The Acquisition of Variation with Incomplete Input: A Case Study of Spanish-English Bilingual Learners

Marielle Lerner

1 Introduction

In modeling language change that originates within the speech community, Labov (2007) based the starting point for children acquiring the language on the finding that children initially match their parents' values of the innovative forms. When they enter their peer group, most commonly when they begin formal schooling, they then participate in incrementation of the change, advancing to surpass their older peers. At the same time, studies have identified a lasting effect of parents' linguistic systems even while children adopt and advance community norms (Johnson 2010, Payne 1976, Roberts 1997b, Sankoff and Laberge 1973, Sankoff 2006). For stable variation, children have also been found to acquire their parents' probabilistic usage, and, rather than going on to increment these probabilities, maintain them upon entering their peer group (Payne 1976, Roberts 1994, Smith, Durham, and Fortune 2007).

This dissertation asks what we can learn about the acquisition of variation by examining cases when one of the principal contributors—either caregiver input or peer input—is absent in the process of language acquisition. This study will take as its subjects young children in the recently established Mexican community in South Philadelphia, specifically those originating in the region of Puebla. In this community, many children have been born in Philadelphia to immigrant parents, or immigrated at a young age. They speak Spanish at home, and begin learning English only on entering the school system. Thus, in Spanish they receive primarily caregiver input, but do not enter a community of Spanish-speaking peers. Meanwhile, they learn English from their peer group without caregiver input prior to school age.

I will attempt to answer the question of whether, lacking caregiver input in English, children still receive and process sufficient cues from peer input that allow them to identify and participate in a change in progress, and distinguish between ongoing change and stable variation. It has already been shown that when children encounter new dialect features in a monolingual environment, with parents who speak different dialects from the local dialect of their peers, their adoption of these features can be problematic (Payne 1976, Johnson 2010). This study will examine whether, analogously, children learning a new language from their peers rather than only a new dialect, will experience similar barriers to acquiring variable systems in the grammar. A related question is whether, from peer input alone, they will acquire the social and stylistic conditions that constrain variation in the same manner as their native English-speaking peers.

Conversely, I will also examine the question of whether, lacking peer input in Spanish, children still receive and process sufficient cues from caregiver input that allow them to identify and participate in a change in progress, and distinguish between ongoing change and stable variation. In the context of English, children in the Philadelphia Mexican community are presented with multiple generations of speakers, arguably a necessity for them to be able to advance a language change (Yang 2000). Meanwhile in the context of Spanish, during the process of acquisition many children receive only the

input of one generation of speakers; that of their parents. Thus this context will isolate the question of whether, lacking multi-generational evidence of a change, other cues might still indicate to children that a particular variable feature of their parents' speech was acquired during a change in progress, and result in incrementation of the change by the youngest generation. If this is not the case, another possible outcome could be the transformation of a change in progress into stable variation from the first to second generation of Mexican immigrants. In a theoretical discussion of language change, Guy (1980) suggests that "This course [of a language change] could also be reversed or arrested, yielding stable variable rules which persist for a long time." A further question is whether children will successfully expand and translate stylistic contexts for variation experienced at home with parents to include the range of stylistic contexts they come to experience in school and with peers.

In order to examine these questions, linguistic analysis of the acquisition of both stable variation and variables undergoing change in Philadelphian English and Poblano Spanish will be conducted. For an analysis of stable variation in English, I will use (-t,d) deletion (Guy 1980, Labov 1989, Guy and Boyd 1990, Roberts 1994, 1997b). For an analysis of ongoing change in English, I will use (ay0), the centralization of /ay/ preceding voiceless consonants (Payne 1976, 1980; Labov 2001; Roberts 1997a; Conn 2005; Wagner 2007, 2008). For an analysis of stable variation in Mexican Puebla Spanish, I will use word-final /n/ variation (between alveolar, velar, and zero realizations) (Amastae and Satcher 1993, Lipski 1986, 1994, Lope Blanch 1990). Finally for an analysis of ongoing change in Mexican Poblano Spanish, I will use syllable-final /ɾ/ frication and assibilation (Rissel 1989, Lipski 1994, Moreno de Alba 1994, Potowski 2011).

As Roberts observes, "The study of the acquisition of variable rules can do much to inform both the studies of sociolinguistics and language acquisition" (Roberts 1997a:369). In Section 2 I review what we have learned from such studies so far, and their relevance to the questions asked in this study.

2 Acquisition of Variation: Background

Labov makes the interesting observation that "The speakers of the language preserve its history in its variable aspects, even more than its invariant aspects" (Labov 1989:86). This statement reflects the importance of what the variable features of language can tell us about language change. Roberts and Labov (1995) emphasize the importance of including preschool age children (ages 3 and 4) in studies of the speech community. They report that children at this age acquire variable rules along with categorical grammatical rules, as well as the norms of their local dialect, and participate in changes in progress. Language change by transmission begins and is advanced at the point when children acquire different forms or usage from their parents. Thus this study will examine child acquisition of linguistic variation in order to illuminate the processes of language change.

In particular this study will focus on the relative influences of peer and caregiver input to a child's acquisition. Poplack expresses a conclusion that many have come to: "Current research on dialect acquisition and language change suggests that a child's speech patterns are affected more by peer-group interaction than by parental influence"

(Poplack 1978:89). This is most obviously clear in the virtually exceptionless finding that children will never present the foreign or non-local accent of their parents in their mature grammars (Chambers 2002). However, it is important to note that Poplack does not say "affected entirely," but "affected *more*." Roberts concluded of the acquisition of ongoing sound changes in Philadelphia by preschool children that "The extent of their acquisition of these changes appears to be influenced by the language and dialect background of their parents" (Roberts 1997b:264). Related to the influence of caregiver speech on child acquisition is that women are more often early primary caregivers, and children thus receive more early exposure to changes being led by women, which in turn may go towards explaining the more rapid advancement of female-led changes (Roberts 1997b:263). Similarly, Johnson (2010) concluded of the acquisition of the low back merger in a transitional region in eastern New England that "Peers have the largest effect, but parents have a lasting effect as well…" (Johnson 2010:209).

In a study of acquisition during the formation of the Tok Pisin creole in Papua New Guinea, Sankoff and Laberge (1973) analyzed a change in the future marker *bai*. The parents in this study are fluent speakers of the pidgin, while their children are the first generation of speakers of the creole.

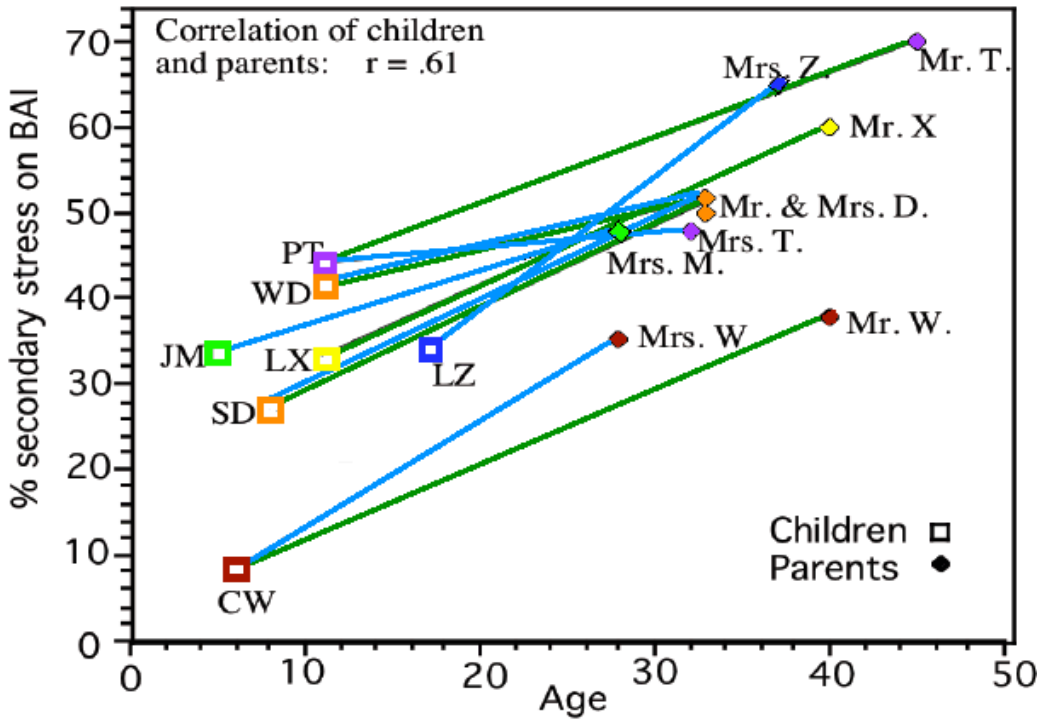

Figure 1: Loss of secondary stress on future marker BAI in Tok Pisin (Sankoff and Laberge 1973, Sankoff 2006, Sankoff 3/17/2010 Ling. 501; colors added).[1] Green lines connect children with their fathers, blue lines with their mothers. Parents and children in the same family are indicated with symbols of the same color.

The change involves the reduction of *bai* in terms of stress and realization of the vowel. Specifically, *bai* was found to be undergoing a three-step progression from secondary

[1] The original chart, which did not include connecting lines between parents and children, was

stress to tertiary stress to vowel reduction or deletion. Adults used the former two variants fairly equally, but very rarely presented the third. Children most favored the second, tertiary stress, but also used considerably more vowel reduction or deletion than adults. The chart in Figure 1 plots the percent use of secondary stress, the outgoing variant, against age, showing a group of children with one or both of their parents. This is a striking representation of how peer and caregiver input can appear simultaneously in the variable aspects of a child's grammar. We can see that all of the Tok Pisin-speaking children are participating in a change in progress along with their generation of peers, and yet the early influence of their parents' speech has not disappeared.

Supposing that this is the typical reality of a speech community where language change is occurring, we can ask where children lacking either a peer group or caregivers who speak their language would fit into this picture. Where would Philadelphia's Mexican children, in effect transplanted into an English-speaking community with no prior English caregiver input, locate themselves linguistically with respect to their English-speaking peers in a chart such as this one? Conversely, supposing that they do not have a peer group to look to for Spanish input,[2] where will they appear with respect to their parents in such a chart?

While this study will focus on children who learn both Spanish and English within the critical period window for native language acquisition, their acquisition of Spanish will precede that of English within that window. We can consider their acquisition of English to be L1 acquisition in the sense that it will result in a native command of English. However, we can also expect some differences between their process of acquisition and that of children who learn both languages from birth. Meisel for one makes a distinction between aL2 (adult second language acquisition), cL2 (child second language acquisition), and 2L1 (bilingual first language acquisition). He includes children who begin learning a second language as early as age 3 in the cL2 category (Meisel 2008:55-6). Studies of the acquisition of a second dialect will also be relevant for comparison with respect to this issue.

Chambers (1988, 1992) studied the acquisition of a number of British English phonological and lexical variables by 6 children in 2 Canadian families who immigrated to southern England. He found varying success at acquiring new dialect features among the children, though younger children tended to acquire more of the features of British English. Payne (1976), in her study on acquisition of the Philadelphia dialect by children in families who had moved to King of Prussia from other dialect regions, found that most children had at least partially acquired phonetic variables, but had more difficulty with phonological variables. The presence or absence of local features in children's' original/home dialects, age of arrival, and number of local peers were all factors for the success of acquisition. Johnson (2010) found differing degrees of peer and parent influence on the acquisition of a vowel merger, depending on the age at which children encountered this new dialect feature, their age at the time of the study, and the presence of the merger in one or both of their parents' speech.

[2] This depends on my initial finding that bilingual Mexican children in Philadelphia prefer to speak English when possible, even with their Spanish-speaking Mexican peers or siblings.

2.1 Acquisition of Variables Undergoing Change

Evidence of differing linguistic forms between generations has been identified as a necessary condition for a language change to progress with each new generation. Yang (2000) discusses the conditions necessary during native language acquisition to produce language change, saying "…heterogeneity in the linguistic evidence… is a prerequisite for language change" and "…language change cannot take place without sufficiently different linguistic evidence across generations" (Yang 2000:237, 241). In the normal context of a speech community of several generations sharing a common language, the lack of such evidence would imply uniformity of a particular linguistic form across generations. However, a case that has not yet been examined is one in which the lack of evidence is due to only one generation of speakers being available to children acquiring the language. The question addressed here is thus whether, presented with a change in progress and input from only one generation, children will perceive other cues, possibly language-internal or stylistic, that subconsciously indicate to them that a change has been occurring, and cause them to advance the innovative form in the direction of the ongoing change.

In a study of the acquisition of the Philadelphia dialect by 6 Philadelphia-born preschool children aged 3;4 to 4;10 in South Philadelphia, Roberts (1997b) analyzed three vowels undergoing change: (aw), (eyC), and (ay0). She found that all 6 children showed progress in acquiring the local system, though with individual variation. All children had acquired the fronting of (aw). The child Mike age 3;4, however, whose parents were native speakers of Italian, had not fully acquired the raising of (eyC) in closed syllables, or the raising and backing of (ay0) before voiceless segments (Roberts 1997b:254). Interestingly, Roberts notes that in Payne's (1980) study of the acquisition of Philadelphia vowels by children who had moved from other dialect areas, subjects had more difficulty acquiring (aw) than other vowels. Payne did not analyze (eyC), but she did find (ay0) to be easily acquired, also in contrast to Roberts' (1997b) results. Payne concluded that the acquisition of (aw) fronting may have been difficult due to the lack of this feature, as opposed to others, in her subjects' initial native dialects. She also suggested that more recent changes could be more difficult to acquire than farther advanced changes (evidenced by successful acquisition of the older changes of (uw) and (ow) fronting in her study).

Returning to Roberts' study, (eyC) was acquired successfully by all children with native Philadelphian parents. However, neither Mike, mentioned above, nor Gia age 3;11, whose father was a native Philadelphian but whose mother was not, had fully acquired the native pattern for (eyC) (Roberts 1997b:255-7). Roberts also found that none of the children in her study had yet fully acquired (ay0), concluding that it was more difficult to acquire than the other variables analyzed. Both Payne (1980) and Roberts (1997b) also examined acquisition of the complex Philadelphia split short *a* system, and found that only those children who had been born in Philadelphia, and also had two parents who were speakers of the local dialect, were able to fully acquire the pattern.

As Mike's parents spoke Italian at home, and he had only recently been enrolled in preschool, one would expect that he had not yet gained command of the Philadelphia dialect. However, Gia had been immersed in the dialect since birth, including local

babysitters, extended family, and a year in preschool with local instructors. While Roberts observed that Gia sounded impressionistically like a typical Philadelphian, linguistic analysis showed that she had not fully acquired the local grammar (Roberts 1997b:260-1). In order to understand why none of the speakers in her sample had acquired raising and backing of (ay0), Roberts interviewed two of the children's mothers, and Gia's father very briefly, and found that the mothers did not show this feature of the Philadelphia dialect in their speech, while Gia's father did (Roberts 1997b:261). Thus we have examples of children who initially spoke different dialects, as well as a child who spoke a different language, at home, and then encountered difficulty acquiring some of the variable features local to Philadelphia. Roberts and Payne had different results for the acquisition of (ay0), which will also be analyzed in this study.

Roberts and Labov (1995:101) concluded that "…even the youngest members of the speech community are actively participating in ongoing sound change." They conducted a study of the acquisition of the Philadelphia short *a* system, which was and continues to be an ongoing change, with a group of 17 children aged 3;2 to 4;11, consisting of 10 girls and 7 boys. These children, who were all born and raised in Philadelphia, were interviewed multiple times over a period of 3 months. Thirteen of them had parents who were both born and raised in Philadelphia as well. For 2 of them, information about their parents was not obtained, Gia, mentioned above in connection with Roberts (1997b), had a non-local mother, and Mike, also mentioned above, had parents born and raised in Italy. Mike had not acquired the short *a* system at all, and was excluded from group analysis. Roberts and Labov found that all remaining children in the sample had acquired the short *a* system quite well, with the exception of Gia, who had acquired the system with the exception of one environment: short *a* preceding /f/. In addition they found the children to be participating in the changes expanding the inventory of phonological contexts for tensing of *a*: the addition of following /l/ and following intervocalic /n/ as environments for tensing (Roberts and Labov 1995).

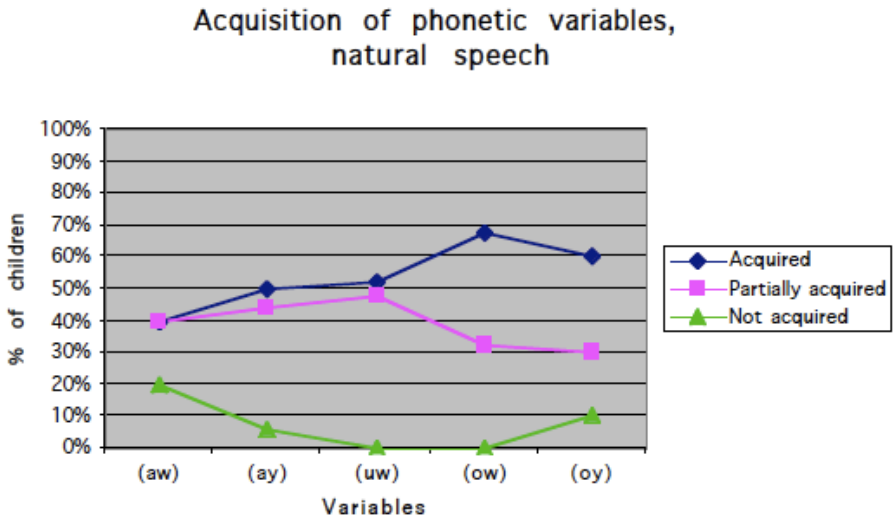

Figure 2: Acquisition of Philadelphia variables by children in King of Prussia (Data from Payne 1976:93, chart from Sankoff 3/17/2010 Ling. 501).

Payne (1976) conducted a study on acquisition of features of the Philadelphia dialect in King of Prussia, Pennsylvania, by children in families who had moved from other dialect regions. In this community, around 55% of the population was local, which gave incoming children the opportunity to learn the dialect despite a large proportion of in-migrants, according to Payne. She also chose families for whom the parents' dialects had high or neutral prestige. She interviewed families that were local, out-of-state, and mixed. Her sample included 108 children and 51 adults, interviewed for 40 minutes to 2 hours. She interviewed parents together in longer interviews of 3-4 hours. Payne surveyed the following Philadelphia vocalic variables: the Philadelphia split short *a* system, fronting of (aw), centralization of (ay0), backing, raising, and rounding of (ahr), raising of (ohr) and merger with (uhr), raising of (oy), fronting of (uw) and (ow), and the merry/Murray merger. Depending on the origin of the families in her study, their original dialects share varying numbers of the same or similar features. However, none shared the same short *a* system, the merry/Murray merger, or centralization of (ay0). Payne found most of the phonetic variables to be only partially acquired, as shown in Figure 2. For each variable, she evaluated only children whose first dialect did not include that variable.

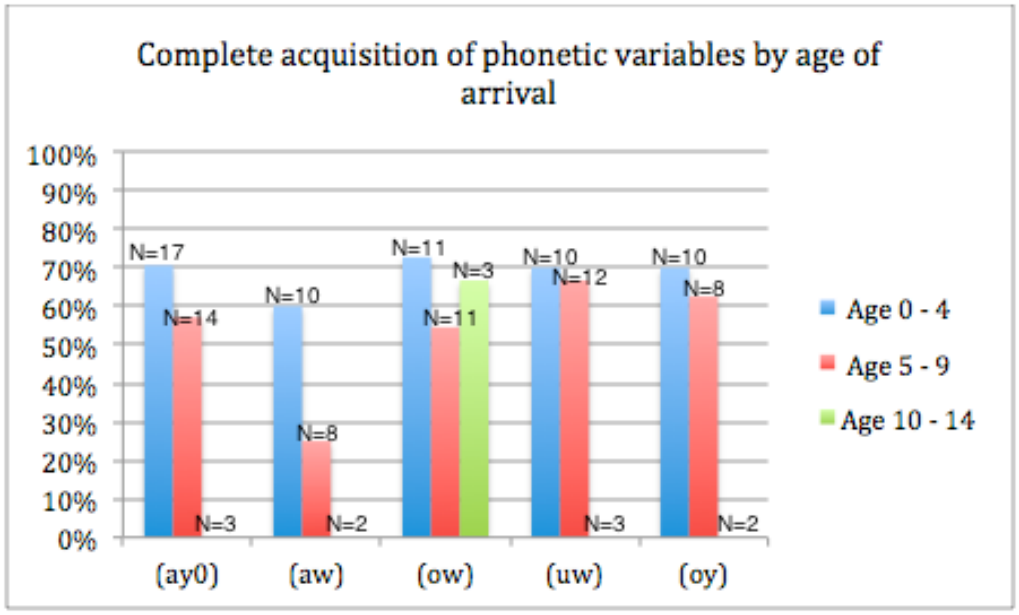

Figure 3: Percent of each age group that completely acquired the phonetic variables. Total Ns for each age group and vowel are labeled in the chart (Data from Payne 1976:114-8).

Payne found some effect of age of arrival on the degree to which children acquired these variables, for some variables more than others. These results are shown in Figure 3. Notably, children who arrived between ages 10 and 14 acquired very little of the Philadelphia variables. There was also a clear correlation between the number of Philadelphia variables acquired and the number of local peers each child had, with children who mentioned more local peers presenting more of the local dialect features successfully. Overall children were much more successful at acquiring the phonetic variables (those shown in Figure 3) than the phonological variables (short *a* system and mergers). Payne reported that almost all of the children in her study learned the phonetic

variables at least partially (note that in Figure 3 percentages only represent the proportion of children who completely acquired each variable) (Payne 1976:212).

Johnson (2010) studied the spread of the low back merger, often referred to as the *cot~caught* merger, along a dialect boundary separating distinct and merged regions in eastern New England. He found that pre-school age children displayed the system of their parents. When their parents had different systems, children showed more influence from the parent of the same sex. Once they had entered the school system, children then displayed influence from their peer group, resulting in a shift to the merger even if one or both of their parents had the distinction. Some older school age children maintained their parents' distinction, based on not having encountered enough evidence of the merger among their peers at a young enough age. These different outcomes even co-occurred within families, where siblings of different ages could have the merger or the distinction. Johnson observed that "…merger can be acquired from peers and… it does not easily pass from younger to older children" (Johnson 2010:210).

Figure 4 shows children in Attleboro, where the low back merger has existed for a century, on the left, and children in South Attleboro, where the merger has recently spread rapidly but adults over age 20 mostly maintain the distinction.

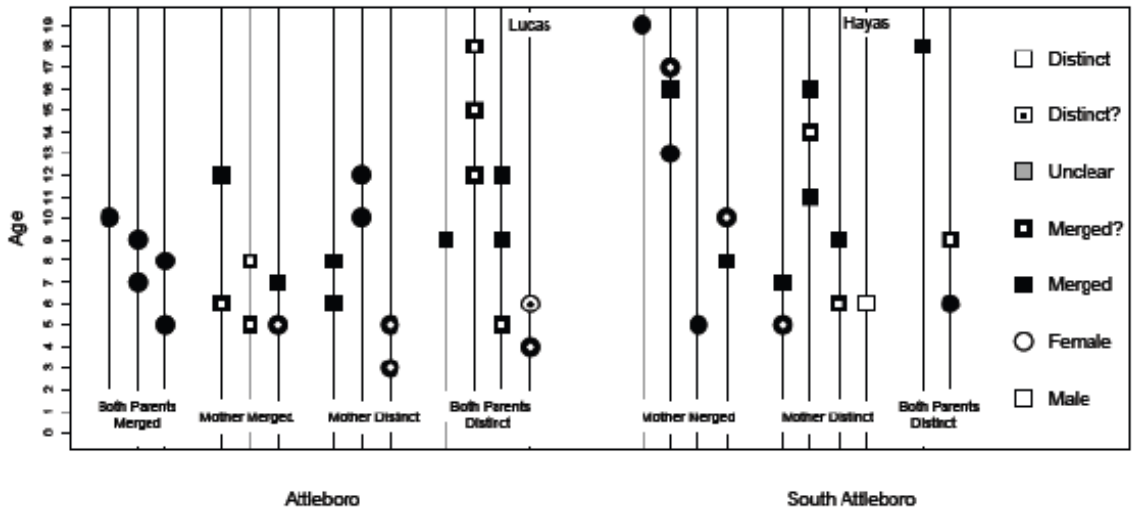

Figure 4: Status of the low-back merger for children and parents in Attleboro and South Attleboro, Massachusetts (from Johnson 2010:153).

Note that the symbol labeled as "Merged?" in the legend indicates speakers who are "probably merged." All children are definitely merged only in those families where both parents are merged, showing parental influence in the spread of the merger to children. However, while not all children are definitely merged if one or more of their parents has the distinction, they are either probably or definitely merged, thus showing the influence of the peer group where the merger is dominant (Johnson 2010:153-4). Only one child is possibly distinct in Attleboro, who moved from a region without the merger halfway through kindergarten, one year prior to being interviewed. Meanwhile, her merged 4-year-old sister was in her first year of preschool in Attleboro at the time of interview, and had not attended school in the distinct region before the family moved. Johnson says that the younger sister is more like her peers in Attleboro, while it is likely the peer exposure

the older sister received prior to moving has prevented her from acquiring the merger, or possibly caused a delay (Johnson 2010:153-4). Already in South Attleboro most children are definitely merged, and only one has the distinction.

Johnson concluded that "After age 5 or 6, the underlying phonological vowel system is unlikely to change, although phonetic adjustment can occur" (Johnson 2010:211); hence the lack of acquisition of the merger, a phonological change, by older children. The English vowel change to be analyzed in this study (centralization of (ay0)) involves allophonic distribution as well as gradual phonetic change, so it will remain to be seen how children who begin acquiring English at age 5 or later handle both aspects of the variable.

2.2 Acquisition of Stable Variation

In cases of stable variation, children acquire their parents' variable usage at a young age. Some internal and external constraints have been shown to be acquired as early as age 3, while others are acquired at later stages of language acquisition. In a study of child acquisition of (ing) for example, it appeared that stylistic constraints were stronger and acquired earlier than grammatical constraints (Labov 1989:96). However, Roberts found that for (-t,d) deletion children acquired phonological and grammatical constraints prior to social and stylistic constraints (Roberts 1997a). Roberts furthermore suggests that "variation is learned simultaneously with the related grammatical and lexical forms" (Roberts 2002:338). Stylistic constraints are also later translated from a limited range of at-home interactions and a limited selection of interlocutors to a wider range of interactions in school and other social contexts (cf. Roberts 1997a; Smith et al. 2007). Crucially, children learn constraints on sociolinguistic variation concurrently with, and in some cases preceding, the other categorical aspects of the grammar they are acquiring. Results of research with children in King of Prussia showed that the stable variables (ing) and (-t,d) deletion were acquired between the ages of 4 and 9 (Labov 1989:96). These children matched their parents' variable usage of (-t,d) deletion and (ing) by age 7 (although some constraints on (-t,d) deletion were not yet fully acquired), with (-t,d) deletion already appearing in some form at age 4. Acquisition of (-t,d) deletion and (ing) also occurs before children have fully acquired some other categorical phonological and grammatical rules (Labov 1989:91-3).[3] While one 7-year-old child in King of Prussia had already acquired his parents' stylistic and grammatical constraints on (ing), a 6-year-old in the same study had acquired only the stylistic constraints. Thus it appears that stylistic constraints on (ing) are stronger and acquired earlier than the grammatical constraints (Labov 1989:93). Figure 5 shows percent usage of the apical variant according to style and grammatical category for Cynthia, age 6, David, age 7, and Margie, age 9. Payne found that constraints on the variable usage of (ing) were not acquired as quickly as those on (-t,d) among the children in her King of Prussia study (Labov 1989:95).

[3] Further discussion of the acquisition of (-t,d) deletion is reserved for Section 4.2.2.

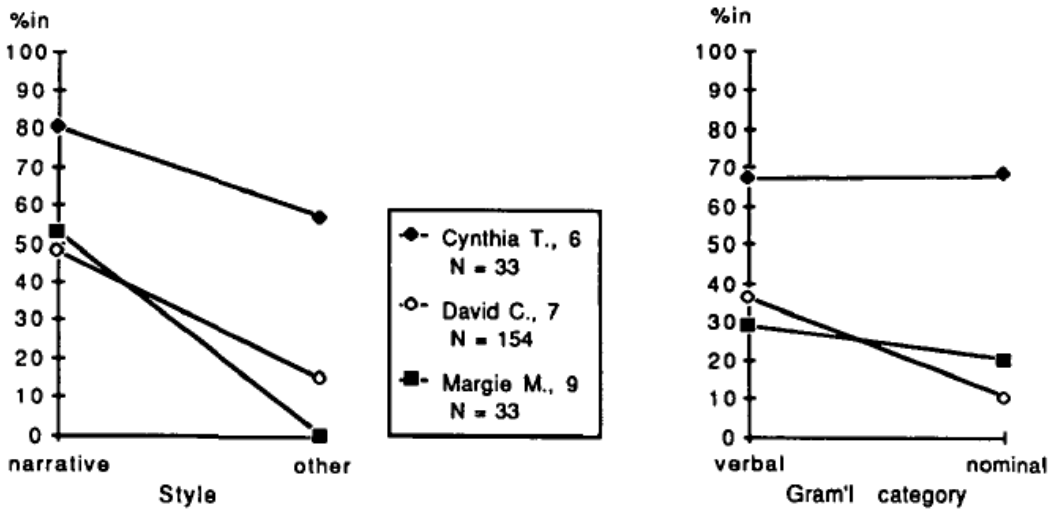

Figure 5: Percent apical variant of (ing) by style and grammatical category for three King of Prussia children (from Labov 1989:94).

Roberts (1994) found both grammatical and stylistic conditioning of (ing) among 3- and 4-year-old children. As a stylistic parameter, she compared speech directed to other children with speak directed to adults, and found that when speaking to other children her informants used more of the apical variant [ɪn], associated with informal styles in adult speech. In addition, she found that these children had already acquired grammatical constraints on (ing), using the apical variant more frequently in verbs and complements than in nouns and adjectives (Roberts 1997a:353).

Díaz-Campos (2001) found sociolinguistically conditioned variation in the deletion of intervocalic /d/ as in *cansado* 'tired', and the lateralization and deletion of syllable-final /ɾ/ as in *cansar* 'to tire', among young monolingual Spanish-speaking children in Caracas, Venezuela.[4] For this study he analyzed a pre-existing corpus of child narrative speech including 30 children from age 3;6 to 5;9. He reported that from a very young age children assign sociolinguistic value, and apply internal and external constraints, to these two stable variables very similarly to the adults of their speech community. Díaz-Campos also found stratification by social class among the younger children in the sample, with lower-class children more likely to delete intervocalic /d/, as well as lateralize or delete syllable-final /ɾ/, while the class difference was greatly reduced or disappeared among the older children. He interprets this as a shift with age towards a school variety of language which favors retention of both phonemes, in concordance with the higher social status of the retained variants (Díaz-Campos 2001:175-7, 197-9). In further analysis of intervocalic /d/ in the same corpus, he found speech style to be a factor for deletion as well, but one that did not emerge until around age 4;6 (Díaz-Campos 2005).

Foulkes, Docherty, and Watt (2005) conducted a study of 20 boys and 20 girls aged 2;0 to 4;0 in the Tyneside region in northern England, who were all the first born children in their families. They also included the primary caregiver of each child, who

[4] The latter is a common feature of Caribbean Spanish dialects, but unrelated to variation in syllable-final /ɾ/ in Mexico.

was always the mother, and used a corpus of adult community speech for comparison. They recorded children with their mothers in 30-45 minutes sessions,[5] in the presence of a researcher (Foulkes et al. 2005:182-3). They analyzed the variation of word-medial intersonorant /t/, as in *water* or *winter*, which varies between the standard [t], local glottal forms, and some other rarely occurring variants. Foulkes et al. consider this variable to be a stereotype in the sense defined by Labov, such that speakers are overtly conscious of it, and it is imitated by outsiders as characteristic of local speech (Foulkes et al. 2005:186).

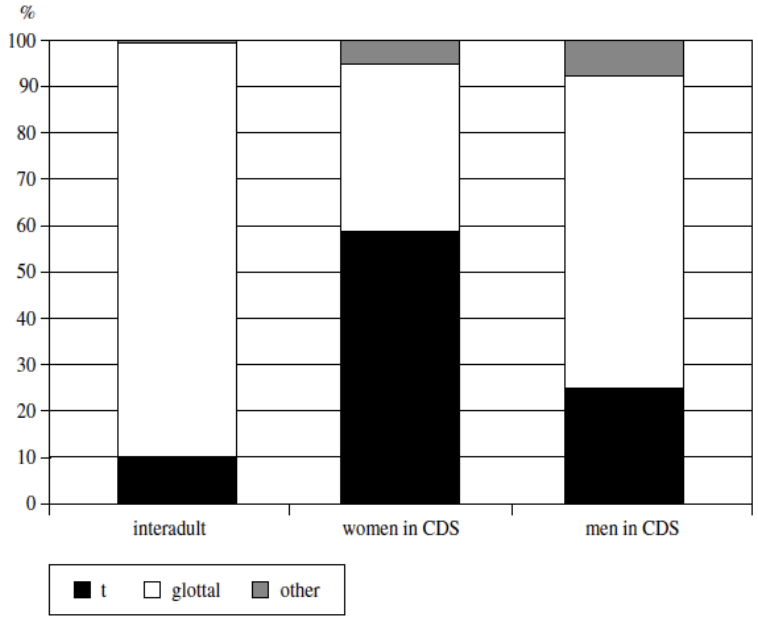

Figure 6: Variants of word-medial intersonorant /t/ in interadult and child-directed speech in Tyneside (from Foulkes et al. 2005:187). Note that interadult and child-directed speech were not collected from the same speakers.

In the inter-adult speech of young working-class women, Foulkes et al. found the standard variant [t] to be used only 10% of the time. However, women shifted to use [t] almost categorically in formal speech styles, while men did not (Foulkes et al. 2005:185-6). Meanwhile, women used [t] 59% of the time in child-directed speech, while men used it only 25% of the time, as shown in Figure 6.

Differences were also found in mothers' child-directed speech depending on the sex and age of their children. Mothers used more of the standard variant when speaking to girls, 70% of the time, and only 48% of the time with boys. Usage of the local variant by mothers also increased with the age of the children, for both girls and boys. These results are shown in Figure 7. Foulkes et al. also examined variation in word-final prevocalic /t/, which varies between standard [t], glottal forms, [d], and [ɹ]. They found similar differences between interadult and child-directed speech, and similar trends for child-directed speech depending on child gender and age (Foulkes et al. 2005:191-2).

[5] This amount of recording resulted in an average of 14.6 tokens per caregiver (Foulkes et al. 2005:186).

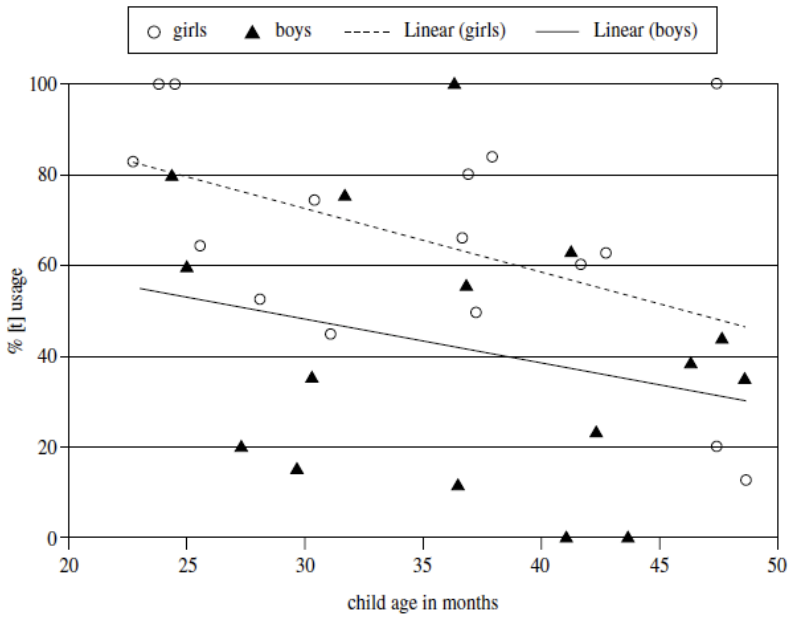

Figure 7: Usage of standard [t] in word-medial intersonorant position in child-directed speech in Tyneside: scatterplot of individual mothers with trend lines for child gender (from Foulkes et al. 2005:191).

Foulkes et al. conclude that mothers use more of the standard variant in speech to their children than to other adults. In addition, they use more of the standard when speaking to female children, as well as to younger children. They also found men to modify their usage of these socially significant variables less than women, although they collected only small amounts of data for men as they were not the focus of the study (Foulkes et al. 2005:196). They thus conclude that child-directed speech provides children with "…opportunities to learn linguistic forms, their alternatives, and the social meanings of those alternatives" (Foulkes et al. 2005:200).

Smith et al. (2007) report on a study of the acquisition of local variable dialect features by children aged 2;6 to 4;0 in the small fishing town of Buckie on the northeast coast of Scotland. Their informants were 24 children and each child's mother, of which 11 ochild-caregiver pairs were analyzed for this study. They selected children who had not yet entered preschool, and whose primary caregivers were their mothers. Children were only included in the study if both of their parents had been born and raised in Buckie. A corpus of adult community speech was also collected by Smith, who is from Buckie, in informal interviews with 19 males and 20 females.

The first variable analyzed is referred to as the *hoose* variable, characterized by variation between two vowel phonemes in a fixed class of lexical items, which varies somewhat depending on region. The local stigmatized variant is a monophthong /u:/, which varies with the standard diphthong /ʌʉ/. Previous studies had found this variable to be stratified according to social class, sex, and style (Smith et al. 2007:70-71). Analysis revealed a large difference between child-directed speech and interadult speech: Adults used the local variant categorically when speaking to other adults, but used the standard diphthong more than half the time when speaking to their children. Meanwhile each child's usage reflected their caregiver's child-directed speech quite closely, as can be seen in Figure 8. The youngest children used the monophthong very infrequently, and

frequency of use increased with age, suggesting that children may first acquire one form only (the standard); likewise frequency of the monophthong in child-directed speech increased with the age of the child. This is similar to the results for word-medial /t/ found by Foulkes et al. (2005).

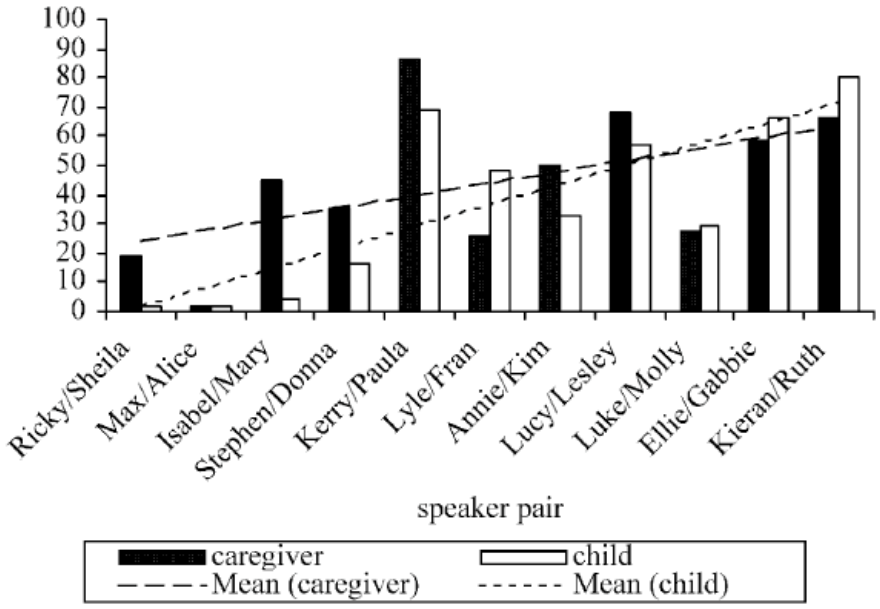

Figure 8: Overall frequency of monophthongal variant for *hoose* by child-caregiver pairs (from Smith et al. 2007:73).

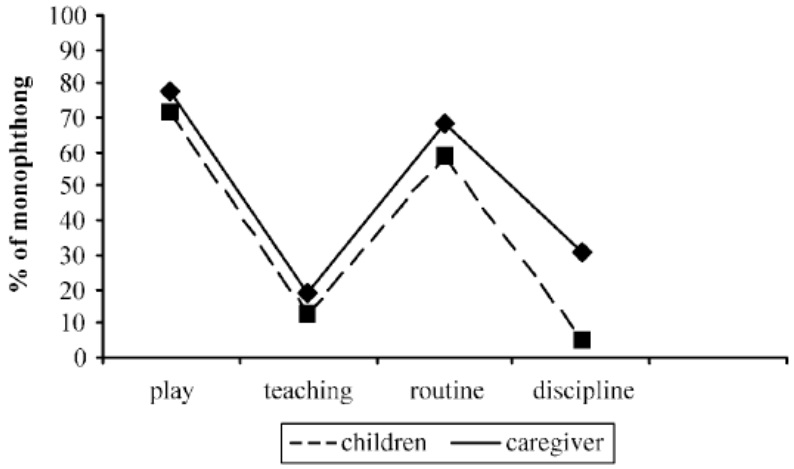

Figure 9: Percentage of *hoose* monophthongal variant according to stylistic context (from Smith et al. 2007:75).

Unlike results from other studies of this variable in adult speech, no sex difference was found for children. Stylistic contexts were defined according to the following interactions: play, routine, teaching, and discipline. In play and routine, which were expected to be the less formal contexts, both caregivers and children indeed used higher rates of the monophthongal variant, and patterned very closely to each other, as can be seen in Figure 9. There is only one child in the study who does not follow the stylistic

constraints on *hoose*, and this is clearly due to her mother's lack of stylistic stratification in child-directed speech, also unique among the caregivers (Smith et al. 2007:72-9).

Next, Smith et al. analyzed the use of verbal *–s* in 3rd person plural contexts, also known as the Northern Subject Rule. They found that children had already acquired an important categorical constraint on this variation: *-s* may occur only with NP subjects, but not the pronoun *they*. As for *hoose*, children matched their caregivers' usage in child-directed speech very closely. However, in this case caregivers' child-directed speech also matched the adult community norms. Even the youngest children who only used the standard variant of *hoose* used non-standard 3rd plural verbal *–s*. Yet there was a lack of stylistic stratification for both caregivers and children, and no significant correlation between child and caregiver usage. Smith et al. suggest that caregivers are not consciously aware of this variable and thus do not overtly modify it depending on whether they're speaking to other adults or to their children, or according to stylistic context, "Thus, they are unable, at least overtly, to help the children acquire sociolinguistic competence" (Smith et al. 2007:91). In sum, children in Buckie acquired sociolinguistic competence along with grammatical competence for *hoose*, while grammatical constraints preceded social and stylistic constraints for verbal *-s* (Smith et al. 2007:80-90).

It is clear from these studies that not all variation is learned at the same rate or stage of language acquisition, and that the order of acquistion of grammatical and social constraints depends on the variable. Both Foulkes et al. (2005) and Smith et al. (2007) found mothers to use different frequencies of variable forms with their children depending on the child's gender and age. Although these studies examine stable variation, if this caregiver behavior also occurs for variables undergoing change, it could be a sources of cues for children to identify and interpret sociolinguistic variation in the absence of evidence from multiple generations of a speech community.

3 Issues in Bilingual Acquisition

3.1 The Critical Period and Bilingual Acquisition

The critical period has been said to end during an age span ranging approximately from 7 to 10 years. Meisel (2004) also discusses age 5 as a transitional point in cognitive development, such that L2 acquisition that occurs before age 5 is in a different category from adult L2 acquisition or child L2 acquisition beginning after age 5, saying "Native competence seems attainable in successive acquisition of bilingualism… if it happens during early childhood" (Meisel 2004). However, later Meisel (2008) differentiates child second language acquisition, or cL2, from bilingual first language acquisition, or 2L1, for children as young as 3 years of age.

Nonetheless, a study of the acquisition of English as a second language by 46 native speakers of Korean and Chinese by Johnson and Newport (1989) showed native speakers and those who began to learn English between age 3 and 7 to be very close to equivalent in their acquisition of a number of features of English grammar. Figure 10 shows the results of the test they administered according to age of arrival in the US.

While Johnson and Newport tested the acquisition of English categorical grammar, Lee (2000) analyzed a regional variable feature, the acquisition of the Philadelphia split

short *a* system, and found that Korean Americans did not acquire short *a*. Even those who were born in Philadelphia had not acquired this variable; Lee proposed that speakers in her study may have been acquiring a non-regional variety of English. Thus it is clear that early age of arrival alone cannot predict native acquisition of local linguistic features.

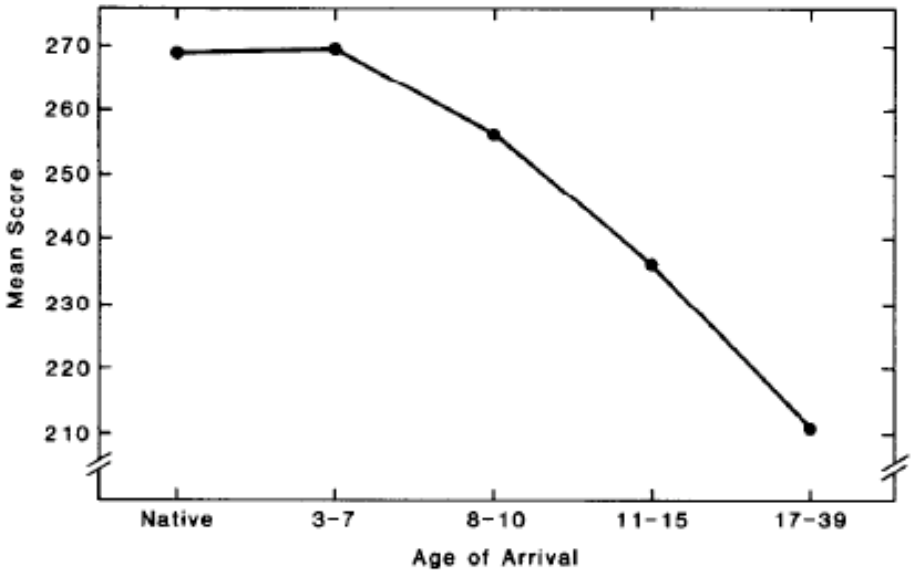

Figure 10: Mean score on English grammar test out of 276 points, for native English speakers and L2 learners, by age of arrival in the US (from Johnson and Newport 1989:79).

3.2 Cross-linguistic Interference

Previous debates in bilingual acquisition focused on the question of whether bilingual children began by acquiring one or two language systems. It is a currently accepted view that they acquire two language systems from the early stages of language acquisition (Ingram 1981-2, Johnson and Lancaster 1998, Deuchar and Quay 2000, Paradis and Navarro 2003, Genesee 1989 Meisel 2004).

A matter still under study is the existence and extent of cross-linguistic interaction between the bilingual child's two languages. Studies have shown temporary systematic structural influence of one language on another in several linguistic domains (cf. Hulk and van der Linden (1998), (Müller 1998), Döpke (1998, 2000), Yip and Mathews (2000), and Müller and Hulk (2001) for syntax; Paradis (2001) for phonology; Nicoladis (2002) for morphology). Likewise studies have also sometimes found a lack of cross-linguistic interference (cf. Paradis and Genesee (1996,1997), Hulk and Müller (2000)).

One theory is that structural areas in which a bilingual child's two languages overlap are the ones where interference is most likely to be observed. It has also been argued that structural ambiguity in one language makes such areas vulnerable for interaction from the other language (Meisel 2004:102). The finding that some linguistic domains are available to cross-linguistic interference in bilingual learners, while some are not, is crucial to the point that bilingual children are acquiring two language systems; any cross-linguistic interference must be systematic and restrained if there are two separate language systems (Paradis and Navarro 2003:372).

Fantini (1985) studied the simultaneous bilingual acquisition of Spanish and English by a child named Mario from birth to age 10. Mario grew up in a Spanish-speaking household in Vermont, where he spoke English at school and in other contexts outside of the home. Mario provides an apt comparison for many children in the Mexican immigrant community of Philadelphia. His initial period of language acquisition was characterized by Spanish input, and the acquisition of English began when he entered the school system (Fantini 1985:134-5). Fantini concluded that Mario had almost completed acquisition of the Spanish phonological system by the time he began learning English (Fantini 1985:140). Fantini observed, between ages 2;6 and 3;0, that Mario's acquisition of the English lexicon was more rapid than his acquisition of its phonological system, such that his first English words were adapted to his Spanish phonemic inventory and phonological system (Fantini 1985:134-5). Overall, Fantini found that the interference of Spanish in Mario's English was almost entirely resolved by age 5. English final consonants in particular took longer for Mario to acquire than other phonemes (Fantini 1985:136). It was not until age 8 that all traces of foreign influence had disappeared from Mario's English speech. Meanwhile, throughout his acquisition of both languages, only very rare examples of the influence of English phonology appeared in Mario's Spanish, including some aspiration of voiceless stops (Fantini 1985:139-40).

3.2.1 Cross-linguistic Interference in Variation

Null subject realization is a common domain where influence from English on the Spanish of bilinguals has been observed. It is also a domain where crosslinguistic interference is predicted to be likely in bilingual acquisition, because it is linked to the pragmatics/syntax interface (Paradis and Navarro 2003:371). In Spanish the expression of subjects is optional, depending on grammatical factors including discourse-pragmatic context, as well as regional dialect differences. For Spanish-speaking adults, the rate of overt subjects in declaratives in natural conversation is estimated to be on average around 30% (from Grinstead 2000).[6] Meanwhile, overt subjects are obligatory in English with the exception of the imperative and a few other "marginal" contexts. Considering that Spanish and English can both have overt subjects, and are both SVO languages, this is a reasonable potential locus for crosslinguistic interference (Paradis and Navarro 2003:375).

Paradis and Navarro (2003) conducted a study of the acquisition of null subject variation using CHILDES data for two Spanish monolingual children (ages 1;8-2;7 and 1;8-1;11), one Spanish-English bilingual child (age 1;9-2;6), and their parental interlocutors. Their study explored the influence of parental input as well, which did not receive much attention in previous such studies (Paradis and Navarro 2003:374). They found higher rates of overt pronouns for the bilingual child, which they concluded could be due to effects from English, but possibly also to the child's adult input (Paradis and Navarro 2003:371-2).

Although it was not a study of child acquisition, Otheguy and Zentella (2012) also found influence of English on null subject realization in Spanish. In a comprehensive study of speakers of six dialects of Spanish in New York City, Otheguy and Zentella found both regional leveling between Spanish dialects, as well as influence from English, on the rates of overt pronoun use (Otheguy and Zentella 2012).

[6] Although considerable variation in frequency exists between regional dialects.

3.3 Reduced Input

Johnson, in his study of the spread of the low back merger, observes that "Younger children generally learn new patterns better, but there are no absolute rules for acquisition under various conditions of exposure" (Johnson 2010:210). One matter to consider with respect to the exposure children in this study receive in English and Spanish is that they will necessarily receive less input in each language than a monolingual speaker would during the critical period for language acquisition.

Silva-Corvalán (2003) examined the effect of reduced input on language acquisition for Mexican American bilingual learners in Los Angeles. She analyzed the speech of 7 children, ages 5;1 to 5;11, all of whom acquired Spanish from birth and English from birth or later, who differed with respect to how much Spanish and English were spoken at home. She found that children who spoke only Spanish at home were more advanced in their acquisition of the Spanish tense-mood-aspect system than children from bilingual homes, who were more advanced than children from English-only homes. In addition to the quantity of Spanish input, Silva-Corvalán suggests that the quality of input, limited to speech contexts for toddlers and preschool children which commonly refer to definite rather than hypothetical future events, also accounts for the children's acquisition patterns (Silva-Corvalán 2003:375, 381). She concludes that for some speakers, an interruption in the process of acquisition of Spanish between ages 3 and 5 (specifically when English becomes used more in certain contexts of daily life), will result in the reduced acquisition of the Spanish tense-mood-aspect system (Silva-Corvalán 2003:395).

In a study of several aspects of Spanish language proficiency among California Mexican-descent children in northern California, Pease-Alvarez, Hakuta, and Bayley (1996) concluded that "…the type of exposure and the social context in which it occurs are of greater importance than simple amount of exposure…" to bilingual acquisition.

This will be something to consider in this study, although it may not be as much of an issue considering that the environments in which the variables to be analyzed occur are fairly frequent in any context of speech.

3.4 Linguistic Change and Variation in a Bilingual Community

Silva-Corvalán, in her 1994 study of Spanish among Mexican-Americans in Los Angeles, concludes that in a language contact situation, changes with both internal and external motivation occur. Those changes that are internally motivated have the following conditions: "(a) they are in progress in the 'model' monolingual variety before intensive contact occurs and/or (b) they may be spurred by such features as the semantic opaqueness of certain language specific forms or the relative complexity of a given paradigm" (Silva-Corvalán 1994:92). In this study, the assibilation and frication of /ɾ/ is an example of the case in (a); analysis will examine whether this internally motivated change in Mexican Spanish continues to advance in the Philadelphia immigrant community.

Silva-Corvalán found that simplification and loss of verb tenses progressed with newer generations, even for those that were advanced Spanish speakers, so that attrition from dominance in English was not a possible explanation. Other internally motivated

changes in Spanish examined in her study were the extension of *estar* 'to be', and the variable placement and omission of verbal clitic pronouns. Silva-Corvalán also reported that even in the case of an internally-motivated change, language contact could have the effect of increasing the rate of diffusion of the new systems involved in change (Silva-Corvalán 1994:92).

The change in *estar*, which consists in its use in innovative semantic and syntactic contexts replacing the verb *ser* 'to be', had also been observed in other Mexican-American and monolingual Spanish communities, so it clearly could not be attributed entirely to contact with English in Los Angeles (Silva-Corvalán 1994:105). However, the change was more advanced in the Mexican-American community than in areas studied in Mexico (Silva-Corvalán 1994:114). Silva-Corvalán attributes a possible accelerating influence to the change from the structure for progressives in English; the extension of *estar* in this context and a consequent association with English *be* may have influenced faster diffusion to the predicate adjective context. The innovative use of *estar* is exemplified in (1), where the conservative variety would use *es* 'is' from *ser*, rather than *está* 'is' from *estar*.

(1) *Si el hombre está/es soltero, puede hacer lo que quiera*.
'If the man is unmarried he can do whatever he pleases.'
(Silva-Corvalán 1994:112)

Although English has only one verb *be* corresponding to Spanish *estar* and *ser*, Silva-Corvalán found no evidence that the Los Angeles Spanish system would converge to one Spanish form under influence of English in the future (Silva-Corvalán 1994:119).

4 Acquisition of Variation in the Philadelphia Mexican Community: Proposed Analysis

4.1 Ongoing Change in English: Centralization of (ay0)

4.1.1 Overview of the Variable

The centralization of (ay0), the raising and backing of the nucleus of /ay/ preceding voiceless consonants also known as "Canadian raising," has been analyzed in numerous studies of Philadelphia speech. Reporting on the Linguistic Change and Variation (LCV) project that surveyed Philadelphia neighborhoods in the 1970s, Labov (2001) called it a "new and vigorous" change in Philadelphia, and noted that it did not show social stratification (when men and women were analyzed together). Centralization of (ay0) has been found to be led by male speakers, uniquely among the current Philadelphia sound changes in progress, and specifically by working class men (Labov 2001, Conn 2005, Wagner 2008). While the studies reported here have focused mostly on white Philadelphians, Labov (p.c.) has also observed that African Americans and Hispanics in the Philadelphia Neighborhood Corpus have been participating in the change as well, though Hispanics lag behind African Americans, who lag behind white speakers, in apparent time.

Conn found (ay0) to be an ongoing change in apparent and real time. He found a faster rate of change among the working classes, and an interaction with social class and age that seemed to suggest the change may have started in the upper classes but came to be advanced by the working classes. For raising of (ay0), Conn found no significant effect for sex. However, he found backing to be led by working class males (Conn 2005:186-8).

Meanwhile, in a study of high school girls in South Philadelphia, Wagner (2007, 2008) reports (ay0) to be a socially salient change, in particular carrying social meaning for South Philadelphia high school groups defined by ethnicity. In a report on 6 high school girls in her sample Wagner, unlike Conn, found that differences in F2 were significant among her female speakers, in this instance depending on Italian or Irish heritage. Specifically, Wagner concluded that Irish girls backed (ay0) as a marker of toughness, a hypothesis reinforced by evaluations of the variable as tough or masculine in subjective reaction tests, as well as to emphasize local identity (Wagner 2007:8).

Fruehwald (2007) examined an expansion of the application of /ay/ centralization to non-pre-voiceless contexts in Philadelphia. He attributes this to the opaque application of centralization, due to flap formation: centralization applies to /ay/ preceding /t/, and continues to apply such as when the addition of a suffix causes flapping, as in *write~writer*, producing a surface centralized /ay/ preceding a voiced segment. This results in minimal pairs where the vowel quality reveals the voicing of the underlying consonant, as in centralized *writer* vs. non-centralized *rider*. Lexical diffusion has been observed in the spread of centralization of /ay/ to other pre-flap contexts, as well as pre-voiced contexts. In a study of male high school students, ages 14-19, Fruehwald found particular lexical items where /ay/ was raised preceding segments other than voiceless consonants, including *spider, cider, cyber, tiny, rhyme,* and *Snyder*. Some lexical items exhibited raising by more speakers than others (Fruehwald 2007). For this study, the lexical items found by Fruehwald to exhibit raising of non-pre-voiceless /ay/ will be elicited during interviews conducted with children and their friends.

4.1.2 Acquisition Studies

As discussed above in Section 2.1, Roberts (1997b) included analysis of (ay0) in her study of Philadelphia preschool children aged 3;4 to 4;10 in South Philadelphia. Mike, the child whose parents were native speakers of Italian, had not acquired centralization of (ay0) at all (Roberts 1997b:254). Furthermore, Roberts found that none of the children in her study had yet fully acquired (ay0), concluding that it was more difficult to acquire than the other variables analyzed, possibly because as a male-led variable young children had not learned it from their female primary caregivers. Payne (1980), however, found (ay0) to be easily acquired by her sample of children up to age 14 acquiring a second dialect in King of Prussia. Over 90% of her child informants had at least partially acquired centralization of (ay0), although (ay0) was not a feature of any of their primary dialects. 70% of children who arrived in King of Prussia by age 4 had successfully acquired (ay0), and nearly 60% of those who arrived between the ages of 5 and 9. The difference between the results of Roberts and Payne may be due to Payne recording children when they were older (her sample included children as old as 17), such that they had received the male input for (ay0) in school that Roberts' younger children hadn't

gotten from their female caregivers.

4.1.3 Issues for Bilingual Acquisition

Stockwell and Bowen (1965:94) say that /aj/ is one of the "normal, frequently occurring diphthongs" in Spanish. In Spanish, /aj/ is not involved in any allophonic or sociolinguistic variation. The centralization of (ay0) in English does not seem a likely locus for crosslinguistic influence from Spanish, except in the case of speakers possibly maintaining the lower nucleus and longer nucleus-to-glide transition of their native Spanish diphthong during early stages of the acquisition of English (Stockwell and Bowen 1965:99).

Zentella et al. reported on the production of Philadelphia vowels in a Linguistics 560 report of a Puerto Rican neighborhood in the Kensington area of North Philadelphia. They analyzed a reading passage for three male and three female speakers, four of whom were under age 20. They found no centralization of (ay0) for any of their speakers. They did find a tendency to produce a monophthongal [a:], characteristic of AAVE. In general, they found a high degree of AAVE phonological and grammatical features for these speakers, mostly for the adolescents in their study, and attributed this to close contact with African Americans. Although they do not specify which speakers' vowels were evaluated, their sample includes speakers born in the US as well as in Puerto Rico (Zentella et al. 1977).

Freed et al. also reported on Philadelphia vowels in their Linguistics 560 report focused on elementary schools in a Puerto Rican neighborhood in central North Philadelphia. They observed that the Philadelphia treatment of (ay0) had entered the system of Puerto Ricans somewhat, but a diphthongized [ay] was still much more frequent than the centralized variant.[7] In addition they found that (ay) preceding voiced segments was most frequently monophthongized, showing AAVE influence. Overall they concluded that the Puerto Rican children evidenced some AAVE variables and some local Philadelphia variables, in addition to influence from the phonology of Puerto Rican Spanish (Freed et al. 1976).

4.2 Stable variation in English: (-t,d) Deletion

4.2.1 Overview of the Variable

In all dialects of English, word-final /t/ and /d/ following one or more consonants are variably deleted. All dialects appear to share the same constraints on this variation, with the exception of the ranking of a following pause with respect to other following environments (Guy 1980, Labov 1989). Before a pause the lowest rates of deletion occur in Philadelphia, but in New York City, as well as for AAVE speakers in general, pause behaves more like a following consonant, showing high rates of deletion.

Deletion of final /t/ and /d/ in consonant clusters is favored in the following conditions: in unstressed syllables, when a third consonant precedes the cluster

[7] I believe that what Freed et al. call the "diphthongized [ay]" refers to a more Spanish-like pronunciation, characterized by a longer nucleus-to-glide transition.

containing /t/ or /d/, and by agreement in voicing with preceding and following segments. According to grammatical status, (-t,d) deletion is favored most to least with the following grammatical environments: *n't* morpheme > part of stem/monomorphemic > ambiguous/derivational/semi-weak suffix[8] > past tense or past participial suffix. According to the preceding consonant within the (-t,d) cluster, favoring environments are: /s/ > stops > nasals > other fricatives > liquids (Guy 1980, Labov 1989). Note that this ranking is specific to white speakers; vowels are excluded because deletion never occurs following a vowel for white speakers, although it does occur for black speakers (Guy 1980:5). Guy also found deletion following /r/ to be rare or nonexistent, concluding post-vocalic /r/ should possibly be considered a vowel (Guy 1980:8). According to following segment, favoring environments (for white speakers) are: obstruents > liquids > glides > vowels > pause (Guy 1980). The word *and* is generally excluded from the envelope of variation. Tokens preceded by /n/ and followed by /s/ are excluded because nasal flap formation occurs in this context. Other excluded tokens are neutralizations caused by following apical stops, palatal stops, or interdental fricatives (Labov 1989:90).

The grammatical status factors may vary in ranking according to individual speakers. Some speakers delete in ambiguous or derivational verbs at similar rates to monomorphemic words, while some speakers rank them between monomorphemic and past tense tokens. As will be discussed further below, the former tendency is especially prevalent in children (Guy 1980). Guy (1980) also reported style shifting, with less deletion in more formal speech styles.

4.2.2 Acquisition Studies

As part of a study of the speech community at the University of Pennsylvania, Guy examined (-t,d) deletion for four children in King of Prussia, finding that they treated the ambiguous or derivational verb class as equivalent to the monomorphemic grammatical class, deleting /t/ and /d/ at high rates for both (Guy 1980:32).

David Cameron, a 7-year-old child in Arvilla Payne's (1976) study of King of Prussia, was found to have acquired the same pattern as his parents with respect to following segment, with the exception of following glides and vowels, which he had reversed. He had acquired the Philadelphia pattern with respect to a following pause, like his parents. Again with respect to grammatical status, David followed his parents' probabilities closely, with the exception of the derivational or semi-weak verb class (Labov 1989:91). It has been observed that the derivational verb class is the only context for (–t,d) deletion that displays considerable individual variation (Labov 1989:92, citing Boyd and Guy (1979)). Guy and Boyd (1990), in a study of speakers age 4-65 in the LCV corpus, presented stages of acquisition for the grammatical constraints on –t,d deletion. These stages in fact represent changing analyses of the linguistic information contained in the final stop of semi-weak verbs, such as *slept*.

[8] These three terms have been used in different studies to describe the class of verbs whose past tense formation consists of a stem vowel change as well as the addition of a past tense morpheme, such as *kept* and *told.*

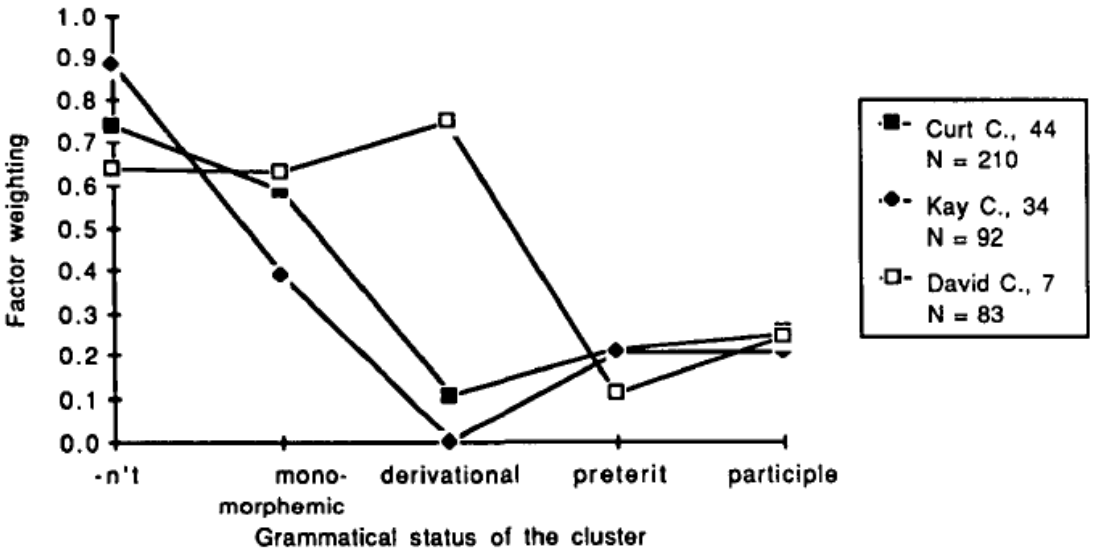

Figure 11: Factor weights for deleted (–t,d) by grammatical status for the Cameron family in King of Prussia (from Labov 1989:91).

The youngest children studied treated verbs in this class as if they had no underlying /-t/ or /-d/, i.e., with a rate of 100% deletion. The next age group, including David at age 7, deleted this class at the same rate as monomorphemic (–t,d). Lastly, older speakers deleted this class at the same rate as the regular past-tense suffix (Labov 1989:92). Figure 11 shows factor weights for (-t,d) deletion by grammatical environment for David and his parents. We can see that David displays the second stage of analysis while his parents display the third. Thus David, at age 7, had been more successful at acquiring abstract language-specific (grammatical) constraints, rather than articulatory constraints. By age 7, David had only acquired some articulatory constraints: syllable stress, preceding segment (consonant vs. vowel), and some but not all of the possible factors for following segment (Labov 1989:93).

Guy (1991) observed age grading in a study of 7 speakers, with an age range of 9 to 55. Overall, he found speakers to retain (-t,d) more frequently as they got older. He attributes this to the possible acquisition of formal stylistic options by adults that are not yet in a child's inventory (Guy 1991:13-14).

Roberts studied (-t,d) deletion in 16 3- and 4-year-old children in South Philadelphia, the same sample analyzed in Roberts and Labov (1995), discussed above. There were 10 girls and 6 boys in the sample, ranging in age from 3;2 to 4;11. She found that these children had mostly acquired the phonological constraints on variation that are found in adult grammars. Roberts considered one factor, following segment, for phonological environment. Figure 12 shows the children using (-t,d) deletion much like their parents, as well as according to the local Philadelphia pattern with following pause favoring deletion the least.[9]

[9] The difference between following vowel and pause for the parent group was not significant (Roberts 1997a:359).

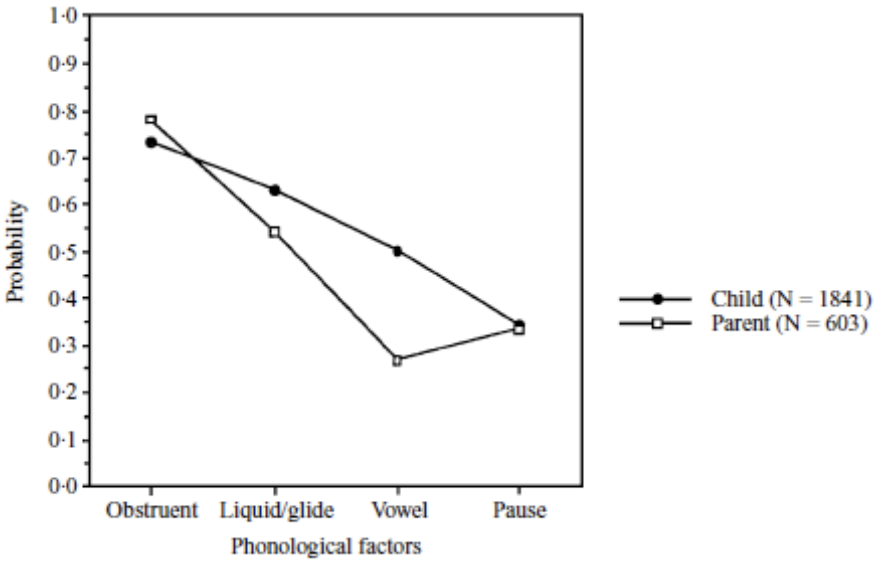

Figure 12: Effect of following segment on (-t,d) deletion for children and parents (from Roberts 1997a:359).

Roberts reports that children deleted /t/ and /d/ in the semi-weak verb class at the same high rates as deletion of monomorphemic tokens, in contrast to the adult pattern (Roberts 1997a). This is similar to what Guy and Boyd (1990) and Guy (1991) reported, although Guy and Boyd found /t/ and /d/ to be categorically absent in semi-weak verbs for the youngest children, while Roberts found /t/ and /d/ to be realized at low rates. Thus Roberts concludes that underlying final /t/ and /d/ do exist in semi-weak verbs in young children's grammars, but they analyze these words as monomorphemic. Meanwhile the adult pattern shows that the /t/ or /d/ in semi-weak verbs is analyzed as a past tense morpheme, resulting in similar rates of deletion for the two categories.

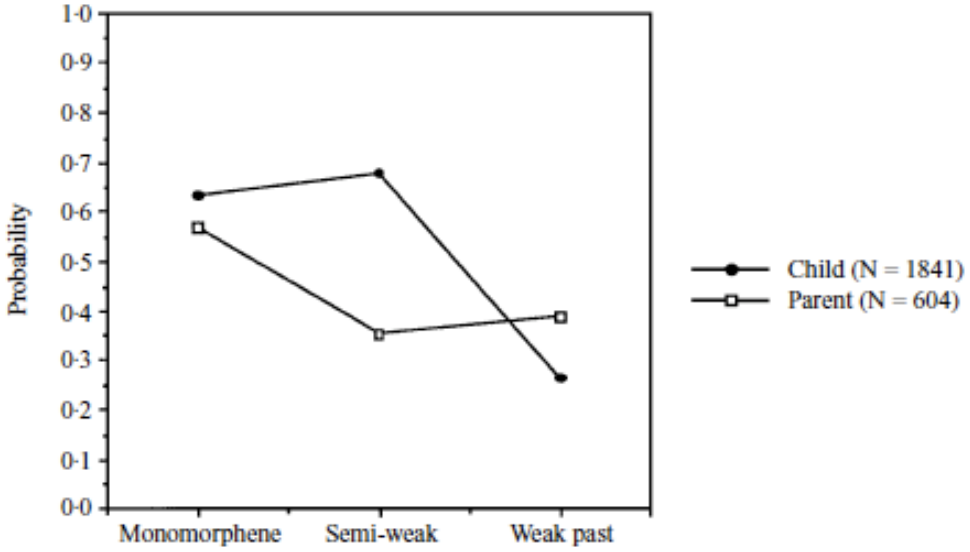

Figure 13: Effect of grammatical category on (-t,d) deletion for children and parents (from Roberts 1997a:363).

Children and parents differ only in the semi-weak class; otherwise children in Roberts' study followed the adult pattern with the highest rates of deletion for monomorphemic words, and the least deletion in regular or weak past-tense forms (Roberts 1997a). Figure 13 shows (-t,d) deletion rates for children and parents in her study according to grammatical category.

Roberts also found the children in her study had not acquired any social or stylistic constraints on (-t,d) deletion. This is in contrast to her results for (ing), which seemed to show that stylistic constraints were acquired before linguistic constraints. Roberts then suggests that for (-t,d) deletion children must acquire linguistic constraints prior to social and stylistic constraints.

In examining the effect of gender, Roberts found that girls deleted /t/ and /d/ more frequently than boys. This is somewhat puzzling considering that women usually lead in changes from below, using more of the innovative or non-standard form, while they are more conservative when it comes to stable variation, tending to use more of the standard form than men. Among others, Roberts considers the possibility that at preschool age female children to do not yet respond to societal pressures that may be responsible for the more conservative treatment of stable variation by women, and thus use more of the non-standard form. Roberts subsequently comes to an interesting hypothesis: "…it may be the case that for three- and four-year olds, there may be no difference between linguistic behaviour in situations of language change and of stable variations" (Roberts 1997a:368).

Smith et al. (2009) also analyzed the acquisition of (-t,d) for the same sample of children and caregivers in Buckie, Scotland, discussed above for Smith et al. (2007). They compared their results for the factor weights of following phonological segment and morphological class with those of Roberts (1997a). Figures 14 and 15 show them to be very similar.

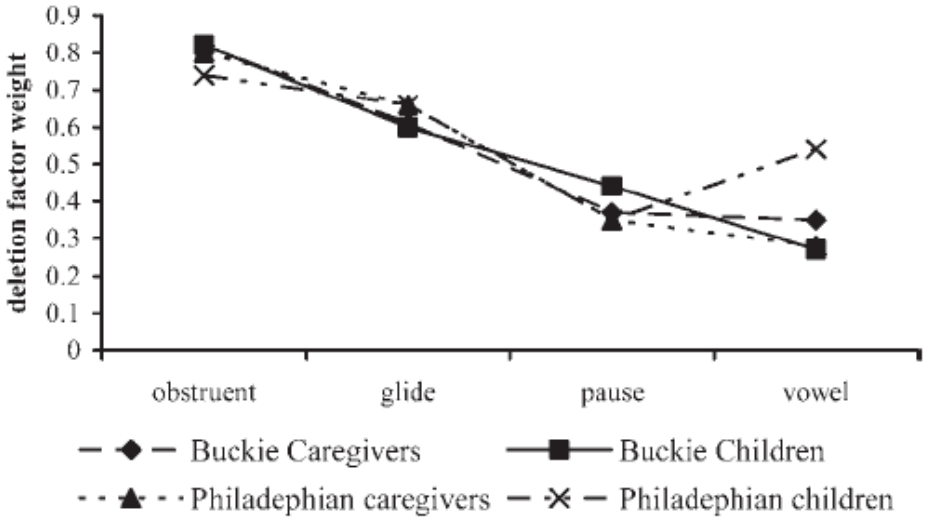

Figure 14: Comparison of factor weights for following phonological segment in Buckie and Philadelphia (from Smith et al. 2009:87).

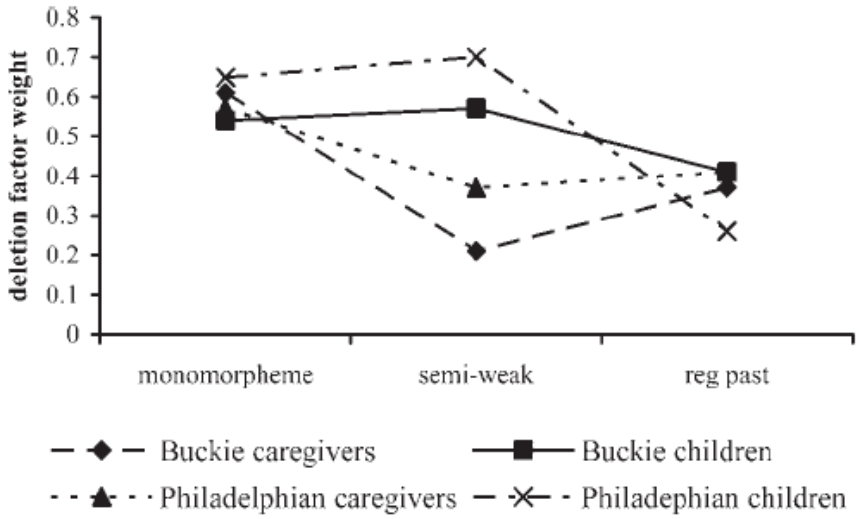

Figure 15: Comparison of factor weights for following phonological segment in Buckie and Philadelphia (from Smith et al. 2009:88).

4.2.3 Issues for Bilingual Acquisition

Fantini (1985) found delayed acquisition of consonants in English, especially in final position, in his case study of Mario, a bilingual child acquiring Spanish and English. In particular Fantini cites assimilation of English /ʃ/, /z/, and /tʃ/ in word-final position to /s/, due to the former three not occurring in syllable-final position in Spanish, while the latter does (Fantini 1985:137). Similarly, Mario was found to modify or delete many other syllable-final consonants in English. In particular, at age 5;0 he tended to delete syllable-final /t/ and /d/ rather than replace them with other phonemes that may occur finally in Spanish (Fantini 1985:138-9). Fantini explains this stage of cross-linguistic interference with a Spanish rule that does not allow word-final full stops (thus disallowing word-final /t/ or /d/). Examples of deletion of these word-final consonants in Mario's speech include:

(2) *She liked* [laik∅] *it.*
Yes, I want [wan∅] *it.*
He used [juz∅] *a book.*

Interestingly, he accommodates other word-final consonants, such as /b/ and /θ/, to phonetically similar Spanish phonemes:

(3) *The tub* [tʌf] *is clean.*
It's the truth [tɹut]. (Fantini 1985:138-9)

While the phonemes /t/ and /d/ occur in both English and Spanish, their distribution is quite different. The phoneme /t/ occurs only rarely in word-final position in Spanish (Stockwell and Bowen 1965:52). Tsuzaki reports of Mexican Spanish that /t/ occurs only rarely in word-final position, giving the example of *zenit* /senit/ 'zenith' (Tsuzaki 1970:40). He does observe additional word-final instances of /t/ in English

words borrowed in the Spanish of Mexican residents of Detroit, including /ditroit/ 'Detroit', /kloset/ 'closet', /boiskaut/ 'boyscout', and /toilet/ 'toilet' (Tsuzaki 1970:47). Although /d/ occurs commonly in word-final position in Spanish, it is realized as the fricative allophone [ð] (Stockwell and Bowen 1965:44).

Also relevant to (-t,d) deletion in English is the fact that syllable-final consonant clusters do not normally occur in Spanish (Stockwell and Bowen 1965:80). Thus influence from Spanish on the English of bilingual speakers, especially in early stages of acquiring English, could result in final consonant cluster simplification, as is often evidenced in the L2 English of native Spanish speakers. Simplification of the subset of English consonant clusters terminating in /t/ or /d/, when it is realized by deleting the final segments, would then produce a surface phonetic realization equivalent to one produced by (-t,d) deletion. This would not make an analysis of (-t,d) deletion impossible, but it must be taken into consideration whether, if (-t,d) deletion appears to occur for any subject, any other clusters are also simplified in their English. However, Ma and Herasimchuk (1968) concluded that (-t,d) deletion in adult Puerto Rican English was not simply consonant cluster reduction due to interference from English, based on their finding of stylistic conditioning (Santa Ana A. 1991:53).

One unique feature of (-t,d) deletion found for some varieties of Latino English is its occurrence in clusters where it is highly disfavored or nonexistent for native speakers of English: those where /t/ or /d/ follows the liquids /l/ (disfavored) or /r/ (nonexistent for white speakers). If the lack of (-t,d) deletion following /r/ has to do with the vocalic status of post-vocalic /r/ in English, as suggested by Guy (1980), we might explain deletion following /r/ for Spanish speakers with the fact that /r/ is consonantal in Spanish. Wolfram (1969) found influence of AAVE for Puerto Rican teenage males who presented post-vocalic and post-rhotic /d/ deletion, and Santa Ana A. (1991) found Chicano English speakers (Mexican Americans in Los Angeles) to delete in /-rd/ clusters (Santa Ana A. 1991). However, Bayley (1994) found that speakers of Tejano English (Mexican Americans in San Antonio) retained the stop in /-rd/ categorically.

In a report of a Puerto Rican neighborhood in North Philadelphia (Kensington), D'Anunciacao et al. (1979) analyzed (-t,d) deletion in the following final consonant clusters: /nt/, /rt/, /st/, /rst/, /nd/, /rd/, and /ld/. D'Anunciacao et al. found an average of 77% deletion for the three speakers they analyzed, although they did not report on rates of deletion according to consonant cluster type. For following phonological environment, they found the following rates of deletion: obstruent 92%, glide 87%, pause 77%, vowel 59% (D'Anunciacao et al. 1979). This is not entirely typical of the Philadelphia pattern, for which we would expect the lowest rate of deletion with a following pause. It is possible that this may reflect influence from the New York City dialect for one speaker, Manuel R., age 49, who was born in Puerto Rico but lived in New York prior to moving to Philadelphia at age 39, and AAVE influence for another, Angela, age 17, who grew up in Philadelphia. The third speaker, age 38, was born in Puerto Rico and moved to Philadelphia at age 33.

Santa Ana A. (1991) found (-t,d) deletion in Chicano English to share most characteristics with other English dialects that have been described. Another potential cross-linguistic interference, the effect of syllable stress on deletion, was not found to affect deletion in Chicano English. However, unlike speakers of other English dialects, speakers of Chicano English did not delete /t/ or /d/ in past tense or participle morphemes.

However, in an interesting parallel to young children in other English dialects, they do delete in the ambiguous or semi-weak class of verbs, apparently because they do not analyze /t/ or /d/ as morphemes containing past tense information in this verb class. Put another way, speakers of Chicano English have only two morphological classes relevant to deletion (Santa Ana A. 1991). Bayley (1994) found comparable results to these for Tejano English. Santa Ana A. (1992) then reported that only younger speakers showed the age grading associated with recategorization of morphological classes, as discussed in Guy and Boyd (1990).

For this analysis, I will be aware of possible AAVE influences on (-t,d) deletion that could be present in the speech of Mexican children: the possibility of deletion following vowels, and the "relexification" of certain words such that they do not have an underlying final stop in AAVE where they would in standard American English, e.g. 'test' /test/ vs. /tes/ (Guy 1980:5,11). It will also be interesting to investigate whether Mexican children in Philadelphia develop any of the (-t,d) deletion patterns found in Chicano, Tejano, or Puerto Rican English discussed above.

4.3 Dialects of Mexican Spanish

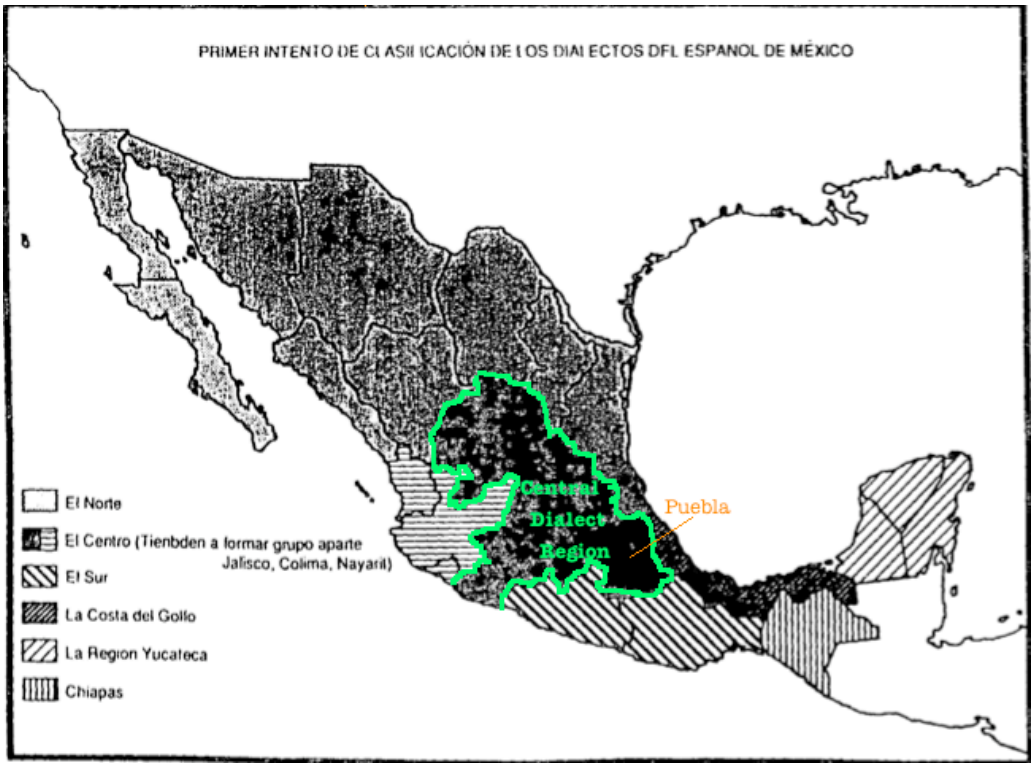

Figure 14: *Primer Intento de Clasificación de los Dialectos del Español de México* 'First attempt at a Classification of the Dialects of Mexican Spanish' (from Hidalgo 1996, indication of central dialect region and Puebla added).

Hidalgo (1996) provides the clearest description of dialect boundaries in Mexico.[10] She presents both macro-dialectal regions, as well as more detailed dialect regions. Much discussion of the features of Mexican Spanish makes reference to Central Mexico as a dialect region. Although finer regional distinctions are preferable for this analysis, Figure 13 shows the macro-dialectal regions, including the Central dialect region as a point of reference for studies that refer to it. Figure 14 shows finer distinctions for dialect regions. In this map, the *Altiplano meridional* 'Southern Highlands' includes Mexico City as well as much of the state of Puebla; notably, this region covers the parts of Puebla where many residents of South Philadelphia originate. The state of Puebla also covers small parts of the *Zona veracruzana* 'Veracruz zone', and *Zona de transición* 'Transitional zone'.

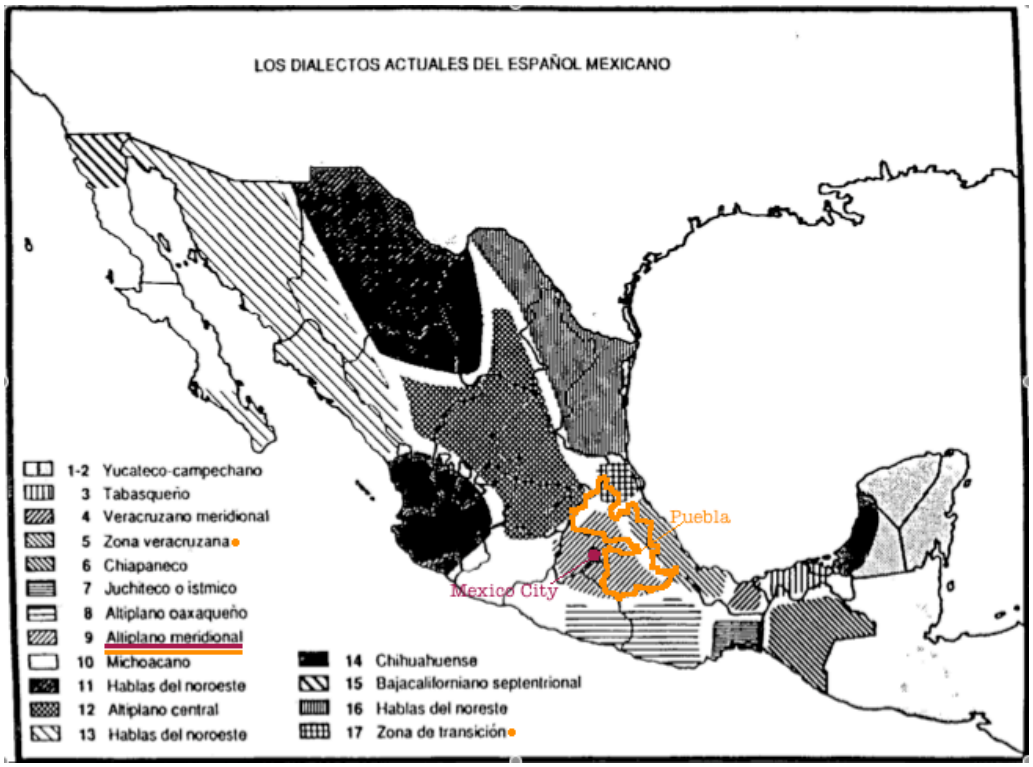

Figure 15: *Los Dialectos Actuales del Español Mexicano* 'The Current Dialects of Mexican Spanish' (from Hidalgo 1996, indication of Mexico City and Puebla added).

4.4 Stable Variation in Spanish: Velarization and Deletion of Final /n/

4.4.1 Overview of the Variable

Word-final /n/ shows stable variation in many dialects of Spanish, especially in Caribbean and coastal dialects (cf. Amastae and Satcher 1993 for Honduran Spanish;

[10] Lipski (1994) reports that there is not a universally accepted division of Mexican dialects, though some commonly recognized dialect areas include a northern-southern distinction, the region of Mexico City, the Yucatán, a Caribbean coastal region including the states of Veracruz and Tabasco, a Pacific coastal region, and Oaxaca (Lipski 1994:294-5).

Poplack 1980a,1980b for Puerto Rican Spanish; Lipski 1994; Stockwell and Bowen 1965). This variation is not as common in Mexico overall, but has been reported in Mexico City and Puebla, in addition to coastal regions (Lope Blanch 1990, Perissinotto 1975). Five different phonetic realizations will be considered for this analysis: alveolar [n], which is the standard pronunciation, following place assimilation, velar [ŋ], deletion with concomitant nasalization of the preceding tautosyllabic vowel, and rarely, simply deletion. Instances of word-final /n/ preceding an [n] or [m] in the following word will be excluded as neutralizing environments. Examples of the five variants taken from my own previous fieldwork in the Pacific region of Colombia are shown in (4)-(8).

(4) *con* [kon̲] *la misma alegría*
'with the same joy'

(5) *yo me puedo ir sin* [sim̲] *plata*
'I can go around without money'

(6) *A que horas se van* [βaŋ̲]?
'What time are you (pl.) leaving?'

(7) *quizás hay solución* [solusjõ(∅)]…
'maybe there's a solution'

(8) *Mujeres no peleaban* [peleaβa(∅)] *en… esa edad, no*.
'Women didn't fight at… that time, no.'

In addition to phonological environment, grammatical status of final /n/ will also be considered. Two categories are relevant for grammatical status: the 3rd person plural verbal ending, as in *hablan* 'they speak', or "other." In my study of Pacific Coastal Spanish in Colombia, the verbal morpheme was found to favor non-standard variants more than non-verbal /n/, although the alveolar [n] was still the most frequent environment in all contexts.

The map in Figure 16 shows where instances of non-standard variants of word-final /n/ occur in the state of Puebla, using data from the *Atlas Lingüístico de Mexico*, henceforth ALM (Lope Blanch 1990). Only results for word-final /n/ in pre-pausal position are shown here. This is not the only environment for velarization and deletion of /n/, but has been shown to present the highest frequencies of velarization in other dialects (Lipski 1986). This subset of data for final /n/ is shown for the purposes of establishing the presence of this feature in the relevant area in Mexico; non-standard variants of /n/ were in fact recorded for all data points in Puebla. Note that although the state of Puebla is not contiguous with a dialect region, for present purposes all and only data points in Puebla from the ALM are shown. The blue thumbtack symbols show the towns of origin of the four initial informants for this study, which are also located in Puebla but are not ALM data points.

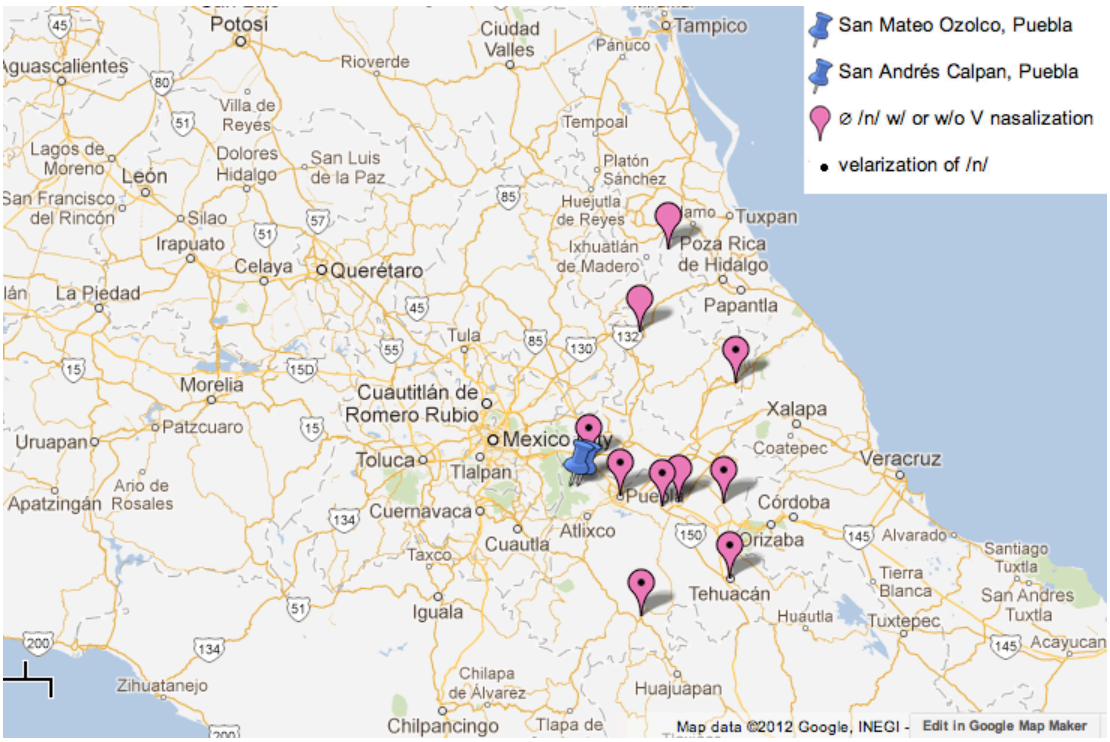

Figure 16: Non-standard variants of word-final pre-pausal /n/ in the state of Puebla (data from Lope Blanch 1990).

4.4.2 Issues for L1 and Bilingual Acquisition

To my knowledge, no studies of the variation in word-final /n/ in Spanish have focused on child language acquisition. However, some factors to do with Spanish L1 acquisition, as well as possible cross-linguistic interference between Spanish and English, will be considered.

The velar nasal [ŋ] occurs as an allophone of /n/, due to assimilation to following velar segments within words, in all dialects of Spanish (Harris 1969:8). Additionally, it occurs as a sociolinguistic variant in word-final position as discussed above. The phone [ŋ] does not occur elsewhere, as /ŋ/ is not an underlying phoneme in Spanish. Meanwhile, /n/ and /ŋ/ are distinctive phonemes in English (Stockwell and Bowen 1965:62). Thus we may consider the possibility of cross-linguistic interference with respect to this variable, due to the existence of equivalent phones in the two languages, with differing phonemic status (cf. Ravindranath (2009).[11]

We might also ask whether the presence of /n/ velarization in the grammatical system of Mexican children learning English could have any effect on their interpretation and usage of (ing) variation in English. While (ing) involves morphemic variation,

[11] Ravindranath, in a study of language shift from Garifuna to English in Belize, suggested that a change in stable variation of Garifuna [ʃ]~[tʃ] to the dominance of [tʃ] in younger generations was due to "younger speakers [having] resolved phonetic variation in their Garifuna by borrowing a phonemic distinction from their BE (Belizean English)… Convergence here may be motivated by the fact that the two phonetic variants already existed in Garifuna, and that they exist as phonemes in English" (Ravindranath 2009:67).

ostensibly the phonetic difference between the two variants is whether the final nasal is alveolar or velar, corresponding to two of the variants involved in Spanish final /n/ variation. Miller et al., in a Linguistics 560 report, found that four Puerto Ricans in their sample from the area off of 5th St. in North Philadelphia did participate in (ing) variation. They found speakers to use the velar variant more frequently in careful speech, and also found higher percentages of the velar with greater time living in the US (although this correlation was not statistically significant), as well as higher rates of the velar for those speakers born in the US vs. those born in Puerto Rico. Although Miller et al. expected to find phonetic conditioning, with higher rates of the velar variant preceding velar segments, as would occur for final /n/ in Puerto Rican Spanish, they did not find this effect. They also found that their speakers' use of the velar variant of (ing) deviated from the typical pattern of variation, lacking any correlation with grammatical category (Miller et al. 1982). Thus there is not clear interference from Spanish on (ing) for these speakers, whose variety of Spanish furthermore typically presents velarization and deletion of final /n/.[12] It appears that these speakers did acquire stylistic constraints on (ing), but not grammatical constraints. Nonetheless, considering the differences between the Puerto Rican and Mexican communities in Philadelphia, I do not necessarily expect to find similar results in the latter.

It does not seem likely that the nature of the acquisition of the phones [n] and [ŋ] in Spanish will provide any complicating factors for the analysis of the variable velarization of final /n/. In one case study by Deuchar and Quay (2000), the child M, who was acquiring both Spanish and English from birth, had acquired both phones by age 1;10 (Deuchar and Quay 2000:32).[13] M's father, a native Spanish speaker, in fact spent most of his formative years in Panama, where final /n/ velarization is a local feature, just as in many Caribbean Spanish varieties. However, there is no discussion of this feature in the Spanish of M's father or M herself by Deuchar and Quay. Mario, the child in Fantini's (1985) study, had also acquired /n/ by age 1;10. However, he acquired [ŋ] quite a bit later, at age 3;2 (Fantini 1985:133). As 3 years will be the youngest age included in this study, we can expect to find enough children who have already acquired these two phones in Spanish.

The other relevant aspect of the early stages of language acquisition in Spanish is the development of subject verb agreement, as the status of final /n/ as a verbal agreement morpheme has a conditioning effect on variation. Thus, if a child's acquisition of person-number agreement were delayed, lack of verbal morphology could be confused with deletion of /n/. This is an issue even for analysis of adult speakers, as the combination of optional null subjects in Spanish and deletion of /n/ can produce ambiguous cases in which a 3rd person singular verb will be indistinguishable from a 3rd person plural verb with a deleted final /n/, e.g. *habla* 's/he speaks' vs. *habla(n)* 'they speak'.[14] Incomplete acquisition of verbal morphology would simply produce more opportunities for

---

[12] This is not discussed in the report by Miller et al., but is reported by many sources for Puerto Rican Spanish (cf. Cedergren 1973, Cedergren and Sankoff 1974, Ma and Herasimchuk 1971, Poplack 1980a, Terrell 1975b).

[13] Deuchar and Quay do not report that M acquired [n] and [ŋ] starting at age 1;10; rather, a report of her phonemic inventory at that age is shown to include these phones.

[14] Accordingly, when analyzing this feature for this study, any such ambiguous tokens will be excluded from coding.

ambiguous cases. However, the acquisition of verbal morphology should not be an issue for this study either. Montrul (2004) reports on studies by Torrens (2002), Durán (2000), and Bel (2001), that show monolingual children acquiring Spanish to develop subject verb agreement from the earliest ages examined: 1;7 and 1;8. These studies showed infrequent errors, around 5% of subject verb agreement, which most commonly involved the use of 3rd person singular verbal morphology in place of 1st or 2nd person singular, but no confusion with the 3rd person plural morphology that would be relevant to this study (Montrul 2004:105-6).

4.5 Ongoing Change in Spanish: Assibilation and Frication of Syllable-final /ɾ/

4.5.1 Overview of the Variable

The map in Figure 17 shows where instances of non-standard variants of syllable-final /ɾ/ occur in the state of Puebla, using data from the ALM (Lope Blanch 1990). Again, all and only data points in Puebla from the ALM are shown. The towns of origin of the four initial informants for this study are indicated by the blue thumbtack symbols.
Only results for word-final /ɾ/ in pre-pausal position are shown here. This is not the only environment for assibilation or frication of /ɾ/, but it has been shown to present the highest frequency of non-standard variants. This subset of the data for syllable-final /ɾ/ is shown for the purposes of establishing the presence of this feature in the relevant area in Mexico; both non-standard variants of /ɾ/ were recorded for all ALM data points in Puebla, with the exception of one where only frication, but not assibilation, is found.

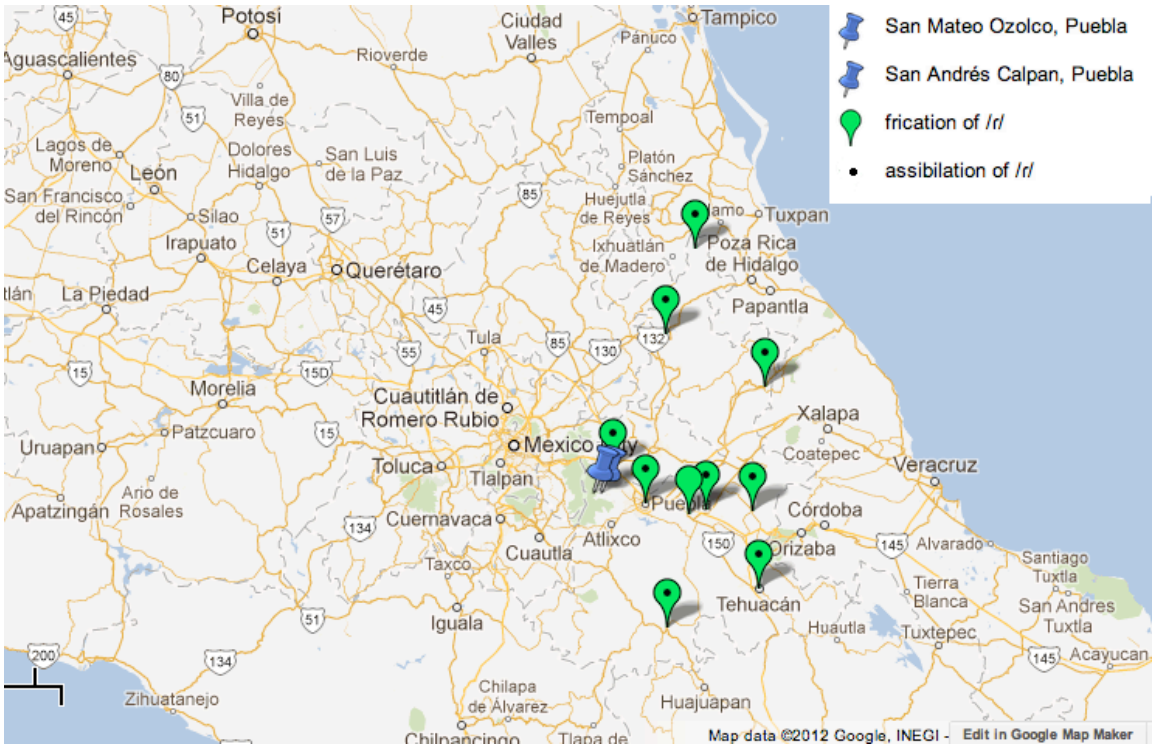

Figure 17: Non-standard variants of word-final pre-pausal /ɾ/ in the state of Puebla (data from Lope Blanch 1990).

Moreno de Alba (1994) reported on /ɾ/ in the same—word-final pre-pausal—phonological context. The map in Figure 18 shows the regions throughout Mexico that he determines to present frequent assibilation of /ɾ/. Note that frication of /ɾ/ is not shown in this map.

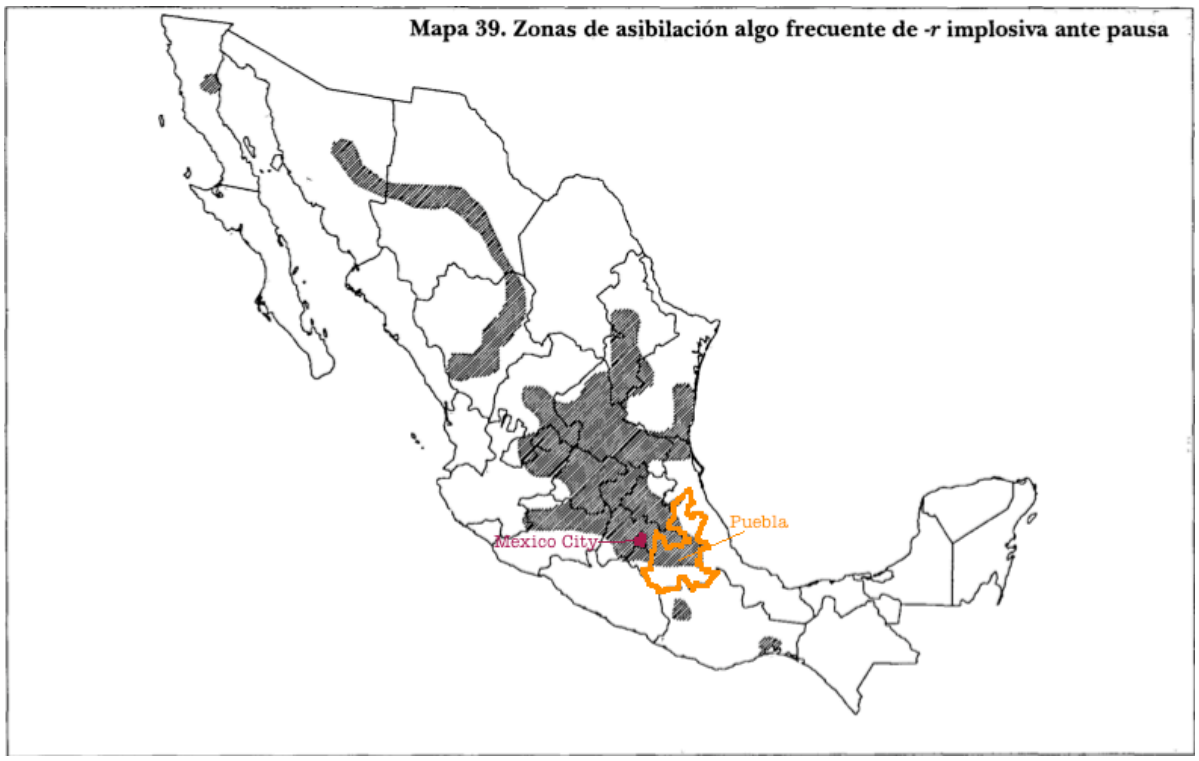

Figure 18: *Zonas de asibilación algo frecuente de –r implosiva ante pausa* 'Zones of somewhat frequent syllable-final pre-pausal –r assibilation' (from Moreno de Alba 1994, indication of Mexico City and Puebla added).

Lipski reports that syllable-final /ɾ/ is often pronounced as a voiceless sibilant, "almost like [s]," throughout southern and central Mexico (Lipski 1994:300, 2008:86). According to several reports, assibilation of /ɾ/ occurs in all syllable-final positions, and most frequently in word-final position preceding a pause (Moreno de Alba 1994, Perissinotto 1975).

Assibilation of /ɾ/ has been observed in other Spanish dialects in consonant clusters such as *tr, dr, gr, cr,* etc., as has assibilation of the trill /r/ in intervocalic position. However, assibilation is rare in these contexts in Mexican Spanish. Moreno de Alba reports that a fricated variant is the most frequent allophonic realization of word-final pre-pausal /ɾ/, followed in frequency by the assibilated variant, and lastly a trill [r] (Moreno de Alba 1994:126-134). Moreno de Alba (1994) proposes that assibilation of /ɾ/ is a process that follows frication; i.e., assibilation operates on the fricated variant, not directly on the flap /ɾ/. Perissinotto (1975:63) in fact refers to the non-standard variant as a "fricative assibilated" /ɾ/. According to Moreno de Alba (1994) and Lope Blanch (1972), the realization of syllable-final /ɾ/ as [r] is particular to Mexican Spanish.

Data from the ALM published in 1990 show a large region covering central Mexico displaying upwards of 40% /ɾ/ assibilation in word-final pre-pausal position,

though documentation of this feature in Mexico is relatively recent according to Moreno de Alba (1994:127-9). Bowman (1960) reports that, in the city of Guanajuato in the Central dialect region north of the Southern Highlands, /ɾ/ assibilation was first found to occur sometime between 1948 and 1952 (Lope Blanch 1975:82). However, Rissel (1989) reports that the first observation of /ɾ/ assibilation was recorded in 1896 in Mexico City, by Marden (1938). Matluck (1952) reported frequent assibilation of final /ɾ/, as well as occasional frication, in Mexico City. Perissinotto found high rates of /ɾ/ assibilation (around 60%) on average in Mexico City, located within the Southern Highlands (Perissinotto 1975:63-4). Moreno de Alba reports that the highest rates of /ɾ/ assibilation are found in the interior highland region of the country, which likely corresponds to the Central Highland and Southern Highland regions defined by Hidalgo (1996) (Moreno de Alba 1994:130).

More than one account of /ɾ/ assibilation has identified the incoming variant as more frequent for women, as is common for a change in progress, and for younger speakers, allowing for an apparent time interpretation of change (Cárdenas 1958, Lope Blanch 1972, Moreno de Alba 1994:130, Perissinotto 1972, 1975, Rissel 1989). Perissinotto observed considerable differentiation according to sex in Mexico City, reporting around 80% assibilation for women and only around 40% for men, higher rates of assibilation among younger speakers, as well as the highest rates in the middle socioeconomic class (Perissinotto 1972:73-4,1975:74). Rissel (1989) found that /ɾ/ assibilation began among women in upper social classes in San Luis Potosí, a city north of Mexico City in the Central Highland region, and came to be a marker of gender in lower classes (Rissel 1989:269). Her study included 56 speakers of age 12-22, and found /ɾ/ assibilation to occur most frequently in syllable-final position, but also infrequently in variation with the trill [r] in word-initial and intervocalic position; Rissel considered the assibilation of the trill to be an incipient change. She found assibilation of /ɾ/ to occur in middle and lower social class groups among women, and among middle and upper class groups among men, concluding that the change was led my middle class women (Rissel 1989).

As different descriptions refer to /ɾ/ assibilation, frication, or both, for this study I will include both variants in initial analysis, to account for the possibility that they may be part of the same process. Likewise, most descriptions refer to assibilation or frication of only syllable-final /ɾ/; however as Rissel (1989) found assibilation in syllable-initial and intervocalic position, these environments will also be considered in initial analysis.

4.5.2 Issues for L1 and Bilingual Acquisition

No linguistic studies have focused on the child acquisition of variable assibilation or frication of /ɾ/ to my knowledge. However, relevant information about the developmental stages of Spanish L1 and bilingual acquisition is discussed below.

In Fantini's (1985) study of bilingual acquisition, he found that the trill /r/ and flap /ɾ/ phonemes of Spanish were the latest acquired by Mario. At age 4;11 Mario began to use the trill /r/ correctly, also substituting it for the flap /ɾ/. By 5;1 he had acquired the distinction and began producing the flap /ɾ/ as well. However, at age 5 he still occasionally "lost control" of the trill, producing some internal and medial alternation with [ǰ] in words such as *rojo* [roho] and *carro* [karo]. The phonemes /r/ and /ɾ/ are often

the last to be acquired by monolingual child Spanish learners (Fantini 1985:131). Fantini reports that children acquiring Spanish are not normally capable of producing the distinction until age 5, although there are known exceptions, and he does not suggest that Mario's acquisition of /r/ and /ɾ/ shows any interference from English (Fantini 1985:131,189). Díaz-Campos on the other hand reports that children acquiring Spanish are able to realize the flap /ɾ/ as [ɾ] by age 2;8 (Díaz-Campos 2001:183).

The common delay in acquiring /r/ is evidenced in the existence of tongue-twister-like verses that are taught to young children to help them practice its pronunciation, such as the example in (8) recorded from personal observation in Colombia. All orthographic *r* below would be pronounced as the trill [r], according to the rules for distribution from Harris (1969), elaborated below.[15]

(9) *R con R cigarro, R con R barril, rápido ruedan los carros cargados de azúcar del ferrocarril.*
'R and R cigar, R and R barrel, the railroad freight cars filled with sugar roll along quickly.'

Some discussion of the phonemic status and allophonic alternations of /r/ and /ɾ/ is relevant to the assibilation and frication of syllable-final /ɾ/. The trill /r/ occurs as an underlying phoneme only intervocalically within a word, where it is contrastive with /ɾ/, as in *pero* [peɾo] 'but' / *perro* [pero] 'dog', one of many such minimal pairs in Spanish.[16] In all other positions, the flap /ɾ/ is underlying, and in some phonological contexts undergoes a rule producing a surface trill /r/ (Harris 1969:46-52). Thus Mexican variation in syllable-final /ɾ/ applies to the underlying phoneme /ɾ/.[17] However, Harris reports that underlying /ɾ/ surfaces categorically as [r] in some environments, listed in (10a), and as [ɾ] in others, listed in (10b). Importantly, he observed a different allophonic distribution depending on whether speech was casual or careful, relevant to this study in that syllable-final /ɾ/ may surface as both [ɾ] and [r].

(10) a. Environments for /ɾ/ > [r]
Word-initially (also maintained in the second member of a compound)
Following /l/, /n/, and /s/ word-internally[18]
In *careful* speech:
Syllable-final, preceding consonants

b. Environments for /ɾ/ > [ɾ]
Following consonants other than /l/, /n/, and /s/ word-internally
Word-finally preceding vowels

---

[15] Note that for the *r* in *cargados* 'filled' and *azúcar* 'sugar', Harris predicts a surface trill in careful speech, but a flap in casual speech. I am presuming that the context of overt language teaching/correcting in which this rhyme would be used would constitute careful speech.
[16] Intervocalically, orthographic *r* consistently corresponds to the flap while *rr* corresponds to the trill.
[17] Intervocalic consonants in Spanish are necessarily syllable-initial.
[18] These first two environments are also cited in Stockwell and Bowen (1965).

In *casual* speech:

Syllable-final, preceding consonants

(Harris 1969:46-52)

Considering this, the delayed acquisition of the trill should not necessarily be a confounding factor for an analysis of variable/ ɾ/ assibilation and frication. Also considering Harris' account, it appears that children show a delay in acquiring the phonetics, or correct articulation, of the trill, rather than the rule for its allophonic distribution. This is apparent because children are delayed in their production of [r] in all contexts, both intervocalically as a realization of /r/, and in other positions as an allophonic realization of /ɾ/.

5 Research Informants and Methodology

5.1 The Philadelphia Mexican Community

Mexicans represent a large proportion of the Hispanic population of the United States: 59% according to the 2000 U.S. Census. The largest and longest-standing populations are in Texas and California (Lipski 2008:75-7). The Mexican community in Philadelphia is relatively new.

According to the U.S. Census Bureau, there were 15,531 people of Mexican origin living in Philadelphia in 2010. This represents 8.3% of the total Hispanic population, and around 1% of the overall population of the city at 1,526,006. The Mexican population of Philadelphia has increased quite rapidly in recent years, more than doubling from 6,220 inhabitants in the year 2000, which was 4.8% of the Hispanic population at the time, and about 0.04% of the city's total population of 1,517,550 (U.S. Census Bureau 2000, 2010). According to personal conversation and two recent documentary films, Mexican immigration to Philadelphia began in the 1990s (D. Owen, p.c.; *Échele Ganas*; *El Sol Sale Para Todos*). The greatest concentration of Mexican immigrants in Philadelphia can now be found around the Italian Market in South Philadelphia, with residents concentrated in the area bordered by Washington and Oregon Avenues, and Front and 8th Streets since 1998 (*El Sol Sale Para Todos*, Shaw 2011b). As of 2010, there were 83 Mexican businesses in South Philadelphia, 39 of those located in the Italian Market area (*El Sol Sale Para Todos*).

During the first wave of Mexican immigration to Philadelphia in the 1990s, immigrants were likely to plan a temporary stay, working for a short time up to a few years to save money and return home to Mexico. Not until the last decade, starting after 2001, have they begun to stay and establish their families here (D. Owen, p.c.; *Échele Ganas*; *El Sol Sale Para Todos*). One early immigrant reports that as recently as 1998 it was still rare to meet other Mexicans in Philadelphia (*El Sol Sale Para Todos*). Otheguy and Zentella also observe that the Mexican population of New York City began to grow in the 1990s, and had more than doubled from the year 2000 to the time of publication of their book in 2012 (Otheguy and Zentella 2012:6).

The population of Mexicans in Philadelphia for the most part falls into what we could call two generations: young parents in their 20s and 30s who grew up in Mexico and immigrated recently, and their children, usually no older than elementary school age,

many of whom were born in Philadelphia and some of whom arrived with their parents at a young age. The majority of South Philadelphia's Mexican community has its origin in the state of Puebla, although there is no record of an exact percentage (Shaw 2011a, 2011b, 2012; D. Owen, p.c.; *Échele Ganas*; *El Sol Sale Para Todos*). The presence of Puebla is evident in the names of restaurants and other Mexican businesses in South Philadelphia, as well as the now yearly tradition of the *Cinco de Mayo* parade that takes place along Washington Avenue. Also known as *El Día de la Batalla de Puebla* 'The Day of the Battle of Puebla' or *Carnaval de San Mateo* 'the Carnival of San Mateo', the holiday is specifically significant to those from the state of Puebla, as the date commemorates a victorious battle there against French forces on May 5, 1862. The state of Puebla is highlighted in pink on the map in Figure 19.

Figure 19: Map showing the state of Puebla (*Maps of Mexico* 2012). 'PUEBLA' in capitals indicates the state while 'Puebla' indicates the capital city of the same name.

The celebration on May 5 in Philadelphia is specifically referred to as the *San Mateo Carnavalero*, as it replicates the carnival celebration of the small town of San Mateo de Ozolco, Puebla (Shaw 2012). According to Shaw (2011) a large number of the Mexicans in South Philadelphia are from a mountainous (in fact volcanic) region of Puebla, which is located to the east of Mexico City. In particular, the towns of San Mateo de Ozolco and San Lucas Atzala in this region are represented by many immigrants living in Philadelphia (D. Owen, p.c.; Shaw 2011, 2012). It is common to hear from those familiar with the Mexican community that around half of the residents of San Mateo de Ozolco, with an original population of approximately 4,000 people, now live in Philadelphia (D.

Owen, p.c.; Shaw 2011). It is also known for the now yearly tradition of the Cinco de Mayo parade in South Philadelphia mentioned above, which takes its name from the town, as it is actually the tradition of this one small town that has been transformed into a tradition for the entire Philadelphia Mexican community.

Different (and not incompatible) explanations exist for the cause of recent Mexican immigration from Puebla, and for the notable number of immigrants from San Mateo de Ozolco and neighboring towns. One push for immigration was the suffering economy in the state of Puebla in the 1980s (Shaw 2011). San Mateo de Ozolco and other surrounding towns like it are poor communities that rely mainly on subsistence farming (D. Owen, p.c.).[19] In addition to a lack of economic opportunities, immigrants from Puebla also cite discrimination for their status as an indigenous people as a reason for choosing to live in the United States, rather than large cities in Mexico such as the nearby cities of Puebla and Cholula, or Mexico City. Puebla is part of a region inhabited by the Nahuatl people, an indigenous group preceding the Spanish colonization of Mexico; in towns like San Mateo de Ozolco, Spanish is a second language for native Nahuatl speakers just two generations back, although for its younger residents it may no longer be learned as a first language. While the experiences of most Mexican immigrants in the United States are likely not free of discrimination, at least some immigrants consider their status as "just Mexican" in the U.S. preferable to their status as *Indios* 'Indians' in Mexico (D. Owen, p.c.).

Another possible influence on continued immigration could have been several eruptions of the volcano Popocatepetl and related earthquakes in 1997 and 1998, which destroyed homes and farmland, followed by a larger eruption in 2000 which precipitated the evacuation of 50,000 residents of the area (San Mateo de Ozolco is the highest village on the slope of the volcano) (D. Owen, p.c.; Volcano World). Other sources say that Poblanos initially immigrated to New York City, but left for Philadelphia and other cities with lower costs of living when housing prices rose in the 1990s. There are even accounts of the first immigrant to Philadelphia from San Mateo de Ozolco who is credited with sparking the wave of immigration. One story that almost borders on legend has it that a man from San Mateo de Ozolco, whose name is unknown, found himself in Philadelphia having lost his way to New York City. On seeing a Mexican flag hanging outside of Tequila's restaurant in Center City, he went inside to ask for directions. Instead, the restaurant employees convinced him that Philadelphia was a better city than New York, and he decided to stay (D. Owen, p.c.). A somewhat similar story reported in local news features a resident of San Mateo de Ozolco named Efren Tellez. A Philadelphia Mexican restaurant owner who remains anonymous tells his version of the story: Tellez was bound for New York but was left in Philadelphia by a smuggler around 1995. He arrived at the restaurant looking for help, and was hired by the owner. A cousin of Tellez, Mario Perez, tells a third version: Tellez originally immigrated to New York City, but didn't like living there and so came to Philadelphia on the recommendation of a friend. In this account he invited his cousin, Perez, and other family members from San Mateo de Ozolco (Shaw 2011).

[19] However, a growing construction industry has apparently sprung up entirely due to immigrants to the US who send back money to build houses for themselves and their families in Puebla.

5.2 Informants

Through my involvement as an ESL teacher with *Puentes de Salud*, an NGO that focuses on the needs of the South Philadelphia Latino community, I have become acquainted with several Mexican immigrant families. I first became involved with *Puentes de Salud* as a tutor for elementary school kids, afterwards switching to teaching English to their parents. For the last 5 months I have been teaching a weekly class to a group of mothers of the children in the tutoring program. The original students have also invited friends and family to join the class. As is characteristic of the Mexican community in Philadelphia in general, the majority of my ESL students are from the state of Puebla. They are all young women, and with the exception of one woman who was invited to join by her sister, all have at least one young child. During the school year, the class was held at Kingston Elementary School after school hours.[20] The ESL students' school age children participated in the tutoring program next door during our class. As paying for childcare is not an option for these women, their children who are too young to have homework would join us in the classroom and play together, or sometimes hang onto their mothers, during class. In this way I have become acquainted with the children, and developed comfortable and friendly relationships with the women.

Four of these students have been approached as potential informants, and agreed informally to participate in this study: Andrea R., Carolina A., Patricia J., and Cecilia E. Patricia J. arrived in the US most recently, a little over 2 years ago, while Carolina A. has lived here the longest of the four, for around 7 years. With the exception of Carolina A., who works cleaning restaurants and other businesses, the women are stay-at-home mothers. All 4 can be considered the primary caregivers for their children, and all are in their mid-20s. Andrea R. has 2 children: Felipe, age 2, and Ilsa, age 6, who were both born in Philadelphia. Carolina A. has 3 children: Brenda, age 1;6, Catalina, age 5, and Moises age 6, all also born here. Cecilia E. has 1 child: Mauricio, age 7. Patricia J. has 2 children: Margarita, age 4, and Jorge age 10. Carolina A. manages some vocabulary in English, mostly related to her work and responsibilities related to her children, but struggles to form grammatical constructions. Andrea R. and Cecilia E. have only very limited, scattered vocabulary in English, while Patricia J. did not appear to have learned any English at all before starting ESL. This is understandable as she has told me that she was too nervous to venture out in the city for the first two years she spent in Philadelphia. In general there is enough of a Mexican presence in South Philadelphia, including restaurants, stores, and services, that one can manage many life necessities speaking only Spanish.

These four women are from two small towns located high up the slope of the Popocatepetl volcano, which lies between Mexico City and the state of Puebla; Andrea R. and Carolina A. are from San Andres Calpán, and Patricia J. and Cecilia E. are from San Mateo Ozolco, discussed in Section 5.1. The two towns are about 18 miles apart, and are both also about 18 miles from the city of Puebla to the east. They are 70-80 miles from Mexico City to the west.

I will recruit 8 additional Mexican families for this study by asking the initial 4 to put me in touch with friends and family. I will limit Mexican informants to immigrants from the region of Puebla, for the sake of dialect uniformity.

[20] The name given for the elementary school is a pseudonym.

Six native English-speaking Philadelphia families will also be included in the study. They will be selected from among the English-speaking peers of the children in the 12 Mexican families. These families will serve a double purpose in this study: to provide data for the English input that the Mexican children are receiving, and to constitute a control group so as to compare the acquisition of (-t,d) deletion and (ay0) among monolingual English-speaking Philadelphia children of similar socioeconomic status and residential area. Of course we could not attribute the same socioeconomic status to American citizens and a largely undocumented immigrant group, many of whose members originate in poor farming communities. However, the classmates and neighbors of the Mexican children in the study will provide the closest comparable English-speaking community.

5.3 Exploratory Research

In order to establish an initial picture of how children of Mexican descent communicate with their peers, and who these peers are, I spent two days observing one 1st grade and one 2nd grade classroom at Kingston Elementary School. Having acquired my current acquaintances in the Mexican community through the *Puentes de Salud* tutoring program and ESL class, which were held at Kingston after school hours, I knew several students who participated in tutoring and were students at Kingston.

At Kingston, 39% of students are English Language Learners, which means that they spend two hours of every school day in an ESOL (English for Speakers of Other Languages) classroom, and also receive assistance from an ESOL teacher in their main classroom one or two days per week. Some, but not all, of the Mexican children at Kingston School participate in the ESOL program. The School District of Philadelphia does not provide statistics for how many students of each ethnicity are English Language Learners. However, I can report on a representative subsample from my classroom observation. In the 1st grade classroom, 9 out of 24 students altogether participate in the ESOL program, while 1 of the 5 children of Mexican descent is an ESOL student. In the 2nd grade classroom, 6 out of 22 students participate in the ESOL program, while 2 of 8 Mexican children are ESOL students.

While most of the children in the *Puentes de Salud* tutoring program attend Kingston, some are also students at Carlisle Elementary School and Ralph Waldo Emerson Elementary School, both located nearby.[21] The locations of the school districts of these three schools are indicated in Figure 20.

Figure 21 shows statistical data from the School District of Philadelphia on the ethnic makeup of the student bodies at these three schools, which are quite similar to one another. Data on the country of origin of students is not available, but the percentage of Latino students may be taken as an approximation of the percentage of Mexican students, considering that this is the dominant origin of the South Philadelphia Latino community (The School District of Philadelphia 2012).

[21] All school names are pseudonyms.

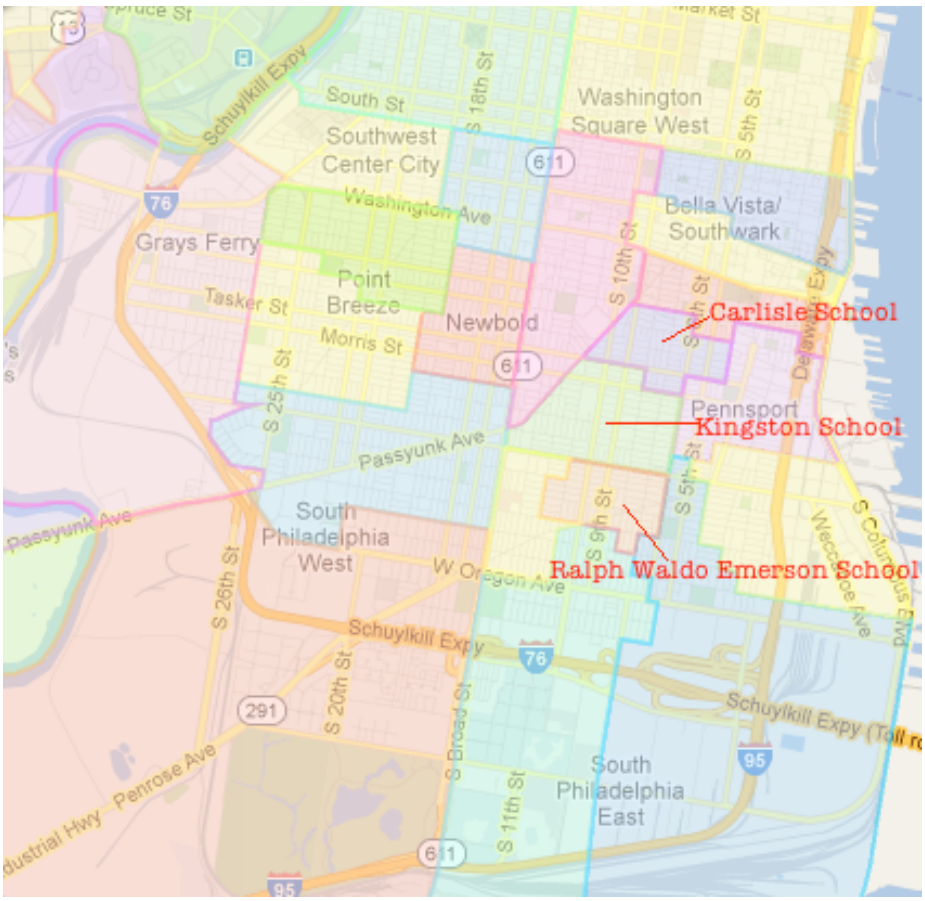

Figure 20: Location of three South Philadelphia school districts serving the Mexican community (school district map from The School District of Philadelphia 2012, school names added (pseudonyms)).

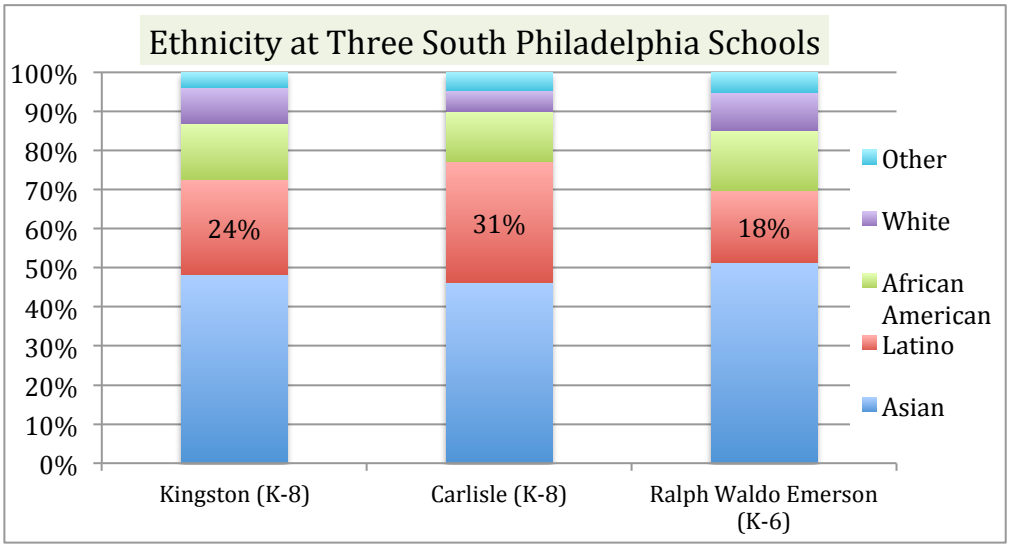

Figure 21: Percentage of ethnicities in the student bodies of Kingston, Carlisle, and Ralph Waldo Emerson Schools in South Philadelphia (Data from The School District of Philadelphia 2012).

Schools in this neighborhood of South Philadelphia serve many English Language Learners, nearly 40% of the student body for all three schools discussed here, as shown in Figure 22. This is in comparison with a much lower overall rate of 8.1% of all students in the Philadelphia School District, calculated for grades K-12 (The School District of Philadelphia 2012).

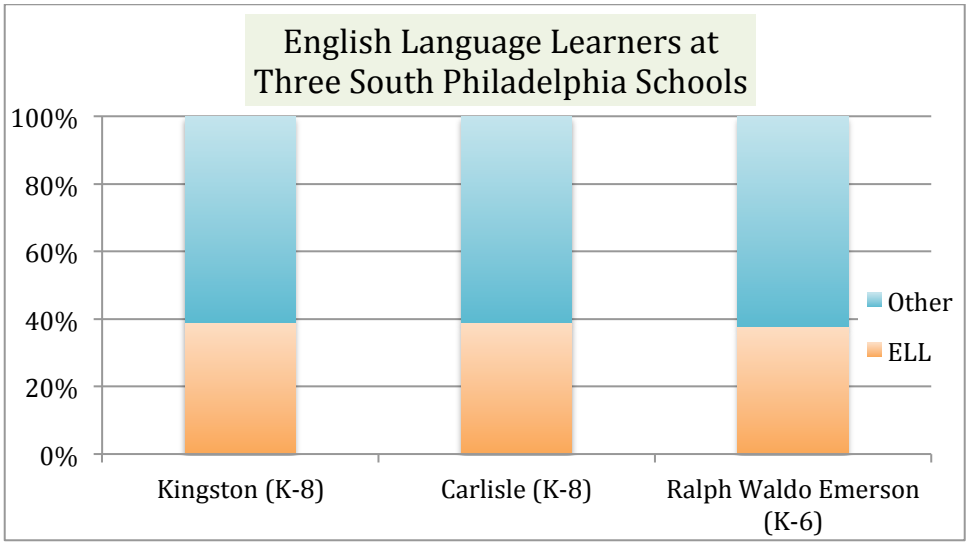

Figure 22: Percentage of English Language Learners at Kingston, Carlisle, and Ralph Waldo Emerson Schools in South Philadelphia (Data from The School District of Philadelphia 2012).

During my classroom observation, I was also able to observe the Mexican children interacting with their peers in class, at lunch, and during recess. Overall I did not find that they only interacted with other Mexican kids, as might be expected. Even though classroom seating is assigned, kids still have a choice as to which other kids they talk to at their tables. I saw the 1st and 2nd graders of Mexican descent communicating comfortably with their Asian, white, and African American classmates in the classroom. In the lunchroom I saw that the mix of ethnicities at classroom tables was maintained at all lunch tables, the only difference being that kids divided themselves by gender at lunch. At lunch I also discovered that all the students are familiar with certain Mexican snacks that the Mexican kids bring to lunch and share with everyone, such as some very popular spicy chips called Takis. Even when I observed Mexican children talking amongst themselves, I found that they spoke English rather than Spanish. I saw an exception to this behavior only in the case of two boys, one in 1st grade and one in 2nd grade, both ESOL students. On a few occasions, a Mexican classmate at their respective tables who was more fluent in English would help them out by translating the teacher's directions into Spanish.

I have also visited the home of one of my ESL students, Andrea R., mother of Isla, age 6 and Felipe age 2. I briefly interviewed Andrea and Ilsa, who was born in Philadelphia and began to learn English when she started preschool at age 4;6. Ilsa is a quiet child, but also sweet and cooperative. I spoke with Andrea first in Spanish for about 15 minutes, and then asked Ilsa to show me her room and toys while I recorded her. I spoke to Ilsa in Spanish as well; having only met her briefly and witnessed her speaking Spanish with her mother, I didn't yet know how comfortable she was in English. After

about 6 minutes of sparse conversation, she spontaneously switched to English. I followed her lead and she clearly preferred to continue the rest of our interview in English, which we did for about 12 more minutes. In fact, on listening to the recording afterwards, I discovered that she had already offered two utterances in English, one after about 1 minute of conversation, and another after 5 minutes. At the time I hadn't noticed, and continued in Spanish. Andrea R. told me that Ilsa likes to teach Felipe English words. Felipe has not started attending preschool yet, so the only English he knows is what his sister has taught him, such as some numbers and letters of the alphabet. Andrea recounted that Ilsa shows her preference for English by giving her brother instructions such as "not *uno*, one!" in response to him using *uno* 'one' in Spanish. This seems to be a common attitude among children of Ilsa's age. Many of my ESL students, who are not yet able to converse comfortably in English, tell me that their children want to speak English with them at home.[22]

More investigation will be required to fully determine what varieties of English are present as peer input for Mexican children in Philadelphia. During my two days of observation, I caught a few of what may be AAVE features in the speech of some Mexican children, more so among the 2nd graders. However, these features were somewhat scattered and difficult to identify definitively. I could not say with certainty that I heard any clear Philadelphia features in their English either.[23] In the 1st grade classroom, there was only one African American student, and she herself did not sound like a strong speaker of AAVE. There was also one white student in the class. Meanwhile in the 2nd grade classroom, there were two African American boys who were quite vocal in class and clearly AAVE speakers as well. In this class there were no white students. It is difficult to determine what relative influence there may be of the Philadelphia dialect and AAVE from the few white and black speakers in each classroom. In this study, a detailed look at who each child's peers are, and how they communicate, will serve to answer these questions.

5.4 Data Collection

This study will be conducted with 12 Mexican families from Puebla and 6 native English-speaking Philadelphia families for a total of 18 families. Recordings will be made of the speech of all children in each family between ages 3 and 8, as well as the primary caregiver. Following Foulkes et al. (2005) and Smith et al. (2007), I will limit informants to those children whose primary caregiver is their mother, and I will not attempt to

[22] In a Linguistics 560 report of elementary school children in a central North Philadelphia Puerto Rican neighborhood, Freed et al. (1976) found mixed usage of Spanish and English in different contexts. While a few children in the study spoke only Spanish at home, the majority used Spanish and English. In addition, while a few used only English with siblings, friends, or teachers, the majority used both Spanish and English in these contexts. This shows a similar desire of children to use English in different contexts, including at home. However, it appears that as of yet the South Philadelphia Mexican community differs from the Puerto Rican community in that there is less mixing of languages within each context: Spanish dominates at home, while English dominates in other contexts.

[23] Without recording, I would not vouch for the frequency or non-existence of any features in the speech I observed.

include both parents in analysis (among the initial group of informants, and others with whom I've become acquainted in the community, mothers are the primary caregivers). I will also limit informants to children who have entered the Philadelphia school system by age 7. As some families may have one child over the age of 3 and some may have more, the exact number of children will not be predetermined. While most families I have met have at least two children, one of these is sometimes below the age of 3. Thus with a goal of 18 families in mind, I expect to have a final sample of around 24-32 children and 18 caregivers. The sample of children will be balanced as closely as possible for sex, and distributed evenly by age.

Two types of recordings will be made at two time points, separated by 4 months, for each child. These will consist of sessions with children and their primary caregiver, as well as children with a peer.

For child-caregiver recordings, digital recorders will be provided for each child between age 3 and 8 in the family and one primary caregiver, to carry on their person (e.g., in pockets for adults, and in small backpacks for children) for self-recording while the researcher is not present, following the methodology of Smith et al. (2007). Parents will be asked to turn on tape recorders for a total of 10 hours of interaction over a period of 2 weeks, to record a range of family activities, with attention to minimizing background noise such as television. As these recordings will be conducted twice for each family over the course of the study, I will obtain a total of 20 hours of recording per family. In addition to the value of obtaining child-directed speech from the primary caregiver, recording while the researcher is not present should help to minimize the effect of the observer's paradox, which as noted by Smith et al. (2007) "…is exacerbated in the case of young children, where the presence of an outsider in the home can render the child literally 'speechless'" (Smith et al. 2007:68). In addition for this study, recording children without the presence of the researcher will be essential to obtaining speech in which children naturally choose to speak Spanish. As was quickly apparent during my visit to Andrea R.'s home, her daughter Ilsa R. preferred to speak English knowing that I spoke English. In order to obtain speech in Spanish from children like her, who seem to be a common case if not the rule, I would have to make an overt request for them to speak in Spanish, which could result in less-than-natural conversation, an uncooperative or unhappy child, or might not work at all.

For peer recordings, the researcher will record each child of the 18 selected families in pairs with a good friend. Payne (1976, 1980) recorded children in pairs with their best friends, in order to "create a situation in which there would be close peer interaction" (Payne 1980:145). When possible, peers from within the 18-family informant pool will be recorded together. This will be the case at least for the children of the English-speaking Philadelphia families who will be recruited based on being identified as peers of children in the Mexican families. However, if certain children only have peers outside of this informant pool, their peers will be recruited for this part of the study only, though their speech will not be a focus of analysis. Several sessions of 1-2 hours will be recorded with the researcher over a period of two weeks as close to the time of family recording as possible, for a total of 10 hours of recorded interactions. Again this will occur at two times during the study, for a total of 20 hours of recording of each child with a peer. During these sessions, the researcher will ask children questions to elicit storytelling, such as 'Have you ever been blamed for something you didn't do?',

'When was a time you were really scared?', etc., and ask children to play games together. In addition I will use other techniques, such as those that were found to successfully elicit speech in Roberts (1994) and Roberts and Labov (1995), including recounting stories from books without pictures, interacting with puppets or other toys controlled by the researcher, and talking on a toy telephone.

Lastly, I will record caregivers in sociolinguistic interviews with one adult peer at one point during the study, in their homes or other location of their choice. Again, when possible peers will be selected from within the informant pool of caregivers. This should be possible in most cases for Mexican caregivers as informants will be recruited through personal contacts to begin with. These recordings will consist of approximately 1-2 hours, and will also follow the format of a sociolinguistic interview. Although this study aims to draw conclusions about child acquisition, it will be important to have a sample of adult-directed speech from caregivers in addition to child-directed speech. Studies discussed above have shown child-directed speech to differ from adult-directed speech, especially in the case of sociolinguistic variables that may have a negative social evaluation (Roberts 2002, Smith et al. 2007). Thus child-directed speech alone may not fully reflect the state of a variable in the parent generation of the speech communities to be studied. Smith et al. (2007) collected speech between adults in addition to caregiver child-directed speech, and Roberts (1997a) collected adult speech in individual sociolinguistic interviews in addition to child speech.

The number of participants and amount of speech to be collected has been determined according to previous studies that depended on conducting statistical analysis of the speech of young children. For her 1997 studies of (-t,d) deletion with 3- and 4-year old children, Roberts used 16 children and 8 parents, and collected a total of 146 hours of recording. The parents were interviewed for comparison; assuming each parent was recorded for about an hour, that leaves around 8.5 hours of recording per child. She was able to collect between 44 and 250 tokens per child, conducting 6-13 sessions per child (44 tokens having been obtained from a particularly quiet child) (Roberts 1997a, 2002, Roberts and Labov 1995). Guy (1980) suggests a minimum of 10, but more advisably 35, tokens per factor for (-t,d) deletion to obtain significant results for individual speakers. To obtain this many tokens from adult speakers, Guy proposes a sociolinguistic interview of 2 hours in length (he does not discuss obtaining tokens from children).[24] Roberts reports that the data for (-t,d) deletion obtained in an adult interview of 1 to 2 hours is obtained in anywhere from 8 to 14 hours of speech from young children (Roberts 2002:336). Smith et al. (2007) had 24 caregiver-child pairs in their study, and collected 10 hours of home recording for each. Of those 10 hours, there resulted on average 6 to 7 hours of analyzable speech (J. Smith, p.c.). They were able to obtain 100-150 tokens of the *hoose* variable per child from this amount of recording (Smith et al. 2007:72). For this study, with 20 hours of recording at home and 20 hours with a peer per child, I can expect to obtain possibly 12-14 hours of speech per child in each context.

[24] Despite this, Guy's 1991 study of –t,d deletion in 7 speakers uses 30-60 minute interviews.

6 Timeline

- Institutional Review Board research protocol approval
    - May 2012 Submitted
    - June 2012 Revisions requested and submitted, protocol approved
- Recruiting of additional informants
    - July-August 2012
- Data collection and transcription
    - July 2012- January 2013
- Data analysis
    - February 2013-May 2013
- Writing
    - June 2013-August 2013

References

Amastae, Jon, and David Satcher. 1993. Linguistic assimilation in two variables. *Language Variation and Change* 5:77-90.

Bayley, Robert. 1994. Consonant cluster reduction in Tejano English. *Language Variation and Change* 6:303-326.

Cameron, Richard. 1992. Pronominal and Null Subject Variation in Spanish: Constraints, Dialects, and Functional Compensation. Doctoral Dissertation, University of Pennsylvania.

Cárdenas, Daniel N. 1958. The geographic distribution of the assibilated r, rr in Spanish America. *Orbis* 7:407-414.

Chambers, J.K. 1988. Acquisition of phonological variants. In *Methods in Dialectology*, ed. A. Thomas and M. Ball, 650-665. Clevedon: Multilingual Matters.

Chambers, J.K. 1992. Dialect acquisition. *Language* 68:673-705.

Chambers, J.K. 2002. Dynamics of dialect convergence. *Journal of Sociolinguistics* 6:117-130.

Conn, Jeffrey C. 2005. Of "Moice" and Men: The Evolution of Male-led Sound Change. Doctoral Dissertation, University of Pennsylvania.

D'Anunciacao, Rosemary, Solange de Azambuja Lira, Julieta Sanchez, and P. Franz Seitz. 1978. *Lawrence St*. Linguistics 560 report, University of Pennsylvania.

Deuchar, Margaret, and Suzanne Quay. 2000. *Bilingual Acquisition: Theoretical Implications of a Case Study*. New York: Oxford University Press.

Díaz-Campos, Manuel. 2001. Acquisition of phonological structure and sociolinguistic variables: a quantitative analysis of Spanish consonant weakening in Venezuelan children's speech. Doctoral Dissertation, The Ohio State University.

Diaz-Campos, Manuel. 2005. The emergence of adult-like command of sociolinguistic variables: A study of consonant weakening in Spanish-speaking children. In *Studies in the Acquisition of the Hispanic Languages: Papers from the 6th Conference on the Acquisition of Spanish and Portuguese as First and Second Languages*, ed. D. Eddington, 56-65. Somerville, Mass.: Cascadilla.

Échele Ganas: A Life Left Behind. Live Screening. Directed by Laurence Salzmann. 2012. Philadelphia, PA: Blue Flower Productions.

El Sol Sale Para Todos. DVD. Directed, produced, and edited by Leticia Roa Nixon, Carlos Pascual Sánchez, and Laura Deutch. 2010. Philadelphia, PA.

Fantini, Alvino E. 1985. *Language Acquisition of a Bilingual Child: A Sociolinguistic Perspective (To Age Ten).* San Diego: College-Hill Press.

Foulkes, Paul, Gerard Docherty, and Dominic Watt. 2005. Phonological variation in child-directed speech. *Language* 81:177-206.

Freed, Barbara, Susan Lindheim, Shana Poplack, and Laurel Tanner. 1976. *An Exploratory Study of Bilingual Puerto Rican Children*. Linguistics 560 report, University of Pennsylvania.

Fruehwald, Josef T. 2007. The Spread of Raising: Opacity, lexicalization, and diffusion. Undergraduate Thesis, University of Pennsylvania.

Genesee, Fred. 1989. Early bilingual development: one language or two? *Journal of Child Language* 16:161-179.

Guy, Gregory. 1980. Variation in the group and the individual: The case of final stop deletion. In *Locating language in time and space*, ed. W Labov, 1-36. New York: Academic.

Guy, Gregory R. 1991. Explanation in variable phonology: An exponential model of morphological constraints. *Language Variation and Change* 3:1-22.

Guy, Gregory R., and Sally Boyd. 1990. The development of a morphological class. *Language Variation and Change* 2:1–18.

Ingram, D. 1981-2. The emerging phonological system of an Italian-English bilingual child. *Journal of Italian Linguistics* 1981/82:95-113.

Harris, James W. 1969. *Spanish Phonology*. Cambridge, Mass.: M.I.T. Press.

Hidalgo, Margarita. 1996. A profile of language issues in contemporary Mexico. In *Spanish in Contact: Issues in Bilingualism*, ed. A. Roca and J. B. Jensen, 45-72.

Johnson, Daniel Ezra. 2010. *Stability and change along a dialect boundary: the low vowels of Southeastern New England.* PADS (Publication of the American Dialect Society) 95. Durham, NC: Duke University Press.

Johnson, C., and Lancaster, P. 1998. The development of more than one phonology: A case study of a Norwegian-English bilingual child. *International Journal of Bilingualism* 2:265-300.

Johnson, Jacqueline S., and Elissa L. Newport. 1989. Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology* 21:60-99.

Labov, William 1989. The child as linguistic historian. Language Variation and Change 1:85-97.

Labov, William. 1994. *Principles of Linguistic Change*. *Volume I: Internal Factors.* Oxford: Blackwell.

Labov, William. 2001. *Principles of Linguistic Change*. *Volume II: Social Factors.* Oxford: Blackwell.

Labov, William. 2007. Transmission and diffusion. *Language* 83:344-387.

Lee, Hikyoung. 2000. Korean Americans as speakers of English: The Acquisition of General and Regional Features. Doctoral Dissertation, University of Pennsylvania.

Lipski, John M. 1986. Reduction of Spanish word-final /s/ and /n/. *Canadian Journal of Linguistics* 31:139-156.

Lipski, John M. 1994. *Latin American Spanish*. New York: Longman Publishing.

Lipski, John. 2008. *Varieties of Spanish in the United States.* Washington, D.C.: Georgetown University Press**.**

Lope Blanch, Juan M. 1972. Estudios Sobre el Español de Mexico. México, D.F.: Universidad Nacional Autónoma de México.

Lope Blanch, Juan M. 1990. Atlas Lingüístico de Mexico: Volumen 1. México, D.F: Departamento de Publicaciones de El Colegio de México.

Maps of Mexico. 2012. Map of Puebla. <http://www.map-of-mexico.co.uk/map-of-puebla.htm>

Meisel, Jürgen M. 2004. The Bilingual Child. In *The Handbook of Bilingualism*, ed. T.K. Bhatia and W.C. Ritchie, 91-113. Oxford: Blackwell Publishers.

Meisel, Jürgen M. 2008. Child second language acquisition or successive first language acquisition? In *Current Trends in Child Second Language Acquisition: A generative perspective*, ed. B. Haznedar and E. Gavruseva, 55-80.

Miller, Kitty, Otto Santa Ana, Christine Lee, Anny Ewing, and Karen Seeley et al. 1982. *Fieldwork in the Puerto Rican Speech Community Philadelphia: 2400 Arroz Street.* Linguistics 560 report, University of Pennsylvania.

Moreno de Alba, José G. 1994. *La Pronunciación del Español en México*. México: El Colegio de México, Centro de Estudios Lingüísticos y Literarios.

Otheguy, Ricardo and Ana Celia Zentella. 2012. *Spanish in New York Language Contact, Dialectal Leveling, and Structural Continuity*. Oxford University Press.

Owen, Daphne, personal conversation with author, March 28, 2012.

Paradis, Johanne, and Samuel Navarro. 2003. Subject realization and crosslinguistic interference in the bilingual acquisition of Spanish and English: What is the role of the input? *Journal of Child Language* 30:371-393.

Payne, Arvilla Chapin. 1976. The Acquisition of the Phonological System of a Second Dialect. Doctoral Dissertation, University of Pennsylvania.

Payne, Arvilla C. 1980. Factors controlling the acquisition of the Philadelphia dialect by out-of-state children. In *Locating Language in Time and Space*, ed. W. Labov, 143-178. New York: Academic Press.

Perissinotto, Giorgio. 1972. Distribución demográfica de la asibilación de vibrantes en el habla de la ciudad de México. *Nueva Revista de Filología Hispánica* 21:71-79.

Perissinotto, Giorgio. 1975. Fonología del español hablado en la Ciudad de México: Ensayo de un método sociolingüístico. México: Colegio de México.

Poplack, Shana. 1978. Dialect acquisition among Puerto Rican bilinguals. *Language in Society* 7:89-103.

Poplack, Shana. 1980a. Deletion and disambiguation in Puerto Rican Spanish. *Language* 56:371-385.

Poplack, Shana. 1980b. The notion of the plural in Puerto Rican Spanish: Competing constraints on (s) deletion. In *Locating Language in Time and Space,* ed. W. Labov, 55-67. New York: Academic Press.

Potowski, Kim. 2011. Intrafamilial Dialect Contact. In *The Handbook of Hispanic Sociolinguistics*, ed. M. Díaz-Campos, 579-597. Malden, Mass: Blackwell Publishing Ltd.

Ravindranath, Maya. 2009. Language Shift and the Speech Community: Sociolinguistic Change in a Garifuna Community in Belize. Doctoral Dissertation, University of Pennsylvania.

Rissel, Dorothy A. 1989. Sex, attitudes, and the assibilation of /r/ among young people in San Luis Potosí, Mexico. *Language Variation and Change* 1. 269-283.

Roberts, Julie. 1994. Acquisition of variation: (-t,d) deletion and (ing) production in preschool children. Doctoral Dissertation, University of Pennsylvania.

Roberts, Julie. 1997a. Acquisition of Variable Rules: a study of (-t,d) deletion in preschool children. *Journal of Child Language* 24:351-372.

Roberts, Julie. 1997b. Hitting a moving target: Acquisition of sound change in progress by Philadelphia children. *Language Variation and Change* 9:249-266.

Roberts, Julie, and William Labov. 1995. Learning to talk Philadelphian: Acquisition of short *a* by preschool children. *Language Variation and Change* 7:101-112.

Sankoff, Gillian. 2006. Cross-sectional and longitudinal studies. In *An International Handbook of the Science of Language and Society, Volume 3*, ed. U. Ammon, N.

Dittmar, K. J. Mattheier, and P. Trudgill, 1003-1013. Berlin: de Gruyter.

Sankoff, Gillian, and Suzanne Laberge. 1973. On the acquisition of native speakers by a language. *Kivung* 6: 32-47.

Santa Ana A., Otto. 1992. Chicano English evidence for the exponential hypothesis: A variable rule pervades lexical phonology. *Language Variation and Change* 4:275–288.

School District of Philadelphia, The. 2012. <http://www.philasd.org/>

Shaw, Julie. Oct. 28, 2011a. From Puebla to South Philly. *Philly.com*. <http://articles.philly.com/2011-10-28/news/30332471_1_poblanos-mexican-states-mexican-new-york>

Shaw, Julie. Oct. 28, 2011b. Puebla man's migration tale a common one in Philly. *Philly.com*. < http://articles.philly.com/2011-10-28/news/30332470_1_immigrants-puebla-town-center>

Shaw, Julie. May 1, 2012. A Mexican accent for S. Philly. *Philly.com.* <http://articles.philly.com/2012-05-01/news/31498540_1_turkish-soldiers-mexican-victory-dance>

Silva-Corvalán, Carmen. 1994. *Language Contact and Change: Spanish in Los Angeles*. Oxford: Clarendon Press.

Silva-Corvalán, C. 2003. Linguistic consequences of reduced input in bilingual first language acquisition. In *Linguistic Theory and Language Development in Hispanic Languages*, ed. S. Montrul and F. Ordoñez, 375-397. Sommerville, Mass.: Cascadilla Press**.**

Smith, Jennifer, Mercedes Durham, and Liane Fortune. 2007. "Mam, my trousers is fa'in doon!": Community, caregiver, and child in the acquisition of variation in a Scottish dialect. *Language Variation and Change* 19:63-99.

Smith, Jennifer, Mercedes Durham, and Liane Fortune. 2009. Universal and dialect-specific pathways of acquisition: Caregivers, children, and t/d deletion. *Language Variation and Change* 21:69-95.

Stockwell, Robert P., and J. Donald Bowen. 1965. *The Sounds of English and Spanish*. Chicago: University of Chicago Press.

Volcano World. 2012. Mexico's Popocatepetl Volcano shows recent activity. Oregon State University Department of Geosciences. **<**http://volcano.oregonstate.edu/mexicos-popocatepetl-volcano-shows-recent-activity>

Wagner, Suzanne Evans. 2007. "We act like girls and we don't act like men": The use of the male-associated variable (ay0) in South Philadelphia. In *Penn Working Papers in Linguistics* 13.1, ed. T. Scheffler, J. Tauberer, A. Eliam, and L. Mayol.

Wagner, Suzanne Evans. 2008. Linguistic change and stabilization in the transition from adolescence to adulthood. Doctoral Dissertation, University of Pennsylvania.

Yang, Charles. 2000. Internal and external forces in language change. *Language Variation and Change* 12:231-250.

Zentella, Ana Celia, Litsa Marlos, Celia Alvarez, and Alicia Pousada. 1977. *Dauphin St*. Linguistics 560 report, University of Pennsylvania.