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The Effects of Official English Laws on Limited-English-Proficient Workers

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Abstract: Workers with limited English skills may suffer adverse effects in the labor market when states declare English the official language. If employers view official English laws as allowing or requiring them to adopt workplace English-only rules that lower the demand for limited-English-proficient workers, such laws may harm individuals who do not speak English very well. Using data from the 1980 and 1990 Census, I estimate whether the earnings and other labor market outcomes of workers who have limited English proficiency and live in states that adopted official English laws declined relative to other workers'. The results suggest a substantial decline in the annual earnings of men with limited English proficiency.

JEL classification: J71, J78

Key words: official English, English only, discrimination

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The Effects of Official English Laws on Limited-English-Proficient Workers

I. Introduction

During the 1980s and 1990s, a period of rising immigration, there has been a surge of support for establishing English as the official language of the United States. Official English legislation has been proposed in Congress several times, and a bill declaring English the official language of the federal government passed the House of Representatives, but not the Senate, in 1996. Although action has not yet succeeded at the federal level, many states have declared English the official state language. The number of states with some form of official English or “English Only” law rose from three in 1979 to 22 in 1996, and more than 10 states considered adopting official English statutes in 1997. Most current state-level official English laws are largely symbolic and simply declare English the state’s official language, but some laws restrict the use of foreign languages in certain government functions.

Despite the limited scope of most official English laws, critics have argued that employers may perceive the laws as a license to discriminate against non-English-proficient or limited-English-proficient speakers. For example, Califa (1989) argues that declaring English the official language creates a tool for prejudice, particularly against Hispanics. Businesses also may misinterpret the laws as requiring them to restrict employees from speaking other languages. Concurrent with the increase in state official English laws, an increasing number of private businesses have prohibited employees from speaking foreign languages while working (Davis 1997). The passage of official English laws is alleged to have led to a “flurry of language-discrimination lawsuits and a record number of complaints with the U.S. Equal Employment Opportunity Commission” (Headden et al. 1995). However, advocates of official English laws contend that the laws simply reinforce the importance of learning English (Mydans 1990).

This paper examines whether individuals who have limited English proficiency experience a decline in earnings and other labor market outcomes, relative to other workers, when states adopt official English laws. Employers may view the laws as either allowing or requiring them to adopt workplace English-only rules after a state declares English the official language. Such rules may lower the demand for limited-English-proficient workers in that state, potentially reducing the wages and employment of workers who do not speak English well. Alternatively, the passage of an official English law may be a signal of other changes that cause relative labor market outcomes to decline for limited-English-proficient workers. For example, a state may experience a large inflow of immigrants who do not speak English well, prompting the state to pass an official English law and causing the relative labor market outcomes of limited-English-proficient workers to decline.

There is a substantial literature on the effect of English ability on earnings, but the effect of official English laws has received little attention. Most studies find that workers with limited English skills earn less than comparable workers who are proficient in English (McManus, Gould, and Welch 1983; Grenier 1984; Tainer 1988; Jasso and Rosenzweig 1990; Chiswick and Miller 1992 and 1995; Bloom and Grenier 1993; Carliner 1996). The earnings penalty associated with limited English skills appears to have increased for some ethnic and educational groups during the 1980s (Sorensen and Enchautegui 1994; Trejo 1997; Mora 1998); an increase in the number of state official English laws may have contributed to this trend.¹ Using cross-sectional data, Mora and Saenz (1997) find that Hispanic workers with limited English proficiency who worked in states with official English laws in 1989 earned less relative to non-

¹ However, Bloom and Grenier (1993) argue that the increase in returns to education during the 1980s led to widening Hispanic-white wage differentials because of the lower educational attainment of Hispanics. Bucci and Tenorio (1997) find that the return to English ability declined among immigrants during the 1980s.

Hispanic whites than did comparable workers in other states. Their estimates indicate the wage penalty associated with poor English skills among Hispanic immigrants was at least 8 percent larger in states with official English laws than in other states.

The methodology used in this study offers several advantages for estimating the effect of official English laws. I use data from the 1980 and 1990 Census to examine the change in the earnings and other labor market outcomes of workers with limited English proficiency in states that adopted official English legislation, relative to English-proficient workers within the same states and relative to workers in states that did not pass such laws. The difference in differences in differences estimation technique used in this paper requires weaker identifying assumptions than traditional cross-sectional and longitudinal methodologies (Gruber 1994). I also investigate the possibility that official English laws are a symptom of other factors that cause the relative labor market status of limited-English-proficient workers to fall, rather than the underlying cause of the observed changes.

The rest of the paper proceeds as follows. The next section briefly describes the content of state official English laws. The data are described in Section III, and the estimation strategy is outlined in Section IV. Section V contains the estimation results, which indicate that male workers with limited English ability experience a relative decline in annual earnings of about 12 percent in states that adopt official English policies. Women with limited English proficiency generally do not experience a significant relative decline in labor market outcomes. Section VI explores whether the estimated effects appear to be caused by official English policies. Section VII concludes.

II. Description of Official English Laws

Movements to restrict the use of languages other than English have arisen periodically in the U.S., often coinciding with or following periods of high levels of immigration. After World War I stirred up anti-foreign sentiments, 21 states passed laws during the 1920s making English the official state language or barring the teaching of foreign languages (Trasvina 1990). The Supreme Court struck down enforcement of the laws, but Nebraska has retained a 1920 constitutional amendment declaring English the official state language. Interest in official English legislation arose again in 1981, when a constitutional amendment to make English the official national language and prohibit governments from requiring the use of other languages was first introduced in Congress. Although Congress has not approved an official English law or constitutional amendment, a number of states have declared English the official state language, either by statute or by constitutional amendment, in recent years.² Table 1 lists states with some form of official English law as of 1996.³

The provisions of state official English (OE) laws vary. The laws in most states simply declare English the official state language, much like designating a state flower. A constitutional amendment in Hawaii declares both English and Hawaiian to be official languages, and Illinois's law replaced a 1923 law that declared "American" the official state language. Although most of the laws are symbolic, several specify or imply some form of enforcement; Arington (1991) and Tatalovich (1995) classify the laws in Arizona, California, South Carolina, and Tennessee as

² Several municipalities also have passed official English ordinances (Arington 1991). Dade County, Florida, was the first in 1980; most of the cities are located in states that also passed official English laws during 1980-1988.

³ A few states have adopted "English Plus" legislation promoting the use of both English and foreign languages. The legislatures in New Mexico, Oregon, and Washington adopted English Plus laws or resolutions in 1989, and the Rhode Island legislature adopted a resolution in 1992 (Tatalovich 1995).

more than symbolic.⁴ The Tennessee law, for example, requires that all government “communications and publications, including ballots,” be in English. Arizona’s law declares English as the “language of the ballot, the public schools, and all government functions and actions.”⁵ The OE laws in Alabama, Arizona, California, Colorado, and Florida are constitutional amendments adopted by voters, usually by an overwhelming margin.

Several state official English laws prohibit government employees from speaking other languages except under certain circumstances, and an increasing number of private companies have established English-only policies. A typical workplace English-only rule forbids employees from conversing in a foreign language in front of customers or coworkers who do not speak the language. The legality of English-only policies is unclear because of conflicting court decisions (Davis 1997). Because most challenges to such rules are private actions, it is not known how many companies have such rules and whether they are more prevalent in states that have adopted official English laws. Many observers believe that the adoption of state official English laws has contributed to the increase in the number of establishments with English-only rules in those states (Mealey 1989; Combs and Lynch 1990; Chen 1992). Martha Jimenez, a lawyer with the Mexican American Legal Defense and Educational Fund, contends, “These laws give people who never really liked hearing other languages an opening to set up these English-only rules” (Mydans 1990).

If official English laws lower the demand for workers who do not speak English well, perhaps because of increased discrimination, a decline in the labor market outcomes of

⁴ Arlington also includes Alabama, while Tatalovich also includes Hawaii, Nebraska, and Virginia.

⁵ The Arizona amendment was declared unconstitutional by the Federal District Court in Phoenix in 1990 and by the Ninth Circuit Court of Appeals in 1995, but the U.S. Supreme Court vacated the decisions in 1997. Details of state official English laws are from Dale and Gurevitz (1997).

individuals with limited English proficiency should be observed when states adopt such laws. Earnings, employment, and other outcomes may decline either absolutely or relative to workers who speak English fluently. This paper tests whether the labor market outcomes of adults who do not speak English well decline, relative to English-proficient adults, when an OE law is passed in a state. However, a decline in the relative labor market outcomes of limited-English-proficient workers may not be caused by discrimination arising from the passage of an OE law. Several alternate explanations are explored, but they are not supported by the data.

III. Data

The data used in this study are from the 1980 and 1990 Census 5% PUMS data sets, which include questions about English ability and labor market status.⁶ The Census asks individuals who report speaking a language other than English at home to assess their own ability to speak English. Four categories are included: very well, well, not well, and not at all. Following Chiswick (1991) and Chiswick and Miller (1992, 1995), individuals who reported their ability to speak English as not well or not at all are considered to have limited English proficiency (LEP) in most of the analysis that follows. Individuals who reported speaking only English or speaking English very well or well are considered to be fluent in English in most of the analysis. The labor market questions in the Census include whether an individual worked during the previous year, the number of weeks worked last year, and usual hours worked per week last year. The Census also asks an individual's annual wage or salary income last year,

⁶ The Current Population Survey (CPS) also included questions about English ability in supplements administered in November of 1979 and 1989. These surveys are not used here because they occurred about the same time as the Census and have smaller sample sizes. Immigrant status could be used a proxy for language skills, but the CPS only began asking immigration status in every survey in 1994.

which is used as the measure of earnings here and is deflated using the consumer price index for urban consumers.⁷ Only individuals aged 25-54 are included in this analysis.

A small proportion of individuals reported that they speak a language other than English at home in the Census surveys. About 11% of all individuals aged 18 and older reported speaking another language at home in the 1980 PUMS, and 14% in 1990; the majority of these individuals said that they spoke English very well. To ensure an adequate sample size of LEP individuals, people who reported speaking English not well or not at all were oversampled in the samples extracted from the surveys. From the 5% PUMS, one-half of all individuals who reported speaking English not well or not at all were drawn, and 2.5% of other individuals.⁸ This sample is used to estimate the effect of OE laws on the probability of employment. To estimate the effect of OE laws on earnings, hours, and weeks of work, a second sample of only individuals who worked the previous year and reported positive earnings was drawn from the 1980 and 1990 Census using the same criteria. Workers are assigned to the state in which they worked during the Census year rather than to the state in which they lived, although this does not affect the estimation results.

The 14 states that adopted OE laws between 1980-1988 are considered OE states in this analysis because the earnings data pertain to 1979 and 1989. This group includes California and

⁷ About 0.3% of the sample of workers earned more than the Census topcodes for wage income (\$75,000 in 1980 and \$140,000 in 1990). In 1990, individuals who earned more than the topcode of \$140,000 were assigned the state mean of the topcoded values. The real value of these state means was imputed to workers who earned more than the topcode in 1980. Dropping topcoded individuals from the sample of workers does not affect the results.

⁸ The 1980 PUMS asked one-half of individuals questions about the state in which they worked. All LEP individuals in the 1980 PUMS who were asked the place of work questions were included in the sample used here, and 5% of English-proficient individuals who were asked the place of work questions. The 1990 PUMS asked all participants their place of work, so one-half of LEP individuals and 2.5% of English-proficient individuals were drawn at random from the 1990 Census. Workers whose state of work is unknown were dropped from the sample. Individuals who reported being self-employed, enrolled in school, in the armed forces, or unpaid family workers in the Census year were dropped from the sample. Individuals whose English ability, work status, earnings, hours, or weeks worked was allocated by the Census Bureau were dropped.

Florida, which have substantial foreign-born populations. Hawaii is dropped from the sample because its law was adopted in 1978 and may have affected relative wage changes in the state during the sample period. The other 35 states, which did not adopt OE laws during the sample period, are the comparison group.⁹ The laws in Nebraska and Illinois were adopted far enough before 1979 that it is unlikely they underlie any relative wage changes in those states.

Table 2 shows the means of several labor market variables for the sample of individuals who worked in 1979 or 1989. The means are presented separately for LEP and English-proficient male and female workers in states that did and did not adopt OE laws. Workers with limited English ability have substantially lower annual earnings than English-proficient workers and work fewer weeks per year. On average, LEP male workers earn 49% less than English-proficient men annually, and LEP female workers earn 35% less than English-proficient women. LEP men work four fewer weeks per year, conditional on working, and LEP women work about two fewer weeks annually. LEP men in the 14 states that adopted OE laws earn less than LEP workers in other states, both absolutely and relative to English-proficient workers. LEP men in OE states earn 50% less than English-proficient workers in those states, on average, while LEP men in non-OE states earn 46% less than other employed men in those states.

Individuals with limited English proficiency are less likely to work than English-proficient individuals. The means for the sample of workers and nonworkers, which are not shown here, indicate that LEP men are about 10 percentage points less likely to be employed than English-proficient men, and LEP women are 27 percentage points less likely to work than

⁹ The District of Columbia is not included because of the large fraction of federal government workers, who are not likely to be affected by state official English laws.

English-proficient women.¹⁰ There are no clear differences between states that adopted OE laws and other states in the probability of employment for LEP individuals relative to English-proficient individuals.

About 25% of workers are classified as limited English proficient, and about one-third of individuals are considered limited English proficient in the sample of workers and nonworkers. This is considerably higher than the prevalence of LEP individuals in U.S. because individuals who speak English not well or not at all are oversampled here. In both samples, about 85% of the LEP individuals are foreign born, and a larger fraction of LEP individuals are foreign born in states that adopted OE laws than in other states. Two-thirds of LEP individuals are Hispanic, and 14% are Asian. LEP workers in OE states in the 1990 Census comprise about 8% of the sample of workers, and LEP individuals in OE states in the 1990 Census comprise about 10% of the sample of workers and nonworkers. The analysis below compares these individuals' labor market outcomes to those of other individuals.

IV. Methodology

This study uses a “difference in differences in differences” methodology to estimate the effect of OE laws on the earnings (or other outcomes) of individuals with limited English proficiency. The method first compares the change in earnings of LEP workers who work in states with OE laws to the change in the earnings of LEP workers in states without such laws. This difference in differences is then compared to the difference between the change in earnings of workers who are proficient in English in states that adopted official English laws and the

¹⁰ The size of the sample of workers and nonworkers is 101,388 men and 120,767 women. The employment-to-population ratio is about 82% for LEP men and 40% for LEP women.

change in English-proficient workers' earnings in other states. The methodology estimates the effect of the law on LEP workers in OE states, relative to LEP workers in non-OE states and relative to English-proficient workers. Gruber (1994) and Gruber and Poterba (1994) employ similar methodologies.

The difference in differences in differences (DDD) methodology requires few identifying assumptions. The methodology requires only that there is no shock over the sample period that affects the wages of LEP workers in states that adopted official English laws differently than it affects the wages of other workers in OE states and the wages of LEP workers in other states. For example, if national business cycle conditions changed over 1979-1989 and this affected LEP workers differently than English-proficient workers, the DDD methodology yields an unbiased estimate of the effect of OE laws if the relative effects on LEP workers were the same in OE and non-OE states.

The DDD methodology is also not likely to be affected by unobserved heterogeneity or ability bias. Unobserved ability may bias traditional cross-sectional estimates of the effect of English proficiency on earnings if English ability is correlated with other, unmeasurable abilities that affect earnings. Traditional estimates may also be biased due to unobserved heterogeneity if an individual's ability to speak English depends on the returns to doing so; immigrants with the highest returns to English fluency may be the most likely to learn English (Chiswick and Miller 1995). The DDD estimates do not suffer from bias from these sources as long as any unobservable differences between LEP workers in OE states and in other states did not change during the sample period.

Table 3 illustrates the methodology. The top portion compares the change in the real average earnings of LEP male workers in states that did and did not adopt OE laws. The mean

log of real annual earnings of LEP men falls by over 13% in states that adopted OE laws, while earnings fall by almost 9% in other states. Comparing the differences across the two groups of states, there is a 4.5% decline in the earnings of male LEP workers in states that adopt OE laws relative to LEP workers in other states. The difference in differences is statistically significant at the .05 level.

This estimate does not control for possible differences in wage changes between OE and non-OE states. The bottom panel of table 3 therefore compares the earnings changes of English-proficient male workers in the two groups of states. The mean log of real annual earnings of English-proficient men in states that adopted OE laws rise by 0.6%, while earnings fall by about 4% in the other states. The wages of English-proficient male workers in states that adopted OE laws rise by 4.8% relative to other English-proficient men, and the increase is significant.

Combining the two difference-in-differences estimates, the relative earnings of LEP male workers fall by more than 9% in states that passed OE laws, compared to the change in the relative earnings in other states. The estimate is statistically significant and suggests that OE laws result in lower earnings for LEP men. The effect occurs through a decline in the earnings of LEP workers' wages in OE states, relative to LEP workers in non-OE states, and through the earnings of LEP workers not keeping up over time with the earnings of English-proficient workers within states that adopt OE laws.

The differences in the sample means are suggestive of the effect of OE laws but do not control for individual characteristics. The quality of LEP workers relative to English-proficient workers may have declined in states that adopted OE laws, causing the changes noted in table 3. Alternatively, the number of LEP workers may have risen in states that adopted OE laws, driving down their relative wages. The next sections use a regression framework to control for

observable variables that may have affected the relative wage changes of LEP workers in OE states. The effect of OE laws on other labor market outcomes is also estimated.

V. Estimation Results

The basic regression used to estimate the effect of OE laws of the labor market outcomes of individuals with limited English skills incorporates fixed effects, interactions of the fixed effects, and individual demographic characteristics. The equation estimated using ordinary least squares (OLS) is

$$\ln W_{ijkt} = \alpha + \beta_1 D_t + \beta_2 D_j + \beta_3 D_k + \beta_4 (D_t \times D_j) + \beta_5 (D_t \times D_k) + \beta_6 (D_j \times D_k) + \beta_7 (D_t \times D_j \times D_k) + \gamma X_{ijkt} + \varepsilon_{ijkt} \quad (1)$$

where i indexes individuals, j indexes English ability (limited or proficient), k indexes states (OE or non-OE), and t indexes years (1979 or 1989). The variable W is the real annual wage or salary income of an individual. The variables denoted D are dummy variables. The variable D_t is equal to one in 1989, D_j is equal to one if a worker has limited English ability, and D_k is equal to one for the 14 states that adopted an OE law over 1980-1988. The coefficient β_4 captures the change over time in the earnings of LEP workers common to all states, β_5 captures the change over time in the earnings of all workers in states that adopted OE laws, and β_6 measures the time-invariant effect of being a LEP worker in an OE state. The third-level interaction measured by β_7 measures the effect of states' adoption of OE laws on the relative earnings of LEP workers and is the coefficient of interest.

The vector X controls for observable individual characteristics and includes dummy variables for age (30 categories), education (10), occupation (11), industry (10), married, divorced, black, Hispanic, Asian, Native American, urban residence, and state (49).¹¹ The regressions also include 6 dummy variables for period of immigration to the U.S., where natives are the omitted category.¹² The regressions are run separately for men and women. Dummy variables for veteran status and Vietnam-era armed forces service are included in the regressions for men, and dummy variables for the presence of children under age 6 and ages 6-17 in the household are included in the regressions for women. The error term is White-corrected for heteroscedasticity within state and year groups to control for the possibility that the error terms of individuals who work in the same state in a given year are correlated.

The regression results suggest the OE laws lower the relative earnings of men with limited English ability. The first column of table 4 shows the estimated coefficients of the third-level interaction from equation (1), β_7 . Among men, the real annual earnings of LEP workers in OE states fall by about 12% relative to other workers, and the estimate is statistically significant at the .05 level. The earnings of female LEP workers in OE states fall by more than 5% relative to other female workers, but the estimate is not statistically different from zero at conventional levels. The other regression coefficients, which are not shown, are largely as expected. For example, the time-invariant penalty to limited English skills, measured by β_2 , is 15% for men. Among both men and women, the coefficients on the age variables indicate a convex relationship

¹¹ Using linear variables for education and potential experience and potential experience squared does not substantially affect the results and leads to lower goodness-of-fit measures. One dummy variable is omitted for the each of the age, education, occupation, and industry variables. Two state dummy variables (one OE state and one non-OE state) must be dropped for the equation to be identified.

¹² The categories are within the last five years, over five not but more than 10 years ago, over 10 years ago but not more than 15 years ago, over 15 but not more than 20 years ago, over 20 but not more than 30 years ago, and at least 30 years ago.

between earnings and age, and the coefficients on the education variables suggest a monotonic positive relationship between earnings and education. Workers who immigrated to the U.S. within the last 15 years earn significantly less than do native-born workers.

Official English laws may affect other labor market outcomes, such as weeks of work, hours per week, and whether an individual is employed. To assess these effects, equation (1) is estimated using OLS with the log of annual weeks worked and the log of hours per week as dependent variables. As in the earnings regressions, only individuals who worked during 1979 or 1989 are included in the sample used to estimate the weeks and hours regressions, and the right-hand side includes the variables discussed above. To estimate whether OE laws affect the likelihood that an LEP individual is employed, equation (1) is estimated using a probit model where the dependent variable is one if an individual was employed in year t and zero otherwise. The sample used to estimate the employment probit regressions includes both individuals who worked and who did not work in 1979 or 1989. The industry and occupation dummy variables are not included in the employment probit regressions.

Men with limited English ability appear to work relatively fewer hours and to be relatively less likely to work at all after a state adopts an OE law. Table 4 reports that weekly hours worked by LEP men in OE states fall by about 2% relative to other workers, although the estimate is significant only at the .1 level. The probability of an man with limited English skills who lives in an OE state being employed falls by 2.4% relative to other men. There is no significant effect on LEP men's weeks of work, conditional on working. Women with limited English skills do not appear to experience significant negative changes in labor market outcomes in states that adopt OE laws.

Hispanics and Asians are two groups that may be particularly affected by OE laws since the majority of recent immigrants are from Latin America and Asia. The bottom four rows of table 4 present the results of estimating equation (1) using a subsample of either Hispanic or Asian workers. As in Mora and Saenz (1997), the comparison group in these regressions is white, non-Hispanic workers who are U.S. natives and do not speak a language other than English at home and Hispanic (or Asian) workers who are proficient in English; the comparison group for the regressions presented in the first two rows of table 4 is all English-proficient workers. In addition to the variables discussed above, the regressions for Hispanics include four dummy variables (Mexican, Cuban, Puerto Rican, and other) to control for time- and state-invariant effects of ethnicity on earnings. The regressions for Asians include seven dummy variables for ethnic background (Chinese, Japanese, Indian, Korean, Filipino, Vietnamese, and other). White, non-Hispanic is the omitted category in both regressions.¹³

Official English laws appear to have different effects on Hispanics with limited English ability than on Asians. The earnings of male Hispanic LEP workers in OE states fall by more than 10% relative to other Hispanic and white, non-Hispanic workers. The estimated negative effect on the annual earnings of Asian males with limited English ability is significant at only the .1 level. Asian LEP male workers also experience a relative decline in weekly hours of 7%, and the likelihood of an Asian LEP man being employed falls by almost 5% relative to other Asian and white, non-Hispanic men.

None of the results reported in table 4 indicate that LEP women incur labor market penalties when states adopt OE laws. Mora and Saenz (1997), in contrast, report large adverse effects on Hispanic women's relative earnings in cross-sectional data from 1989. In the

¹³ The regressions do not include the dummy variables for black, Hispanic, Asian, and Native American.

regressions estimated here, the estimates of β_2 , the coefficient of the indicator variable for limited English proficiency, are not significant in the earnings regressions for women.¹⁴ If English ability does not affect women's earnings after controlling for other observable characteristics, it may not be surprising that OE laws do not appear to lower the relative earnings of LEP women. As noted earlier, LEP women are considerably less likely to work than either English-proficient women or LEP men. The women who have limited English ability who do work may be more similar to English-proficient working women than LEP men are to English-proficient men. Alternatively, English ability may affect workers' ability to benefit from the on-the-job training, which may play a larger role in labor market outcomes for men than for women (Gronau 1988).

Men who do not speak English at all incur the largest drop in relative earnings when a state adopts an OE law. If only individuals who do not speak any English are defined as limited English proficient in equation (1), the estimated coefficient β_7 is $-.188$ (s.e. $.056$) for men. Similarly, the estimated effect on the earnings of Hispanic men who do not speak any English is $-.169$ ($.062$). Male workers who do not speak any English also experience a decline of about 4% percent in annual weeks worked and a decline of 6% in hours per week relative to other workers. When a state adopts an OE law, individuals who do not speak any English do not experience a significant decline, relative to other individuals, in the probability of being employed.

The adverse effects are also largest in the states that adopted the strictest OE laws. Equation (1) was estimated with only Arizona, California, South Carolina, and Tennessee defined as OE states, and observations from the other ten states that adopted OE laws over 1980-1988 were not included in the regression. The earnings of LEP male workers in the four OE

¹⁴ Bloom and Grenier (1993) find small and generally insignificant effects of English ability on Hispanic women's earnings after controlling for observable characteristics, and Carliner (1996) reports smaller effects for women than for men.

states fall by more than 16%, relative to other workers. Annual weeks worked by LEP men in OE states fall by 4%, relative to other workers, and weekly hours experience a relative decline of about 3%. The probability of an LEP man in an OE state being employed falls by more than 3% relative to other men; all of the estimates are significant at the .01 level.

The negative effects of OE laws are concentrated in California, which has the highest limited-English-proficient population share and one of the strictest laws. If observations from California are dropped from regressions that include all of the other 48 states, the effect of OE laws on earnings is smaller and no longer significant. The estimated coefficients β_7 are $-.020$ (.045) for men and $.011$ (.090) for women in the earnings regressions. The estimates of β_7 are also not statistically significant in the hours and employment probit regressions for men if California is dropped from the sample.¹⁵

The importance of California to the results is problematic if the decline in LEP workers' relative wages in California was due to changes in the state's economy rather than to the adoption of an OE law. For example, an industry that employs a large fraction of LEP workers, such as agriculture, may have experienced a downturn over 1979-1989. If LEP workers in California are concentrated in sectors where the wages of both LEP and English-proficient workers are declining, the state's OE law is not likely to underlie the observed effects.

The Census sample was restricted to observations in California in order to control for cyclical effects within industry, occupation, and education groups. The regressions were modified to include year-specific effects for each industry, occupation, and education group. The equation estimated for workers in California using OLS is

¹⁵ If only AZ, SC, and TN are classified as OE states and the other OE states are not included in the sample, the results remain negative and significant in employment probit regression for men.

$$\ln W_{ijt} = \alpha + \beta_1 D_t + \beta_2 D_j + \beta_3 (D_t \times D_j) + \gamma X_{ijt} + \varepsilon_{ijt} \quad (2)$$

where W is real annual earnings, annual weeks of work, or weekly hours of work. The coefficient β_1 measures the change in all workers' outcomes between 1979 and 1989, and the coefficient β_2 measures the time-invariant effect of being an LEP worker on relative outcomes. The coefficient β_3 measures the change in LEP workers' outcomes over 1979-1989, relative to English-proficient workers, and is the coefficient of interest. The vector X again includes dummy variables for age (30 categories), education (10), occupation (11), industry (10), married, divorced, black, Hispanic, Asian, Native American, and urban residence.¹⁶ Interactions of the education, occupation, and industry dummy variables with D_t are also included in order to control for changes in education, occupation, and industry outcomes common to all workers. The probit regressions used to measure employment effects include interactions of the education dummy variables with D_t to control for changes in the effect of education on the likelihood of employment over 1979-1989; the industry and occupation variables are not included because nonworkers are included in this sample.

The results indicate that both male and female LEP workers in California experienced a significant decline in relative earnings, even after controlling for average changes in industry, occupational, and educational returns. LEP men in California experience a 12% decline in relative earnings, and LEP women experience a relative decline of more than 14%; both

¹⁶ The regressions for men also include dummy variables for veteran and Vietnam veteran. The regressions for women also include dummy variables for children under age 6 and children ages 6-17. The sample size for workers is 15,188 men and 9954 women. The sample size for workers and nonworkers is 19,340 men and 22,339 women.

estimates are significant at the .01 level. The estimated coefficients are about twice as large if the interactions of the industry, occupation, and education dummy variables with the time dummy variable are not included in the regressions. Weekly hours worked by LEP men fall by almost 3% relative to English-proficient male workers. LEP women experience a decline of more than 9% in the relative probability of employment, while LEP men do not experience a significant decline over the decade when controlling for changes in the effect of education on the likelihood of employment.¹⁷

The estimated changes within California suggest that some factor other than cyclical changes within industries, occupations, and educational groups caused the relative labor market outcomes of LEP workers to decline. The state's official English law is one potential culprit. The next section discusses several other potential causes of the decline in LEP workers' labor market outcomes in states that adopted OE laws.

VI. Do Official English Laws Underlie the Observed Changes?

Many of the states that adopted OE laws during the 1980s have large foreign-born populations that grew during the decade, raising concerns that factors other than the laws may have caused the labor market penalties incurred by LEP workers. In particular, California and Florida have large foreign-born populations that increased during the 1980s, and voters in those states passed ballot propositions that enacted OE laws. However, New York and Texas also have large and growing foreign-born populations and did not adopt OE laws. Nevertheless,

¹⁷ LEP women experience significant negative changes in several labor market outcomes in California over 1979-1989. This finding contrasts markedly with the insignificant results for women in the national sample and suggests that either LEP women in non-OE states also experience declines in relative outcomes or LEP women in the other OE states experience positive changes in relative outcomes.

having a growing immigrant or limited-English-proficient population may have caused the relative earnings of LEP workers in a state to fall and caused the state to adopt an OE law. The empirical model is modified below to control for the percentage change in the fraction of the state population that has limited English skills. The effect of controlling for the fraction of the population that is limited English proficient is also investigated.

Increased prejudice against minority groups may also underlie the observed relative changes. Negative attitudes towards Hispanics and Asians may have caused both a relative decline in those groups' labor market outcomes and adoption of an OE law. OE laws may be symptoms of a change in attitudes but not the cause of the observed change in outcomes. To examine this, relative changes between LEP and English-proficient Hispanics or Asians are estimated. If prejudice against all members of a minority group caused the effects estimated earlier, then the outcomes of LEP Hispanics who live in OE states should not decline relative to other Hispanics. In addition, I examine whether selective out-migration from states that adopt OE laws partially explains the relative decline in labor market outcomes for LEP workers in OE states.

A. Effect of Limited-English-Proficient Population Share

Omitted variables bias is a concern if an increase in the limited-English-proficient population share affects LEP workers' relative wages and whether a state adopts an OE law. Equation (1) may incorrectly attribute relative wage changes to OE laws because it does not control for changes in states' demographic composition, such as an increase in the fraction of the state population that is foreign born or in the fraction that has limited English skills. An increase in the fraction of the population with limited English ability may increase the penalty to limited

English skills because the supply of LEP workers rises. However, the demand for LEP workers also may rise, so the expected effect is indeterminate.¹⁸ In addition, changes in the limited-English population share may affect labor market outcomes of English-proficient workers, who may be complements or substitutes for LEP workers.

The empirical model is modified to control for the effect of the change in the limited-English-proficient population share on labor market outcomes. The equation estimated is

$$\begin{aligned} \ln W_{ijkt} = & \alpha + \beta_1 D_t + \beta_2 D_j + \beta_3 D_k + \beta_4 (D_t \times D_j) + \beta_5 (D_t \times D_k) + \beta_6 (D_j \times D_k) \\ & + \beta_7 (D_t \times D_j \times D_k) + \delta_1 \% \Delta Pop_{kt} + \delta_2 (\% \Delta Pop_{kt} \times D_j) + \gamma X_{ijkt} + \epsilon_{ijkt} \end{aligned} \quad (3)$$

where $\% \Delta Pop_{kt}$ is the percentage change between 1980 and 1990 in the fraction of the state population aged 18–64 that does not speak English at least well. The variable is interacted with the dummy variable indicating whether an individual has limited English proficiency, D_j . The variable $\% \Delta Pop_{kt}$, which is derived from the 1980 and 1990 Census, varies across states, and the interaction term also varies across individuals within a state based on English ability. The variable is equal to zero for observations from the 1980 Census. All of the other variables discussed above are also included in the OLS or probit regressions.

Limited-English-proficient male workers continue to experience a relative decline in earnings in states that adopt OE laws when the percentage change in the limited-English-proficient population share is controlled for. As shown in the first column of table 5, the

¹⁸ Bloom and Grenier (1993) find that Hispanics earn lower wages relative to whites in areas with higher concentrations of Hispanics. Jasso and Rosenzweig (1990) find that the wage penalty associated with not speaking English is smaller in areas with more non-English speakers. These studies do not examine the effect of a change in the minority population share.

estimated negative effect on the relative change in earnings rises slightly to more than 14% for LEP men. The growth of the limited-English-proficient population share is negatively associated with all workers' earnings, but the estimated effect is not significant. For LEP workers, the effect of the percentage change in the limited-English-proficient population share on earnings is the sum of δ_1 and δ_2 , which is positive. The point estimates for the other outcomes are affected little by controlling for the growth of the limited-English-proficient population share. The results for limited-English-proficient Hispanics and Asians, which are not shown, are similar to the results reported in table 4.

The fraction of the population that is limited English proficient, rather than the growth of the LEP population, may affect relative outcomes. A variable measuring the fraction of the population that does not speak English at least well in 1980 or 1990 and that variable interacted with the LEP dummy variable D_j were included in Equation (3); in other words, $\%Pop_{kt}$ was included instead of $\%\Delta Pop_{kt}$. The results, which are not shown, are similar to the results reported in tables 4 and 5. LEP men in OE states experienced a significant decline in their relative earnings. The relative changes in LEP men's weeks, hours, and probability of employment are also negative, but the estimated coefficients are not significantly different from zero at conventional levels.

The result that LEP workers experienced declines in their relative outcomes also holds within California, the state with the largest influx of new immigrants during the 1980s. Controlling for the percentage change in the LEP population at the consolidated metropolitan statistical area (CMSA) level, results not shown here indicate that LEP men and women experienced a significant decline in earnings, hours, and weeks of work relative to English-

proficient workers in the same CMSA.¹⁹ Controlling the fraction of the population of a CSMA that does not speak English well, LEP men and women experienced a significant decline in earnings, hours, weeks of work, and the probability of employment relative to English-proficient workers in the same CMSA.

B. Effect Relative to English-Proficient Minorities

Adoption of an OE law may indicate a rise in negative attitudes toward minority groups, and increased prejudice, rather than OE laws, may underlie the observed relative changes. One means of examining whether prejudice or OE laws underlie the observed changes is estimating relative changes between LEP and English-proficient members of a minority group. If prejudice is directed at all members of a minority group but OE laws primarily affect persons who do not speak English well, LEP and English-proficient Hispanics or Asians may experience similar declines in states that adopted OE laws if prejudice underlies the laws. If LEP workers in OE states experience a decline relative to English-proficient workers within the same minority group, then the results are consistent with OE laws rather than prejudice against all minorities causing the observed effects.

The difference in differences in differences model given in equation (1) is used to compare LEP workers to English-proficient workers from the same group (Hispanic or Asian). The coefficient on the third-level interaction term, β_7 , measures the change in the outcomes of LEP workers who live in states that adopted OE laws relative to LEP workers who live in non-OE states and relative to English-proficient workers in the same minority group. The regressions

¹⁹ The regressions included individuals living in 11 CMSAs in California. Jaeger et al. (1998) provide the coding to create consistent CMSAs in the 1980 and 1990 PUMS.

are estimated separately for Hispanics and Asians and include the measures of human capital included in the earlier regressions.²⁰

The results indicate that LEP Hispanics in OE states experience a decline in outcomes relative to other Hispanics. As table 6 reports, annual earnings of LEP Hispanic men in OE states fall by about 11% relative to other Hispanic workers. The results also suggest that LEP Hispanic women in OE states experience adverse effects on earnings and weeks worked relative to other Hispanic women; earlier results, in contrast, indicated that LEP Hispanic women in OE states do not experience significant effects relative to other Hispanics and whites.

Asians who do not speak English well and live in OE states generally do not experience a significant change in outcomes relative to other Asians. Although the estimated coefficients are negative, only the effect on the relative probability of employment for LEP Asian men is significant. Earlier results also suggested that LEP Asians in OE states do not experience significant negative effects on earnings relative to whites and other Asians but do experience a significant relative decline in the probability of employment.

C. Effect of Migration

Selective migration may increase the estimated effect of OE laws on the relative wages of workers with limited English ability. If OE laws result in discrimination against LEP workers, or if OE laws are a symptom of worsening labor market prospects for workers who do not speak

²⁰ The regressions for Hispanics include dummy variables for three ethnicities (Mexican, Cuban, and Puerto Rican) to control for time- and state-invariant effects of ethnicity on earnings, and the regressions for Asians include six ethnic dummy variables (Chinese, Japanese, Indian, Korean, Filipino, and Vietnamese). The samples included one-half of all Hispanics and Asians in the 5% PUMS. The sample sizes for Hispanic workers are 84,393 men and 57,368 women; for Hispanic workers and nonworkers, 112,134 men and 118,894 women; for Asian workers, 27,505 men and 23,364 women; for Asian workers and nonworkers, 35,465 men and 40,819 women.

English well, some LEP workers may move from states that adopt an OE law to other states. In particular, the most skilled LEP workers may be the most likely to out-migrate, or positive selection in migration may occur.²¹ If positively selected migration occurs when OE laws are adopted, the skill levels of LEP workers in OE states would fall and the skill levels of LEP workers in other states would rise. The average wage of LEP workers then would fall in OE states and would rise in other states. If some aspects of skill are unobservable and cannot be controlled for in the regressions, selective migration may partially underlie the estimated effects of OE laws.

The potential effect of migration can be partially controlled for in the Census data. The 1980 and 1990 Census include a question on an individual's location five years ago. All individuals who did not live in the same state five years ago as they lived in during the Census year were dropped from the sample, and the regressions were reestimated. Dropping individuals who live in a different state (or country) during the Census year as they did five years earlier removes individuals who are the most likely to have migrated because of worsening labor market conditions in a state or because of adoption of an OE law. About 12% of English-proficient individuals lived in a different state five years ago, and about 27% of LEP individuals; the fraction is higher among LEP individuals because a substantial fraction of the LEP group immigrated to the U.S. within the last five years.

Controlling for bias due to selective migration by dropping individuals who moved to a different state over the last five years does not reduce the estimates of the effect of OE laws on individuals with limited English proficiency and suggests even more adverse effects among LEP

²¹ Bartel and Koch (1991) find that more educated immigrants are more likely to move to a different city over a five-year interval. The regressions here control for education, but individuals who are more skilled along unobservable dimensions that affect labor market outcomes may be more likely to move.

Asian men. When individuals who lived in a different state five years earlier are dropped from the sample, the results are similar to those reported in table 4 for all men and women and for Hispanics. For example, annual earnings of LEP men in OE states fall by more than 10% relative to other workers. The estimated effect on LEP Asian men increases when recent movers are dropped from the sample. Asian male workers who do not speak English well experience a relative decline in annual earnings of more than 33%, and their weekly hours fall by over 8% and annual weeks worked by over 9%. The relative likelihood of employment for Asian LEP males falls by over 6% when states adopt OE laws; the estimates are significant at the .05 level.

VII. Conclusion

In recent years, a number of states and countless employers have adopted policies that promote the English language. As of 1996, 22 states had some form of law declaring English the official language, and some of the laws restrict the use of other languages in governmental functions. Many observers attribute at least part of the increase in the number of workplaces with English-only rules to the adoption of state OE laws. Employers may misinterpret a state OE law as requiring them to restrict workers from speaking foreign languages, or they may view it as a license to discriminate. Regardless of intent, the adoption of OE laws may reduce the demand for workers with limited English ability and result in lower earnings and other labor market outcomes for those workers.

An analysis of the 1980 and 1990 Census reveals that men who speak English not well or not at all suffer a disadvantage in states that states adopt OE laws. The annual earnings of LEP men in states that declare English the official language fall by about 12% relative to other male workers. The effect does not appear to be due to a rise in the limited-English-proficient

population share or to selective migration in response to passage of an OE law. Comparisons between members of the same minority group are consistent with the hypothesis that OE laws, rather than prejudice directed at all members of a minority group, underlie the observed changes for Hispanics. Some regressions also suggest that men with limited English ability in OE states experience a decline in weekly hours worked and in the probability of working. Most results do not indicate significant adverse effects among women with a limited ability to speak English.

The results consistently indicate that men who do not speak English well and live in states that adopted official English laws experience an earnings loss relative to other men. Further research is needed to determine whether official English laws directly cause the negative effects. In particular, firms' adoption of workplace English-only rules and their effects should be examined to determine whether such rules are the mechanism by which official English laws have adverse effects on limited-English-proficient workers. In addition, the long-term effect of such laws is unknown. The negative effects noted in this paper may only occur for a few years after an official English law is adopted, perhaps because of employer confusion. If such laws lower the demand for workers who do not speak English well, however, the effects may persist if limited-English-proficient individuals have difficulty acquiring fluency in English or are unwilling to move to states without such laws.

Official English laws and workplace English-only rules are likely to continue to receive public attention. The Spanish-speaking population in the U.S. is projected to reach over 16 million persons in the year 2001, nearly double its level in 1976 (Veltman 1990). If, as observers such as Califa (1989) contend, Hispanics are the primary targets of the official English movement, English-only rules may become more common. Congress is also likely to revisit the issue of declaring English the official national language if Puerto Rico chooses to become a state.

Pressure for workplaces, states, and Congress to adopt rules or laws restricting the use of foreign languages may intensify if the current high levels of immigration continue. Even if such policies are not intended to be discriminatory, they may result in fewer opportunities for individuals who do not speak or read English fluently.

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Table 1
Official English States and Year of Adoption

State	Year of Adoption	Form of Law
Alabama	1990	Constitutional amendment
Arizona	1988	Constitutional amendment
Arkansas	1987	Statute
California	1986	Constitutional amendment
Colorado	1988	Constitutional amendment
Florida	1988	Constitutional amendment
Georgia	1986, 1996	Statute
Hawaii	1978	Constitutional amendment
Illinois	1923, 1969	Statute
Indiana	1984	Statute
Kentucky	1984	Statute
Mississippi	1987	Statute
Montana	1995	Statute
Nebraska	1920	Constitutional amendment
New Hampshire	1995	Statute
North Carolina	1987	Statute
North Dakota	1987	Statute
South Carolina	1987	Statute
South Dakota	1995	Statute
Tennessee	1984	Statute
Virginia	1981, 1996	Statute
Wyoming	1996	Statute

NOTE.—Adapted from Crawford (1992).

Table 2
Sample Means

	Limited-English-Proficient Workers				English-Proficient Workers			
	State Adopted OE		State Not Adopt OE		State Adopted OE		State Not Adopt OE	
	1979	1989	1979	1989	1979	1989	1979	1989
Men:								
Real annual earnings (in thousands)	13.81 (9.42)	12.12 (9.41)	15.04 (10.18)	13.91 (12.07)	25.06 (16.22)	25.85 (19.43)	26.84 (16.60)	26.55 (19.18)
Annual weeks worked	45.21 (11.28)	44.36 (11.96)	46.00 (11.05)	45.26 (11.48)	49.22 (7.12)	49.19 (7.57)	49.50 (6.88)	49.32 (7.42)
Weekly hours worked	41.65 (9.15)	42.09 (10.27)	41.74 (9.27)	43.23 (10.92)	43.10 (8.93)	44.26 (9.31)	43.09 (8.69)	44.35 (9.33)
Sample size	3850	7656	4606	5980	9040	11867	17864	21047
Women:								
Real annual earnings (in thousands)	8.71 (5.95)	8.61 (6.63)	9.19 (6.09)	9.67 (7.41)	12.60 (8.64)	15.46 (11.09)	12.66 (8.53)	14.76 (11.36)
Annual weeks worked	42.76 (13.15)	42.92 (13.27)	43.32 (12.72)	44.17 (12.70)	45.14 (11.58)	46.75 (10.29)	45.15 (11.77)	46.57 (10.58)
Weekly hours worked	38.00 (9.30)	38.71 (10.36)	37.62 (9.25)	38.80 (11.11)	36.94 (9.74)	38.70 (9.89)	35.79 (10.00)	37.07 (10.47)
Sample size	2463	4611	3259	4067	7256	10288	13162	17916

NOTE.—The samples are drawn from the 1980 and 1990 Census and include only individuals ages 25-54 who worked the previous year. Limited-English-proficient workers are workers who report that they speak a language other than English at home and speak English not well or not at all. Standard deviations are in parentheses.

Table 3
DDD Estimates of the Effect of Official English Laws on Annual Earnings

Group and location/year	1979	1989	Time difference for location
A. Limited-English-proficient male workers			
States that adopted OE law	9.288 (.013)	9.155 (.009)	-.133 (.016)
States that did not adopt	9.364 (.013)	9.276 (.010)	-.088 (.016)
<hr/>			
Location difference at a point in time:	.076 (.018)	.121 (.013)	
Difference-in-differences:	<hr/>		
	-.045 (.022)		
B. English-proficient male workers			
States that adopted OE law	9.929 (.008)	9.935 (.007)	.006 (.011)
States that did not adopt	10.022 (.005)	9.980 (.005)	-.042 (.007)
<hr/>			
Location difference at a point in time:	.093 (.009)	.045 (.009)	
Difference-in-differences:	<hr/>		
	.048 (.013)		
Difference-in-differences-in-differences:	-.093 (.026)		

NOTE.—Cells contain the mean log of real annual wage or salary income for the group identified. Standard errors are in parentheses.

Table 4
Estimates of the Effect of Official English Laws on Limited-English-Proficient Workers

Group	Log annual earnings	Log weeks per year	Log hours per week	Employment (probit)
Men	-.120 (.050)	-.016 (.020)	-.023 (.013)	-.155 (.073) [-.024]
Women	-.053 (.069)	-.013 (.017)	-.003 (.028)	-.007 (.056) [-.003]
Hispanic men	-.103 (.043)	-.004 (.018)	-.010 (.016)	-.030 (.078) [-.004]
Hispanic women	-.044 (.071)	-.013 (.020)	-.008 (.035)	.021 (.071) [.008]
Asian men	-.166 (.092)	-.051 (.050)	-.070 (.028)	-.390 (.137) [-.048]
Asian women	-.063 (.103)	-.011 (.036)	-.007 (.022)	-.085 (.085) [-.031]

NOTE.—Shown are the estimated coefficients for the third-level interaction term in equation (1). See text for a discussion of other variables included. The comparison group for the top two rows is all proficient English speakers, and the comparison group for the bottom four rows is white, non-Hispanic native English speakers and either Hispanic or Asian proficient English speakers. Heteroscedasticity-corrected standard errors are in parentheses, and marginal probabilities are in brackets.

Table 5
Estimated Effects, Controlling for Change in Limited-English Population Share

Group and coefficient	Log annual earnings	Log weeks per year	Log hours per week	Employment (probit)
<u>Men</u>				
β_7	-.145 (.053)	-.012 (.021)	-.029 (.011)	-.176 (.083) [-.028]
δ_1	-.014 (.019)	-.002 (.005)	-.004 (.004)	.057 (.039) [.008]
δ_2	.077 (.043)	-.013 (.013)	.018 (.013)	.122 (.088) [.017]
<u>Women</u>				
β_7	-.114 (.064)	-.006 (.018)	-.017 (.027)	-.059 (.058) [-.023]
δ_1	-.086 (.021)	-.014 (.006)	-.026 (.006)	-.055 (.022) [-.021]
δ_2	.155 (.069)	-.035 (.026)	.028 (.023)	.142 (.058) [.055]

NOTE.— β_7 is the estimated coefficient for the third-level interaction term in equation (3), δ_1 is the estimated coefficient for the percentage change in the fraction of the state population that does not speak English at least well (divided by 100), and δ_2 is the estimated coefficient for that variable interacted with whether an individual has limited English proficiency. Heteroscedasticity-corrected standard errors are in parentheses, and marginal probabilities are in brackets.

Table 6
Estimated Effects Relative to English-Proficient Minorities

Group	Log annual earnings	Log weeks per year	Log hours per week	Employment (probit)
Hispanic men	-.108 (.030)	-.030 (.016)	-.010 (.011)	-.095 (.071) [-.016]
Hispanic women	-.147 (.051)	-.069 (.019)	-.007 (.028)	-.077 (.066) [-.030]
Asian men	-.024 (.091)	-.017 (.040)	-.030 (.032)	-.283 (.120) [-.047]
Asian women	-.074 (.117)	-.020 (.032)	-.017 (.024)	-.139 (.108) [-.051]

NOTE.—Shown are the estimated coefficients for the third-level interaction term in equation (1). See text for a discussion of other variables included. Heteroscedasticity-corrected standard errors are in parentheses, and marginal probabilities are in brackets.