3

Consonantal variables correlated with ethnicity

Consonants are readily associated with interference and substrate effects. That is, ethnic varieties, or ethnolects (Clyne 2000), commonly adopt consonantal variants that are the same as or similar to those of their ethnicity's heritage language and thus differ in perceptually distinctive ways from forms found in the mainstream variety spoken around them. Such deviation makes intuitive sense when one considers the challenges facing learners of the majority language. Language learners often have difficulty with new (L2) consonants not found in their native (L1) languages, contributing to an interlanguage (Tarone 1979) in which L2 consonants are produced in ways that directly or indirectly reflect the speaker's L1. While a fuller explication of this phenomenon was presented in Chapter 1, here we briefly discuss the particulars again with specific reference to consonantal variation.

Consonantal inventories of a speaker's L1 and L2 quite often are not identical. Well- known examples include the English consonants /r/ and /l/, which pose problems for Japanese learners of English because Japanese lacks a similar contrast (e.g., Goto 1971; Miyawaki et al. 1975), and the English interdental fricatives /θ/ and /ð/ for learners from Japanese, Russian, and French (see Brannen 2011) and many other language backgrounds that lack interdental fricatives. In their attempts to produce these consonants accurately, learners commonly substitute L1 phones (e.g., [t] and [d] or [s] and [z] for the interdental fricatives) or otherwise approximate the L2 consonants as best they can. In other cases, the learner's L1 and the L2 share comparable consonants, yet these analogues may differ subtly in articulatory details. In such cases, learners may produce/perceive the L2 sound identically to how they would their L1 sound (Flege 1995). Studies of English learners from Dutch and German (Flege 1997; Bohn and Flege 1997) and Japanese (Yamada 1995) language backgrounds indeed find that learners often systematically produce various L2 consonants in ways that are distinct from those of native heritage speakers of the same language.

In light of these tendencies, it has long been assumed that errors in L2 production can be predicted accurately through a contrastive analysis of the phonology of the two languages in question (Weinrich 1963; Lehiste 1988). That is, wherever discrepancies between the languages exist, whether they are fundamentally different phones not shared between the two languages or "close-enough" phones that differ only subtly, the assumption is that a learner will encounter difficulty acquiring native-like proficiency with new L2 sounds in phonologically predictable ways. Similar assumptions have undergirded the study of the koineization of ethnolects and other dialects (Trudgill 1986; Kerswill 2002). It may seem reasonable to assume that the characteristic features of ethnolects are byproducts of years of comingling between languages in contact, the results of many phonetic substitutes and near-misses by the original language learners and their children. However, sociolinguists who study ethnolects note that heritage language phonological features are but one contributor to the systematic patterns of an ethnic variety (Tarone 1979). Especially as it pertains to sociolinguistic variation, there can at times be little or no clear connection between a speaker's heritage language and the linguistic features he or she uses.

In North Town, Texas, we see a Mexican American ethnic variety that uses consonants in ways that follow each of these patterns. Because the Spanish and English consonantal systems are broadly similar, a close examination is necessary. Numerous previous discussions of Spanish to English transfer have uncovered several consonantal transfer features, such as confusion of /tʃ/(as in *church*) and /ʃ/ (as in *she*), as will be seen below. However, the actual patterning, both linguistic and social, is frequently more complex than what has been thought previously. Here, we will discuss several salient consonantal variables from a quantitative perspective, using acoustic analyses when appropriate. It will become evident that, in the context of North Town, a major dialectal fault line follows the ethnic boundary. This fault line appears to be the primary division within the community.

One variable that we have not included is devoicing of /z/, whether final or intervocalic. This omission may strike some as odd because devoicing of /z/ is one of the most commonly reported features of MAE (Lynn 1945, Sawyer 1964, Castro-Gingrás 1972, Metcalf 1972, Natalicio and Williams 1972, Ornstein 1975, Thompson 1975, Doviak and Hudson-Edwards 1980, Garcia 1984, Penfield and Ornstein-Galicia 1985, Bayley and Holland under review). We decided not to analyze this variable for two reasons. First, lack of glottal pulsing during /z/ realizations is widespread not just in MAE, but also in Anglo speech (José 2010), including—as we observed—that of North Town. Much of the lack of glottal pulsing appears in phonetically expected contexts, such as those before a pause or a voiceless consonant. Second, lack of glottal pulsing does not necessarily make

/z/ identical to /s/. Various other cues, such as duration of frication, duration of the preceding vowel, and amplitude of frication, can still distinguish /z/ from /s/ even in the absence of glottal pulsing. The relationship between phonological representation and phonetic realization becomes complex and no clear boundary between /z/ and /s/ can be established. While some tokens of /z/ sound clearly [s]-like, others are ambiguous. Hence any division would necessarily be subjective. Even acoustic measurements would leave some questions open because durations of segments are affected by rate of speech and amplitude is problematic to measure in field recordings.

/l/

This variable involves the way /l/ is realized in word-initial positions, generally considered the least velarized context for /l/ in English (Hayes 2000). Non-velar ("light") /l/ has been associated with Mexican American (Galindo 1987, 1988; Van Hofwegen 2009) and other Latino Englishes (Slomanson and Newman 2004; Newman 2010), while velar ("dark") /l/s are associated with mainstream (Anglo) varieties in the United States (Recasens and Espinosa 2005:2-3). The light /l/ in Latino varieties of English can be directly tied to the /l/ of Spanish, which has categorically light /l/s (in terms of F_2 measurements) in all positions, and its /l/s are lighter overall than those of other European languages such as Catalan and German (Recasens 2004). However, sociolinguistic research conducted on this variable thus far has been mostly impressionistic (e.g., Slomanson and Newman 2004). Following Van Hofwegen (2009), this study used acoustic measurements to determine whether /l/s in North Town MAE are indeed lighter than those of Anglos in the community.

The acoustic parameter most relevant for /l/ relative lightness/darkness is F_2 (see Carter, 2003; Recasens 2004; Oxley et al., 2006). As a rule, F_2 rises as /l/s become lighter. However, /l/ is highly susceptible to coarticulation with neighboring vowels, and back vowels are associated with more velarized /l/ (Oxley et al. 2006). Thus, acoustic analyses of /l/ must take vowel context into consideration. Another factor reported in the literature as influencing the realization of /l/ is the duration of the lateral. Reports on the effects of duration are mixed. While Sproat and Fujimura (1993) hypothesize that darker /l/s are longer in duration than lighter /l/s, Huffman (1997) and Carter (2003) find conflicting evidence. Instead, the effect of duration on /l/ relative lightness/darkness appears to be variable and dialect-specific. Duration, in any case, has come to be regarded as an important factor in acoustic analyses of /l/.

For this analysis, approximately 40 tokens of word-initial /l/ were analyzed for each of the 42 speakers (n = 1449). F_2 was measured at the midpoint of each /l/ token using LPC in Praat (Boersma 2001). These values were then normalized using the formula developed by Lobanov (1971). The effect of the following vowel was calculated using the difference between the /l/ midpoint F_2 and the F_2 of the following vowel (taken 50 milliseconds after the /l/ offset). The measurement points are exemplified in figure 1. /l/ duration in milliseconds for each token was determined through inspection of spectrograms.

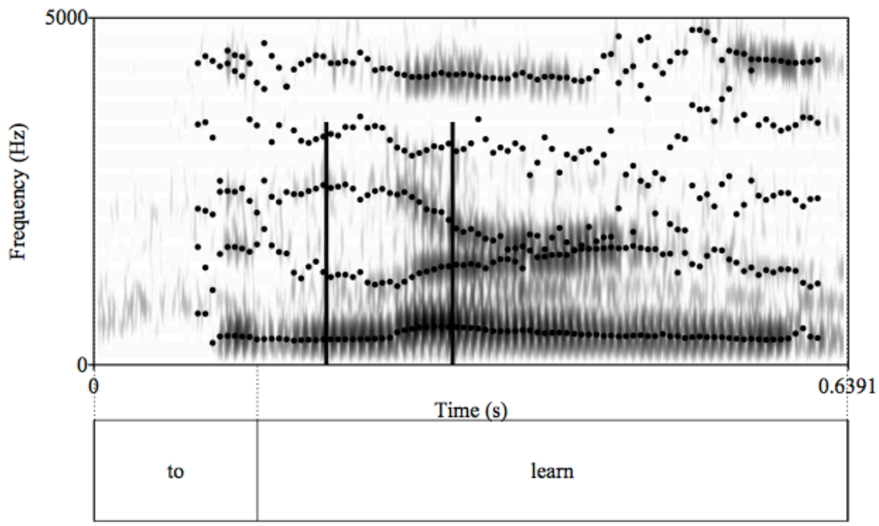

Figure 3.1 Spectrogram of *to learn* showing measurement points, indicated by vertical bars, for the midpoint of /l/ and the point 50 ms after the onset of the syllabic /r/ (treated like a vowel) in *learn*. An LPC formant track is superimposed.

Multi-level mixed effects regression analyses were conducted, as shown in Table 3.1, using the outcome (dependent) variable *Lobanov-normalized F_2* and the predictor (independent) variables *(following) vowel context*, *duration*, *(speaker) ethnicity* (Mexican American or Anglo), *(speaker) birth year*, and *(speaker) sex*. As expected, vowel context significantly predicted /l/ relative lightness/darkness ($p < 0.001$) in that back vowels (lower F_2s) predict darker /l/s, likely due to coarticulation. Duration was not significant. Among the social factors, only speaker ethnicity, at $p<.001$, reached statistical significance, with Mexican Americans exhibiting significantly lighter /l/s (higher midpoint F_2s) than Anglos. Figure 3.2 plots the mean Lobanov- normalized midpoint F_2 values for each speaker by birth year, with ethnicity indicated. Consistent with the regression analysis, the figure shows that Mexican Americans have much higher F_2 values as a group than do the Anglos. There is no change in apparent time across the groups.

Table 3.1 Best-model multi-level mixed effects linear regression results for /l/ relative lightness, with speaker as a random effect. Outcome variable is Lobanov-normalized F_2 at /l/ midpoint. Speaker sex, year born, and educational level, which did not reach significance at p<.10 in previous runs, are excluded. Akaike Information Criterion=2065.6, Bayesian Information Criterion=2102.5, log likelihood=-1025.8.

Random effects:					
Speaker	(Intercept)		Residual		
Standard dev.	0.21438		0.47654		
Fixed effects:					
	Value	Standard error	DF	t value	p value
(Intercept)	-0.8128	0.0751	1405	-10.818	0.0000
ethnicity	0.4125	0.0805	40	5.125	0.0000
duration	0.8560	0.4679	1405	1.829	0.0676
vowel context	-0.1412	0.0165	1405	-8.566	0.0000

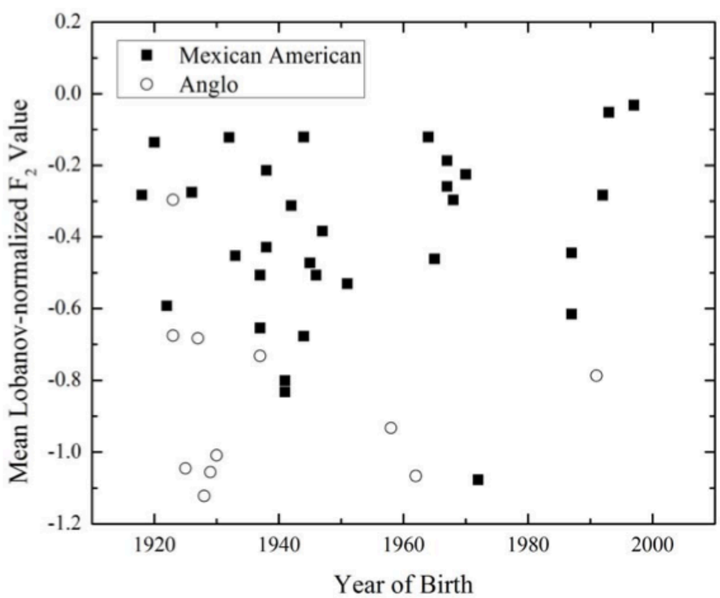

Figure 3.2 Mean Lobanov-normalized F_2 values for midpoint /l/s by year of birth.

The significant difference between the relatively lighter /l/s of the Mexican Americans in North Town and the darker /l/s of their Anglo counterparts agrees with the previous literature on the Englishes of American Latinos. It also bears out the prediction of residual Spanish phonological features in the ethnolect spoken by Mexican Americans of North Town. Moreover, the fact that this difference has persisted over generations suggests that it has become a phonological mainstay of this dialect. Is this just a straightforward case of a substrate feature in a modern ethnolect? Light /l/ here clearly stems from Spanish influence, but it appears that the light /l/s of North Town Mexican Americans have their own distinctive character. Van Hofwegen (2009) reports that the /l/s of a Mexican American native speaker's Spanish are notably lighter than the /l/s of English-speaking Mexican Americans from the same community. This suggests that while North Town MAE exhibits relatively light /l/ forms, the range of realizations is not identical to that of Spanish /l/. Instead, the forms that emerge are a compromise between typical realizations of the two languages.

Post-alveolars.

A frequently named feature of MAE is confusion of /tʃ/ and /ʃ/. That is, /tʃ/ may be realized as a fricative—e.g., as [ʃɹ̩ʃ] 'church'—and /ʃ/ as an affricate—e.g., [tʃi] 'she' (Lynn 1945; Sawyer 1964; Natalicio and Williams 1972, Ornstein 1975; Wald 1981, 1984; Melendez 1982; Penfield and Ornstein-Galicia 1985:39-41; Merrill 1987; Galindo 1988, Fought 2003:82). This feature is generally agreed to stem from the fact that Spanish does not contrast these two sounds. Standard Spanish has /tʃ/ but not /ʃ/, though it is known that /tʃ/ is commonly softened to [ʃ] in dialects of Spanish from (at least) Panama, northwestern Mexico, Puerto Rico, and parts of the Andes region (Cedergren 1973; Hualde 2005; Lipski 2007). Confusion of /tʃ/ and /ʃ/ is well- attested in the North Town English interviews. Softening of /tʃ/ to [ʃ] was also observed in the Spanish of some speakers. The process is extended to /dʒ/, as in *judge*, in North Town MAE, so that /dʒ/ may be realized as [ʒ]; this facet of it has been noted by Wald (1984:22-23) for east Los Angeles.

A few of the above studies, most notably Wald (1981), have noted that position within a word has an effect on realization as an affricate or a fricative. Specifically, affricate realization is favored word-initially, as in *check* and *she*, while fricative realization is favored word finally, as in *which* and *fish*. Word-medial positions are intermediate, but Wald reported that affricates were more favored after a consonant, as in *question* or *mansion*, and fricatives after a vowel, as in *itchy* or *ocean*. Cedergren (1973) found a parallel tendency in Panama City Spanish, in which /tʃ/ was more likely to be weakened to a fricative intervocalically, as in *mucho* 'many,' than word-initially, as in *chico* 'boy.'

Tokens were coded as binary variables based with a combination of audition and analysis of spectrograms. The spectrograms were examined for presence or absence of a stop burst. The burst would indicate an affricate realization—i.e., [tʃ] or [dʒ]—and absence of a burst would indicate a fricative. Ordinarily, the burst was contiguous with the frication and, as a result, appeared as an area of high amplitude at the onset of the frication noise. For fricatives, the noise normally began gradually, gaining amplitude at a much slower rate. Examples are shown in figure 3.3. At least 100 tokens of all the post-alveolar sounds (/tʃ/, /dʒ/, /ʃ/, and /ʒ/) together were coded for each subject whenever possible. 28 of the 42 subjects had at least 100 tokens and only one had fewer than fifty. Although /ʒ/, most often encountered in the word *usually*, was coded, it was too rare to permit a coherent analysis and so is excluded here. Tokens falling after a /t/ or /d/ were excluded from the statistical analysis because it cannot be conclusively determined whether such sequences represent, phonetically, stop+affricate or stop+fricative. Tokens were coded according to which consonant they represented; whether a consonant, vowel, or pause preceded and followed the post-alveolar; and the position within a word (initial, medial, final, or cross-lexical, as in *whatchou* ‘what you’). A total of 1047 tokens were coded for /tʃ/, 1195 for /d/, and 1676 for /ʃ/.

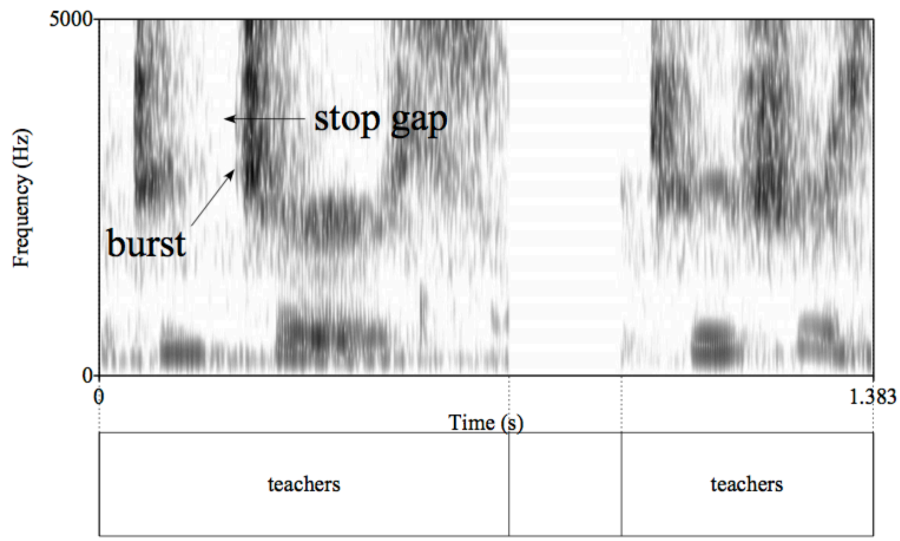

Figure 3.3 Spectrograms of *teachers* with /tʃ/ produced as [tʃ] (left) and as [ʃ] (right). 0.2 seconds of silence is inserted between the two utterances. Note the presence of th stop gap and the burst for [tʃ] and their absence for [ʃ].

Each of the three post-alveolar sounds that were suitable for statistical analysis, /tʃ/, /dʒ/, and /ʃ/, was subjected to logistic regression. The three sounds were analyzed separately. For this and subsequent logistic regression analyses, subjects were divided into four generations and three educational levels according to the following criteria. Subjects born before 1940 were assigned to generation 1, those born 1940-1959 to generation 2, those born 1960-1979 to generation 3, and those born 1980 or later to generation 4. For education, subjects with less than a high school diploma or GED were assigned to level 1, those with a high school diploma or GED but two years or fewer of post-secondary education to level 2, and those with more than two years of post-secondary education to level 3.

For all three post-alveolars, ethnicity emerged as the most highly significant independent variable, external or internal, in the initial runs.[1] This finding is expected because MAE has Spanish interference in its background and Anglo English does not. Occurrences of /tʃ/ and /dʒ/ as fricatives and of /ʃ/ as an affricate occurred among the Anglos, but only rarely. For that reason, only Mexican Americans were included in subsequent statistical analyses of post- alveolars.

Percentage of /tʃ/ tokens realized as fricatives is plotted for each speaker against speakers' years of birth in figure 3.4. Anglos, not surprisingly, show rates close to zero. Among Mexican Americans, there is a sharp drop-off between the oldest speakers and the middle-aged ones. The single young speaker with a high value was born in Mexico (though she came to Texas at a young age) and speaks Spanish at home. The pattern evident in figure 3.4 suggests that fricative realization of /tʃ/ is primarily an interference feature, produced by speakers whose first language is Spanish. It never completely disappears, however, even among speakers who are English-dominant.

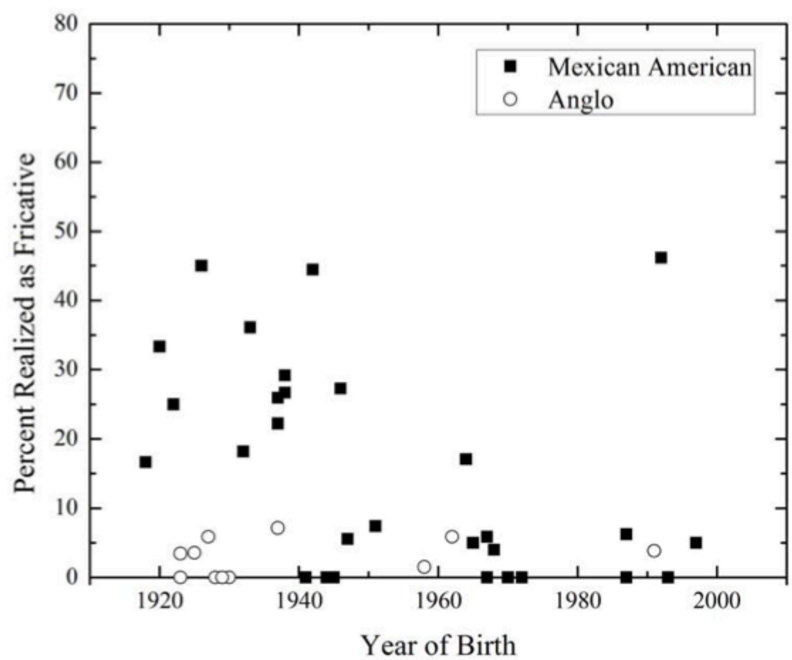

Figure 3.4 Percentages of realization of /tʃ/ as a fricative.

Logistic regression with speaker as a random effect was performed for each

[1] Significance levels of ethnicity were 1.05*10^7 for /tʃ/, 1.53*10^5 for /dʒ/, and 1.04*10^6 for /ʃ/.

post-alveolar for Mexican American subjects. For /tʃ/, sex and preceding environment failed to reach significance at p<.10 in the first run. Results from the subsequent run, which provided a better model, are shown in Table 3.2. A clear generational trend is apparent. Generations 2, 3, and 4 all show significantly fewer fricatives than generation 1. This result matches what was observed in figure 3.4. A following pause or vowel decreased the incidence of fricatives mildly. Position has strongly significant effects. Frication is much less frequent in initial and medial positions than in word-final position. This distribution coincides with the observations of such previous researchers as Wald (1981, 1984). Cross-lexical position also appears to be less likely for fricatives than final position, but because of the small number of cross-lexical examples, this result should not be taken too seriously.

Table 3.2 Best-model logistic regression results for fricative realization of /tʃ/, with speaker as a random effect. Sex, educational level, and preceding environment, which did not reach significance at p<.10 in a previous run, are excluded. Akaike Information Criterion=510, Bayesian Information Criterion=555.5, log likelihood=-245. Reference settings are realization: affricate; generation: 1; following environment: consonant; and position: final.

Random effects:				
Group	Variance		Standard dev.	
Speaker (Intercept)	1.314		1.1463	
Fixed effects:				
	Estimate	Standard error	z value	p value (>|z|)
Intercept	0.4090	0.4472	0.915	0.360436
generation: 2	-2.0363	0.6428	-3.168	0.001534
generation: 3	-2.3536	0.7031	-3.347	0.000816
generation: 4	-2.0782	0.7897	-2.631	0.008501
following envrironment: pause	-1.1212	0.4685	-2.393	0.016701
following envrironment: vowel	-0.5798	0.2870	-2.020	0.043364
position: initial	-1.4083	0.3449	-4.083	4.45*10^-5
position: cross-lexical	-2.5688	0.8000	-3.211	0.001323
position: medial	-1.5031	0.3480	-4.319	1.57*10^-5

Results for /dʒ/ parallel those for /tʃ/ to a large degree. Figure 3.5 plots percentage of /dʒ/ tokens that each speaker realized as a fricative against each speaker's year of birth. As figure 3.5 shows, there is a fall-off in fricative realizations between older and middle-aged Mexican Americans, just as for /tʃ/. Curiously, it is a different young speaker, and not one who is especially fluent in

Spanish, who stands out by showing high rates of fricatives for /dʒ/. Considering how closely /dʒ/ follows /tʃ/ in fricative realization in North Town, it seems odd that /dʒ/ has received so much less attention than /tʃ/ in past studies of MAE. It is highly unlikely that fricative realization of /dʒ/ characterizes MAE only in North Town or even southern Texas—and, after all, Wald (1984) had reported it from Los Angeles.

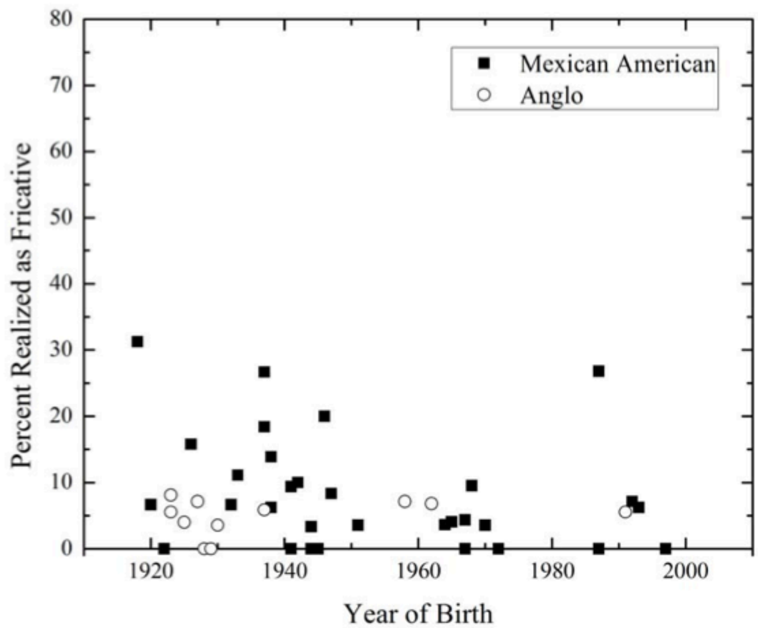

Figure 3.5 Percentages of realization of /dʒ/ as a fricative.

Logistic regression results for /dʒ/ are shown in Table 3.3. Similar tendencies emerged for /dʒ/ as for /tʃ/, but with some key differences. The generational drop between the first and second generations produced a p value of only .099701, and the third and fourth generations were even less significantly different from the first generation. Fricatives were significantly less likely to appear when a pause preceded /dʒ/ than when a consonant preceded it. As with /tʃ/, fricatives were less likely before a vowel. Also like /tʃ/, fricatives were less likely in initial and medial position, as in *just* and *sergeant*, than in final position, as in *college*.

Table 3.3 Best-model logistic regression results for fricative realization of /dʒ/, with speaker as a random effect. Educational level, which did not reach significance at p<.10 in a previous run, is excluded. Akaike Information Criterion=657.5, Bayesian Information Criterion=719.4, log likelihood=-315.7. Reference settings are realization: affricate; generation: 1; sex: male; preceding environment: consonant; following environment: consonant; and position: final.

Random effects:				
Group	Variance		Standard dev.	
Speaker (Intercept)	0.52685		0.72585	
Fixed effects:				
	Estimate	Standard error	z value	p value (>|z|)
Intercept	0.3688	0.5102	0.723	0.469679
generation: 2	-0.7661	0.4653	-1.646	0.099701
generation: 3	-0.4613	0.4792	-0.963	0.335738
generation: 4	-0.6644	0.5592	-1.188	0.234825
sex: female	-0.4658	0.3848	-1.211	0.224825
preceding environment: pause	-1.4270	0.6411	-2.226	0.026026
preceding environment: vowel	-0.1664	0.2256	-0.738	0.460684
following environment: pause	-0.2473	0.4586	-0.539	0.589725
following environment: vowel	-0.7559	0.2962	-2.552	0.010706
position: initial	-1.09201	0.3266	-3.344	0.000826
position: cross-lexical	-15.4478	993.8958	-0.016	0.987599
position: medial	-1.268	0.3419	-3.709	0.000208

For /ʃ/, the object of interest is the occurrence of affricates. The percentage of /ʃ/ tokens realized as affricates is plotted in figure 3.6. Much like fricative realizations of /tʃ/ and /dʒ/, a drop is discernable between older and middle-aged Mexican Americans. Two of the older speakers appear as outliers, with noticeably higher percentages than anyone else. Among Anglos, many of the affricate realizations were in positions after a nasal, as in *suspension*. In such words, the shift from a voiced nasal stop to a voiceless fricative commonly produces a period of voicelessness before the frication commences, which is to say, a voiceless stop—the first element of the affricate [tʃ].

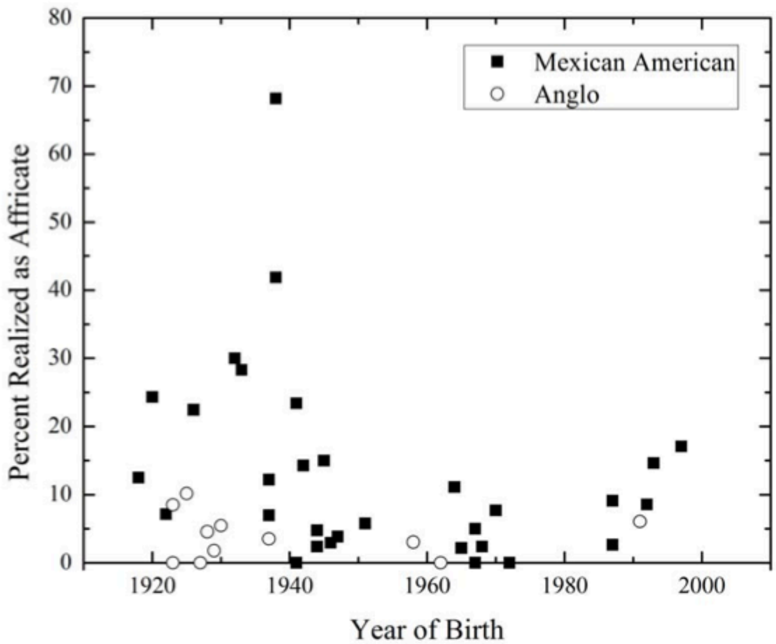

Figure 3.6 Percentages of realization of /ʃ/ as an affricate.

Data from the Mexican American subjects was subjected to logistic regression just as with /tʃ/ and /dʒ/. The analysis was set up so that it assessed the proportion of fricatives, the same as for the other post-alveolars. Results are shown in Table 3.4. As might be expected, the results for /□/ are in large part a mirror image of the results for /tʃ/ and /dʒ/. Generations 2, 3, and 4 are all significantly different from generation 1, but the polarity of the estimates is positive instead of negative, indicating that the latter generations show a greater proportion of fricatives. Fricatives are significantly more likely after a vowel than after a consonant. The negative polarity of the estimates for initial, cross-lexical, and medial position—as opposed to the positive polarities seen for /tʃ/ and /dʒ/—reflects the fact that fricatives are more favored in the reference position, word-final.

Interdental fricatives

Both /θ/, as in *thick*, and /ð/, as in *this*, occur in a number of variant realizations in dialects of English. /θ/ may be realized as a dental or alveolar stop (“stopping”) or as a labiodental fricative. /ð/ is subject to those processes as well, but it can also undergo assimilation to a preceding consonant, as in [wəzˈæt] ‘was that’ (Taylor 1997). In the North Town interviews, stopping and assimilation of /ð/ were common and stopping of /θ/ was present but somewhat less common. /ð/ occurs in spontaneous speech a great deal more frequently than /θ/ because it occurs in many common function words, which makes it easier to collect substantial corpora of /ð/ than of /θ/. Because /ð/ undergoes more processes, is mutated more often, and is much more frequent, a decision was made to focus on /ð/ and not analyze /θ/. The two processes that /ð/ undergoes, stopping and assimilation, were then treated as separate variables.

Stopping of /ð/ is fairly well-known as a feature of MAE. Ornstein (1975), Penfield and Ornstein-Galicia (1985:36), and Fought (2006) regard stopping of /ð/ (in any phonetic context) as characteristic of MAE. Castro-Gingrás (1972), however, found it mainly among more heavily accented Mexican Americans. This last study is one of the few that have analyzed the variable quantitatively in MAE.

Tokens of /ð/ were analyzed and coded, using a combination of audition and examination of spectrograms just as with the post-alveolars. Each token was identified as an interdental fricative, a stop (dental and alveolar stops were not distinguished), an affricate (i.e., [dð]), an alveolar fricative, a labiodental fricative, assimilated to a preceding consonant, ambiguous between assimilated and stopped, or elided. Alveolar and labiodental fricatives were exceptionally rare. Tokens with a stop articulation that fall after /t/ or /d/, as in *at this*, constituted the ambiguous tokens. In statistical comparisons, they were not counted as stopped or as assimilated.

For stopping of /ð/, the key acoustic cue was the presence or absence of a stop burst, as shown in figure 3.7. Although a burst may occasionally be camouflaged by a glottal pulse, the burst must be present in order for a stop to have been produced. Presence of a burst obligatorily indicates a stop. This cue was crucial because, to the ears of a native English speaker, dental stops and interdental fricatives often sound virtually indistinguishable. Whenever possible, at least 100 tokens of /ð/ were analyzed for each speaker. Only one speaker had fewer than 100 tokens. A total of 4781 tokens were coded.

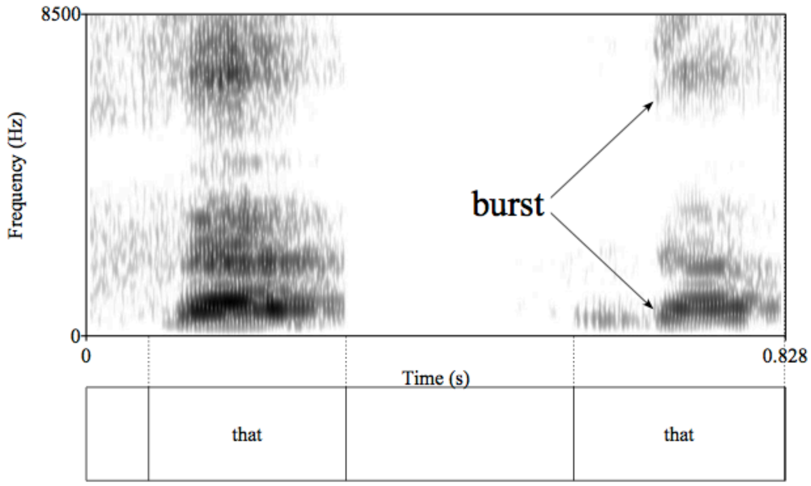

Figure 3.7 Spectrogram showing /ð/ in the word *that* realized as a fricative (left) and as a stop (right). Note the absence of a stop burst on the left and its presence on the right.

Tokens were coded according to whether the preceding element was a consonant, a vowel, or a pause. They were also coded according to whether the /ð/ was word-initial, word- medial, or word-final. The vast majority of tokens were word-initial, though there are ample numbers of word-medial tokens, such as in *other*. Word-final tokens were quite rare, in part because most speakers in this region produce /θ/, not /ð/, at the end of *with*. A few tokens of *with* by an elderly Anglo who had /ð/ in that word and one token each of *breathe* and *smooth* by Mexican Americans constituted the only tokens of word-final /ð/ in the corpus.

The preceding element had a noticeable effect on the stopping of /ð/. Figure 3.8 shows the percentage of stopped /ð/ tokens after consonants by each speaker. The amount of stopping varies widely among Mexican Americans, though not with any obvious change across generations. Stopping in this context occurs only sporadically among Anglos.

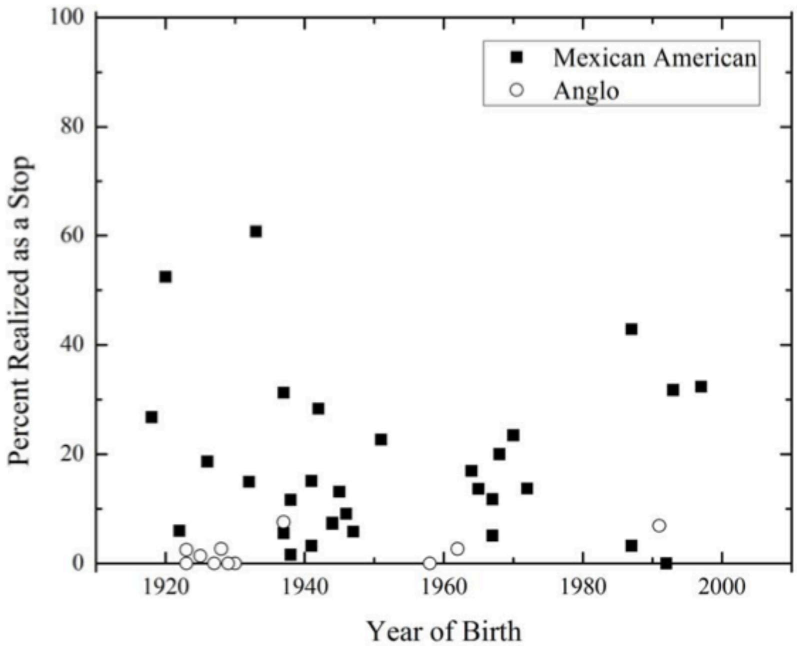

Figure 3.8 Percentages of stopped /ð/ tokens when /ð/ follows a consonant.

Some striking differences appear in figure 3.9, which shows the percentage of stopped /ð/ tokens after pauses by each speaker. First, the percentages are consistently higher than after consonants. Second, Anglos show an appreciable amount of stopping here. The behavior of the Anglos and the increased rates of stopping among Mexican Americans probably relate to the difficulties inherent in articulating voiced fricatives. Optimal frication requires more airflow than glottal pulsing, so a tradeoff is necessary. That tradeoff is an intermediate amount of airflow that is ideal neither for frication nor for glottal pulsing. The problem is exacerbated when airflow is initiated, as it is after a pause. In this case, the speaker needs to coordinate the onset of airflow and the movement of the tongue tip just right. Moreover, the amount of airflow has to rise to an adequate level to sustain frication but not so high that it prevents glottal pulsing. Figure 3.9 suggests, however, that speakers do not attain the perfect combination of articulatory gestures every time. If the tongue tip reaches the teeth before airflow is sufficient, the airflow cannot prevent the tongue from creating a full closure and a stop results.

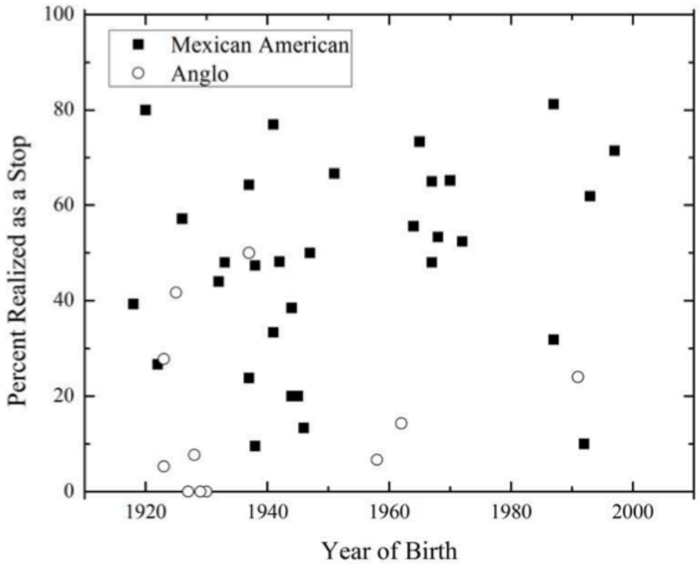

Figure 3.9 Percentages of stopped /ð/ tokens when /ð/ follows a pause.

The opposite conditions prevail when /ð/ falls after a vowel, in which case airflow is already present before the onset of /ð/. This situation favors fricatives. As can be seen in figure 3.10, which shows stopping of word-initial /ð/ when the previous word ended in a vowel, the percentages of stops are relatively low. The stopping practically disappears altogether for word- medial /ð/ following a vowel, as in figure 3.11.

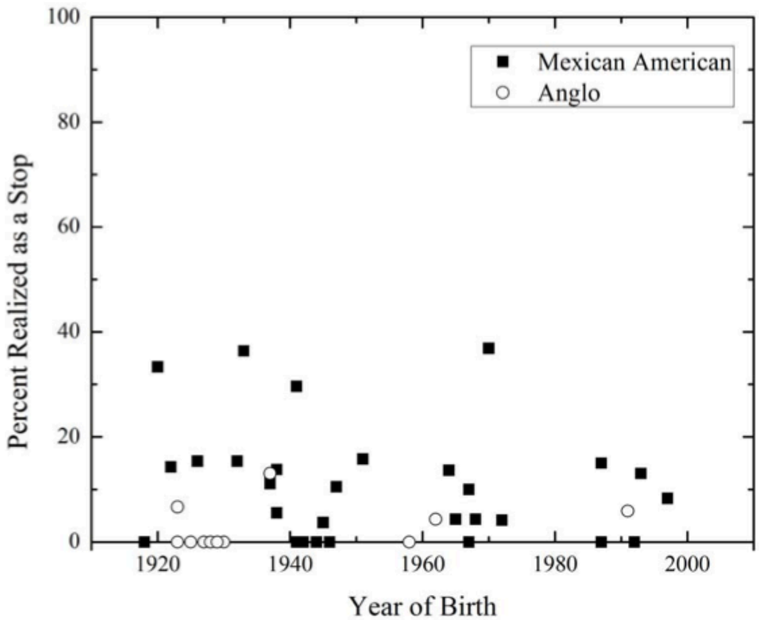

Figure 3.10 Percentages of stopped /ð/ tokens for word-initial /ð/ following a vowel.

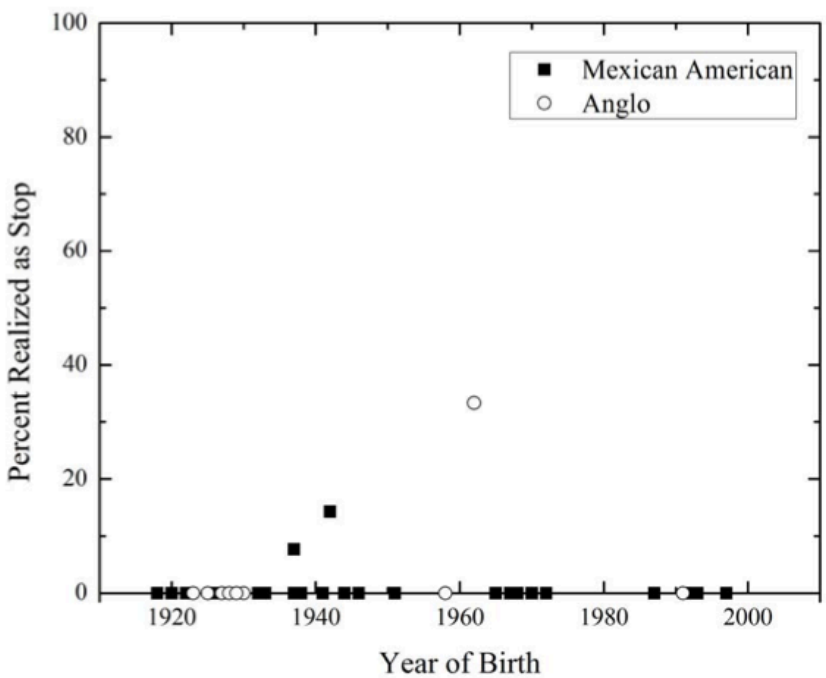

Figure 3.11 Percentages of stopped tokens for word-medial /ð/ following a vowel.

The behavior of /ð/ in North Town MAE resembles the behavior of Spanish /d/. In Spanish, /d/, which is normally dental instead of alveolar, is produced as a stop after a pause, a nasal, or a lateral (as in *andar* ‘to walk’ or *Dos* ‘two’ if it occurred after a pause) and as a continuant after a vowel (e.g., *cada* ‘each’). The continuant is generally closer to an approximant than a fricative, and its conditioning crosses word boundaries, as in *para dos* ‘for two’ (Hammond 2001; Hualde 2005). This conditioning is, in all likelihood, related to the articulatory issues just discussed. The patterning of /ð/ in MAE then begins to seem like a chicken-and-egg situation: is it due to the articulatory factors or to the Spanish substrate? A fair answer would be to attribute it to both factors. The articulatory factors by themselves result in the kinds of patterns that the Anglos exhibit. The Spanish substrate, however, elevates the amount of stopping, primarily in contexts in which Spanish /d/ is produced as a stop.

The data for stopping of /ð/ were subjected to logistic regression with speaker as a random variable. Sex, generation, and educational level did not reach statistical significance in the initial run. The results of the best model, which excludes those variables, are shown in Table 3.5. Ethnicity is highly significant, with Mexican Americans more likely to produce stops. Stops are significantly more likely after a pause than after a consonant and significantly less likely after a vowel than after a consonant. Medial position is significantly less likely to show stops than initial position. All of these factors turned out as expected.

Table 3.5 Best-model logistic regression results for stopping of /ð/, with speaker as a random effect. Sex, generation, and educational level, which did not reach significance at $p<.10$ in a previous run, are excluded. Akaike Information Criterion=3393, Bayesian Information Criterion=3438, log likelihood=-1689. Reference settings are realization: stop; ethnicity: Anglo; preceding environment: consonant; and position: initial.

<table>
<tr><td colspan="5">Random effects:</td></tr>
<tr><td>Group</td><td colspan="2">Variance</td><td colspan="2">Standard dev.</td></tr>
<tr><td>Speaker (Intercept)</td><td colspan="2">1.1558</td><td colspan="2">1.0751</td></tr>
<tr><td colspan="5">Fixed effects:</td></tr>
<tr><td></td><td>Estimate</td><td>Standard error</td><td>z value</td><td>p value (>|z|)</td></tr>
<tr><td>Intercept</td><td>-4.0023</td><td>0.3816</td><td>-10.487</td><td>2*10^-16</td></tr>
<tr><td>ethnicity: Mex. Am.</td><td>2.1554</td><td>0.4286</td><td>5.029</td><td>4.92*10^-7</td></tr>
<tr><td>preceding environment: pause</td><td>1.6662</td><td>0.1014</td><td>16.432</td><td>2*10^-16</td></tr>
<tr><td>preceding environment: vowel</td><td>-0.6426</td><td>0.1493</td><td>-4.304</td><td>1.67*10^-5</td></tr>
<tr><td>position: final</td><td>2.9050</td><td>1.7772</td><td>1.635</td><td>0.102139</td></tr>
<tr><td>position: medial</td><td>-2.4808</td><td>0.7339</td><td>-3.380</td><td>0.000724</td></tr>
</table>

Assimilation of /ð/ to a preceding context behaves in a manner much different from stopping. It can occur only after another consonant, and because it is rare after /r/, medial contexts such as in *further* are not a factor, so only word-initial examples are relevant. These restrictions eliminate preceding environment and position as relevant independent variables. Assimilation tends to be most common after /n/, as in [ənˈɪn] 'an' then,' and after /z/, as in [wəzˈæt] 'was that.' If tokens that are ambiguous between stopping and assimilation, such as [ətə] 'at the,' are counted, it might be common after /t/ and /d/ as well.[2] These ambiguous tokens were not counted as assimilated in statistical analyses, however.

Just as with the other variables, a combination of audition and examination of spectrograms was used to assess whether a token showed assimilation of /ð/. When [ð] is present, a discontinuity between the preceding segment and the [ð] will be present in a spectrogram, as in figure 3.12. If /ð/ is assimilated, no such discontinuity will be apparent. For auditory judgment, the consonantal interval and the following vowel were isolated and played in order to determine whether any [ð] was audible. The quality of the consonant/vowel transition was most useful in this regard.

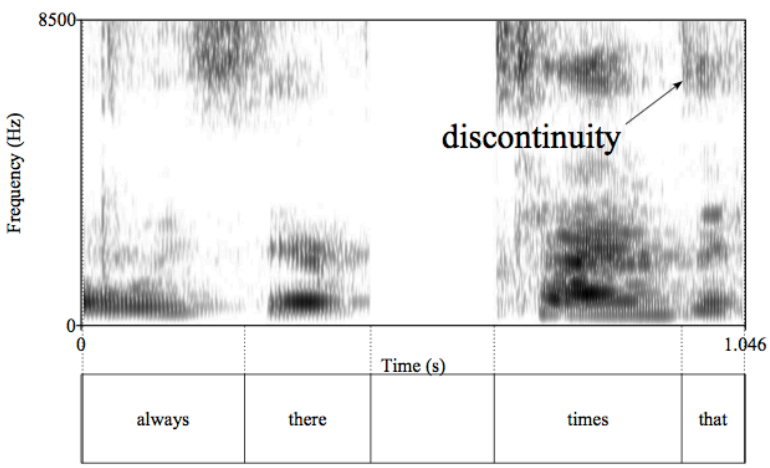

Figure 3.12 Spectrogram of assimilated [ð] (left) and unassimilated [ð] (right) illustrating a discontinuity with the preceding segment for the unassimilated token.

[2] The realizations when /ð/ is mutated after /n/, /t/, or /d/ provide evidence that this process is indeed assimilation and not deletion of /ð/. In such cases, a stop, not a tap, is observed for the vast majority of tokens: e.g., [ɪnə] 'in the,' [ətə] 'at the.' In contrast, taps are practically obligatory when the second word in such sequences begins with an unstressed vowel: e.g., [ɪɾ̃ə] 'in a,' [əɾə] 'at a.'

Figure 3.13 shows the percentage of /ð/ tokens that were assimilated by each speaker. Almost everybody shows assimilation in some instances, primarily in rapid speech or under weak stress. The highest degrees of assimilation, however, occur among Anglos. It is notable that, of the two non-standard variants associated with /ð/, stopping is predominantly a Mexican American feature and assimilation is predominantly Anglo. Mexican Americans have rejected the high levels of assimilation that typify the speech of certain Anglos.

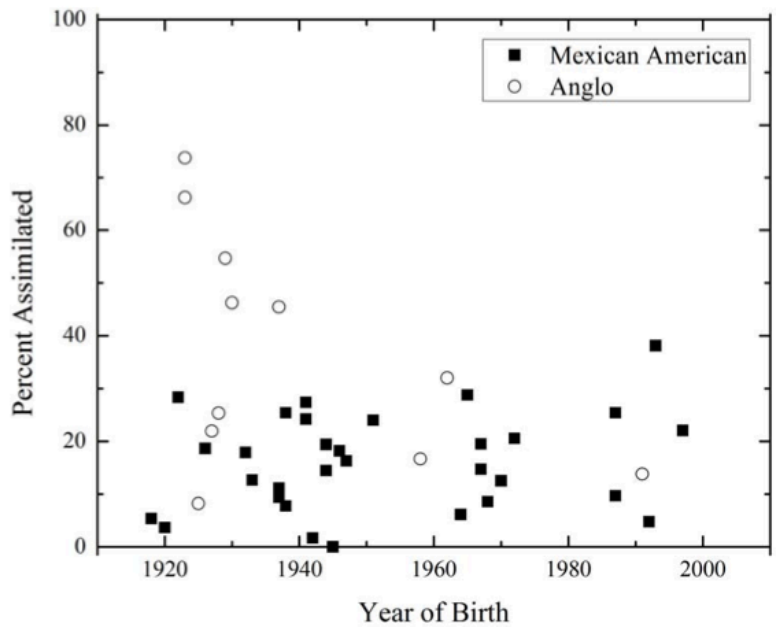

Figure 3.13 Percentages of assimilated tokens of /ð/

Logistic regression with speaker as a random variable was applied to assimilation of /ð/. Generation did not reach statistical significance in the initial run. In the better model, shown in Table 3.6, ethnicity was highly significant, not surprisingly. College-educated subjects showed significantly more assimilation than people with only a grade school education, probably because all the people with only a grade school education were Mexican Americans but many of the Anglos had a college education.

Table 3.6 Best-model logistic regression results for assimilation of /ð/, with speaker as a random effect. Preceding environment and word position are not relevant for assimilation. Generation and sex, which did not reach significance at p<.10 in a previous run, are excluded. Akaike Information Criterion=3469, Bayesian Information Criterion=3501, log likelihood=-1729. Reference settings are realization: assimilated; ethnicity: Anglo; sex: male; and educational level: grade school.

Random effects:				
Group	Variance		Standard dev.	
Speaker (Intercept)	0.41292		0.64259	
Fixed effects:				
	Estimate	Standard error	z value	p value (>|z|)
Intercept	-1.7992	0.4068	-4.423	9.74*10^-6
ethnicity: Mex. Am.	-0.9937	0.2540	-3.913	9.12*10^-5
educational level: high school	0.2816	0.3600	0.782	0.4341
educational level: college	0.8660	0.3857	2.245	0.0248

R-lessness

R-lessness, or non-rhoticity, is the absence of /r/ in pre-pausal and pre-consonantal positions, as in *here* and *four* when preceding a pause or a word beginning with a consonant, or as in *beard* and *hard*. Some dialects, such as African American Vernacular English (AAVE) and some old-fashioned Southern White Anglo varieties, extend the process to intervocalic /r/, especially at word boundaries (see, e.g., Thomas 2007). When the /r/ is present, the realization is said to be *r*-ful, or rhotic. In contrast to the other features covered here, *r*-lessness does not have an obvious source in Spanish interference (though see below).

R-lessness is not a feature commonly associated with MAE. Galindo (1987), one of the few sources that mention rhoticity, regards MAE as basically *r*-ful. Nevertheless, several studies have discussed the occurrence of *r*-lessness in MAE. Harris (1969) reported that Mexican Americans and African Americans in Austin, Texas, showed more stylistic variation in *r*-lessness than White Anglos there. McDowell and McRae (1972), who also examined *r*-lessness among Mexican Americans, African Americans, and White Anglos in Austin, found variability in *r*- lessness among all three groups, but with African Americans showing much more r-lessness than the other two. *R*-lessness usually decreased with increasing formality of speaking style, though in contrast to Harris (1969), slightly less for Mexican Americans than for Anglos. Neither study employed statistical analysis, and with Harris's small sample size (six Mexican Americans) and the wide variation among individuals that McDowell and McRae found, it is doubtful that the stylistic differences would have reached statistical significance. Galindo (1987), in a third study of Austin, reported that MAE there was almost entirely *r*-ful. However, she found one male subject who showed extensive contact with and orientation toward African Americans, and he showed a great deal of *r*-lessness. Contact with African Americans is certainly a plausible explanation for this behavior, as numerous studies have shown African Americans to exhibit high degrees of *r*-lessness: see Thomas (2007) for a review. Bernstein (1993) and Tillery, Bailey, and Wikle (2004) analyzed findings from a public poll of Texas in which several words were elicited from respondents. One of these words was *forty*, and *r*-lessness was tallied for it and subjected to statistical analysis. Their results placed Mexican Americans in an intermediate position between White Anglos, who were more *r*-ful, and African Americans, who were more *r*- less. Hartford (1975) studied MAE in Gary, Indiana, and noted that Mexican Americans differed according to their occupational aspirations. Those with lower aspirations tended to show more vernacular features, some of them interference features from Spanish and others borrowed from AAVE. One of these vernacular features that she attributed to borrowing from AAVE was *r*- lessness. Her subjects showed 32% *r*-lessness in codas after a front vowel, 30% in unstressed syllables, 22% in codas after a back vowel, and 2% for stressed, syllabic /r/. They also showed more *r*-lessness before consonants than before vowels or pauses. These constraints match those found in other groups in part. However, they differ in that codas after a front vowel showed greater *r*-lessness than unstressed syllables and in the fact that *r*-lessness was about the same before vowels and before pauses.

In the context of southern Texas, it would be expected that the Anglo contact dialect should show some *r*-lessness. Historically, the coastal plain of Texas, settled by Anglos from the Gulf States, did show a great deal of *r*-lessness. A number of studies over the years (e.g., Stanley 1936:240-46, Norman 1956, Harris 1969, McDowell and McRae 1972, Bernstein 1993, Tillery et al. 2004) have described varying degrees of *r*-lessness among Texas Anglos. Pederson et al. (1986-92, vol. 5) provide tables and maps for numerous words showing that *r*-lessness occurred throughout the section of Texas that they covered but was much more prevalent along the Gulf coast than inland. The Anglo settlers in North County were largely “Hill Southerners” with roots in Arkansas and Tennessee who would have been relatively *r*-ful. Even in the Upper South, however, there was some residual *r*-lessness in favored contexts such as unstressed syllables. Hence, *r*-lessness occurring in the English of North Town Mexican Americans could have spread from Anglo speech. At the same time, it is conceivable that the now-vanished African American population of North Town could have been a contact source of *r*-lessness in North Town MAE, or that it has been reinforced more recently through exposure to Hip Hop or other African American cultural icons. It is also possible that Spanish influence could have played a role, as final /r/ is sometimes elided in certain dialects of Spanish (Lipski 2007). A less direct Spanish influence could occur if the switch from the tapped and trilled /r/ forms of Spanish to the bunched or retroflex articulations of English (each of which involves not merely a dorsal or retroflex constriction but a pharyngeal constriction as well—cf. Delattre and Freeman 1968) created some difficulty.

At any rate, *r*-lessness does occur in North Town English at low levels and it is found in the speech of both Mexican Americans and Anglos. We analyzed it as a binary variable, but, as with post-alveolars and /ð/, decisions on whether a token was *r*-ful or *r*-less were based on a combination of auditory and spectrographic scrutiny. The use of spectrograms to judge rhoticity served as a check on the auditory analysis, and this practice sets our analysis apart from previous studies of *r*-lessness. Lowering of the third formant (F_3) is the hallmark of /r/ in American (and most other) English varieties. By examining whether F_3 was lower where the /r/ occurred than it was in the vowels in nearby syllables, we could, in conjunction with audition, determine whether a token was *r*-ful or *r*-less. An illustrative spectrogram is shown in figure 3.14.

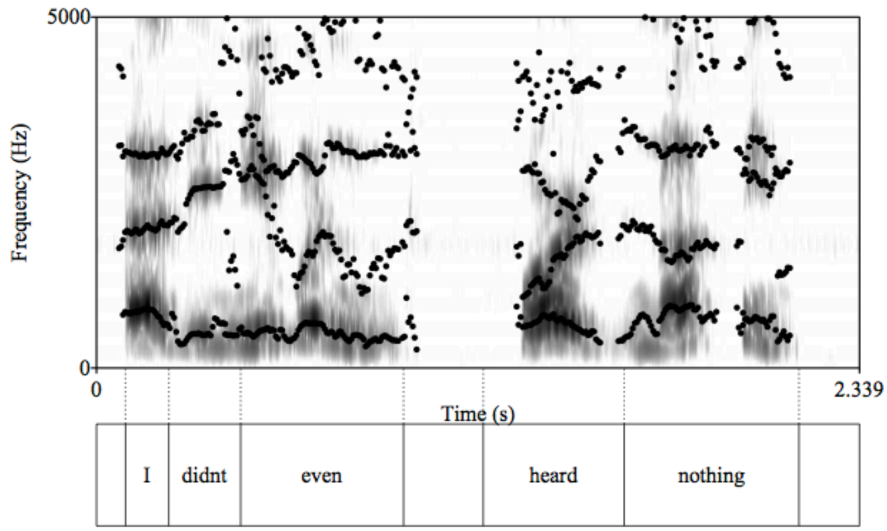

Figure 3.14 A spectrogram with a superimposed LPC formant track illustrating how syllabic /r/ shows lower F_3 values than vowels in nearby syllables. F_3 reaches its lowest point in the word *heard*.

Tokens of /r/ that preceded a consonant or a pause were included. We also tallied tokens of /r/ preceding word boundaries when the next word began with a vowel, as in *there and* or *better in*. Cases in which a word-final /r/ was followed by a word beginning with /r/ were excluded. Tokens were coded as one of six categories: 1) stressed, syllabic /r/, as in *first* or *sir*; 2) coda /r/ following a front vowel, as in *stairs* and *here*; 3) coda /r/ following a back vowel, as in *hard* or *before*; 4) unstressed /r/ following /ð/, as in *other* or *together*; 5) the word *over*; and 6) all other unstressed /r/, as in *better* or *survive*. Categories 4 and 5 were distinguished from category 6 because they showed noticeably higher rates of *r*-lessness. Whether a consonant, a vowel, or a pause followed the /r/ was also coded. Tokens for which the sound quality was too poor for confident coding were omitted. Whenever possible, we coded at least 120 tokens for each speaker. 39 of the 42 subjects have at least 120 tokens, and among the remaining three, the lowest total was 99 tokens. 5682 tokens in all were included in the analysis.

A partial breakdown of the results is given in Table 3.7. Mexican Americans and Anglos show essentially the same patterning, but Anglos exhibit lower rates of *r*-lessness. The results showed some familiar patterns and some unfamiliar ones. As expected, *r*-lessness was rare in stressed, syllabic contexts, with only 0.6% *r*-lessness. A previously unreported pattern is that, when *over* and post-/ð/ tokens are removed, the remaining unstressed tokens show approximately the same degree of *r*-lessness (8.4%) as coda /r/ does (8.5%). *Over* was 69.2% *r*-less and post- /ð/ tokens were 35.3% *r*-less. This finding suggests that *over* has been lexicalized without /r/ for many residents of North Town. The high rate of post-/ð/ *r*-lessness may have an articulatory explanation. Production of an interdental requires forward movement of the tongue, while production of English /r/, whether bunched or retroflex, requires lingual retraction. The two gestures work against each other, making it difficult to say both sounds in quick succession. A similar effect of /ð/ on *r*-lessness rates was discussed in Wolfram and Thomas (2002) for White Anglos and African Americans in a very different community, Hyde County, North Carolina.

Table 3.7 /r/ realization by context and ethnicity. Numbers indicate numbers of tokens.

contextual position	following element	Mexican Americans			Anglos			All Subjects		
		r-ful	*r*-less	*r*-less/total	*r*-ful	*r*-less	*r*-less/total	*r*-ful	*r*-less	*r*-less/total
stressed syllabic	consonant	613	4	4/666 0.6%	177	1	1/195 0.5%	790	5	5/861 0.6%
	pause	24	0		6	0		30	0	
	vowel	25	0		11	0		36	0	
coda after front vowel	consonant	444	56	74/898 8.2%	193	7	13/363 3.6%	637	63	87/1261 6.9%
	pause	197	9		63	3		260	12	
	vowel	183	9		94	3		277	12	
coda after back vowel	consonant	602	93	104/881 11.8%	266	13	19/333 5.7%	868	106	123/1214 10.1%
	pause	84	5		16	3		100	8	
	vowel	91	6		32	3		123	9	
over	consonant	13	69	71/92 77.2%	6	11	12/28 42.9%	19	80	83/120 69.2%
	pause	2	1		4	0		6	1	
	vowel	6	1		6	1		12	2	
un-stressed after /ð/	consonant	68	62	74/219 33.8%	19	19	26/64 40.6%	87	81	100/283 35.3%
	pause	43	8		13	2		56	10	
	vowel	34	4		6	5		40	9	
other un-stressed	consonant	823	118	128/1420 9.0%	297	32	35/523 6.7%	1120	150	163/1943 8.4%
	pause	236	6		88	0		324	6	
	vowel	233	4		103	3		336	7	

There does not appear to be a strong trend across generations within the community. Figures 3.15 and 3.16 show percentages of *r*-lessness in coda and unstressed (non-*over*, non- post-/ð/) positions, respectively. Although it is customary in studies of *r*-lessness to exclude tokens that occur before a vowel because that context tends to condition a "linking *r*," these tokens are included here because in this community pre-pausal tokens group with pre-vocalic tokens, as will be discussed below. Among Mexican Americans, there is no readily obvious increase or decrease in *r*-lessness across year of birth.

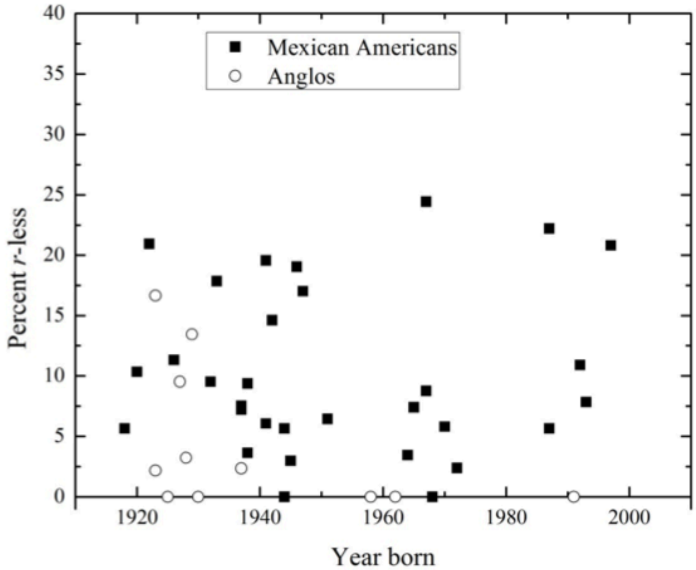

Figure 3.15 Rates of *r*-lessness in syllable codas, collapsing position after a front vowel and position after a back vowel.

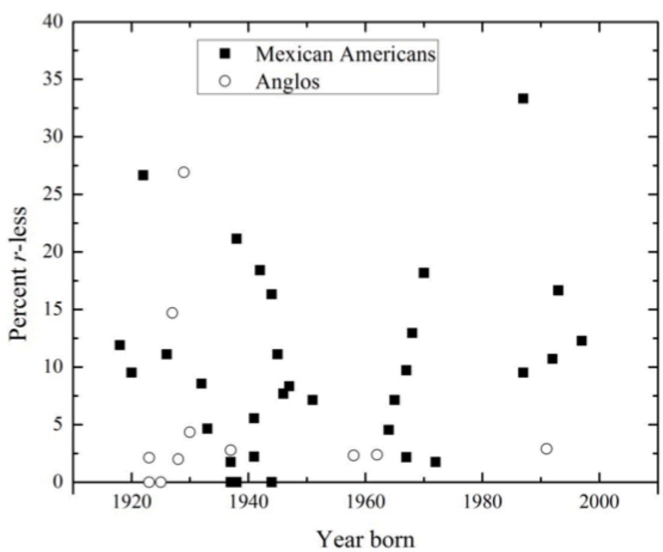

Figure 3.16 Percentages of *r*-lessness in unstressed syllables, excluding *over* and post-/ð/ tokens.

The data were subjected to logistic regression with a random effect for speaker. Sex and educational level did not reach significance in an initial run of the logistic regression. In a subsequent run, those two variables were excluded and a more optimal model was produced. This model is shown in Table 3.8. Mexican Americans were significantly more *r*-less than Anglos, as indicated by the negative polarity of the number in the "Estimate" column in the row for "ethnicity: Mex. Am." One generational difference reached statistical significance, but only at p=.03317: the third generation was more *r*-ful than the first generation, which was used as the reference generation. No other generations showed a significant difference from the first generation. The analysis bears out the observed patterns for linguistic variables. Both position of /r/ and what follows it ("before" in the table) show highly significant effects.

Table 3.8 Best-model logistic regression results for rhoticity, with speaker as a random effect. Sex and educational level, which did not reach significance at p<.10 in a previous run, are excluded. Akaike Information Criterion=2867, Bayesian Information Criterion=2954, log likelihood=-1421. Reference settings are realization: r-ful; ethnicity: Anglo; generation: 1; position: nuclear; and before: consonant.

Random effects:				
Group	Variance		Standard dev.	
Speaker (Intercept)	0.47049		0.68592	
Fixed effects:				
	Estimate	Standard error	z value	p value (>|z|)
Intercept	5.82793	0.51946	11.219	2*10^-16
ethnicity: Mex. Am.	-0.99597	0.30590	-3.256	0.00113
generation: 2	0.48113	0.32560	1.478	0.13950
generation: 3	0.73425	0.34471	2.130	0.03317
generation: 4	0.00176	0.37272	0.005	0.99623
position: *over*	-6.39459	0.50841	-12.578	< 2*10^-16
position: coda after back vowel	-3.16216	0.46470	-6.805	1.01*10^-11
position: coda after front vowel	-2.88408	0.46918	-6.147	7.89*10^-10
position: after /ð/	-5.12597	0.47641	-10.760	< 2*10^-16
position: other unstressed	-3.03613	0.46215	-6.570	5.05*10^-11
before: pause	1.47587	0.19231	7.675	1.66*10^-14
before: vowel	1.34652	0.18519	7.271	3.57*10^-13

As noted earlier, when post-/ð/ tokens and *over* are removed, the remaining unstressed tokens exhibit rates of *r*-lessness close to those of coda /r/. As a post hoc procedure, logistic regression was run with the reference state for position set to each of the different positions. This procedure allowed comparison of whether each position differed significantly from each other position. The outcome was that the six contexts fell neatly into four groups, with no overlap, as shown in figure 3.17. The word *over* formed a group by itself as the most *r*-less. Next came the post-/ð/ tokens. They were followed by an assemblage of other unstressed /r/, codas after front vowels, and codas after back vowels. Stressed nuclear position was most *r*-ful. Aside from the status of nuclear position, this configuration is not reported in previous studies of rhoticity.

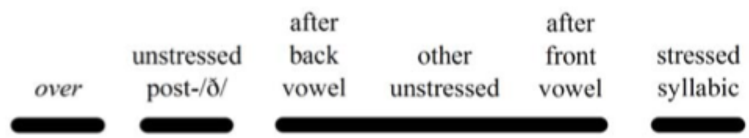

Figure 3.17 Ordering of positional constraints on *r*-lessness. Bars unite constraints that do not differ significantly from each other.

The same kind of post hoc analysis was performed on the following element. Once again, an unorthodox configuration was confirmed. Pre-pausal contexts did not differ significantly from pre-vocalic contexts, though both were significantly more *r*-ful than pre- consonantal contexts, as depicted in figure 3.18. This result agrees with the pattern found by Hartford (1975). However, in most dialects of English that are basically *r*-less, [ɹ] is retained before a vowel but not before a consonant or a pause. The high rate of retention here before pauses has a straightforward explanation. Tokens falling before pauses ordinarily were subject to pre-pausal lengthening, which should result in less phonetic undershoot of the [ɹ] because the speaker has more time to move the articulators into place.

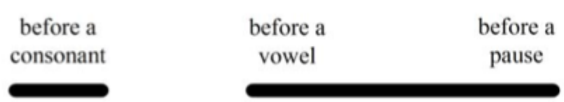

Figure 3.18 Ordering of following element constraints on *r*-lessness. Bars unite constraints that do not differ significantly from each other.

R-lessness, while not usually thought of as distinguishing MAE, emerged as a significant variable correlating with ethnicity in North Town. Although the origin of *r*-lessness in the MAE of North Town is obscure and it may have multiple sources, it occurred consistently, if at low frequencies, in the data. Analyses of variables of this sort that are not considered characteristic of a particular dialect are necessary to provide a broad picture of how the dialect develops. Moreover, new configurations, such as those observed here for context and following element, may come to light. The new patterns found in this study for *r*-lessness could provide fresh perspectives on how *r*-lessness first appeared in other dialects before it assumed its current patterning in those dialects.

Commonality vs. Diversity

The seven consonantal variables analyzed here—three post- alveolars (/ʃ/, /tʃ/, and /dʒ/) plus /l/, /r/, /ð/ stopping, and /ð/ assimilation—demonstrate that even patterns that are strongly correlated with ethnicity cut across MAE and the community at large in different ways. They seem to exhibit substrate influence from heritage Spanish in different ways and to differing degrees. All of these features share in common a significant difference in production between North Town Mexican Americans and Anglos. However, some features show robust ethnic differentiation in patterns consistent with how they are produced in Spanish, others show differentiation in expected ways (but are perhaps not as much a reflection of the Spanish influence), and two show patterns that are difficult to explain from predicted substrate effects.

Of the former category, the three post-alveolars are a case in point. They pattern in MAE in a ways consistent with how Spanish /tʃ/ falls out in some forms of Spanish because nearly the same linguistic constraints operate in both languages. The post-alveolars in MAE tend toward affricates in word initial positions but toward fricatives in word-final and (to some extent) medial positions, constraints similar to those reported for /tʃ/ in certain Spanish dialects. Nevertheless, there is a significant decrease in this pattern among the English-dominant generations, suggesting that it is, with occasional exceptions, tied to use of Spanish as a first language.

Likewise, /ð/-stopping and /l/ realization are tied to Spanish patterns. For these variables, however, the Spanish-influenced forms persist across generations. /ð/-stopping reflects the patterning of Spanish /d/: it is more likely to be stopped in post-pausal and post-consonantal positions than after a vowel. In fact, stops are decidedly rare after a vowel within the same word, as in *other*. Even though stops are not categorical in the favored contexts, as they presumably are for Spanish /d/, the observed configuration reflects the behavior of Spanish /d/. Birth year was not a significant predictor for this variable, which has remained stable and salient for Mexican Americans over time.

For /l/, MAE realizations are significantly lighter—less velar—than the Anglos'. This effect is independent of linguistic factors such as vowel context and duration and shows no change over time. It has clearly remained a robust feature of the North Town ethnolect and in all likelihood it stems from the substrate Spanish, whose /l/ is attested to be lighter than English /l/. MAE /l/ may not as light as Spanish /l/ and the relationship between its linguistic constraints and those of Spanish /l/ remains to be fully explored, but the tie between ethnolect and heritage language seems clear for this variable. Both /ð/-stopping and light /l/ have made the leap from Spanish interference features to stable ethnolectal features.

If the above group of variables transparently reflects Spanish influence, the last two consonantal features (/ð/-assimilation and /r/) covered in this chapter show ethnic differentiation for other reasons. Ethnicity is a significant predictor for the assimilation of /ð/ to a preceding context, but there is no necessary phonological expectation for how or why this ethnic differentiation would happen for this feature in this community. In Spanish, the [ð]-like allophone of /d/ does not occur after most consonants, the context for assimilation of English /ð/. Hence, Spanish influence cannot promote assimilation. What we find in North Town, however, is an ethnic difference of a different sort. Although nearly all speakers exhibit sporadic /ð/ assimilation, the speakers with high rates of assimilation are all Anglos. It appears that Mexican Americans have rejected a vernacular Anglo feature. This theme will resurface in chapter 5, which covers the vowels.

The final consonantal feature analyzed in this chapter is the most enigmatic. Our analyses find that North Town Mexican Americans are significantly more *r*-less than are their Anglo neighbors. The degree of *r*-lessness, while low and somewhat restricted in its contextual occurrence, is not diminishing appreciably across all four generations. It is unclear is why MAE shows higher rates of *r*-lessness than Anglo English in North Town. Even the provenance of this *r*-lessness is uncertain, though there are several possibilities and the actual source may be a combination of factors.

How does it happen that MAE in North Town can show consonantal features with such diverse trajectories of development? This question is central to the issue of how ethnolects develop. Much of the input comes from the heritage language, but the source language is certainly not the only factor. Some interference features persist and others do not, presumably because of social prestige, and additional features such as *r*-lessness that are not easily related to substrate influence soon enter the fray. The formation of a new ethnolect results from a convergence of factors, not one in particular. Its composition is not easily predictable either from contrastive analysis of the source and target languages or from the sociolinguistic configuration of the contact community.

As it turns out, the variables considered here are not the only phonological features analyzed here that show significant ethnic differentiation in North Town. The broadest cluster of variables correlating with the Mexican American/Anglo divide occurs within the vowel system, for which the ethnic differences are deep and pervasive. The vowels are the subject of chapter 5. There are even two additional consonantal variables—retention of /hw/, as in *when*, and retention of

/ju/ after coronals, as in *new*—that show significant ethnicity effects in ways that suggest Spanish influence. These two features also show strong correlations with generation (i.e., change over time), and thus will be discussed in the next chapter, which deals with diachronic changes.

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