PUMS sample who report wage and salary income for 1989.

A Simple Earnings Function

We first estimate an earnings function that includes a measure of English fluency (or lack thereof); indeed, many studies in the social science literature have conducted such an exercise. To illustrate, the natural logarithm of hourly earnings Ln(Wage) (measured by 1989 annual income divided by hours worked) can be expressed as

$$\ln(\text{Wage}) = \text{Proficiency } \alpha + V\beta + e, \tag{2}$$

where Proficiency is a vector of the English-skill categories, V indicates a host of attributes commonly associated with earnings (education, experience and its square, gender, ethnicity, region, the MSA LEP-share of Hispanics [see n. 15 above], and residence outside of an MSA), α and β represent coefficient vectors to be estimated, and e is the stochastic error term.

An ordinary least squares (OLS) regression of equation (2) provides insight into the relative earnings penalties associated with different degrees of English fluency, as reflected in the estimated coefficients of α. We realize that more sophisticated regression techniques exist, such as nonlinear regression that simultaneously estimates an English deficiency index;[17] however, in this analysis we prefer to keep things simple for the sake of illustration.

Table 3 reports the coefficients on the different English-skill categories, and table B1 in Appendix B lists the regression results from estimating equation (2). Note that Hispanic immigrants lacking English fluency earn less than their otherwise similar fluent peers, as expected (see n. 3 above), and this earnings penalty monotonically relates to the different degrees of English deficiency. That is, the largest earnings penalty is ob-

TABLE 3

ENGLISH DEFICIENCY EARNINGS PENALTIES FOR RECENT
HISPANIC IMMIGRANTS IN 1990

English Skill Category (Base = Highest Fluency)	Penalty from Simple Earnings Function (Eq. [2])	Penalty from Wage-Decomposition (Eqq. [3] and [4])
Speaks English well	−.027	−.034
Speaks English not well	−.116	−.083
Does not speak English	−.143	−.079

NOTE.—Dependent variable = natural logarithm of 1989 hourly earnings. See Appendix B for the remaining regression results and standard errors. The base English-skill category contains individuals who speak English ''very well'' or who speak English only at home. The earnings functions are weighted using the 1990 PUMS-provided statistical weights. See the text for the sample selection.

tained by workers with the lowest English fluency. The face value of the results in table 3 implies that Hispanic immigrants who acquire the highest English fluency should experience an increase in earnings of 2.7% if reported as currently speaking English ''well,'' 11.6% if ''not well,'' and 14.3% if no English is spoken.[18] It should be noted, however, that the coefficient on the ''well'' category does not statistically differ from zero.

Wage Decomposition
One implicit assumption when estimating earnings functions like equation (2) is that workers face comparable labor market outcomes regardless of English proficiency. Perhaps the wage structures and human capital returns vary between the deficient and fluent workers because of differences in employment sectors or geographic location. Indeed, other work has shown that English fluency serves as an occupational sorting mechanism and that poor English fluency serves to decrease the returns to other forms of human capital.[19] An additional problem with the simple earnings function involves multicollinearity because English skills certainly relate to many of the covariates in (2), as observed in table 2. A wage-decomposition technique should help to mitigate these concerns.

To utilize the wage-decomposition method, we first estimate a separate earnings function similar to equation (2) using OLS (reported in table B1) that solely includes individuals reporting the highest proficiency level:

$$\ln(\text{Wage})^{\text{proficient}} = V^{\text{proficient}}\beta^{\text{proficient}} + e^{\text{proficient}}. \tag{3}$$

The coefficients obtained from estimating equation (3) ($\beta^{\text{proficient}}$) represent the earnings structure experienced by the fully proficient workers. Using these coefficients, a wage-decomposition technique can be used to deter-

mine how much the less fluent workers could earn on average if employed in the English proficient sector.

To illustrate, equation (4) describes the effect of poor English skills on earnings as the difference between the observed average wage for workers reporting the jth fluency category [Average ln(Wage)^j] and the wage these workers could have earned on average if employed in the English-proficient sector [Predicted ln(Wage)$^j_{proficient}$]:

$$\text{Average ln(Wage)} - \text{Predicted ln(Wage)}^j_{proficient}. \qquad (4)$$

The observed average ln(Wages) for recent Hispanic immigrants who reported speaking English ''well,'' ''not well,'' or ''not at all'' are 1.899, 1.766, and 1.669 in the 1990 PUMS, and the average Predicted ln(Wage)$^j_{proficient}$ can be estimated by applying the less fluent samples to the estimated English-fluent coefficients ($\beta^{proficient}$) from equation (3).

Table 3 provides the earnings penalties from this exercise. Note that the wage-decomposition technique yields different penalties than those obtained from simple OLS. Those who speak English ''well'' face a slightly larger penalty (3.4%), and those who speak English ''not well'' or ''not at all'' have smaller penalties (8.2% and 7.9%). It is interesting to note that the penalties obtained using the wage-decomposition technique are no longer monotonic with respect to English skills. The relatively smaller penalties for recent Hispanic immigrant workers in the two lowest fluency categories (particularly those who do not speak English) indicate that differences in observed characteristics and wage structures explain a considerable portion of the estimated earnings penalties from the simple OLS technique.

Kernel Density Estimation
One potential shortcoming with using the wage-decomposition technique is that it provides insight into earnings differences only at the mean and does not indicate effects of poor English fluency on the distribution of wages. Moreover, both the simple regression (eq. [2]) and the wage-decomposition (eqq. [3] and [4]) methods implicitly assume that the sample characteristics and labor market aspects for the proficient workers would remain the same without the existence of the less fluent sectors. That is, these alternative methods ignore the possibility that the existence of workers with poor English skills affects the wage distribution of the fluent workers.

Kernel density estimates allow for an exploratory investigation of the earnings distribution that would prevail if all recent Hispanic immigrant workers acquired proficiency in English.[20] We thus estimate two
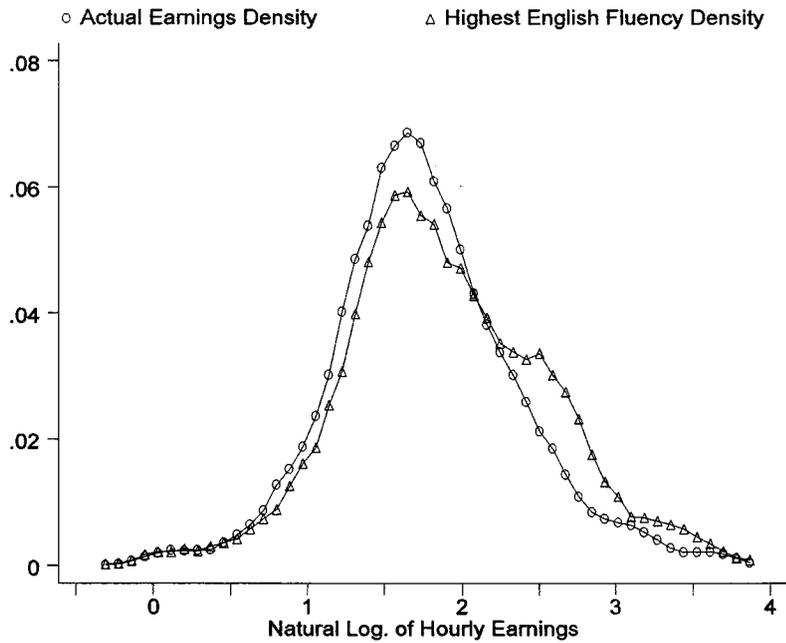
FIG. 1.—Kernel density estimates of the 1989 earnings distributions of recent Hispanic immigrants, entire sample and the distribution if all acquired the highest level of English fluency.

Epanechnikov kernel densities as seen in figure 1: the ''actual density,'' which displays the observed earnings distribution in the recent Hispanic immigrant sample, and the ''highest English fluency density,'' which represents the earnings distribution that would hypothetically exist if all recent Hispanic immigrants reported the highest fluency level (i.e., if they reported speaking English ''very well'' or spoke only English at home).[21]

We obtain the latter density by solely using the proficient sample weighted by θ—the ratio of the simple probability of being fully proficient to the probability a worker is proficient conditional on a set of characteristics (X). Formally, θ may be expressed as

$$\theta = [\text{prob}(\text{Proficient})]/[\text{prob}(\text{Proficient}|X)]. \qquad (5)$$

Prob(Proficient) is measured by the sample share of the English proficient, and prob(Proficient$|X$) can be estimated from the predicted values of a logit with English fluency as the dependent binary variable and the right-hand-side variables from X in equation (1). We do not report the logit results here because they mirror those in table 2. Also, because the use of kernel density methods may be misleading when distributions

have ''long tails,''[22] we exclude 60 individuals from the recent Hispanic immigrant sample with hourly earnings outside of three standard deviations of the mean ln(Wage).

The difference between the two kernel estimate densities in figure 1 indicates the effect of not being fully proficient in English on the earnings distribution of recent Hispanic immigrants. Note that the existence of Hispanic workers lacking English fluency tends to equalize the distribution of wages, where more workers earn around the mean as shown in the center of the ''actual density'' distribution, compared to the more dispersed distribution comprising the English-skilled Hispanic immigrant workers. Moreover, if all incoming Hispanic immigrants fully mastered English, a larger share of workers would earn above the average as indicated by the relatively greater weight in the upper half of the ''highest English fluency density'' distribution.

However, the overlapping densities in the lower tail suggest that recent Hispanic immigrant workers at the lower boundary of the earnings distribution do not seem affected by the existence of the less proficient, presumably because many workers in the actual sample with these wages currently report fluency in English. Then, if all recent Hispanic immigrants acquired the highest English-skill level, the lower tail of the earnings distribution would be unaffected.

How might the earnings distribution of recent Hispanic immigrants be affected if all acquired at least a minimal knowledge of English? Using the same procedure described above (e.g., eq. [5]), we now obtain additional kernel density estimates to address this question by successively adding workers who report speaking English ''well'' (in fig. 2) and ''not well'' (in fig. 3) to the fully proficient Hispanic immigrant sample.

Figure 2 presents the earnings distributions of all recent Hispanic immigrant workers (''actual density'') and the hypothetical earnings distribution that would exist if all immigrants learned to speak English at least ''well'' (''speaks English well or better''). While the hypothetical ''speaks English well or better'' density in figure 2 is slightly ''smoother'' than the ''highest English fluency density'' depicted in figure 1, the same basic pattern holds in that the existence of workers with little or no English skills tends to equalize the earnings distribution of recent Hispanic immigrants. Also similar to figure 1, a larger proportion of workers would earn above the average if all spoke English well, although the lower end of the income distribution would most likely be unaffected.

Figure 3 repeats the actual earnings distribution of the recent Hispanic immigrant sample (''actual earnings density'') and shows the earnings distribution that would exist if all spoke at least a minimal amount of English (''excludes non-English speakers''). It is interesting that the two densities are rather similar, indicating that the move from not speak-
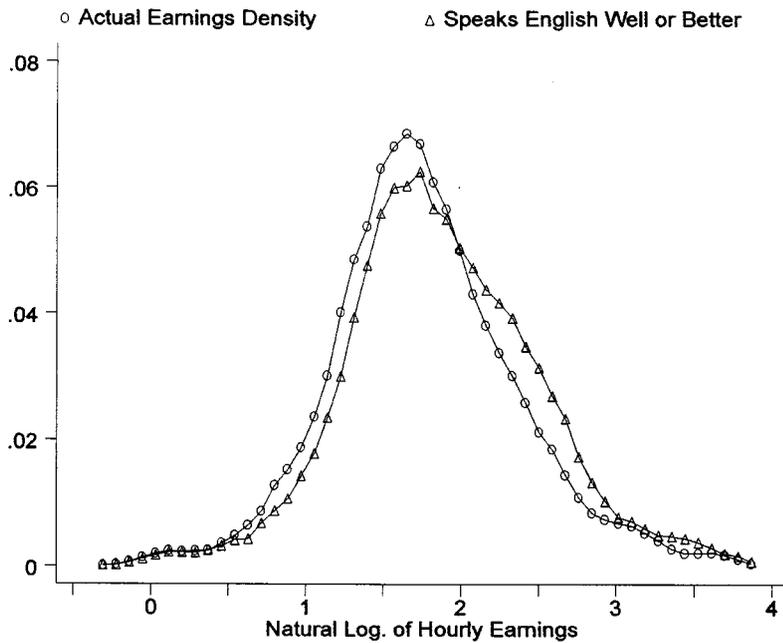
Fig. 2.—Kernel density estimates of the 1989 earnings distributions of recent Hispanic immigrants: entire sample and the distribution if all spoke English ''well'' or better.

ing English to speaking English ''not well'' would only slightly affect the income distribution of recent Hispanic immigrants. Thus, to achieve major changes in the distribution of earnings, figures 1–3 indicate that recent Hispanic immigrants would have to learn to speak English ''well'' or better.

In sum, if all recent Hispanic immigrants acquired at least a moderate knowledge of English, the overall earnings distribution would improve despite some wage dispersion (i.e., a slight ''flattening out'' of the distribution). Average earnings would be higher, and a greater proportion of workers would earn above the mean; however, it appears that recent Hispanic immigrant workers at the lower end of the distribution would be unaffected.

VI. Concluding Remarks
Over the past few decades, socioeconomic and political elements increased the incentives for individuals with limited English fluency to acquire English skills. In particular, the 1980s witnessed a surge in these incentives as English-proficiency earnings premiums grew, INS-apprehension possibilities expanded, and ''English-only'' legislation flourished. While recent studies have analyzed whether language minorities
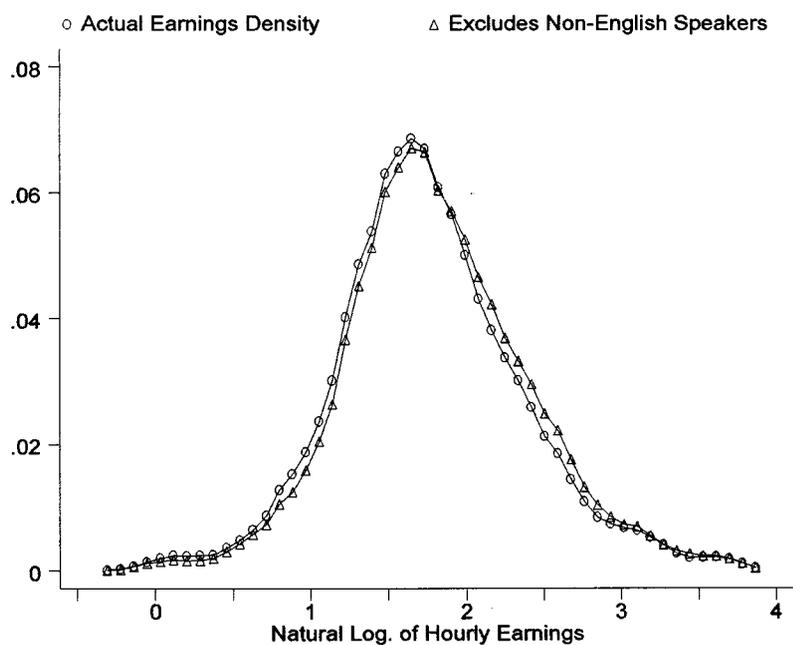
FIG. 3.—Kernel density estimates of the 1989 earnings distributions of recent Hispanic immigrants: entire sample and the distribution if all spoke English.

in the United States subsequently responded by acquiring higher levels of English fluency, few studies, if any, explore the impact of these incentives on the English skill and potential earnings distributions of immigrants arriving late in the decade.

Employing 1980 and 1990 1% PUMS data, we find that recent Hispanic immigrant workers (particularly the less educated) who entered the United States between 1985 and 1990 reported significantly higher English fluency levels in 1990 than the levels reported in 1980 by their otherwise similar 1975–80 migrating counterparts. These results suggest that Hispanic immigrant workers rationally responded to the higher English-skill incentives by investing in such skills prior to or immediately following migration. Nevertheless, because the U.S.-born Hispanic labor force also reported higher proficiency in 1990 than in 1980, the English-skill gap between recent Hispanic immigrants and Hispanic natives diverged during this time.

One implication of our findings pertains to potential changes in Hispanic labor markets. To gain insight into this issue, we explored the effects of English proficiency on the earnings distribution of recent Hispanic immigrants in 1990. Consistent with other research, our findings show that investments in English proficiency enhance earnings. Moreover, kernel density estimates indicate that if all recent Hispanic immi-

grant workers acquired moderate English skills, the share of workers earning above the average wage would increase, although the lower tail of the earnings distribution may be unaffected.

A second implication of our results involves the perception of this nation's linguistic identity. The ''English-only'' legislation passed by many states reflects the preoccupation of some policy makers to integrate the populace through a common language. While the English-skill differential between recent Hispanic immigrants and U.S.-born Hispanics seemed to widen in the 1980s, individuals fearing a linguistically diverse society should take heart that both groups appear to be investing more in the majority language—English.

A third consideration relates to immigrant children in U.S. schools. Controversy currently exists over whether programs like bilingual education represent the best means to instruct children who lack English skills, as exemplified in the June 1998 passage of Proposition 227 in California.[23] Much of this controversy hinges on the extensive costs and lack of consistent evidence on the relative effectiveness of bilingual education.[24] Indeed, an estimated \$2–\$3 billion are spent each year on special educational services for LEP students at the state and local level in the United States.[25] If recent immigrants possess stronger English skills than their past counterparts, as our results imply, one would expect immigrant parents to transfer these skills to children,[26] perhaps reducing the need for (and subsequently the cost of) these types of schooling programs over time.

Finally, a fourth implication involves the issue of the ''quality'' of immigrants in the United States. While researchers debate whether or not immigrants today are of lower ''quality'' than those who migrated in the past on the basis of relative earnings,[27] we note that the response to growing English proficiency incentives, particularly among the less educated, should contribute some insight into the rationality, capability, and earnings potentials of immigrants working in this country.

Appendix A

TABLE A1

MEAN CHARACTERISTICS OF RECENT IMMIGRANT AND U.S.-BORN HISPANIC WORKERS

CHARACTERISTIC	RECENT IMMIGRANTS		BORN IN THE UNITED STATES	
	1980	1990	1980	1990
Natural logarithm of last year's				
hourly earnings	1.321	1.783	1.671	2.176
	(.779)	(.676)	(.791)	(.690)
Education	8.060	8.902	11.030	12.058
	(4.760)	(4.916)	(3.636)	(2.951)
Potential job experience	21.144	20.214	22.043	21.245
Mexican American or Mexican	.604	.540	.769	.804
Cuban	.035	.031	.011	.018
Other Hispanic	.361	.430	.220	.178
Female	.371	.370	.448	.470
LEP-share of Hispanics in MSA	.300	.289	.217	.209
	(.086)	(.091)	(.105)	(.106)
Resides outside of MSA	.078	.053	.226	.160
Resides in California	.446	.437	.312	.324
New England	.016	.023	.006	.007
Middle Atlantic region	.153	.168	.031	.026
North Central region	.080	.050	.0086	.076
South Atlantic region	.090	.168	.048	.045
South Central region	.165	.095	.328	.322
Mountain region	.036	.042	.165	.174
Pacific region, excluding				
California	.012	.017	.023	.025
Number of observations	3,139	5,735	19,968	26,830

NOTE.—Selected standard deviations are given in parentheses. These are weighted using the 1990 PUMS-provided statistical weights; the 1980 PUMS data are self-weighted. Mean earnings are obtained from those individuals who report wage and salary income.

Appendix B

TABLE B1

REGRESSION RESULTS FOR THE EARNINGS OF RECENT HISPANIC IMMIGRANTS IN 1990

VARIABLE	ENTIRE RECENT IMMIGRANT SAMPLE (Eq. [2])		MOST FLUENT SAMPLE ONLY (Eq. [3])	
	Coefficient	SE	Coefficient	SE
Speaks English well	−.027	.035	. . .	. . .
Speaks English not well	−.116	.031	. . .	. . .
Does not speak English	−.143	.033	. . .	. . .
Education	.028	.003	.054	.007
Experience	.011	.004	.017	.009
Experience squared/100	−.012	.008	−.036	.017
Female	−.196	.023	−.213	.050
Cuban	−.200	.072	−.315	.157
Other Hispanic	.021	.029	.126	.065
MSA LEP-share	.117	.157	.104	.295
Resides outside of MSA	−.125	.043	−.138	.098
Constant	1.464	.094	1.022	.194
R^2	.076		.166	
Number of observations	4,646		870	

NOTE.—Dependent variable = natural logarithm of 1989 hourly earnings. Other variables included in the analyses (available from us) account for geographic location (New England, Middle Atlantic, North Central, South Central, South Atlantic, Mountain, Pacific [excluding California], and California [base]). The constant refers to English-proficient Mexican immigrant men residing in an MSA in California. These earnings functions are weighted using the 1990 PUMS-provided statistical weights. See text for sample restrictions.

Notes

1. Alberto Dávila and Marie T. Mora, ''The English-Skill Acquisition of Hispanic Americans during the 1980s,'' *Social Science Quarterly* 81 (2000), in press.

2. U.S. Bureau of the Census, *Resident Population of the United States: Middle Series Projections, 2001–2005, by Sex, Race, and Hispanic Origin, with Median Age* (Washington, D.C., March 1996), at www.census.gov/population/projections/nation/nsrh/nprh0105.txt.

3. Walter McManus, William Gould, and Finis Welch, ''Earnings of Hispanic Men: The Role of English Language Proficiency,'' *Journal of Labor Economics* 1 (1983): 101–30; Walter S. McManus, ''Labor Market Effects of Language Enclaves: Hispanic Men in the United States,'' *Journal of Human Resources* 25 (1990): 228–25; Guillermina Jasso and Mark R. Rosenzweig, ''Language Skill Acquisition, Labor Markets and Locational Choice,'' in *Migration and Labor Market Adjustment,* ed. J. Van Dijk, F. Hendrik, H. W. Herzog, Jr., and A. M. Schlottman (Dordrecht: Kluwer Academic Press, 1989), pp. 217–39; Ross M. Stolzenberg, ''Ethnicity, Geography, and Occupational Achievement of Hispanic Men in the United States,'' *American Sociological Review* 55 (1990): 143–54; Alberto Dávila, Alok K. Bohara, and Rogelio Sáenz, ''Accent Penalties and the Earnings of Mexican Americans,'' *Social Science Quarterly* 74 (1993): 902–16; Barry R. Chiswick and Paul W. Miller, ''The Endogeneity between Language and Earnings: International Analyses,'' *Journal of Labor Economics*

13 (1995): 246–88; Ross M. Stolzenberg and Marta Tienda, ''English Proficiency, Education, and the Conditional Economic Assimilation of Hispanic and Asian Origin Men,'' *Social Science Research* 26 (1997): 25–51; Edward P. Lazear, ''Culture and Language,'' *Journal of Political Economy* 107 (1999), in press; and Alberto Dávila and Marie T. Mora, ''English-Skills, Earnings, and the Occupational Sorting of Mexican Americans along the U.S.-Mexico Border,'' *International Migration Review* (2000), in press.

4. Marie T. Mora and Alberto Dávila, ''Gender, Earnings, and the English Skill Acquisition of Hispanic Americans in the United States,'' *Economic Inquiry* 36 (1998): 631–44; and Marie T. Mora, ''Did the English Deficiency Earnings Penalty Change for Hispanic Men between 1979 and 1989?'' *Social Science Quarterly* 79 (1998): 581–94.

5. For example, see Kevin M. Murphy and Finis Welch, ''The Structure of Wages,'' *Quarterly Journal of Economics* 107 (1992): 285–326.

6. The underpinning of this latter point stems from A. D. Roy, ''Some Thoughts on the Distribution of Earnings,'' *Oxford Economic Papers* 3 (1951): 135–46. Recent applications of Roy's study include George J. Borjas, ''Self Selection and the Earnings of Immigrants,'' *American Economic Review* 77 (1987): 531–53; and Alberto Dávila and Alok K. Bohara, ''Equal Employment Opportunity across States: The EEOC, 1979–1989,'' *Public Choice* 80 (1994): 223–43.

7. Dávila, Bohara, and Sáenz (n. 3 above).

8. Ibid.

9. K. L. Adams and D. T. Brink, *Perspectives on Official English: The Campaign for English as the Official Language of the USA* (New York: Mouton de Gruyter, 1990).

10. According to Adams and Brink, Hawaii (1978), Illinois (1920), and Nebraska (1969) were the only three states with ''English-only'' legislation prior to 1980. During the 1980s, 14 additional states (Arizona [1988], Arkansas [1987], California [1986], Colorado [1988], Florida [1988], Georgia [1986], Indiana [1984], Kentucky [1984], Mississippi [1987], North Carolina [1987], North Dakota [1987], South Carolina [1987], Tennessee [1984], and Virginia [1981]) passed similar laws. Between 1990 and 1998, Alabama (1990), Alaska (1998), Missouri (1998), Montana (1995), New Hampshire (1995), South Dakota (1995), and Wyoming (1996) joined the ''English-only'' list. For a discussion on the potential labor market implications of such legislation, see Madeline Zovodny, ''The Effects of English Laws on Limited-English-Proficient Workers'' (Federal Reserve Bank of Atlanta, unpublished manuscript, 1998).

11. Thomas J. Espenshade and Haishan Fu, ''An Analysis of English-Language Proficiency among U.S. Immigrants,'' *American Sociological Review* 62 (1997): 288–305.

12. In the 1980 questionnaire, island-born Puerto Ricans could skip the questions related to migration time because this information pertained only to individuals born in a foreign country. Consequently, it is not possible to determine the year of migration to the mainland United States for most island-born Puerto Ricans in the 1980 PUMS. The 1990 census clearly asked individuals born in U.S. territories to report the time of migration to the United States.

13. Other studies using similar techniques include Dávila and Mora, ''The English-Skill Acquisition of Hispanic Americans during the 1980s'' (n. 1 above); Espenshade and Fu; David P. Lindstrom and Douglas S. Massey, ''Selective Emigration, Cohort Quality, and Models of Immigrant Assimilation,'' *Social Science Research* 23 (1994): 325–49; and Kristin E. Espinosa and Douglas S. Massey, ''Determinants of English Proficiency among Mexican Migrants to the United States,'' *International Migration Review* 31 (1997): 28–50. Alter-

natively, McManus, Gould, and Welch (n. 3 above) estimate a continuous English deficiency index, while additional work combines some of the less fluent categories to construct binary variables, such as Jasso and Rosenzweig, ''Language Skill Acquisition, Labor Markets and Locational Choice''; and Chiswick and Miller (both in n. 3 above).

14. The 1990 PUMS does not provide the number of schooling years; instead, it categorically presents the highest education level. These categories parallel the schooling coding presently utilized by the CPS; however, in February 1990, the CPS continuously and categorically provided education. Since the same individuals had both codes, schooling years can be estimated using the education categories; see Jin Heum Park, ''Estimation of Sheepskin Effects and Returns to Schooling Using the Old and New CPS Measures of Educational Attainment,'' Working Paper no. 338 (Princeton University, Department of Economics, Industrial Relations Section, August 1994). We use Park's translations here.

15. The presence of children at home is included in the household record in the 1980 PUMS and in the personal record in 1990. To match the codes, we create a household variable using the personal records of Hispanic adults in 1990, such that an individual in a household with children under the age of 18 has a value of 1 for this variable. We control for geographic region here and in the earnings section below because other work, such as Stolzenberg (n. 3 above), has illustrated that the geographic distributions of Hispanics vary across regions. The differing regional economies may thus yield a spectrum of both English-skill incentives and socioeconomic outcomes. We slightly modify the census-defined regions to separate California from the Pacific region because of the large share of immigrants who reside in California (see table A1 in App. A). We further combine the regions of East North Central and West North Central into ''North Central,'' and East South Central and West South Central into ''South Central'' because of the extremely small number of recent immigrants residing in the West North Central and the East South Central areas of the United States. Along with geographic region and residence outside of an MSA, the MSA share of LEP Hispanic adults controls for region-specific influences. Indeed, the language or ethnic composition of a community might affect English-skill incentives and outcomes, as noted by Dávila and Mora, ''The English-Skill Acquisition of Hispanic Americans during the 1980s'' (n. 1 above); Espenshade and Fu; McManus (both in n. 3 above); Gillian Stevens, ''The Social and Demographic Context of Language Use in the United States,'' *American Sociological Review* 57 (April 1992): 171–85; J. M. Sanders and V. Nee, ''Limits of Ethnic Solidarity in the Enclave Economy,'' *American Sociological Review* 52 (1987): 771–73; and Marta Tienda and Lisa J. Neidert, ''Language, Education, and the Socioeconomic Achievement of Hispanic Origin Men,'' *Social Science Quarterly* 65 (1984): 519–35. To calculate this share, we take the average of LEP adults among the nonstudent Hispanic population aged 18–64 years within an MSA for each census year. This measure equals 0 in MSAs with fewer than 10 Hispanics, and equals the state average for those living outside of an MSA or in two MSAs for the corresponding year. Individuals who report speaking English ''not well'' or ''not at all'' are classified as LEP.

16. For example, see Alberto Dávila and José A. Pagán, ''The Effect of Selective INS Monitoring Strategies on the Industrial Employment Choice and Earnings of Recent Immigrants,'' *Economic Inquiry* 35 (1997): 138–50.

17. See, e.g., McManus, Gould, and Welch; and more recently, Mora and Dávila (n. 4 above).

18. More precisely, these percentages are 2.7, 11.0, and 13.4 when using the correction for interpreting the percentage effects of binary variables on de-

pendent variables in the estimations of semilogarithmic equations; see Peter Kennedy, ''Estimations with Correctly Interpreted Dummy Variables in Semi-logarithmic Equations,'' *American Economic Review* 71 (1981): 801. This correction assumes the form of $a = \exp[\alpha^* - 0.5\ \text{var}(\alpha^*)] - 1$, where a indicates the corrected percentage effect of the binary variable from equation (2), α^* represents the estimated coefficient of the binary variable, and var(α^*) is the variance of α^*.

19. Mora and Dávila (n. 4 above); Stolzenberg; McManus; Jasso and Rosenzweig, ''Language Skill Acquisition, Labor Markets and Locational Choice''; McManus, Gould, and Welch; Stolzenberg and Tienda (n. 3 above); and Tienda and Neidert.

20. This section relies on Jack Johnston and John DiNardo, *Econometric Methods,* 4th ed. (New York: McGraw-Hill, 1997), pp. 370–79.

21. The Epanechnikov kernel densities (estimated using the default bandwidth in StataCorp, *Stata Statistical Software,* Release 5.0 [College Station, Tex.: Stata Corporation, 1997]) are weighted by the 1990 PUMS-provided statistical weights.

22. Johnston and DiNardo.

23. Proposition 227 eliminated most native-language instruction in the state of California in favor of placing LEP students in intensive sheltered-English-immersion classes for up to 1 year. This proposition's passage stemmed from the disillusionment with the state's conventional methods for educating LEP children.

24. See, e.g., D. August and K. Hakuta, *Improving Schooling for Language-Minority Children: A Research Agenda* (Washington, DC: National Research Council, 1997).

25. American Legislative Exchange Council, ''Bilingual Education in the United States, 1991–1992,'' in *The Report Card on American Education,* special suppl. (Washington, D.C., 1994).

26. Gillian Stevens, ''Sex Differences in Language Shift in the United States,'' *Sociology and Social Research* 71 (October 1986): 31–36.

27. For example, see Borjas, ''Self Selection and the Earnings of Immigrants'' (n. 6 above), and ''Self Selection and the Earnings of Immigrants: Reply,'' *American Economic Review* 80 (1990): 305–8; and Guillermina Jasso and Mark R. Rosenzweig, ''Self-Selection and the Earnings of Immigrants: Comment,'' *American Economic Review* 80 (1990): 298–304.