LANGUAGE MAINTENANCE AMONG THE CHILDREN OF IMMIGRANTS: A COMPARISON OF BORDER STATES WITH OTHER REGIONS OF THE U.S.

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ABSTRACT. The impact of diatopia, geographic location, on the maintenance and loss of non-English languages in the U.S. represents one area that has received scant study in the literature. However, striking demographic changes in certain minority language groups raise questions on language loss and maintenance relating to geographic region. Hispanos represent significant segments of the populations in the states that form the southern border of the U.S. As this group continues to grow in both numbers and economic presence, the question arises as to what impact these factors have on language shift. Thus, a major goal of the present research is to examine current language use patterns across the nation and along the southern border, using an innovative analytical approach, the SYNTHETIC COHORT, with data from the 2000-2003 PUBLIC USE MICRODATA SAMPLES OF THE AMERICAN COMMUNITY SURVEY (PUMS ACS). The authors focus on children in particular, given their central importance in language maintenance, to compare geographic variation in an attempt to better understand the impact of region on language shift.*

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*The issue of which label to employ in referring to the Spanish speaking community in the U.S. is fundamentally problematic. In this article, the authors employ the term HISPANO simply because it is a common term employed in the area in which they research.

INTRODUCTION. The impact of diatopia, geographic location, on the maintenance and loss of non-English languages in the U.S. represents one area that has received scant study in the literature. Bills, Hernández Chávez, and Hudson (1995) do discuss distance from the U.S.-Mexico border as a factor in language loss among Spanish speakers in the Southwest, but beyond that study the issue has largely been ignored. However, striking demographic changes in certain minority language groups raise questions of language loss and maintenance relating to geographic region. As has been widely reported, those of Spanish speaking origin, a group that defies any single label, now form the largest minority group in the U.S. (http://www.census.gov). Spanish is the most widely spoken non-English language in this nation; as noted in Villa (2000), the U.S. is one of the principal Spanish-speaking nations in the world with regard to both number of speakers and their economic presence. However, the distribution of Spanish speakers throughout the nation is not homogeneous. In 2000, for example, only 1.7 percent of Alabama's population self-reported as being of 'Hispanic or Latino' origin, with the national average at that time consisting of 12.5 percent (http://www.census.gov).

At the same time, Hispanos represent significant segments of the populations in the states that form the southern border of the U.S. For the purpose of this study the authors define as BORDER STATES Texas, New Mexico, Arizona and California.[1] For the year 2000, the U.S. Census Bureau (http://www.census.gov) offers the percentage of the total border state populations that Hispanos represented:

(1)	Texas:	32%
(2)	New Mexico:	42%
(3)	Arizona:	24%
(4)	California:	32%

As can be seen, these percentages well exceeded the 12.5 percent national average. Further, certain areas directly contacting or closely adjacent to the southern border demonstrated even higher percentages of Hispano residents. To offer but a few examples from the 2000 Census data, in Hidalgo County, Texas, Hispanos represented 88 percent of its residents; in Doña Ana County, New Mexico, that figure was 63 percent. In Yuma County, Arizona, 50 percent of the population was Hispano and in Imperial County, California, they represented 72 percent of the population. Regarding socioeconomic factors, while it remains the case that some recent immigrants from Spanish speaking nations occupy the lower economic ranks, Hispanos are moving up the metaphorical ladder. As a measure of this phenomenon, Humphreys (2004) reports that Hispano buying power experiences the highest rate of growth of any ethnic group in the nation. This is reflected in the fact that in Doña Ana County, for example, Hispanos are business owners, attorneys, doctors, politicians, professors, judges, accountants, school teachers, and administrators, in short, occupy all levels of the socioeconomic structure of the area, and are not restricted solely to the lowest tiers of the local economy.

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[1] The use of the states to identify the border region is not uncommon (e.g. Lorey 1999), although narrower definitions exist, such as the counties adjacent to Mexico (e.g. Fullerton 2001, Peach 1997) and the major border cities (e.g. Robles 2002, Dávila & Mora 2000b). The geographic information in our dataset (discussed below) necessitates the state definition.

As this group, both in border and non-border regions, continues to grow in demographic and economic presence, the question arises as to what impact region has on language shift. That Spanish is lost in Hispano populations here has been consistently documented over the last 30 years, and earlier (see, e.g. López 1978, Veltman 1988, Bills 1989, Solé 1990, Pease-Álvarez 1993, Bills et al. 1995, and Rivera-Mills 2001, to name only a few). However, the RATE at which a non-English language is lost becomes of interest, as changes in that rate might indicate a shift in the general pattern of loss. The classic Fishman model of loss predicts a high level of shift in third generation members of a non-English language group. However, that model does not include explicit means for differentiating between different language populations. Anecdotally, the authors encounter a number of 3+ generation Spanish speakers in the border regions in which they work and live. Non-anecdotally, Mora, Villa, and Dávila (2003) find that immigrant Spanish speakers are much more likely to pass the language on to their children than other non-English language groups. Such findings beg the following question: are certain social structures changing in a border region in a manner that encourages the maintenance of a language, in this case, Spanish?

García (1993) documents the history of Spanish in U.S., at many periods a highly stigmatized language. She also notes changes in this country brought about by social developments and legislation such as the 1964 Civil Rights Act. A major goal of the present research, then, is to employ an innovative research model to track current language use patterns among children across the nation and along the southern border, in order to compare geographic variation in an attempt to better understand the impact of region on language shift. The authors assert that a better understanding of such dynamics, based on the use of new analytical tools, may serve to shed light on the broader issue of the status of Spanish in this country, as reflected in the maintenance/loss dichotomy in recent years.

1. THE STUDY. The present study examines the language use of children 1) whose parents have migrated to this country from non-English speaking communities, and 2) who were either born here or migrated at an early age. The motivation for this focus lies in the centrality of the role of children in preserving or losing a language, in this case in as recent a time period that existing data permit (in this study, from 2000-2003). Regarding the role of children in language maintenance and loss, in the study of indigenous languages in North America (and elsewhere as well), the vitality of a non-majority language is often measured in terms of how many children of the particular language group speak their parents' language, as opposed to adult members of the community. A DYING or ENDANGERED language is one spoken

only by a few elderly community members, while a LIVING one, for which there is hope of survival, is widely spoken among the community's children (see, e.g. Krauss 1998).

In the study of the loss and maintenance of Spanish in the U.S., various scholars such as Veltman (1988) and Hudson, Hernández Chávez, and Bills (1995) note that Spanish is being lost and that only migration appears to forestall its extinction in the near future. However, Villa (2000) points out that Veltman's (1988) calculations for the U.S. Spanish speaking population for 2001 fell well short of the mark, due not to the strength of the latter's analytical modeling, but rather to Veltman's inability to predict future migration patterns (few researchers have the luxury of owning a crystal ball). As a result, researchers such as Villa (2001) and Mora et al. (2003) contend that migration is a dynamic factor to which the field must pay closer attention in the study of language maintenance and loss. In other words, the tendency of immigrants to transmit their mother tongue to their children (or not) may impact on the rate of attrition of non-English languages in this nation.

This study, then, examines the rate of transmission of non-English languages from immigrants to their children, again, who were either born here or who migrated to the U.S. at an early age. One motivation for such a comparison among these language groups lies in the fact that, at least on one plane, all non-English languages face the same societal pressures that discourage their use. For example, California's Proposition 227 prohibits bilingual instruction in any non-English language in that state's public school system, and during the past couple of decades a number of states across the nation have passed some form of 'official English' legislation (see http://www.us-english.org/inc/). The fact that all non-English language groups undergo some degree of shift from their mother tongue to English reflects the pervasive societal pressures, either explicit or implicit, to speak only English. However, if differences in the rate of shift can be detected, then it may be the case that there exist changes in those pressures, reflecting a possible shift in societal attitudes toward speaking another language in addition to English.

2. METHODOLOGY AND DATA. A growing body of work empirically analyzes language shift in the U.S. employing large databases, such as Veltman (1988), Bills (1989) and Bills et al. (1995), and Bills, Hernández Chávez, and Hudson (2000). Much of this work, however, relies on cross-sectional analyses, in which data from one single year are explored. The estimation of language shift in these data depends on comparing individuals of different ages; for example, the language use of six- and sixteen-year olds can be directly compared to determine the extent of the language shift over a ten-year period. One potential shortfall with this approach is the possibility that individuals observed at different ages do not represent the same population. That is, the socioeconomic and demographic characteristics related to language maintenance among the six-year-olds could differ from those possessed by their sixteen-year-old peers a decade earlier.

In order to avoid this potential pitfall, the authors employ the empirical technique of the SYNTHETIC COHORT, using consecutive cross-sectional datasets. Despite being relatively new to the linguistics literature (e.g. Mora et al. 2003), synthetic cohorts have been analyzed by economists and sociologists to explore issues related to English-language acquisition (e.g. Dávila & Mora 2000a) as well as homeownership (e.g. Myers & Lee 1996, Dávila, Méndez & Mora 2003) and the 'quality' of immigrant cohorts (e.g. Borjas 1994). This approach synthetically tracks populations over time by comparing individuals in the same age cohort in consecutive datasets. For example, in decennial census data, the language maintenance of the six-year-old population can be observed in the population of sixteen-year-olds in the SUBSEQUENT census, excluding the foreign-born who migrated to the U.S. after the initial census.

Of course, the issue of selective emigration conceivably introduces an analytical difficulty in the interpretation of the synthetic cohorts.[2] However, given this study's focus on the language maintenance among the children of immigrants, this issue becomes less of a concern when considering that the synthetic cohort represents a CONSERVATIVE approach. Indeed, as noted by Mora et al. (2003), immigrants with a high proficiency in the English language probably have relatively low tendencies to return to their country of origin. As such, selective emigration along the language dimension would bias the synthetic cohort sample toward those most likely to speak (and transmit) English. It follows that results indicating an increased use of a non-English language among members of a synthetic cohort would represent lower-bound estimates of the potential language maintenance in the cohort.

2.1. PUMS ACS DATA. In this study, the authors construct synthetic cohorts using the 2000-2003 Public Use Microdata Samples of the American Community Survey (PUMS ACS) to analyze the language maintenance of the children of immigrants in the U.S. over a four-year period. The PUMS ACS is a recent data innovation by the U.S. Census Bureau that allows for the undertaking of such analyses with an up-to-date and frequently administered large-scale national dataset. These data contain individual-level information from the ACS questionnaire, one based on the long-form decennial census and nationally administered to a statistically-sampled population.[3] As a result, the PUMS ACS provides detailed data on a host of socioeconomic and demographic characteristics, including birthplace and the language spoken at home. The Census Bureau also provides statistical weights to maintain the national representation of the sample (for more information on the PUMS ACS, see the U.S. Census Bureau 2004).

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[2] Selective emigration implies that immigrants who return to their home countries are systematically different from those who remain in the host country. For example, selective emigration along the skill-dimension occurs when the skill distributions of emigrants significantly differ from those of the non-returning immigrants. As such, observed changes in the skill-levels of a foreign-born population over time would be partly driven by the fact that the population itself has changed.

[3] It should be observed that the 2000-2003 ACS excludes individuals residing in group quarters, such as institutions and college dormitories; starting in 2005, the U.S. Census Bureau plans to begin administering the ACS to the group quarter population.

The authors are aware that four years may not be enough time to observe a dramatic shift in language use because attending school (and in many cases, being significantly exposed to English for the first time) does not necessarily affect how children communicate with their parents. At the present, however, only four years of PUMS ACS data exist. Moreover, evidence of any language shift over these four years would contribute to the literature by empirically illustrating that such a shift might occur more rapidly at the national level than previously suspected.

The synthetic cohort analyzed in this study includes foreign-born children and U.S.-born children with at least one foreign-born parent in the U.S. who were five or six years old in 2000, six or seven in 2001, seven or eight in 2002, or eight or nine in 2003. The foreign-born sample only includes those individuals who had migrated to the U.S. by 2000, in order to preserve the synthetic cohort. The authors selected the five- and six-year-olds in 2000 because the children would have been old enough to speak, but still young enough to primarily be influenced by household factors rather than the external environment (such as in schools). Thus, the sample of interest allows for the tracking of non-English language use among children as they begin to move through the schooling system. While younger children than these would also be of interest to this study, PUMS ACS data do not provide information on language use for children under five.

The PUMS ACS contains information on birthplace, allowing for the direct identification of foreign-born children. The authors identified the U.S.-born children with foreign-born parents by matching children to their parent(s) in the household on the basis of the variables pertaining to the relationship to the household head, age, gender, and the employment status of parents (which indicates whether the parents live in the household). It is not possible in the PUMS ACS to determine the parents' birthplace for U.S.-born children who did not live with a parent; the samples contained here therefore exclude U.S.-born children who did not reside with at least one foreign-born parent. Regardless, the authors remain confident that their sample reasonably captures the population of children of immigrants.

Recall from above that beyond analyzing language maintenance, one goal of this study is to explore whether such maintenance differs according to geographic region, namely the U.S.-Mexico border *vis-à-vis* the U.S. interior. The smallest geographic area currently identified in the PUMS ACS is at the state level, such that the U.S.-Mexico border region will be defined here as the four adjacent states to Mexico identified in the introduction. As the U.S. Census Bureau releases future versions of the PUMS ACS with more precise geographic identification, researchers should further explore potential differences in language shift between individuals residing in U.S. cities or counties directly on the Mexican border and those in the interior sections of these four border states.

2.2. SAMPLE CHARACTERISTICS. Table 1 provides the race and ethnic demographic profiles of the synthetic cohort in each year. Mexican-origin children represent around 40 percent of the total sample, which changes little when partitioning the cohort by birthplace (i.e. foreign-born and U.S.-born). Non-Hispano Asians (referred to simply as ASIANS here) account for 16 percent of the cohort, slightly larger than the representation of the non-Mexican Hispano children. It is interesting to note that the sample shares of the different racial/ethnic groups in the synthetic cohort remain statistically unchanged over the four years; similarly, the share of immigrants in the entire cohort remains steady over the four years. The stable demographic profile of the cohort provides credibility to the robustness of the construction of the synthetic cohort. Changes in the sample representation of one or more of these groups would indicate selective emigration after 2000, which is not evident here. The propensity to reside with only one parent also remained stable between 2000 and 2003, with no apparent difference in this propensity between foreign- born and U.S.-born children.

Table 1 further shows that about 45 percent of the entire synthetic cohort resides in one of the four states along the U.S.-Mexico border and the rest of the U.S. This number is not surprising given the large numbers of immigrants who reside in California. Interestingly, a larger share of U.S.-born children with foreign-born parents lives in a state bordering Mexico than children born abroad. The variable regarding poverty reflects the percentage of the family income of the poverty threshold as established by the federal government (see the U.S. Census Bureau 2004 for more information). Table 1 shows that children in this cohort lived in households around 225 percent above the poverty line on average in 2000, regardless of birthplace. However, while the poverty status remained statistically unchanged (at conventional levels) between 2000 and 2003 among foreign-born children, family incomes slightly improved on average for U.S.-born children of foreign-born parents. The issue of why income levels would improve for immigrants with U.S.-born children and not for those who gave birth to their children abroad goes beyond the scope of this study; nevertheless, future studies should explore whether a child's birthplace relates to the earnings mobility of immigrant parents.

Did the observable characteristics in Table 1 affect the language maintenance among members of the synthetic cohort between 2000 and 2003? In particular, the relationship between poverty and language usage has been discussed in extant work, such as Bills et al. (1995), who found that Spanish speakers were more likely to shift toward English as they achieved a higher socioeconomic status. The next section provides empirical insight into this question.

3. RESULTS. Table 2 contains the percentages of the synthetic cohort who speak non-English languages at home, partitioned by race and ethnicity. Several points should be made with respect to this table. First, Hispano children in general were

Characteristic	2000: Ages 5 or 6	2001: Ages 6 or 7	2002: Ages 7 or 8	2003: Ages 8 or 9
Entire cohort:				
Mexican American	39.6%	38.8%	38.9%	40.2%
Non-Mexican Hispano	14.3%	13.9%	14.8%	13.7%
Asian	16.3%	15.8%	16.1%	15.9%
Non-Hispano & non-Asian	29.8%	31.5%	30.2%	30.1%
Resides in border state	44.8%	47.6%	46.7%	46.3%
Foreign-born	19.2%	21.0%	19.0%	19.2%
Resides with one parent	23.2%	24.9%	25.2%	25.0%
Percent above	226.3	223.7	225.8	232.2
poverty line	(151.7)	(150.9)	(151.1)	(153.6)
N (unweighted)	1,581	4,891	4,420	5,026
N (weighted)	1,527,497	1,513,280	1,539,931	1,488,520
Foreign-born:				
Mexican American	36.7%	33.5%	38.9%	39.9%
Non-Mexican Hispano	10.0%	12.7%	11.0%	11.1%
Asian	18.3%	17.1%	14.8%	15.1%
Non-Hispano & non-Asian	35.0%	36.8%	35.4%	33.9%
Resides in border state	38.1%	38.9%	35.6%	40.2%
Resides with one parent	22.8%	25.9%	25.9%	27.1%
Percent above	224.1	216.3	216.5	213.3
poverty line	(156.6)	(157.1)	(156.3)	(156.2)
N (unweighted)	318	1,077	906	999
N (weighted)	293,262	317,914	293,178	286,183
U.S.-born of foreign-born parents:				
Mexican American	40.3%	40.2%	38.9%	40.3%
Non-Mexican Hispano	15.3%	14.2%	15.7%	14.3%
Asian	15.8%	15.5%	16.4%	16.1%
Non-Hispano & non-Asian	28.5%	30.1%	29.0%	29.3%
Resides in border state	46.4%	49.9%	49.3%	47.7%
Resides with one parent	23.3%	24.7%	25.6%	24.4%
Percent above	226.8	225.6	228.0	236.7
poverty line	(150.6)	(149.2)	(149.8)	(24.4)
N (unweighted)	1,263	3,814	3,514	4,027
N (weighted)	1,234,235	1,195,366	1,246,753	1,202,337

Table 1. *Selected Average Demographic Characteristics of the Synthetic Cohort*[4]

more likely than other children to use a non-English language; Mora et al. (2003) report a similar tendency. Second, among all foreign-born children in the synthetic cohort, the propensity to speak a non-English language at home did not change between 2000 and 2003; this finding is not that surprising given the relatively short time period studied here. However, it would appear that Mexican-born children became INCREASINGLY likely to speak Spanish at home during this time, while non-Hispano/non-Asian foreign-born children experienced the classic pattern of language loss. While the statistical significance of the change for Mexican children falls outside of the conventional five-percent level of confidence, at a minimum the findings in Table 2 indicate that despite being exposed to English-oriented environments (such as in school), Hispano and Asian children born outside of the U.S. have been retaining their parents' language in recent years, at least in the household. The fact that foreign-born non-Hispano/non-Asian children became significantly less likely (at the five-percent level) to speak a non-English language at home during this short time-period indicates that language loss occurs rapidly among certain immigrant groups shortly after arriving to the U.S.

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[4] Some of the race/ethnicity percentages do not sum to 100 percent because of rounding. The parentheses contain the standard deviations of the continuous variable (percent above poverty). The unweighted N represents the actual sample size while the weighted N is the estimated size of the population reflected by the sample. None of the average characteristics are statistically different (at the ten-percent significance level) between 2000 and 2003 except for the poverty rates of U.S.-born children. The synthetic cohort includes children who were five or six in 2000 who had at least one foreign-born parent; foreign-born children who migrated after 2000 are not included in the cohort.

When focusing only on children born in the U.S. in Table 2, moreover, a stark pattern emerges in that with the exception of Mexican American children, those with foreign-born parents appear to be experiencing the traditional language loss

	2000: Ages 5 or 6	2001: Ages 6 or 7	2002: Ages 7 or 8	2003: Ages 8 or 9	Significance level (p value) of change between 2000 & 2003
Foreign-born:					
Entire sample	77.3%	74.5%	75.5%	75.5%	0.563
Mexican	94.9%	97.4%	97.8%	98.7%	0.073
Non-Mexican Hispano	87.9%	87.2%	92.8%	91.5%	0.638
Asian	75.4%	74.4%	72.5%	76.1%	0.911
Non-Hispano & non-Asian	56.7%	49.3%	46.9%	42.8%	0.019
U.S.-born of foreign-born parents:					
Entire sample	72.3%	70.2%	69.1%	68.6%	0.033
Mexican American	88.6%	92.4%	91.3%	91.2%	0.177
Non-Mexican Hispano	91.6%	86.4%	84.9%	85.1%	0.025
Asian	74.7%	70.5%	68.4%	67.6%	0.087
Non-Hispano & non-Asian	37.6%	32.5%	31.1%	30.0%	0.015

TABLE 2. *Share of the Synthetic Cohort Who Spoke a Non-English Language at Home*

even over this short period of time, including non-Mexican Hispano and Asian children. The data in this table empirically illustrate how quickly language shift can take place for certain ethnic groups; until now, such information could not be observed at the national level. In contrast, Mexican American children appear neither more nor less likely to speak Spanish at home on average between 2000 and 2003, again revealing the presence of language transmission that seems to be particular to members of this group.

Overall, Table 2 indicates that children with Mexican-born parents are, at a minimum, retaining Spanish during their early elementary school years in the U.S. This finding raises the question of whether immigrants who reside near their homeland preserve their languages for their children more than other immigrants. Alternatively, perhaps this finding reflects changes in the underlying family structure or poverty status as the children age over the four ACS years.

For insight into these possibilities, we next estimate logit regressions for 2000 and 2003 with the use of a non-English language at home as the dependent variable (coded to 1 for those who speak a non-English language at home and 0 otherwise). The logit is based on the cumulative logistic probability function, and the estimation of the logit (typically by maximum likelihood) provides the expected probability that a given set of characteristics relate to a particular outcome (in this case, speaking a non-English language in the household). Specifically, the logit estimated here regresses the odds ratio (the log of the probability that the child speaks a non-English language over the probability that the child speaks English at home) on a set of observed characteristics, namely ethnicity/race, residing in a U.S.-Mexico border state, gender, poverty status, and living with only one parent. For more information on the logit, see e.g. Pindyck and Rubinfeld (1998) and Gujarati (2003).

Table 3 presents the estimates from these regressions for 2000 and 2003. Non-Hispano/non-Asian children represent the base group of comparison, captured by the CONSTANT term. The reported coefficients describe log-odds ratios, such that a positive coefficient sign reflects a positive relationship between the independent variable and the odds of speaking a non-English language at home. The p values—which describe the statistical significance levels of the differences in the coefficients between 2000 and 2003—are obtained by estimating a third logit that pools the 2000 and 2003 samples and fully interacts all of the right-hand-side variables with a binary variable equal to one for individuals in the 2003 sample (and equal to zero for those in the 2000 sample). The z tests on the coefficients of these interaction terms provide the p values for the differences between 2000 and 2003.

Several general features are apparent in this table. First, similar to Table 2 above, foreign- and U.S.-born Hispano and Asian children are significantly more likely to speak a non-English language at home than their non-Hispano/non-Asian counterparts. Mexican-born children, for example, were nearly eight times more likely [$e^{2.052}$] to speak a non-English language instead of English than their non-Hispano/

non-Asian peers in 2000 when controlling for other characteristics. Second, the higher the family above the poverty line, the less likely the children speak a non-English language at home. This finding reflects the correlation between income level and language use that Bills et al. (1995) encountered; as non-English speakers move up the economic ladder, the more likely they are to abandon the non-English language. Third, residing with only one parent relates to a lower propensity to speak a non-English language. Finally, among foreign-born children, residing in a state that borders with Mexico is associated with a greater propensity to speak a non-English language at home. We will return to this latter issue in more detail below.

First, it is worthwhile to compare 2000 with 2003 in Table 3. Note that, chil-

	FOREIGN-BORN			US-BORN OF FOREIGN-BORN PARENTS		
POPULATION	2000	2003	SIGNIFICANCE LEVEL (*P* VALUE) OF DIFFERENCE	2000	2003	SIGNIFICANCE LEVEL (*P* VALUE) OF DIFFERENCE
MEXICAN	2.052**	3.824**	0.052	2.299**	2.849**	0.061
	(0.603)	(0.683)		(0.253)	(0.150)	
NON-MEXICAN HISPANO	1.613*	2.476**	0.290	2.814**	2.480**	0.316
	(0.656)	(0.486)		(0.290)	(0.164)	
ASIAN	0.834*	1.544**	0.105	1.681**	1.607**	0.777
	(0.368)	(0.236)		(0.227)	(0.126)	
RESIDES IN BORDER STATE	0.153	0.498†	0.459	-0.046	0.065	0.625
	(0.378)	(0.274)		(0.197)	(0.111)	
FEMALE	-0.477	-0.157	0.104	0.037	0.304**	0.828
	(0.329)	(0.212)		(0.171)	(0.099)	
PERCENT ABOVE POVERTY LINE	-0.005**	-0.005**	0.973	-0.003**	-0.003**	0.899
	(0.001)	(0.001)		(0.001)	(0.0003)	
DOES NOT LIVE W/BOTH PARENTS	0.321	-0.770*	0.388	-0.457*	-0.333**	0.593
	(0.411)	(0.319)		(0.196)	(0.126)	
CONSTANT	1.959**	1.085	0.111	0.352	-0.155	0.066
	(0.443)	(0.323)		(0.239)	(0.137)	

Dependent Variable = 1 if Non-English Language Spoken at Home; = 0 Otherwise
**, *Statistically significant at the one and five percent levels, respectively
†Of interest at the ten percent level

TABLE 3. *Logit Regression Results on the Propensity to Speak a Non-English Language*[5]

dren of Mexican ethnicity became INCREASINGLY likely in the early 2000s to speak a non-English language at home, relative to their non-Mexican counterparts, when controlling for other household characteristics. Similar to Table 2, moreover, is the observed decrease in Table 3 in the use of non-English languages among non-Hispano/non-Asian U.S.-born children on average (see the decline in the coefficient on the CONSTANT term). Overall, these results suggest that the Spanish language maintenance among the children of Mexican immigrants in the U.S. is stronger than the minority-language retention among other children (including non-Mexican Hispanos) on average.

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[5] The parentheses contain robust standard errors. The unweighted (weighted) sample sizes in 2000 and 2003, respectively, were 315 (293,262) and 984 (286,183) for the foreign-born children, and 1,263 (1,234,235) and 4,027 (1,202,337) for the U.S.-born children. The synthetic cohort includes children who were five or six in 2000 with at least one foreign-born parent; immigrant children who migrated to the U.S. after 2000 are not included.

Admittedly, the statistical significance of these changes does not occur at the five percent level (a measure commonly considered to be a cut-off for significant results). However, the *p* values equal 5.2 percent (a hair above five percent) for Mexican-born children and 6.1 percent for U.S.-born Mexican Americans, such that the authors consider these results to be of statistical interest in that children with Mexican-born parents appear to be more likely than other children to preserve their parents' language during their early school years. Whether or not this finding will still hold as the children continue aging (or as new years are added to the PUMS ACS dataset) certainly remains a topic worthy of future research.

Table 3 further indicates that the relationship between the remaining explanatory variables and the use of a non-English language at home remained stable (at conventional levels of confidence) as the cohort aged. It follows that the influence of factors such as family income, while negatively related to the use of a non-English language, does not appear to significantly exacerbate or hinder language maintenance over time.

For more insight into whether children in states bordering Mexico experience different degrees of language maintenance, Tables 4 and 5 provide additional logit regression results when partitioning the synthetic cohort according to border-state residence. Of specific relevance to this study are the differences observed between the samples in states that border with Mexico and those that do not. Note that in Table 4, Mexican-born children residing in a state bordering their homeland were significantly more likely (at the five percent level) to speak Spanish at home in 2003 than in 2000. While the propensity to speak Spanish also seemed to rise among members of this population in non-border states, this increase is not statistically of interest at the ten percent level. This finding indicates that *something* encourages Mexican-born children in U.S. states bordering Mexico to maintain the Spanish language at home.

Moreover, while foreign-born Asian children residing in U.S.-Mexico border states were more likely than non-Hispano/non-Asian children to speak their parents' language at home, this greater likelihood did not significantly change between 2000 and 2003. Nonetheless, Table 4 shows that those in non-border states experienced a growing propensity to use a non-English language as they aged *vis-à-vis* other children. It might be the case that the increased non-English language

	U.S.-Mexico Border State			Non-Border State		
Population	2000	2003	Significance level (p value) of difference	2000	2003	Significance level (p value) of difference
Mexican	2.674** (0.762)	5.214** (0.883)	0.029	1.836** (0.908)	3.199** (0.804)	0.261
Non-Mexican Hispano	+	+	+	1.188† (0.681)	2.307** (0.552)	0.201
Asian	2.343* (0.959)	1.536** (0.456)	0.446	0.460 (0.407)	1.592** (0.272)	0.021
Female	-0.484 (0.700)	-0.088 (0.464)	0.637	-0.480 (0.377)	0.224 (0.235)	0.113
Percent Above Poverty Line	-0.006** (0.002)	-0.003** (0.001)	0.231	-0.004** (0.001)	-0.005** (0.001)	0.512
Does not live w/Both Parents	0.183 (0.781)	-0.753 (0.544)	0.324	-0.430 (0.544)	-0.879* (0.396)	0.505
Constant	1.654* (0.829)	0.879 (0.628)	0.455	1.970** (0.498)	1.224** (0.380)	0.233

Dependent Variable = 1 if Non-English Language Spoken at Home; = 0 Otherwise
**, *Statistically significant at the one and five percent levels, respectively
†Of interest at the ten percent level
+Too few observations to provide reliable estimates when controlling for other characteristics; as such, foreign-born non-Mexican Hispanos are excluded from the U.S.-Mexico border subsample in this analysis.

TABLE 4. *Logit Regression Results for the Propensity to Speak a Non-English Language among Foreign-Born Children in Border and Non-Border States*[6]

use among Asian-born children outside of the border region in particular reflects the relatively strong growth of Asian communities in non-border states.[7] The issue of whether language maintenance among Asian children in non-border regions is pan-ethnic or not goes beyond the scope of this study; nevertheless, this topic is worthy of future investigation.

When focusing on U.S.-born children of foreign-born parents in Table 5, the cohort members in border states were not more or less likely to speak a non-English language at home in 2003 than in 2000. In non-border states, however, some

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[6] The parentheses contain robust standard errors. The unweighted (weighted) sample sizes in 2000 and 2003, respectively, were 92 (104,021) and 294 (103,009) for the children in border states, and 217 (159,352) and 667 (148,597) for the non-border children. The synthetic cohort here includes foreign-born children who were five or six in 2000; those who migrated to the U.S. after 2000 are not included.

[7] For example, using data published by the U.S. Census Bureau (2002), the authors estimate that between 1990 and 2000, the Asian population increased by 58.9 percent in the four states bordering Mexico, but 83.2 percent in non-border states.

	U.S.-Mexico Border State			Non-Border State		
Population	2000	2003	Significance level (P value) of difference	2000	2003	Significance level (P value) of difference
Mexican American	1.853**	2.595**	0.111	2.484**	3.079**	0.185
	(0.407)	(0.226)		(0.385)	(0.232)	
Non-Mexican Hispano	2.744**	1.951**	0.235	2.796**	2.665**	0.736
	(0.594)	(0.306)		(0.333)	(0.197)	
Asian	1.044**	1.671**	0.176	1.971**	1.532**	0.179
	(0.395)	(0.243)		(0.292)	(0.145)	
Female	0.467	0.419*	0.106	-0.218	0.230†	0.067
	(0.289)	(0.169)		(0.213)	(0.122)	
Percent above Poverty Line	-0.004**	-0.004**	0.966	-0.002**	-0.002**	0.864
	(0.001)	(0.001)		(0.001)	(0.0004)	
Does not live w/Both Parents	-0.390	-0.471*	0.820	-0.444†	-0.258	0.549
	(0.291)	(0.203)		(0.266)	(0.162)	
Constant	0.740	0.318	0.475	0.245	-0.338*	0.076
	(0.529)	(0.261)		(0.293)	(0.167)	

Dependent Variable = 1 if Non-English Language Spoken at Home; = 0 Otherwise
**, *Statistically significant at the one and five percent levels, respectively
†Of interest at the ten percent level

TABLE 5. *Logit Regression Results on the Propensity to Speak a Non-English Language among U.S.-Born Children of Foreign-Born Parents in Border and Non-Border States*[8]

language loss occurred on average (see the decline in the coefficient on the constant variable), although this loss did not seem to vary with respect to ethnicity. Moreover, being female appears to have offset some of this loss. The relationship of gender to language shift, particularly with regard to Spanish, represents an important research area in the field (see, e.g. Ortiz 1975, Betancourt 1976, Veltman 1981, Cain 1985, Stevens 1986, Klee 1987, and Chávez 1988, 1993, to name only a few). The finding here that females may be experiencing different rates of language maintenance than males in certain geographic regions seems to contradict certain conclusions in some of these earlier works, while supporting others. For example, Chávez, researching this issue in Northern New Mexico, writes '…females are the precursors in language shift to English due to language prestige and female employment opportunity' (1993:48). However, Stevens (1986) finds that women are less likely than men to stop speaking their native language after learning English. The link between gender and language shift in specific geographic regions cannot be addressed in depth here due to space limitations, but the authors recognize it as it as an area that needs further detailed research.

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[8] The parentheses contain robust standard errors. The unweighted (weighted) sample sizes in 2000 and 2003, respectively, were 542 (572,737) and 1,712 (573,586) for the children in border states, and 721 (661,498) and 2,315 (628,751) for the non-border children. The synthetic cohort here includes U.S.-born children who were five or six in 2000 with at least one foreign-born parent.

4. CONCLUSION. Seismologists employ highly sensitive instruments to measure minute geological movements, with the aim of better understanding the dynamics of much larger subsequent shifts, earthquakes. This procedure might serve as a metaphor for the goals of this article. The authors employ a dynamic model to better understand one facet of language behavior, attempting to detect small changes that could precede larger ones in the future. In the introduction to this article the authors, citing García (1993), observe that during much of the history of the U.S. Spanish existed as a stigmatized language in this nation. At the same time, mentioning Villa (2000), they note the increasing demographic and economic presence of Hispanos in this nation. These growing numbers and buying power impact the socioeconomic status of Hispanos, and by extension the language they speak.

Following the seismology metaphor, a small tremor might have been uncovered in the results presented above, based on 2000-2003 PUMS ACS data. The data appear to indicate a different pattern of language shift among Hispanos in the U.S. in recent years, and among an important subgroup of that population. Children of Mexican descent, living with Spanish-speaking immigrant parents in an area bordering the ancestral homeland, seem to be more likely than other children to maintain their parents' language during elementary school. This difference may represent a tremor that indicates societal attitudes toward Spanish are currently undergoing a shift, with Spanish enjoying a different prestige as a language in the border states than it did in the past. They recognize that they do not have direct evidence of this phenomenon, but do assert that the high level of maintenance observed here is not coincidental, and must have some relationship with the societal forces that impact maintenance and shift.

In other words, in this region immigrant parents from Mexico feel comfortable in speaking Spanish with their children, and in having their children learn the language. They do so with the apparently implicit knowledge that their children are in no danger of not learning English, and thus in the future will not be denied the benefits that accrue to English speakers in this nation. Further, they do not appear threatened by environmental factors that would pressure them to abandon their mother tongue. Vanishingly few of such parents are probably aware that Mora et al. (2003) document the fact that virtually all second generation Spanish speakers also speak English. Rather, they rely on their observations of their immediate linguistic reality in order to arrive at this implicit understanding. Finally, the authors wish to suggest that those interested in researching current language shift among

Spanish speakers in any geographic area of the U.S. continue to monitor closely factors such as income level, social and political status, migration patterns, gender, among the many others that impact this phenomenon, for as these change, language shift patterns will continue to evolve. As social and demographic changes occur in other parts or the country, the phenomena observed here may begin to appear in other areas as well. The border states possibly serve as a bellwether of change in Fishman's classic shift model. Spanish speakers live in a highly dynamic environment in this region, undergoing very rapid demographic and socioeconomic shifts. The question of whether these small tremors signal much larger changes in the status of U.S. Spanish in this nation poses a challenge to all researchers interested in these language dynamics.

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