THE ST. LOUIS CORRIDOR: MIXING, COMPETING, AND RETREATING DIALECTS

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ABSTRACT

THE ST. LOUIS CORRIDOR: MIXING, COMPETING, AND RETREATING DIALECTS

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William Labov

The St. Louis Corridor shows a number of Northern Cities Shift (NCS) features originating from the Inland North dialect area despite being geographically situated in the Midland region. Past studies have shown evidence of the Corridor's special status as an Inland North enclave (Labov 2007, Bigham 2010) but have not demonstrated how this dialectal relationship has grown and changed over time, showing mixed results when explaining or defining the Inland North influence (Kenny and Stanford 2013). In this dissertation, I demonstrate how the NCS rise and retreat in the Corridor is a result of population movements tied to both the development of Route 66 and historical periods of population movement. By analyzing new interviews collected for this project as well as existing interviews collected as early as 1972, this dissertation shows both dialect influence and retreat over the course of a generation. This discovery has implications for the communication patterns involved in dialect spread and retreat, including the role of child speakers, adult speakers, and location in diffusion as well as the overlap of speech communities.

Analysis of the data also shows dialect interaction and interference stemming from the contact between the two competing Corridor dialects (NCS and Midland). Instead of demonstrating dialect leveling or movement of existing dialect boundaries, the NCS and Midland dialect features interact both at the phonological and broad dialectal level. During the period of Inland North influence, the strength of the NCS meant that even Midland sound changes unrelated to NCS dialect features (fronting of /aw/, /ow/, and non-coronal /uw/) showed a dip during the NCS influence period across the entire Corridor in both rural and urban areas. However, many individual vowel changes present in these dialect regions interfere directly

(specifically Midland /ʌ/ fronting vs. NCS /ʌ/ backing, Midland conditioned low-back merger vs. NCS /o/ fronting, and the US nasal /æ/ system vs. NCS /æ/ raising). The strengthening of the Midland dialect ultimately led to the retreat of the NCS in the region. The exploration of these dialectal interactions contributes important insight to the study of competition between linguistic systems.

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CHAPTER 1

Introduction

In this dissertation, I investigate the intersection of dialect contact and population movement. Taking the St. Louis Corridor as a test case, I explore how both linguistic and non-linguistic factors can lead to both dialect diffusion and dialect retreat. By using data from original interviews conducted in the Corridor, along with interviews from the Atlas of North American English (Labov, Ash, and Boberg 2006, henceforth ANAE) and publicly available oral histories, I am able to determine the full extent of the Inland North dialectal influence on a Midland dialect area covering almost 100 years. Specifically, I locate the population affected by the Inland North influence in both space and time: speakers born between 1926 and 1952 who grew up in large cities in the Corridor, paralleling the history of the rise and eventual replacement of Route 66 in Illinois. In addition, the gradual growth of the nasal /æ/ system in the Corridor differs in critical ways from other nasal systems across the country. The distinct trajectory that this specific nasal system follows helps illuminate aspects of the Midland and Inland North influence. In tracking the nasal system and other features, I also find direct phonological interactions and overall dialectal interference that impedes the growth of each dialect.

This research follows a long tradition of case studies analyzing the geography of sociolinguistic variation, chiefly those that study the boundaries of different dialects. However, this dissertation differs from past studies in critical ways – most importantly, instead of showing a dialect boundary, the Inland North influence may be better described as a dialectal "breach" of the Midland area. Though the Midland dialect gradually increases in the Corridor over time, the Inland North dialect (a series of vowel

movements called the Northern Cities Shift**)** makes a generation-long appearance along a heavily traveled route before reversing almost entirely. This spike in dialect influence occurred during a time when the population was moving towards the center of the state. The Corridor has resisted linguistic description in previous studies, providing clues of the Northern Cities Shift but hiding its full story of dialect influence, interaction, and reversal. Therefore, the first goal of this study is to describe the dialectal history of the St. Louis Corridor by using the features associated with both dialect diffusion and transmission to explain the actuation and retreat of the Northern Cities Shift in the Corridor.

In considering the dialectal change of this specific geographical area, the analysis of this dialect interaction addresses the implications of opposing linguistic forces on individual phonemes. Although initially it appears as though there is less Northern Cities Shift influence than expected, the lack of movement of /ʌ/ or the abrupt reversal in /æ/ raising may be the result of a more complex interaction between opposing rules that affect the same phonemes. However, because unrelated phonemes from the different dialects also appear to show some interference, this interaction is likely not just phonemic but also involves some competition of the two linguistic systems. Although it may not be possible to completely disentangle the opposing linguistic forces present in this study, I introduce some possible methods to separate out the effects of individual dialect features.

Finally, I argue that the results of this dissertation, though geographically constrained, hold broader implications for the explanatory power of both population histories and sociolinguistic variation to illuminate patterns of dialect spread. Town size and transportation patterns are important in the spread of one dialect, which ultimately dies

out within a generation. However, the growth of the other dialect shows a similar growth pattern regardless of size, location, and demographic distribution of the population. This contrast demonstrates the different roles both adults and children play in dialect diffusion in addition to its transmission (or lack thereof) across generations.

1.1 Overview

In the introduction that follows, I will discuss the background concerning how dialects spread and strengthen over time. Although the dialect of the St. Louis Corridor is influenced by two different sources (namely the surrounding Midland area and the noncontiguous Inland North region), the ways in which the two dialects spread through the area are constrained by how they enter into the dialect. Previous studies of dialect influence have established regular patterns of dialect spread across a large geographical area through both adult and child speakers. At the same time, within a speech community, different levels of contact can be found, each of which has implications for the direct spread of dialect features. Each type of dialect source has implications for the findings from the current study.

1.2 Dialect spread and change

Because the adoption and retreat of the dialect changes in this study occur within a generation, we will first look at whether child or adult speakers were at the forefront of this dialect spread. The earliest studies of dialect contact generally did not directly address the question of adult compared to child agency in dialect contact and change. However, as communities with dialectal change led or adopted by children have been studied in depth, researchers have found that dialect features adopted by children are

different in character than features adopted by older speakers. Labov (2007) divides the sources of dialect change into two main categories:

1) **Diffusion**: the spread of dialectal change from one community to another led by adults through their contact with other adults.

2) **Transmission**: acquisition of features transferred to child through the regular process of language acquisition. Within this category is the process of **incrementation**, in which successive cohorts and generations of children advance the change in a dialect feature further than an older cohort or generation.

These two sources of dialect change proceed in distinct ways and the resulting changes are quite different in character. The main distinction is that diffusion is advanced by adults while transmission applies to the language acquisition process by children – the linguistic faculty of children allows transmission can more faithfully reproduce distinctions that adult adopters are unable to accomplish. In sum, the characteristics of dialect change allow us to determine the way in which features spread through a community: through children or by adults. The next few sections deal with diffusion and transmission both within and between communities, as well as the implications of these methods of dialect change for the current study.

1.2.1 Transmission and diffusion within a community

The distinction between how adults and children adopt the language features of those around them differs in predictable ways. While children adopt the same patterns of their parents or peers through the process of transmission, a dialect that is result of diffusion via older speakers may not be entirely faithful to the phonetics or phonological distinctions of the source dialect. For instance, in Payne's (1976, 1980) study of acquisition of the Philadelphia dialect in King of Prussia, the children who moved to the

area later in life were less likely to acquire phonetic variables of the Philadelphia dialect than those who moved there before age 8. This finding led to the conclusion that the age a child comes into contact with dialect features (before adulthood) has a marked effect upon acquisition of dialectal features. Chambers (1992) has similar findings for a group of Canadian children who moved to Great Britain and were in the process of acquiring British variables. In his study, he finds that children who moved at about the same age as those in King of Prussia (9 or younger) demonstrated the ability to reproduce the phonetic rules of their adopted dialect. However, in order to pick up on phonemic rules, such as /æ/ backing, children needed to be exposed to the dialect even earlier. Therefore, even though children adopt the basic phonemic categories of their peers throughout their childhood and can approximate their vowel system, fine-grained distinctions (such as the tense-lax /æ/ system of Philadelphia) are tied to the earliest stages of a child's language development.

Although many of the authors of the studies mentioned above argue for an age cap in adopting phonetic and phonological distinctions, adults can also show some of the effects of a non-native dialect upon their own. The study by Payne (1976), which mainly focuses on children's acquisition of the Philadelphia dialect before age 8, also demonstrates that some adults from out of state appeared to demonstrate a slight amount of phonetic influence[1] in their dialect. Although the adults did not pick up the same phonetic or phonological distinctions as the children, their dialect did change as a result. Sankoff and Blondeau (2007) show in their panel study that a sizeable minority of adults

[1] By phonetic influence, I mean phonetic effects that do not alter speakers' phonologies. For instance, in Payne's (1976) study, some adults showed slight movement of the means of vowels (ex. continuous /æ/ raising) but not the acquisition of clear phonetic distinctions (ex. /ay/ raising before voiceless segments and the /æ/ pattern).

participate significantly in a community change from [r] to [R] across a 13-year time span. Over a 24-year span, the oldest group showed a 10% increase. This study, among other lifespan studies, shows that the entirety of one's dialect is not entirely set before adulthood. Furthermore, Cedergren's (1988) real-time trend study of Panamanian ch-lenition also demonstrates an increase in ch-lenition for older speakers over time. Although finding adult language change is not necessarily common in real-time studies of sound change, these two studies demonstrate that speakers are capable of changing their language use beyond adolescence.

In addition, within a single speech community, change in progress can also reveal different patterns according to generations or cohorts. For instance, based upon the evidence from Philadephia, Labov (2001, 2002) shows that generations of men in Philadelphia at the time of the study were fronting /aw/ not in a linear fashion by age but in a step-wise progression, with abrupt rises in the strength of /aw/ fronting every generation. Women show a more gradual increase over time of /aw/ fronting. Labov attributes this male uniform incrementation model in apparent time to acquisition from caretakers (particularly female, who show a gradual incrementation) of the incoming change, and very little influence from the general peer group. However, Labov hypothesizes a different pattern for regular change in progress, namely a sharp increase in the strength of ongoing sound change for teenagers. This pattern is what Labov calls an **adolescent peak** in sound change: during a change in progress, adolescents, not young children, are the ones who have the strongest forms of the change. Children will pick up on the new feature and each cohort of children builds upon the last to advance their forms even farther. This process peaks in adolescence (around 17) and older generations in

apparent time graphs will show less advanced forms of the change. In this way, adolescence is generally the time period during which the change progresses the most. In fact, as Tagliamonte and D'Arcy (2009) point out, most studies where speech communities are undergoing a dialect change show this exact pattern in apparent time. However, this type of change assumes that the ongoing change is rooted in the community – if the origin of a dialect change is an outside influence and the source or level of interaction changes in some way, it would follow that the change would cease to advance in this way.

In considering which criteria to use in determining a person's relationship to one city over another, one factor that should be taken into consideration is the speaker's social network. Although Bloomfield (1933) considered only face-to-face interactions in building a city's dialect, one must consider a different approach when individuals do not leave their town or interact with outsiders. Milroy (1980) addressed this issue in her study of stable variation in Belfast. In addition to correlating variables with age and gender, Milroy also categorized speakers according to their social network, considering both how dense their local social network was and what connections they had to others in the neighborhood, including family, colleagues, and how much social time they spent with colleagues (Milroy 1980:141-2). She found that although external predictors, such as gender and age, did correlate with use of variables, that the social networks added a level of explanation and further clarified correlations with external variables. Also, social networks were better indicators than neighborhood by itself, which correlated very poorly with these variables. In the Philadelphia neighborhood study, Labov (2001) centered the network indices on density of a number of relationships, including actual interaction,

potential interaction, and friendship, both on and off of the block a speaker lived on. However, a higher local density of friends and interactions on a speaker's own block did not necessarily correlate with stronger variables, as some speakers with strong non-local connections ended up being leaders of linguistic change. Although the community connection aspect is important in considering the spread of local features in the area, this last finding in particular for speakers with strong non-local ties has implications for the current study. If speakers were moving from the Inland North to the Corridor, particularly if they were integrated into communities with strong ties, their dialectal patterns might have been more likely to be integrated into the community as a whole. However, if people with strong non-local ties can be the leaders of linguistic change, that means locals from Corridor towns and cities with ties to Chicago, or perhaps St. Louis as a possible secondary source of the Inland North features, could have led the incoming changes themselves. Although this study does not touch upon any one community or town in depth, this type of connection and source of change will be considered.

1.2.2 Dialect diffusion between communities

Although much of ongoing sound change is viewed at the community level, there have also been many studies where outside influence is the driving force of change. It is possible for a change to spread equally through an area (as may be the case for the Midland dialect in the current study), but many times the data shows a different pattern of dialect spread. One theory of dialect diffusion where strength of dialect features is correlated with larger population is called the Cascade model. Initially, in his study of Chicago area college students at Northwestern University, Callary (1975) found /æ/ raising to be correlated with hometown size without considering distance. However, the

Corridor lies outside of the Inland North and the closest large city, Saint Louis (population 320,000), is 300 miles from Chicago through mostly farmland, using a highway that did not exist until the 1920's. Therefore, distance should be used in addition to population to show influence of the Inland North dialect on the Corridor.

In order to account for distance, as well as other factors, Trudgill's (1974) Gravity model uses just these predictors, city size (P) and geographical distance (d) between city centers (i and j) in addition to some measure of "linguistic similarity" (s), to determine the linguistic effect one city would have upon another. The formula he proposes that takes these into consideration is shown in (3). Although this model has been successfully

3) $$Iij = s*\frac{PiPj}{(dij)^2}*\frac{Pi}{Pi+Pj}$$

applied in some circumstances, it does not always fully account for the complicated situation of dialect spread. For instance, while working with the same data as Callary (1975) did for his Cascade model, Chambers and Trudgill (1980) found the Gravity model unsuccessful at predicting /æ/ raising. This finding has implications for the Inland North dialect, specifically that the Inland North can be considered a single speech community because it does not follow the expected path of a spreading sound change.

However, the dialect area Trudgill (1974) was studying (in Norway's Brunlanes Peninsula) which formed the basis for his Gravity model ultimately shows a different pattern that may be more applicable to the current study. In comparing the older speakers to the younger speakers in the dialect maps in Figure 1.1, it is possible to see two different patterns of diffusion. The older speakers on the left show more advanced features in the larger coastal towns (Hamna to the south, Steavern to the east, and Larvik

to the north). The influence was coming from the largest town, Larvik, and was diffused to the coastal cities through water transportation, leaving the inland area around Foldvik free of advanced features. Between then and present day, the transportation patterns changed from water to land, causing the highway in red (right) to become more

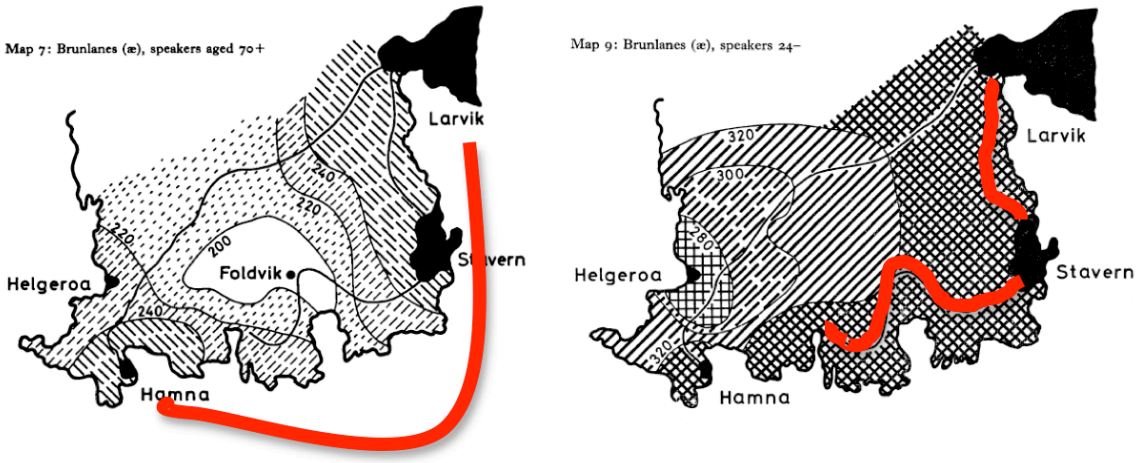

Figure 1.1 Brunlanes dialect concentration for the older (left) and younger (right) age groups from Trudgill's (1974) study of Norway. Maps are altered by the author to illustrate the main form of transportation, water or land, in red (1974:228-231).

important. In the map that charts the advancing features of younger speakers (right), we can see that the advanced features fill in the areas between the port towns, along the highways. It is true, as Trudgill notes, that the features are still the most advanced in the larger port cities, but the areas between them are filled in when the mode of transportation changes.

The question then arises of whether town size, distance, or transportation patterns can be used to account for the dialect spread in the Corridor. If population were the only important factor, St. Louis (with 7 times the population of the next largest town at its height) would show the effects of dialect spread first. However, the possible influence of transportation patterns along Route 66 complicates the situation. If living along Route 66

has any significant influence over the linguistic effect of Chicago and St. Louis on any of the larger cities in the area, the Gravity model would certainly be more powerful, particularly if his "linguistic similarity" measure accounted for Route 66. Although a good number of the larger Corridor cities are on Route 66, such as Springfield, Bloomington-Normal, and Saint Louis, there are also others of approximately the same size that do not lie directly on this axis: Peoria, Champaign-Urbana, and Decatur. Therefore, this study considers town size, distance, and transportation patterns in forming conclusions about the Corridor's Inland North influence.

When it comes to linguistic influence between communities, it is generally shown that town size and distance between locations does play a large role. However, in drawing a parallel with transmission within a community, one of the major factors is age. Generally studies that focus on non-native children concentrate on the effect of their adopted hometown on their own dialect (see the discussion of Payne 1976, 1980 and Chambers 1992 in the section above). Other work has shown that if enough children migrate to an area, their non-native dialect features can be adopted by their native peers. In particular, Johnson's (2007) study of the low-back merger in Massachusetts demonstrated how when enough non-native group of merged children moved to the area their native peers began to adopt the merger. In that case, once enough children with a merger migrated to the area, Herzog's (1965) Corollary (mergers expand at the expense of distinctions) took over and the low-back merger spread throughout that particular age group. However, it is not always the case that native children adopt the same non-native feature. For instance, instead of native child speakers adopting the features of the area's established dialect, the children in Kerswill and Williams's (2000) Milton Keynes study

showed the creation of an entirely new dialect. In that case, migration from many different areas led to the creation of a new dialect with features formed from both the incoming dialects and feature leveling. At the same time, the existence of an incoming change or new feature does not mean all children will participate in that change in progress. Brody's (2009) study of Philadelphia child acquisition shows that even when children grow up with a group of peers who are advancing a change in progress, it is possible that some of those children will not participate in the change.

As a group, these studies show the power of language acquisition in children to propagate a change in different ways than adults. Since mergers and distinctions are developed during the normal process of acquisition, the sudden introduction of speakers with the low-back merger in Massachusetts could only have affected children. Johnson (2007) showed that the parents and even the older siblings of the merged children kept their distinctions, demonstrating a sharp contrast in the dialect adoption capabilities of young children and older speakers. However, it is unclear whether children alone can faithfully adopt a change introduced by diffusion and transmit that change over the generations. If in fact the Inland North influence diffused to the St. Louis Corridor, could diffusion to adults or children alone explain the initial rise and perhaps the retreat of the influence in the Corridor? Although they do not set out to tackle this exact question, Stanford and Kenny (2013) address the distinctions between the Inland North and Corridor in terms of the dialect features incrementation (or lack thereof) of the dialect features. In conducting an agent-based simulation of the Inland North dialect features in both Chicago and St. Louis (to represent the Inland North and Corridor), they show a distinction in incrementation patterns in each area. In particular, they find a strong

positive correlation of dialect features with age in Chicago (expected in cases of incrementation) and a very weak or nonexistent one in St. Louis. They initiated a chain shift in three vowels in their simulation by initially placing one vowel too close to the other in Chicago; that change was picked up and advanced by the children, and was simultaneously diffused to St. Louis through the agents' interactions with Chicago adults. Their method simulated person-to-person interaction both in Chicago and between Chicago and St. Louis in addition to acquisition and incrementation by children in Chicago. The expected incrementation pattern expected from a change in progress held in Chicago, but not in St. Louis, which showed wide variation between speakers but not nearly same amount of change as in Chicago in the same period. Stanford and Kenny conclude that the St. Louis speakers show piecemeal adoption of the chain shift over time and not the entire shift, attributing this to adult dialect diffusion from Chicago. Although I will argue the same point for the Inland North influence in the Corridor, I also contend that acquisition of the dialect by children in the Corridor was key in its existence there in the first place.

1.3 The Inland North and Midland dialects

The St. Louis Corridor combines features of two distinct dialect areas: the Inland North and the Midland. Although there is some overlap between the specific vowels the two dialects affect, each has its own dialect features and history. In the following sections, I describe both the geographical areas the two dialects cover and the features or changes in progress found there. Using the ANAE as a benchmark, I establish the criteria used throughout the analysis of this dissertation to determine whether speakers have specific features of each dialect.

1.3.1 The Midland dialect: Geographic diversity and changes in progress

The Midland dialect region covers the area south of the Inland North and north of the Ohio River. This area has been described as stretching either from eastern Ohio through central Kansas, as demonstrated in Figure 1.2 from the ANAE, or from Pittsburgh to St.

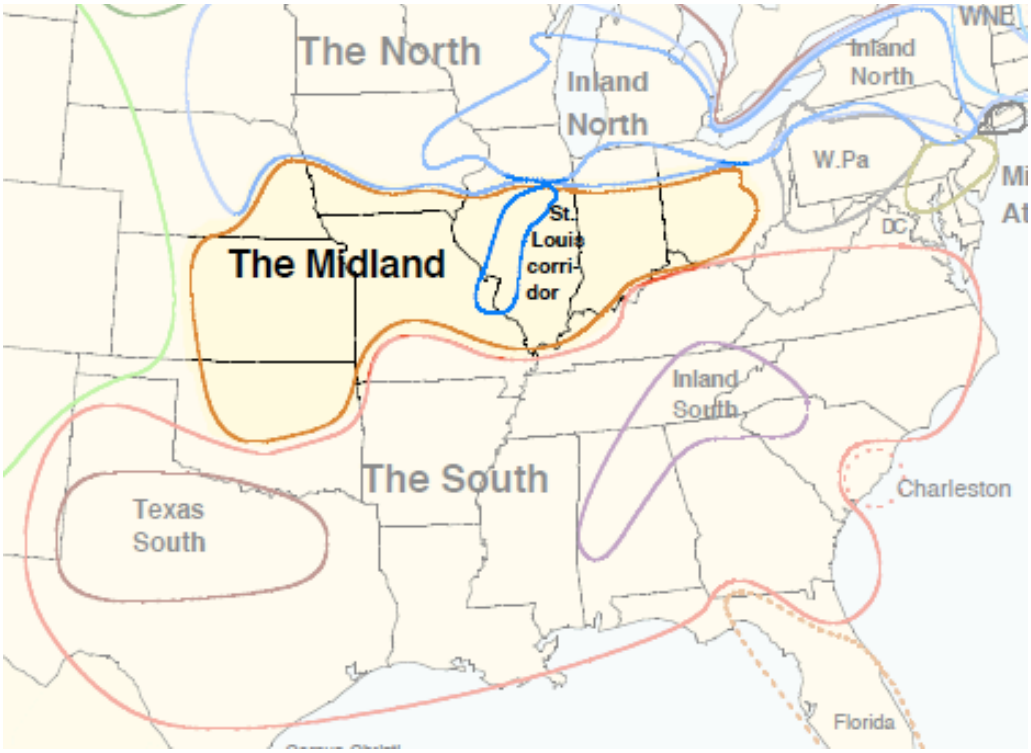

Figure 1.2 The Midland and St. Louis Corridor (ANAE p.148, highlighting and alterations by author).

Louis (Boberg and Strassel 2000:108). Historically, the people living in this area come from a number of locations: the Upland South (Virginia, West Virginia, Kentucky, and Tennessee), the eastern North Midland (Pennsylvania and New Jersey), and New England (Frazer 1986:143). The ANAE describes the Midland as lacking the homogeneity that dialects in the North and South show; according to their data, local sound changes are more common than larger dialect features. For instance, the nasal /æ/ system appears to be entering the dialect of young Cincinnati, Columbus (Boberg and

Strassel 2000, Durian 2012), and Indianapolis (Fogle 2008) residents. In northern Ohio, Thomas (2010) finds generalized /uw/[2] fronting and the low-back merger to be key changes in the center of the state, where older speakers show a conditioned low back merger and younger speakers demonstrate an unconditioned merger. In Columbus (western Ohio), Durian (2012) finds the same changes: a conditioned low-back merger for older speakers (born before 1937) and both /uw/ fronting and an unconditioned merger for younger speakers (born after 1945). This contrasts with the Inland North, where the same dialect features are consistently present in speech found in all locations, and the South, where the Southern Shift influences the dialect in each locale.

The ANAE lists a few criteria for the Midland dialect while noting that they are not entirely consistent throughout the region (135). The defining criteria are the fronting of /ow/ to an F2 greater than 1200 Hz, the difference in F2 between /e/ and /o/ less than 375 Hz (in the Inland North), low-back vowels as neither distinct nor merged, a continuous /æ/ system, and no monophthongization of /ay/ before obstruents. Also mentioned are the fronting of the nucleus of /aw/ and /ow/, fronting of /Kuw/ (/uw/ following non-coronals), and fronting of /ʌ/. In addition, the ANAE mentions the distinctive population centers of Cincinnati (mentioned above) and St. Louis (central to this dissertation). Despite the characteristics that differentiate them from the Midland, the ANAE notes that both Cincinnati and St. Louis are otherwise consistent with the Midland dialect. For instance, St. Louis speakers still have slightly fronted /ow/ and /aw/, and Cincinnati speakers are only distinct from other Midland locales in their /æ/ system and low back merger. Fogle (2008) notes that in addition to generalized /uw/ fronting, /ow/ fronting,

[2] The phonetic symbols /aw/, /ow/, /uw/, and /u/ refer to the International Phonetic Alphabet symbols sounds /ɑu/, /ou/, /u:/, and /ʊ/.

and a conditioned low-back merger, Indianapolis speakers also show a nasal /æ/ system, as younger speakers do in Cincinnati and Columbus. Since Indianapolis is geographically closer to the Corridor than Cincinnati and Columbus, this finding points to an increased likelihood that the Midland features and nasal /æ/ system would be found in the Corridor. In addition, Durian (2012) finds generalized /æ/ raising in Columbus for older speakers (born 1896-1913 for men, 1896-1937 for women) followed by a nasal /æ/ system (for men born 1924 and later and woman born 1945 and later). Although Springfield is much smaller in population than St. Louis, Cincinnati, Indianapolis, and Columbus, I would expect it to have the same general characteristics as these four large Midland cities: despite the presence of Inland North influence, Springfield speakers, as well as other Corridor speakers, would theoretically also show the Midland features, mainly the Midland fronting of back vowels.

There have been two studies in the last few decades that have looked at the Midland dialect in Illinois. The first is Habick's (1980, 1993) study of Farmer City, a small town in central Illinois, northeast of Springfield and contained in the area of investigation for this study. Habick focuses on the presence of /uw/, /ow/, /ʌ/, and /u/ fronting, particularly in relation to the Southern or South Midland dialects.[3] The second is Frazer's (1983) study of McDonough County in Western Illinois near the Missouri border. In his study of McDonough county, Frazer found /aw/ fronting and raising to be increasing mainly in the speech of men in the more urban areas, an increase he attributes to the variable having covert prestige as well as to a large movement away from the rural and into the urban areas following World War II. Kurath and McDavid (1961) identified /aw/ fronting as a

[3] Habick investigates whether dialect features in Farmer City originated in Kentucky, so the analysis focuses on comparisons to the dialect in a Kentucky town.

variable characteristic of the Midland dialect in their dialectal study of the US. Considering the proximity of the speech communities in these two studies, I would expect to find many of the same fronted vowels (/uw/, /ow/, and /aw/ in particular) to be present in the speech of those living around the St. Louis Corridor as well as Corridor speakers. However, it is also possible that these vowels are showing an increase or a decrease in this area, depending upon which forces are at play. If the Inland North dialect is the retreating urban dialect in the area and the Midland the more rural dialect, then it is possible the Midland dialect is taking hold in urban areas to fill a dialectal gap. However, I will show that the progress of vowel movements over time does not support that theory.

Since it seems as though the Inland North dialect is retreating in the Corridor, I shall investigate whether there is any interaction between the two, if the Midland dialect is replacing it, or if the Midland dialect is moving from "rural" to "urban" areas, as Frazer found for /aw/ in McDonough County. A number of possible Midland features have been identified more than once in the literature, represented in Table 1.1, with each of the studies that identified each feature. Although /u/ fronting is an incipient change in Farmer City, IL, a town close to the Corridor, it is found only in that area and would not make for a good measure of the Midland dialect in the Corridor. In addition, the nasal system, though common throughout the Midland, is not a Midland-specific feature. Finally, because a key feature of the Inland North is /ʌ/ backing, it would be difficult if not impossible to separate out the forces of Midland /ʌ/ fronting and Inland North /ʌ/ backing. Therefore, throughout this study, I will focus on four Midland features: the fronting of vowels /ow/, /Kuw/ (/uw/ following non-coronal consonants), and /aw/, as well as the conditioned low-back merger, which are present throughout the Midland

	/Kuw/ fronting	/ʌ/ fronting	/ow/ fronting	Conditioned low-back	/aw/ fronting	Nasal system
Midland (ANAE)	✓	✓	✓		✓	
Midland (Kurath & McDavid 1961)					✓	
Northern Ohio (Thomas 2010)	(born after 1910)	✓		✓		
Columbus, OH (Durian 2012)	(born after 1945)	✓	✓	(born before 1937)		(born after 1970)
Indianapolis, IN (Fogle 2008)	✓		(born after 1982)	✓		✓
Farmer City, IL (Habick 1980, 1993)	✓	✓	(born after 1950)			
McDonough C, IL (Frazer 1983)					(born after 1923)	
Cincinnati, OH (Boberg & Strassel 2000)						(born after 1965)

Table 1.1 A summary of known Midland dialect features or changes in progress by location. For changes in progress, age ranges have been noted.

region. Separately in Chapter 4, I will investigate the nasal /æ/ system, which is progressing in other Midland cites (Cincinnati, Columbus, Indianapolis), and compare its development in the St. Louis Corridor to its advancement across the country.

1.3.2 The Northern Cities Shift: description, chronology, and timeframe

The St. Louis Corridor may lie geographically in the Midland, but this study also focuses on the presence of Inland North dialect features known as the "Northern Cities Shift" (henceforth NCS) in the Corridor. The NCS is a chain shift of vowels that have been found in the dialect of the large Midwestern cities situated around the Great Lakes (Labov, Yaeger, and Steiner 1972, ANAE). The presence of the NCS in this geographical area, referred to by Labov, Yaeger, and Steiner as the "Inland North," was first recognized in academia under different names in the 1950's and 1960's (Kurath and McDavid 1961, Marckwardt 1957, and Allen 1964). As Labov (1994) points out, Fasold (1969) was the first to recognize that this combination of vowel movements an unpublished paper. In this paper, Fasold shows that data from Shuy, Wolfram, and

Riley's (1966) Detroit study demonstrate the raising of /æ/ and the fronting of /o/ and /oh/. However, the NCS is a more complex and broader system than those three vowels alone.

The NCS, as described in the ANAE, is a clockwise chain shift of 6 vowels[4]: /æ/, /o/, /oh/, /ʌ/, /e/, and /i/. As a chain shift, the vowels have moved into the position formerly occupied by another sound, which has also moved along the same general path.[5] For example, /æ/ is fronted and raised while /o/ is fronted and moves into the former position of /æ/. The others follow in a clockwise fashion, where the fronting and lowering of /oh/ moves into the former position of /o/ and so on. Labov argues that this shift is mainly a combination of pull chain shifts and one push chain for /ʌ/ (1994). As shown in the three stages in Figure 1.3, this process first affects /æ/, /o/, and /oh/, followed by /e/ and /i/, and

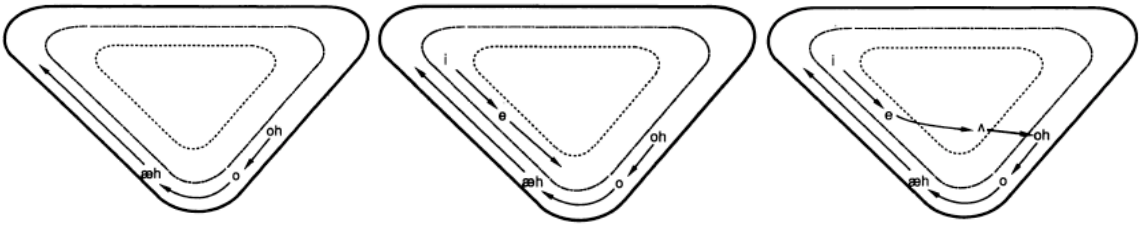

Figure 1.3 The three stages of the NCS, as postulated from apparent time data in the 1970's (Labov 1994).

finally /ʌ/. From left to right, Labov (1994) argues that the initial three changes - /æ/, /o/, and /oh/ - are part of a pull chain, where the raising of /æ/ (or /æh/) leaves an open space for /o/ to move to the front and /oh/ to lower and front into the initial position of /o/. In the second stage, /e/ lowers and backs to the area near where /æ/ used to occupy, leaving an open space for /i/ to lower. Labov states that for the final steps, evidence supports a

[4] The characters /o/, /oh/, /e/, and /i/ refer approximately to the International Phonetic Alphabet symbols /ɑ/, /ɔ:/, /ɛ/, and /ɪ/.
[5] Labov, Yaeger, and Steiner (1972) argue /æ/, which does not move into the space of a displaced vowel, to be the first stage of the shift.

push chain where /e/ instead moves back to the /ʌ/ space and the /ʌ/ is pushed back to the spot previously held by /oh/ (1994:195). Gordon (2001) points out that this theory of the chronology of the NCS is based upon apparent time data of speakers from the 1970's from three different locations (Buffalo, Detroit, Chicago). The ANAE determines based upon further data from their study (collected between 1992 and 2004) that the NCS has the order in Figure 1.4, a slightly different picture than the one presented in Figure 1.3.

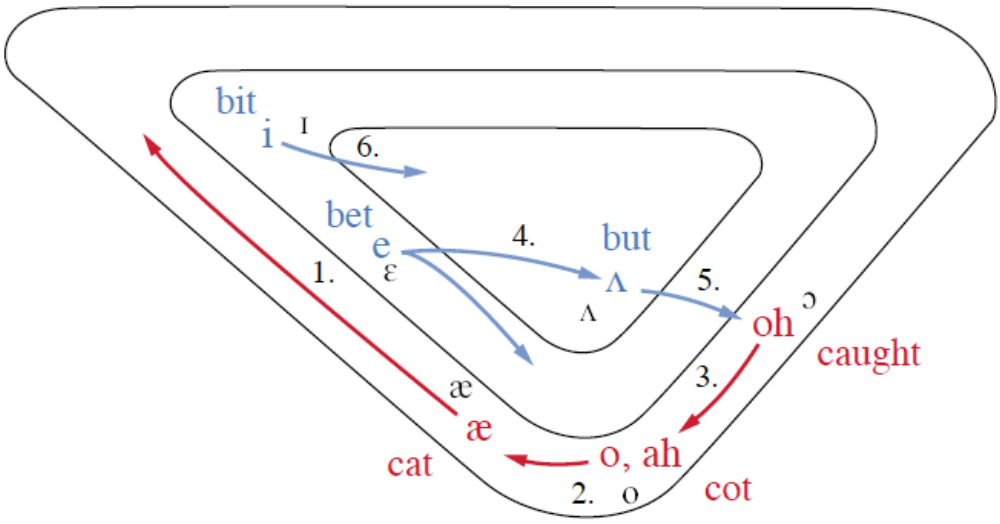

Figure 1.4 The Northern Cities Shift (ANAE:190) with IPA symbols in black by author.

There is substantial evidence that /æ/ tensing and raising is one of the older changes – if not the oldest change – in the NCS. ANAE also concludes that /i/ is likely the final stage of the shift because of its inconsistent movement across speakers. In addition, the ANAE finds /i/ movement to be mostly backing, a change from the earlier version of the shift. Despite the claims by Eckert (1988) and Labov (1994) that /oh/ lowering is an earlier vowel movement in the shift, the ANAE also points out it was not present for all Inland North speakers (191). The ordering of /e/ backing before /ʌ/ backing is motivated by a

number of ANAE speakers for whom /e/ has moved but /ʌ/ remains in a central location. Although this is the general picture adopted for the ANAE, it also points out that different orderings may be in effect in other cities and within social groups (191).

Gordon (2001), Stockwell and Minkova (1997), and McCarthy (2010) each present alternative views of the NCS that challenge its characterization as a series of push and drag chains as well as the movement ordering from Figure 1.4. Although most if not all studies present the same vowel movements in the NCS, most agree that /e/ backing is a much more recent innovation (Callary 1975, Labov 1994, Eckert 1988). In fact, in her study of NCS speakers in suburban Detroit, Eckert (1988) found that /æ/, /o/, and /oh/ (the more established NCS vowel changes) were led by females of both social groups while the teenagers in the burnout social group led the advancement of /ʌ/ and /e/. As Labov (1991) points out, the tendency in changes from below in progress is for women to be more advanced or "innovators" (Principle II) and this split in participation for these different vowels in the shift points to these gender-driven changes as the earlier ones and those tied to social group as the incoming change. For Chicago (a particularly important city for the development of the Corridor dialect), McCarthy (2010) provides evidence of older speakers demonstrating /o/[6] and /æ/ fronting before /æ/ raising instead of /æ/ fronting and raising simultaneously.[7] This not only gives a different chronology for Chicago speakers but also calls into question how critical /æ/ raising was to the NCS. Perhaps /æ/ tensing, realized as fronting, was how the vowel first made its way westward

[6] In her study, McCarthy refers to /o/ as /ah/, the vowel in "father." In the Inland North, this vowels is merged with and interchangeable with /o/. To avoid confusion, I will refer to both vowels as /o/.
[7] Note that McCarthy uses data from 6 speakers; only one speaker from birth years 1895 through 1917 and 5 out of the 6 are female teachers, both of which could skew the data. Also, this study only considers the "beginning stages" of the NCS (/æ o oh/) and not the later stages (/ʌ e i/).

through the Inland North. I explore the possibility of /æ/ fronting as a measure of /æ~e/ reversal in Section 5.3.

The origins of the NCS in the Inland North are debated in the literature. Although there is no single clear beginning date for the NCS, Gordon (2000) describes a few studies that might be early examples of the NCS (Emerson 1891 and Monroe 1896), but ultimately determines that Thomas's (1935-37) study of upstate New York shows the first conclusive evidence of a shift. Emerson and Monroe's studies from the late 19th century demonstrated some generalized fronting of /æ/ and NCS in certain lexical items in addition to the general movement of /o/ and /oh/. On the other hand, Thomas's data demonstrated /æ/ raising, /e/ and /i/ lowering, and fronted variants of /o/ and /oh/, leading Gordon to conclude that this was the first legitimate example of the full NCS. However, /æ/ fronting has been found in other Northern areas outside the Inland North and parts of the movement of the /o/ and /oh/ vowels could be connected to the low-back merger. This places the timeframe for the actuation of the shift in upstate New York sometime between 1890 and 1935, presumably for speakers born 1870 to 1915. In Chicago, McCarthy (2010) finds speakers born as early as the 1890's demonstrated /o/ and /æ/ fronting, but the raising of /æ/ is only present for those born 1920 and later. This gives the possibility that the NCS could have spread all the way to Chicago by the 1890's, making the actuation date for the NCS earlier. More importantly, it gives an older (pre-1920) and newer form (post-1920) of the Chicagoan NCS, which could give a better idea of when the NCS spread to St. Louis or if the NCS spread from Chicago or St. Louis to the Corridor.

Despite the strength of the NCS in the Inland North shown in the ANAE, not all studies show a significant increase of NCS vowels in the Inland North over time. Dinkin (2008, 2009) found two New York communities (Cooperstown and Sidney) to be receding from the NCS in a timeline that I will show parallels my results. Cooperstown and Sidney, "fringe" Inland North communities in upstate New York, show a retreat from the NCS features in apparent time, particularly after 1965, as shown in Figure 1.5 below. After considering a number of other towns with differing amounts of NCS criteria in

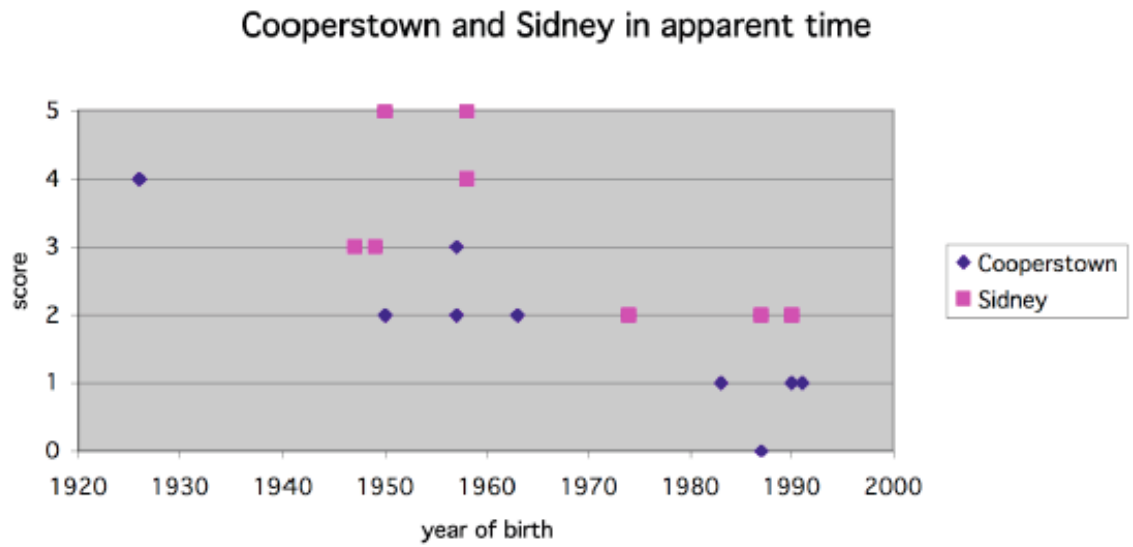

Figure 1.5 NCS scores in Cooperstown and Sidney versus age (fig. 3.10, Dinkin 2009:74).

apparent time, Dinkin concludes that both Cooperstown and Sidney are retreating from the NCS (Cooperstown from a "fringe" NCS community and Sidney from a "core" NCS community). In fact, he finds the Pearson correlation between year of birth and NCS criteria score to be significant at $p<.002$ or better (2009:74). Dinkin describes these two retreating villages as being "regionally affiliated" with a medium-sized, non-NCS city (Oneonta) nearby, giving the increased contact with non-NCS speakers as an explanation for the retreat (110).

In their study of speakers from three different dialect groups (the Inland North, Midlands, and Inland South), Jacewicz et al (2011) find a pattern of retreat similar to Dinkin's. In particular, for those from Milwaukee, Wisconsin (in the Inland North), there appears to be significant /æ/ lowering over successive generations as well as some /i/ fronting for the youngest group.[8] Their finding that younger speakers' vowels are becoming closer to a dialect they refer to as "General American" is interesting within the larger context of general dialect retreat. In fact, other studies have shown that local varieties have been retreating in recent years towards more regional patterns in Europe (Milroy 1980 for Belfast, Holmquist 1988 for Spain, and Gal 1980 for Austria) and in the US (Baranowski 2008 for Charleston and Dinkin 2009 for upstate New York, for example). Except at the edges of the Inland North in Upstate New York, the NCS in the Inland North appears to be an exception to dialect leveling.

1.3.3 Social history of the Corridor

The broad area that sociolinguists call the St. Louis Corridor is not generally singled out in social histories. However, the history of the Corridor is tied to the history of Route 66. In 1926, Route 66 became the first paved road in Illinois to connect Chicago to the West Coast through St. Louis. Before that point, some portions of paved road existed[9] but for the most part roads were not paved and the fastest form of travel was by waterways. Instead of diverting traffic in the way a modern highway might, Route 66 connected existing roads (Cassity 2004:61). Travelers, truckers, and people going out west all

[8] Note that /æ/, /e/, and /i/ were the only vowels under investigation for this study.
[9] Some histories state that IL-4, the predecessor to Route 66 in Illinois, was paved in pieces before 1926 and was fully paved a few years before Route 66 was designated (Heritage Research 2013:4). The 1926-1935 alignment follows IL-4.

traveled this same two-lane road and traveling between Chicago and St. Louis took much longer than today. In the mid 1930's, the southern portion of Route 66 was realigned (2004:239), meaning that people who grew up on Route 66 came from two sets of towns. The map in Figure 1.6 highlights these two, with the original alignment noted with a

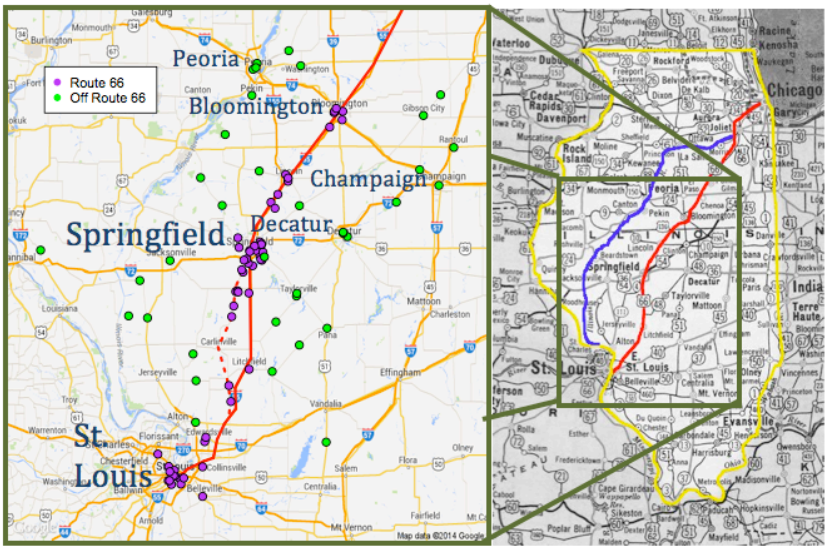

Figure 1.6 Location of 95 Corridor speakers from the current study divided into Route 66 and off Route 66 towns. Route 66 is emphasized in red with a broken line noting the location of the 1926-1935 alignment. The historical map to the right demonstrates the relative position of this area in relation to the state as well as the I & M Canal in blue (66 University Online, alterations by author).

broken line and the later alignment in solid red. This map also demonstrates the distinction between the Route 66 (purple) and off Route 66 speakers (green) in this study.

The highway as it stands today is not the same one that was paved in 1926. In the 1950's and 1960s, Route 66 was widened from a two-lane to a four-lane highway (Cassity 2004:238-9), allowing for more traffic and cutting down travel times. Over this period, bypasses around the small towns were also built (Heritage Research 2013:7), leading to less interaction between the people who lived and worked on Route 66 and outsiders. As a result of the Highway Beautification Act of 1965, the well-known highway advertisements along Route 66 were taken down and tourism decreased. By

1977, the bypasses were complete and Route 66 became Interstate 55 (Kaszinsky 2003:29, Heritage Research 2013:8). In Chapter 3, I will show that the area's history parallels the linguistic patterns in the Corridor. Before there were paved roads in Illinois, the main type of transportation was by the Illinois & Michigan Canal (in blue), a waterway known as the I&M Canal located to the north and west of Route 66 (Canal Corridor Association 2004). As discussed in Section 1.2.2, changes in transportation patterns can change the established patterns of dialect diffusion within a generation. Therefore, with new transportation patterns and increased population mobility, the general stability of the North/Midland boundary found in the general area could be simultaneously maintained and infiltrated down a specific path.

St. Louis, today a city of over 300,000, was a much larger city in the early 20th century: in 1930's to the 1950's, the population passed 800,000. Springfield has always been a smaller city, but the order of magnitude has changed over time: today it is a third a third of the size of St. Louis today but a tenth of the size in the 1930's to 1950's. However, it is Springfield that has historically drawn people with political leanings from the Chicago area. Springfield has been the capital of Illinois since 1839 (Illinois Bluebook 1975-1976). Throughout the first half of the 20th century, Chicago held about a third of the legislative seats in state government, although more than a third of the population lived in Cook County, the county Chicago resides in (Green 1987). With politicians and their support staff moving to Springfield (Chicago politicians and the population downstate did not get along historically, so it would make sense for politicians to bring supporters and employees), there would be a frequent influx of new Inland North speakers to Springfield and the surrounding area. Although the number of people who

moved to the area would have been fairly small, only 18 congressmen from the Chicago area (Green 1987), it might have attracted others to the area.

In terms of the regular movement of population to the area, there is limited information about the social characteristics of the area available in histories and online. Information from sampling census records and historical traffic maps will be covered in the next chapter. However, one external source of information about population movements is the population center of Illinois. The population center of the state is calculated each year according to census records in terms of where people are living in the state. This calculation finds the center of the state not based upon geographical area but on population concentration across Illinois. Michael Sublett[10] states that the historical center of population of Illinois, as demonstrated in Figure 1.7, used to be in the physical center of the state in Springfield in the 1840's but has since moved along Route 66/I-55 towards Chicago (quoted in Erickson 2011). The map in Figure 1.7 shows that the only time period that the population center moved southward was during the Great Depression in the 1930's, shown by the 1940 census data point outlined in red. Judging from the populations of the counties during that period, Sublett argues that during the Great Depression, people were not moving towards populated areas (like Chicago) but instead towards farmland and direct food sources. In comparison to the rest of this area of Central Illinois, the area along Route 66 had more factories and industry than farmland. The movement of the center of population along Route 66 demonstrates that there was not a large increase either to the northwest or southeast of the highway. The

[10] Michael Sublett is a professor in the Department of Geography-Geology at Illinois State University.

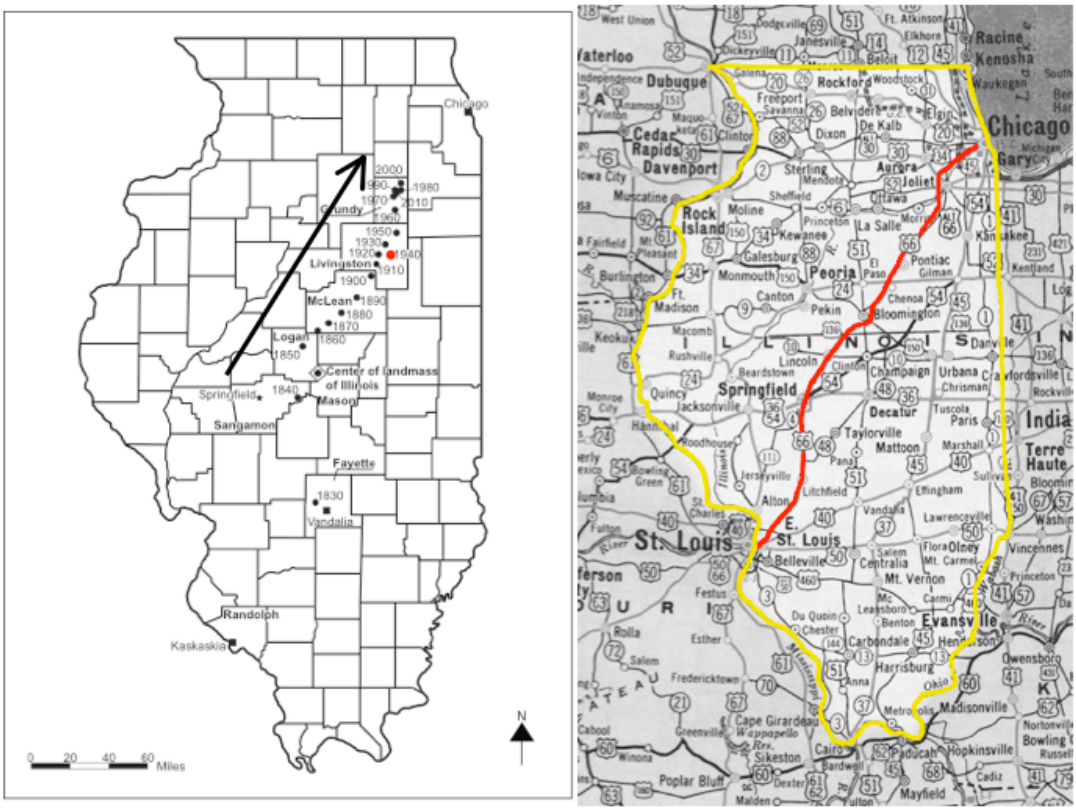

Figure 1.7 Maps of Center of population on the left (Larson and Soot 1973, Brod and Haigh 2011) and Route 66 from 1957 on the right (66 University Online, alterations by author).

population center has since moved towards the Chicago area, reflecting the city's growth. This reversal in the population center toward the Corridor corresponds with the paving of Route 66, giving more meaning to this time period in Illinois history.

Although it is difficult to ascertain the social characteristics of the area, one recurring concept that came up in interviews was the Liars Table. A Liars Table, as described by multiple people in this study, is a designated table at a local diner or other gathering place where a group of men would traditionally meet for coffee or meals and to socialize. For example, Karen G., born in Edwardsville, IL in 1978, described the Liars Table at the restaurant and bar she works at in Hamel, IL:

> "All the ones that come in here, that table, we call it the Liars Table. Come in and gossip and- and talk, and they're in here about 4 times a day. But it's all, we get lots of farmers."

Barb A., born in 1960, and Pat A., born in 1938, both grew up in Springfield. While speaking to them at a local fast food restaurant, where Barb is the proprietor and Pat a frequent diner, they described a few different Liars Tables:

Pat A.: It [the Liars Table at the restaurant] was a gathering place for all the guys in Southern View [an area of Springfield], too, the old guys that- who were retired.
Barb A.: And we've always had a table like this, that we call the coffee drinkers' table or the Liars Table. And we still have that, it's just different people.
Pat A.: If you're the first guy here, you don't have a chance … Dalton City [east of Springfield], we have a place called Krekel's over there and we all get together when we are in planning, in fact I just left over there, it's getting too muddy, it's going to start raining. There's about twenty-five over there that get together.

Their awareness of Liars Tables in different towns and establishments shows that people are aware that it exists outside of their town. In fact, the idea of a "Liars Table" is not confined to Route 66 or even the Midwest. My own research on the topic has uncovered a handful of descriptions and mentions online, in Maine (Gurian 2002), Alabama (Schultz 2014), Mississippi (Davis 2011), Florida (Comerford 2014), Iowa (Lasley 2004), and Ohio. In Cleveland, a straw poll of local politics at the local Liars Table were published in the local paper (Cleveland Daily Banner Staff Reports 2010). In many of these locations, the Liars Table has held an important place for informal meetings about local concerns and in some places could have provided a space for men of varying career paths and social classes to interact on a regular basis. Although very few speakers in this study were regular participants at local Liars Tables themselves, many were aware of this social ritual.

Although there is not much written about them formally, Liars Tables could allow for many of the interactions that are important for dialect spread. First, they are usually

located at the main diner in town. If an outsider were passing through a Route 66 town on their way somewhere, they would likely use one of these diners and interact with a number of people, including the owners, waitresses, and the ever-present group of men at these tables. In addition, some of the interviews conducted with the children of small business owners mentioned spending a great deal of time at their parents' businesses, even helping out. When speaking to Rhonda, who was born in 1958 in Benld, IL, she mentioned that she had spent a good amount of time around her parents' restaurant, interacting with the customers:

> "We would go there after school versus home, and then at the end of the evening, you know, we'd all go home together … I always loved being out front with the customers and talking to people. My mom would always say, you need to get in the back, you shouldn't be out here."

Dynamics like this would allow for at least some children to get more interactions with the Liars Table, people driving through the area, or perhaps new people in town. Since the important men in town would gather at these tables, if enough had moved there from Chicago or elsewhere in the Inland North, they could in theory be the origin of some of the dialect diffusion, particularly diffusion through adults.

Although there is no direct information about the change in population makeup of the Corridor nor comprehensive history of the people of the area, there are many clues as to its connections to the Inland North area. The St. Louis Corridor is a notable area for its traffic and political connections to Chicago. The social habits of locals would have lent themselves to brief but frequent interactions with outsiders, and the service economy of Route 66 would have increased interaction. Finally, the movement of the population downstate in the 1930's might point to an influx of former Inland North residents.

CHAPTER 2

Methodology

2.1 Introduction to the Corridor population

The goals of this study are twofold. The first is to build a more comprehensive picture of the dialect found in the St. Louis Corridor, an area without a complete linguistic description. The second is to use that data to draw conclusions about the development of the NCS in the Corridor, and its eventual retreat, to provide a test case for dialect retreat. In order to accomplish these goals, I collected linguistic data through phone interviews and in-person sociolinguistic interviews, in addition to existing recordings and measurements from the ANAE and oral history collections.[11] For the original interviews, I created a plan to sample the dialect by using the data gathered in 2011 as a part of my pilot study as a guide to obtain interviews from a number of large and medium-sized towns. To sample this large geographical area, I began by recording data from speakers from the big towns (population greater than 60,000) in the area carrying out a telephone survey (Springfield, Bloomington, Decatur, Champaign, and Peoria). Following the methodology in Dinkin 2009, I hoped to obtain at least 2 phone interviews from each community before visiting the area again. My initial plan was to use preliminary results from these phone interviews to determine which areas I would need to obtain additional speakers from. For example, in the case of a medium sized town with two speakers who demonstrated different dialect features, I would aim to obtain more in-person interviews to get a better idea of the situation in that town. The map I used as a guide to determine

[11] For the geographical location of the following towns, please refer to the map in Figure 2.1.

which towns to call appears in Figure 2.1. Towns were determined based mainly upon their size and proximity to Route 66 and the larger cities.

However, between the time when the ANAE calls were made (1993-2004) and now, cell phones have replaced landlines and many if not most of cell phone numbers are unlisted. The 516 phone numbers I dialed (49 from the pilot study, 467 from the study itself) produced only 12 interviews. Comparing the breakdown of the outcomes of

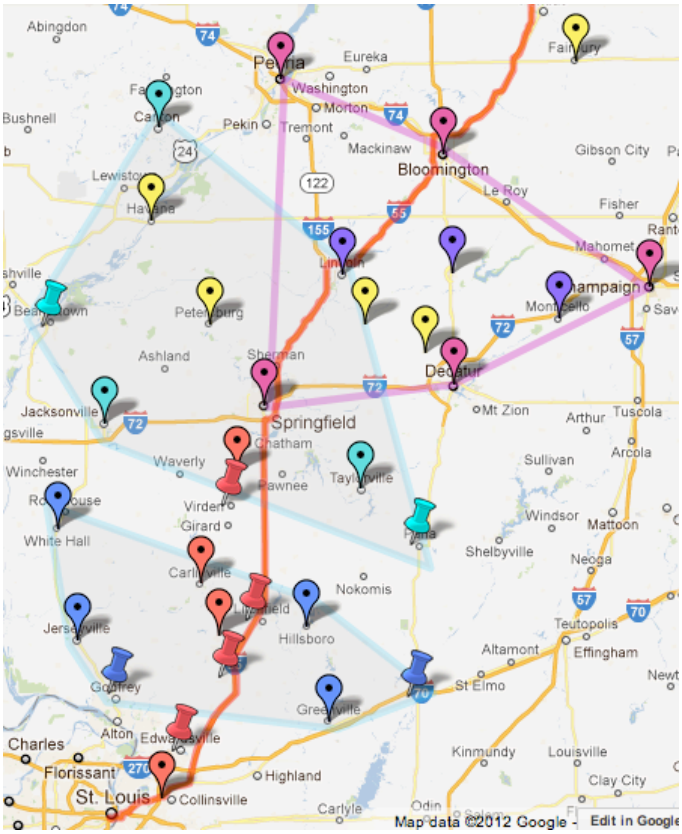

Figure 2.1 Map of towns for projected interviewees for the main study. Pins with black dots are referred to in this section, while pushpins refer to towns where I collected data in my pilot study (red), based upon analysis of interviews nearby.

prospective interviews in Table 2.1 to similar populations in the ANAE (specifically the Chicago and the Midwest populations), it is readily apparent that there were far fewer successful phone interviews obtained in the Corridor. Calls by ANAE interviewers in Chicago and the Midwest did have a higher success rate than in other areas –the Corridor

success rate, at 2%, was comparable to some of the lowest TELSUR survey areas (1% in San Diego, 4% in Texas, and 12% in New York/Pennsylvania). Therefore, it is possible that the refusal rates of speakers in the Corridor pattern like those in western states instead of the Midwest. However, much of the discrepancy can also be explained by a much higher percentage of disconnected phones, which made up almost half of calls placed in calls made in this study to the Corridor. The first five lines of Table 2.1 refer to

	Chicago	Midwest	Corridor phone	Corridor in-person
No answer	6%	14%	3% (4%)	-[12]
Answering Machine	29%	9%	24% (25%)	-
Busy signal	0	3%	3% (3%)	-
Phone disconnected	0	8%	48% (47%)	-
Not a residence	0	0%	7% (6%)	-
Respondent not local	0	15%	3% (3%)	13% (12%)
Interview refused	18%	16%	10% (9%)	2% (2%)
Call back later	24%	6%	1% (1%)	1% (1%)
No adults at home	0%	5%	0% (0%)	0% (0%)
Successful interview	24%	23%	2% (2%)	76% (80%)
Total number of calls	17	86	463 (510)	104 (127)

Table 2.1 Percentage of outcomes of dialing the telephone in five cities or regions in ANAE (2006:26) and the phone portion of the current study.

calls made where a live person was not reached. Since the number of people who refused to be interviewed[13] is lower in the Corridor than Chicago or the Midwest, Table 4.4 from the ANAE is also recreated in Table 2.2 to show refusal and success rates. This table shows the percentage of outcomes as well as the success and refusal rates of obtaining an interview once a live person was reached on the phone. Although the number of interviews obtained in Corridor phone interviews is similar to the number of those found in Chicago in particular (4 vs. 8), the refusal rate when a speaker was reached in the

[12] The first five outcomes do not apply to those interviewed in person because no phone was involved.
[13] This number includes both those who actively declined to be interviewed and those who hung up before they could answer whether they were local or not.

	Chicago	Midwest	Corridor phone	Corridor in-person
Respondent not local		13	13 (14)	13 (15)[14]
Interview refused	3	14	45 (48)	2
Call back later	4	5	3 (5)	1
Successful interview	4	20	8 (12)	79 (104)
Refusal rate, incl. Non-locals	27%	27%	65% (61%)	2%
Refusal rate, excl. Non-locals	27%	36%	80% (74%)	2%
Success rate, incl. Non-locals	36%	38%	12% (15%)	76% (80%)

Table 2.2 Percentages of refusal and success in obtaining phone interviews in ANAE (2006:27) and the current study.

current study is more than double that in both ANAE subsets. In addition, the success rate for phone interviews in the Corridor is less than half the ANAE subsets. Another contributing factor to the lack of success in the phone interviews is that people tend to keep their phone numbers after moving: the phone interviews were more likely to find speakers who had a mismatch in where their phone records said they lived and where they actually lived (50% in the pilot, 40% in the primary study) than during in-person interviews when people were found in locations removed from where they lived (18% for both).

Because the phone interviews proved to be difficult to obtain, my plan to obtain in-person interviews was slightly altered. Instead of using the phone interviews as a guide to obtain more interviews in towns with advanced speakers, the in-person portion of the study focused on obtaining a larger number of interviews from the larger cities, Springfield in particular, and towns of varying sizes both on Route 66 and at various distances from Route 66. This plan was based upon the finding from the pilot study that

[14] I only marked down non-local people I personally spoke to and asked if they were local. On more than one occasion, I showed up at a location and explained to the first person I interacted with that I was looking for locals and, before I could ask the original person whether or not they were local, was recommended to another individual. It is possible in a number of cases that the first person was also a local but I did not obtain that information. I also did not count these interactions in my dataset.

Route 66 itself may have a concentration of speakers with NCS features. Unlike the phone interviews, in-person interviews were overwhelmingly well received. I was most successful finding speakers willing to be interviewed at small businesses on the main square of towns, local libraries, and a senior center in Springfield. Small town libraries in particular were very useful, as many librarians had grown up in the same town or knew locals and were willing to help connect me with them. Libraries in the larger towns were larger and had a more staff, but head librarians generally had privacy and other concerns.

Although in-person interviewees occasionally gave excuses that they were busy or to come back at a less busy time, only two people of over 100 refused to give an interview. If a person did not grow up locally, they pointed me in the direction of a local, either at the same location or nearby (in many cases a few doors down). I did not record the number of referrals I received when obtaining in-person interviews, though it was quite high. In comparison, each of the 12 speakers I interviewed by phone (pilot study and the primary study) declined to connect me with additional speakers.

The scripts for the phone interview and the in-person interview, recreated in Appendix A, are based upon the TELSUR phone interviews from the ANAE and Q-Gen-II (Labov 1984). For the phone interviews, I began the interaction by asking if they would be interested in participating and obtained informed consent before beginning my recordings. After asking questions about where they grew up and questions that aimed at determining how much interaction they had with speakers of area cities, I elicited categories of words (food, farm animals) then elicited specific words that represented the vowel categories in addition to semantic differentials (for example, the difference between ‘pond’ and ‘pool’). A few of the elicitations were altered from the pilot study,

both to add vowels of interest (post-coronal /uw/ in particular) and to avoid misunderstandings. Finally, I obtained demographic information and directed them to a web page I had set up for this study.

The in-person interviews were mainly modeled on the Q-Gen-II Modules – questions pertained to general personal history, demographics, childhood games, and about their neighborhoods. Although much of my purpose in asking these questions is to elicit additional speech, it also allows me to better situate the speakers in my sample. The childhood games question in particular also gave insight into whether they integrated into the local speech community during their childhood or spent more time around originally non-local children (Payne 1976:235). In addition, I asked them the "danger of death" question, which Labov (1972) has shown to be effective in eliciting the most casual speech. Finally, most speakers also agreed to read a word list, which was based on the words elicited from the phone interviews.

Finally, in order to increase the time depth of my study, I analyzed a number of oral histories that are publicly available online from the University of Illinois Springfield Archives Oral History Collections (Wood 1996) and the Historical Society of Missouri Oral History Collection. The Illinois collection contains recordings of interviews conducted in the 1970's to 1990's with speakers from the St. Louis Corridor born between 1884 to 1945. The three interviews from the Missouri collection were all St. Louis speakers born 1915, 1926, and 1935. These interviews, in addition to covering the relevant historical subject matter, mostly begin with a short family history and where the person has lived, which is useful to situate these new subjects in the study. The main purpose for these interviews was to expand my sample to speakers older than those I

would find today,[15] especially those born before 1930 and those who grew up in smaller towns where there are currently very few residents. The three St. Louis speakers in particular were chosen because their years of birth allowed a clearer picture of whether St. Louis or Springfield showed NCS features first. I also made additional vowel measurements from the original ANAE recordings (including those not originally measured for the ANAE).

These 39 additional interview subjects, ranging in interview dates from 1972 to 1998, allowed me to look 26 years farther backwards in time (40 years total) and strengthened the new results. In fact, as I show in Section 3.3, this new data does not introduce new results but amplifies the findings from the Corridor. The map in Figure 2.2 below divides the interview subjects' locations into original interviews and other collections. Although the historical interviews cover a large amount of geographical space, they crucially do not provide interviews from many speakers who grew up in the smaller towns and farming villages.

[15] During the pilot study in the spring of 2011, I had a difficult time finding speakers in their 80's or older using regular interviewing techniques.

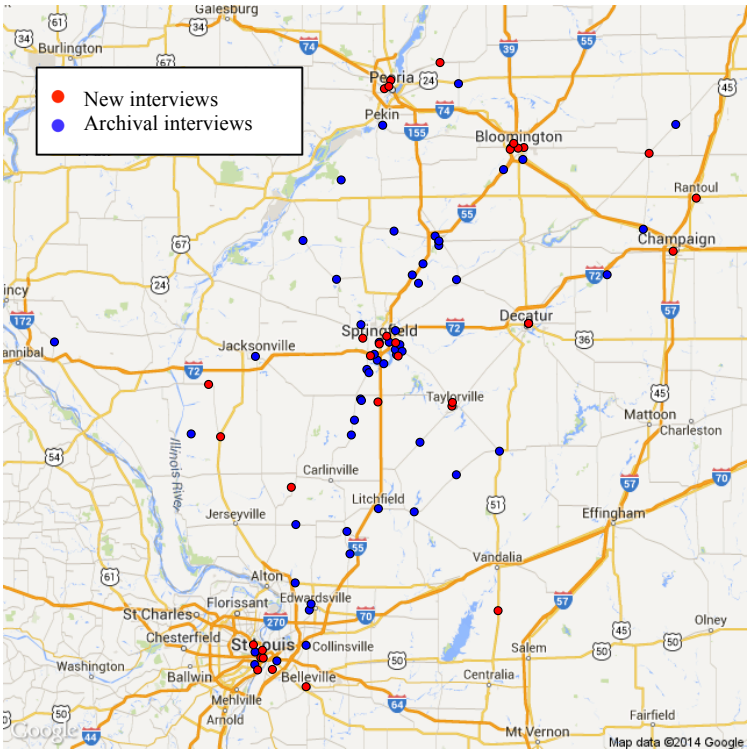

Figure 2.2 Map of the St. Louis Corridor divided into original interviews collected in 2011 and 2012 (blue) and oral histories and ANAE data collected between 1972 and 1998 (red).

2.2 Social data collection

Although the collection of recordings of participants' speech is arguably the most important and extensive aspect of the study, there are a number of non-linguistic items also collected in order to inform the social network aspect of the study. In the interviews, I asked questions to determine the speaker's connections with St. Louis, Springfield, and Chicago. In the pilot study, I asked approximately how many times they had visited each town per year and if they had family living in either place. In the primary study, I changed this line of questioning to whether older speakers had primary contact (meaning they visited these places) or secondary contact (had family who lived there or friends who were from there) with these cities or people from these cities in their childhood and early

adulthood. These questions were intended to expose whether they had personal contact with locals in these cities and if it would be possible that the NCS pattern in the area was a result of direct influence from these city centers. In the telephone study, I also included questions about their affinity for certain regional food items or sports teams that are associated with the area to determine their orientation towards the region they represent.

I also analyzed newly available census data more to determine where people living in this area came from originally. The census reports on where individuals were born and, in the 1940 census and after, the place a person was living 5-10 years ago. However, easily accessible census reports written in years past do not have this information for the Corridor area. Therefore, I sample individual census forms from Springfield and a few towns of varying sizes on Route 66 using the 1940 census, which made available online in 2012 (1940 U.S. Census). By comparing the dialect in the areas according to an apparent time interpretation alongside the population data for the same time period, I was able to somewhat illuminate where the NCS present in people's dialects originated (Chicago, St. Louis, or elsewhere). My primary focus was on the 1940 data, as it is now readily available online and has information about where those residents lived in 1935 as well as their birth state.

These pieces of information about subjects and people who lived in the area in the time period under consideration do not directly shed light on where a dialect comes from or how it diffuses into a community. However, using them in tandem with linguistic data can provide a better picture of population movements, communication, and relationships between the Corridor and the Inland North.

2.3 Automatic measurements of data

The current study is based upon a corpus of 95 speakers: 56 original interviews (48 from in-person interviews and 8 from phone interviews), 15 ANAE interviews (2 previously untranscribed, one re-transcribed for this study), and 24 oral history archives interviews.

83 of these interviews were transcribed using the ELAN program (Brugman and Russel 2004), then forced-aligned and extracted vowels using the FAVE program suite (Rosenfelder, Fruehwald, Evanini, and Yuan 2011). Although three files are produced in the FAVE extraction process, the study uses the file that contains normalized measurements using the Lobanov (1971) method (.pll file). After alignment and extraction, I hand-checked outlying vowels for accuracy before vowel means were calculated. The number of vowels extracted for each speaker varied based upon a number of factors, including length of interview and type of interview (phone interviews generally had less speech than in-person interviews), but 500-1500 vowels[16] were measured for each speaker (average of 933). However, not all of these tokens were used in the analysis; specifically, vowels before /r/ and laterals, vowels without primary stress, and non-content words (based upon those specified in Plotnik (Labov 2011)) were excluded. In the end, the 95 speakers each had an average of 408 tokens. A full table of the speakers, their demographic data, number of vowels extracted, and the source of the interview appear in Appendix B.

However, there were quite a few interviews that were collected and not used for this study. 128 total speakers were interviewed over the course of the in-person and telephone interviews. 18 speakers were excluded because they did not provide enough

[16] A number of interviews could not be included in the analysis because of lack of speech, including an in-person interview and a number of additional ANAE interviews.

information about where they grew up, they spent their formative years in multiple locations, or they did not grow up in the Corridor area. For two speakers, the recording was made during a bingo game that was too loud to discern speech from. An additional two speakers were analyzed, but there were too few tokens to determine accurate vowel means. The remaining 50 were not analyzed because they duplicated data already gathered from a specific area and time period.

Many of the recordings from the publicly available oral histories had accompanying basic transcriptions. These were used as sources and guides during ELAN transcription, but changes were made to these transcriptions to better match the actual language used.

CHAPTER 3

The spread of the Midland and Inland North dialect features in the Corridor

This chapter lays out the main findings of this study of the dialect features. By using binary criteria for continuous variables, I am able to show that the NCS was a community change that mainly affected the dialects of children of a single generation who grew up on Route 66, and secondarily by children who grew up off Route 66 in the next generation. In Section 3.1, I briefly discuss the focus on Route 66 in analyzing the results. In Section 3.2, I discuss the most basic findings for the Midland and NCS dialect spread in the Corridor and use that as a basis for the rest of the study. Although I touch upon the real time aspect of the study in Section 3.2, in Section 3.3 I compare the three different sources of data and conclude that the NCS is a community change. Section 3.4 considers the limitations of binary features to describe the dialect change with the EQ criterion as a test case. However, Chapter 5 goes into more details of altering the NCS criteria. Section 3.5 considers the geographical spread of the results along with their time depth and concludes based on both where and how the NCS entered the area. In Section 3.6, I explore additional non-linguistic sources of information about the population, particularly the 1940 census and historical traffic flows. In light of other studies that have taken a more mathematical approach to dialect spread, Section 3.7 considers the role of feature thresholds in the population. Specifically, I look at what happens when a dialect feature does not reach the minimum number of speakers to force a system-wide change. Finally, Section 3.8 considers the general history of the area and poses possible explanations for the actual spread of the NCS.

3.1 The Importance of Route 66 in the St. Louis Corridor

The St. Louis Corridor as a geographical region is described by Labov (2007) as the area around I-55 in Illinois stretching from Chicago to St. Louis. Past literature does not focus upon distinctions within the Corridor itself, considering all towns both large and small across central Illinois to be within its boundaries. In the course of analyzing the pilot study for this project as well as planning for the majority of the fieldwork involved in this analysis (described in more detail in Section 2.1), it became clear that for linguistic purposes, the St. Louis Corridor can be divided into two geographical areas: those who live on the path of the historical highway Route 66 and those who live in towns where Route 66 did not pass through, as shown on the map in Figure 3.1. As the first paved road in Illinois in the 1920's and the eastern end of a highway that reached the West Coast, Route 66 was important both locally and to the United States as a whole, as westward migration in the early 20th century followed that path. Section 3.6 will examine the parallels between the linguistic data and evidence of movement through along Route 66 through historical traffic maps and census records. In addition, Route 66's importance as a path for migration and home to many businesses with contact to outsiders will be explored in Section 3.8. Since the southern portion of Route 66 had two historical alignments (realigned in the 1930's), as shown with the broken line in Figure 3.1 below, speakers from both of those alignments[17] in the "Route 66" group were included.

[17] One of these Route 66 alignments was previously an unpaved Route 4 before it was Route 66.

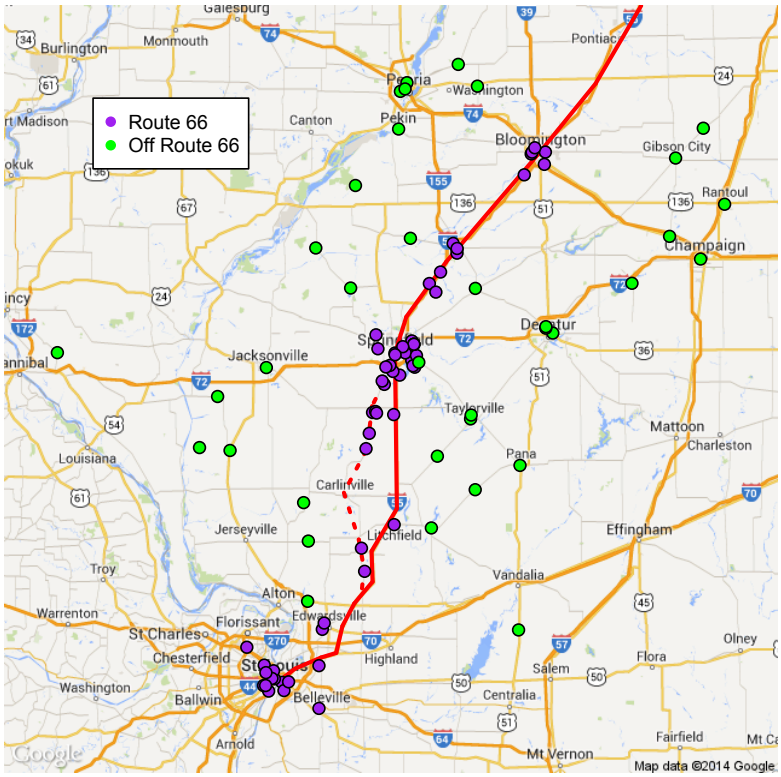

Figure 3.1 Map of the St. Louis Corridor with Route 66 outlined in red, noting the original alignment of Route 66 south of Springfield with a broken line [N=95].

3.2 Results from the Corridor

There are a total of 95 speakers in this study (56 original to this study, 15 from the ANAE, 21 from the University of Illinois-Springfield audio archives, and 3 from the State Historical Society of Missouri Oral History Collection) show a great variety of NCS and Midland variables in their speech. When considering all variables together using the criteria from the ANAE, for example in Figure 3.2, one can see that most of the NCS variables are centered around Springfield and St. Louis, the two largest cities in the area. Of course, there are a handful of exceptions, most of which are on Route 66 north of Springfield or around a smaller metropolitan area (Peoria to the Northwest and Champaign to the East). However, in order to see the effect of the NCS over time, one can look at the number of criteria satisfied in different age groups over time. By using

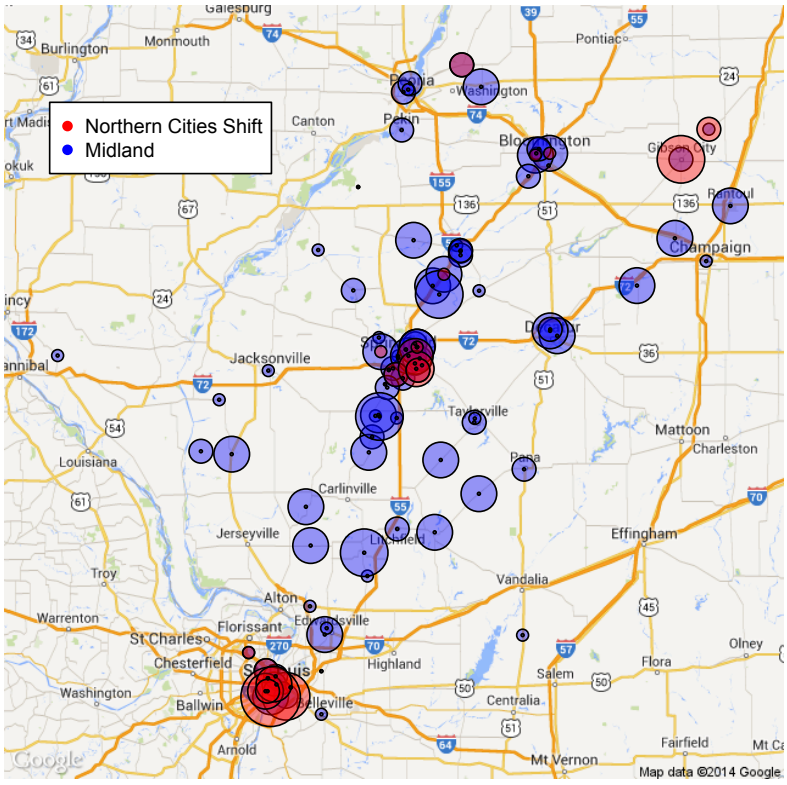

Figure 3.2 Map of number of strict NCS ANAE criteria (AE1, O2, EQ, UD, ED) and Midland criteria (fronting of /ow aw Kuw/ and conditioned low back merger) satisfied for each speaker [N=95].

the original interviews collected in this study, it is possible to see some striking patterns of NCS and Midland usage in apparent time. Even without considering the full geographical array in Figure 3.2, it is still possible to see the strength of Route 66 (outlined in red). For instance, when speakers born on Route 66 and those born off Route 66 are considered in apparent time only (from the interviews collected in 2011 and 2012), it is clear that those born on Route 66[18] show some signs of the NCS before those off Route 66 (Figure 3.3). When the speakers from the ANAE and various oral history archives are added to the interviews collected for this study (N=95), the pattern found for NCS and Midland variables in Figure 3.3 below is both amplified and extended further

[18] The "Route 66" category includes cities St. Louis, Springfield, and Bloomington, while the "off Route 66" category includes cities Decatur, Peoria, and Champaign.

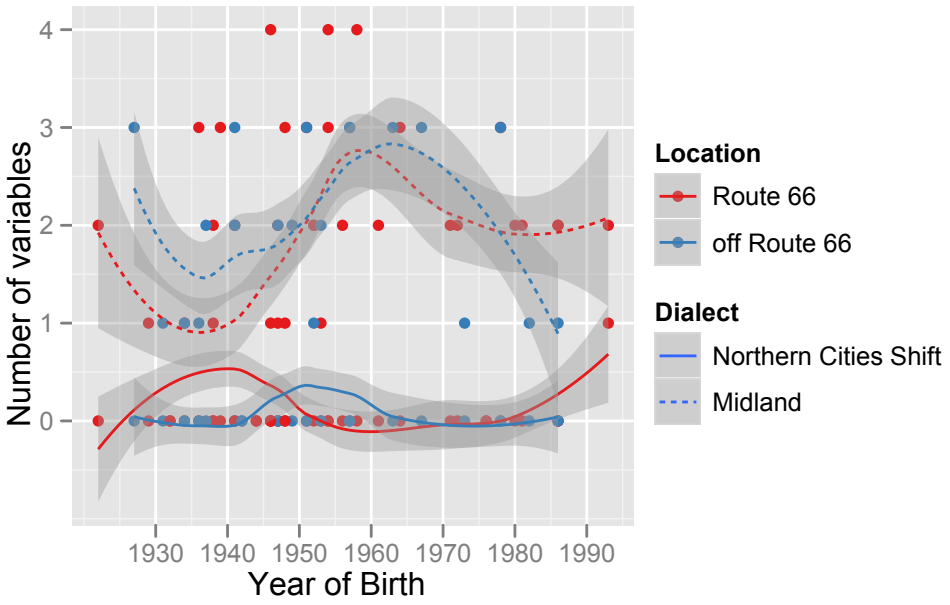

Figure 3.3 Average number of Midland and NCS variables satisfied by speakers interviewed for this project in apparent time (interviewed in 2011 and 2012), divided into those living on Route 66 (R66) and those not living on Route 66 (off) [N=56].

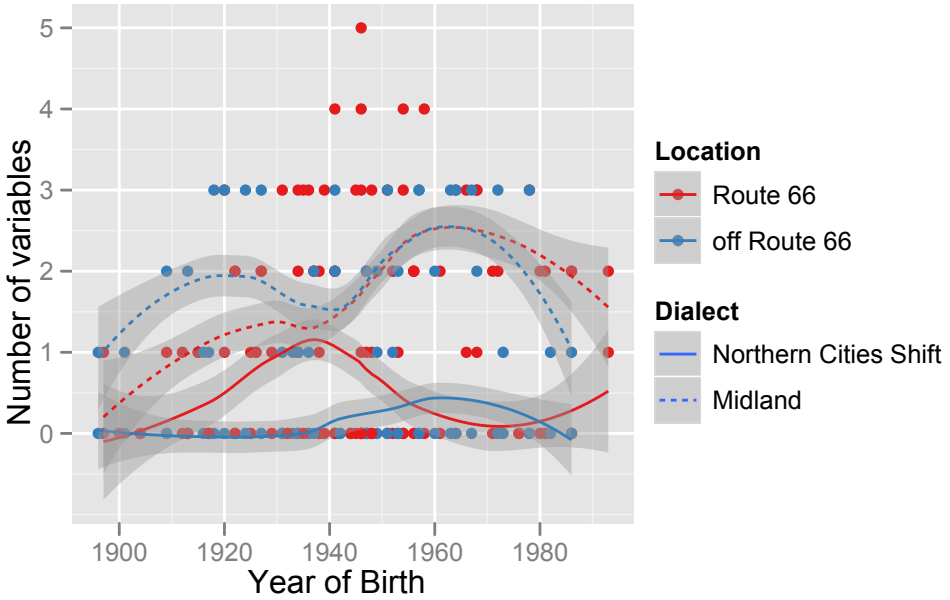

Figure 3.4 Average number of Midland and NCS variables satisfied by year of birth, divided into those living on Route 66 and those not living on Route 66 [N=95].

back over 20 years to those born in 1900 (Figure 3.4). One important difference between the two is the Midland influence before 1930: in the new apparent time data in Figure 3.3 above, it appears as though the Midland features may have been stronger before 1930, but the real time data in Figure 3.4 above shows that this was a temporary spike in Midland features. Because of the parallels between the two, the rest of the graphs will include speakers from all data sources. A more detailed discussion of the differences and similarities of the three different sources appears in the following section, 3.3.

In addition, it is possible that the NCS does show some influence on the dialect in the areas off Route 66 once the NCS decreases on Route 66 (for those born between 1940 and 1960), but the effect is not statistically significant. However, it appears that the Midland dialect features are not only much stronger than the NCS features but that it affects both regions equally. Another important comparison is that the increase in NCS features for those off Route 66 and an increase in Midland features for all speakers occurs simultaneously (for those born 1940-1960). However, in the case of the NCS vowels, it appears that not all criteria are satisfied at the same time. Figure 3.5 below shows that

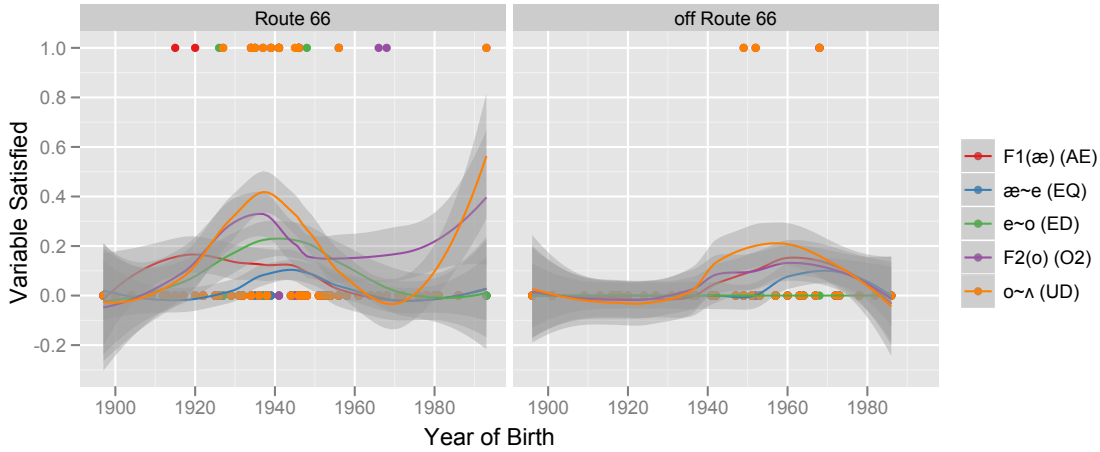

Figure 3.5 Percentage of each NCS variable satisfied over time, divided into those who grew up on Route 66 and those who did not [N=95].

speakers born on Route 66 have two waves of criteria satisfied: first the raising of /æ/, the fronting of /o/, and the backing of /ʌ/ (which involve steps[19] 1, 2, and 5 of the NCS), followed by the backing and lowering of /e/, seen in the reversal of /æ/ and /e/ and F2(e) – F2(o) < 375 Hz (EQ and ED, or step 4 of the NCS). This first wave (the early movements of the NCS) occurs during the early Route 66 alignment (born 1926 until the 1940's) while the second wave (which mainly concerns /e/) hits its apex in the 1950's in apparent time. It appears that the increase of NCS off Route 66 that appears in Figure 3.4 above (red line on the right graph) mainly involves the fronting of /o/ (O2), as by 1960 no other criteria is present. The simultaneous decreasing of F2(o) and F2(o) < F2(ʌ) (O2 and UD), as well as the increasing of F2(e) – F2(o) (ED) during the 1940's and 1950's points to the strength of the backing of /e/ (step 4) during this time. It is also possible that the backing of /ʌ/ (step 3) remained even though the instance of F2(o) < F2(ʌ) decreased and F2(o) backed. This comparison can be seen on the right side of Figure 3.6. In comparing the F2 values of /e o ʌ/, it is possible to see that the F2(o) began moving back in the late 1930's even though the backed nature of /ʌ/ remained for those born through the mid-1940's. Finally, in comparing the F2 values of /o/ for Route 66 and non-Route 66 speakers, it appears as though the Route 66 speakers lead the trend over the early years until those born in the late 1930's, then a retreat over the next 20 years coincides with the fronting of /o/ for non-Route 66 speakers. Overall, it appears as though the NCS influence, as seen in the map in Figure 3.2 and the apparent time graph in Figure 3.4, mostly correspond first to the leading three vowels of the NCS /æ o ʌ/ (according to the

[19] Steps 3 and 6, the lowering and fronting of /oh/ and the backing of /ɪ/, are not considered in the ANAE criteria for the NCS. For the steps of the NCS and accompanying diagram, see Section 1.3.2.

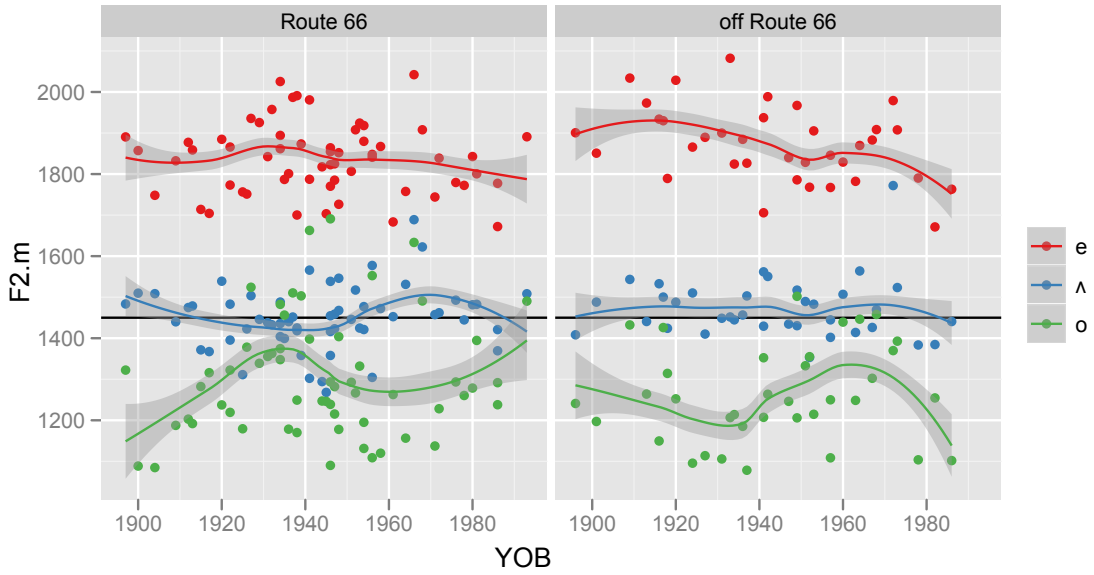

Figure 3.6 Average F2 of /e o ʌ/ for speakers by year of birth [N=88].

ANAE and Labov 1994), then to /e/.

Judging from the map in Figure 3.2, the locations with the strongest NCS influence are St. Louis and Springfield, which act as anchors of the Corridor. As might be expected, the early Route 66 presence of NCS variables can also largely be divided among these two large metropolitan areas. Both account for the spike in NCS features between 1920 and 1960. As one can see in Figure 3.7, where satisfaction of variables is graphed by Metropolitan Statistical Area[20] (MSA) according to year of birth, St. Louis

[20] Metropolitan Statistical Areas include not only the city itself but also nearby towns in certain neighboring counties. The St. Louis MSA originally had a very low score because the St. Louis MSA includes a wider geographical area than any of the other MSAs (for instance, Staunton, at the crossroads of the original Route 66 and the realigned road, is considered to be in the St. Louis MSA). In terms of percentage of city dwellers vs. non-city dwellers, Springfield is about 70% of its MSA and St. Louis (and East St. Louis) was 45% of its MSA. The St. Louis MSA in Figure 3.7 is actually altered from the official MSA so that only the immediately surrounding counties in Illinois (Jersey, Madison, St. Clair and Monroe) and city dwellers are considered. In addition, Bond, Calhoun, Clinton, and Macoupin county are considered to be a part of the St. Louis MSA by the U.S. Census, but include towns as far away as Virden, which is 26 miles from Springfield and 84 miles from St. Louis. By including only the immediate area, this graph avoids including speakers who are from too far away. Additionally, there were too few speakers from the other Corridor

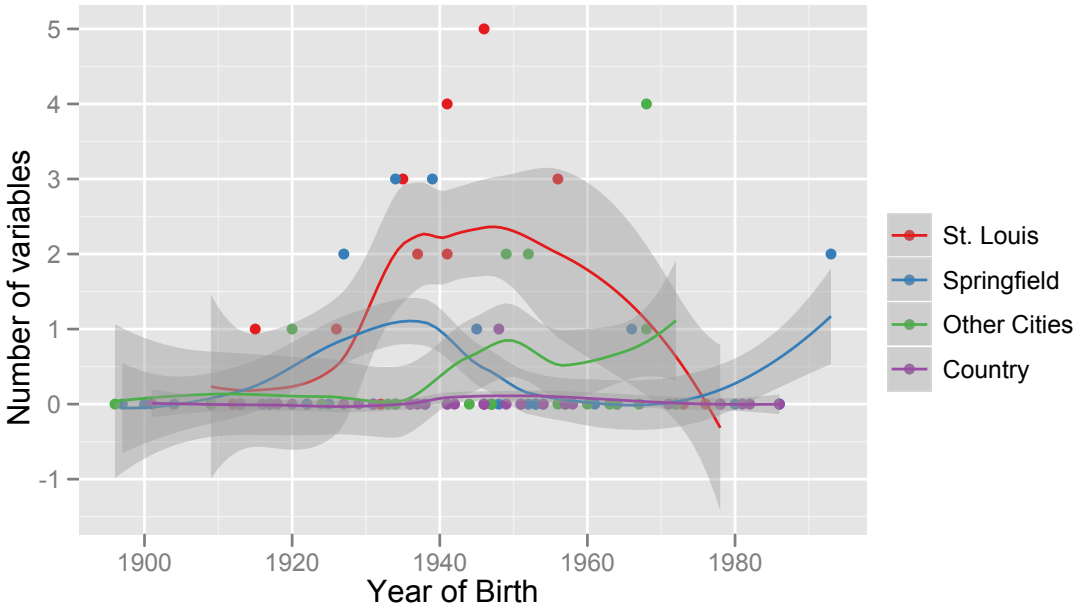

Figure 3.7 Average number of NCS criteria satisfied by MSA in apparent time.

has the speakers with the highest spike in NCS influence, but both Springfield and St. Louis drive this change initially. Springfield has a handful of speakers with strong NCS features (2-3 variables) born between 1927 and 1939, but the first St. Louis speaker with more than a single NCS feature is Robert B., born in 1935. It is also unclear whether St. Louis speakers show NCS features before or after Springfield shows NCS influence[21]. This finding begs the question of which direction the NCS influence infiltrated the area: did it spread from St. Louis to Springfield, or Springfield to St. Louis? Although there are two early St. Louis speakers (born in 1915 and 1922) with one NCS feature, there are three other St. Louis natives (and two others from the MSA) born before 1935 without NCS features. It is possible that this simply reflects a hole in the data, since there is a gap

cities (Peoria, Bloomington, Decatur and Champaign) to compare them each in this diagram, so speakers from their MSA's are grouped into the "North" category.

[21] I refrain here from giving an end date of the NCS influence on St. Louis because the youngest St. Louis-born speaker was born in 1956 and has NCS features, although there are speakers from the St. Louis metropolitan area born later on who have no NCS variables.

in city-dwelling St. Louis speakers between 1926 and 1932. Although speakers born as early as 1900 show the altered EQ criterion in Springfield, the first Springfield city-dweller with two or more NCS features (Weston K.) was born in 1927 and the first St. Louisan with two features (Irene T.) was born in 1926. With a timeframe so close together, the overall pattern fits with the finding that Springfield and St. Louis are carrying the NCS influence early on but it is unclear which began the change. Finally, the second wave of NCS influence, which mainly affects off-Route 66, is found mainly in the other MSAs (the green line in Figure 3.7).

The Midland features of /Kuw ow aw/ fronting and the conditioned low-back merger have a much stronger presence both on and off Route 66. According to Figure 3.4, the initial boom in Midland features occurs around the turn of the century, although those off Route 66 had a bit of a lead. When we compare specific Midland features in Figure 3.8, it appears that the earliest Midland feature was actually /ow/, which is nearly categorical among those born off the Corridor around 1900, but this decreased below 50% for the next half century. Between 1900 and 1920, the other three variables increase, but none as

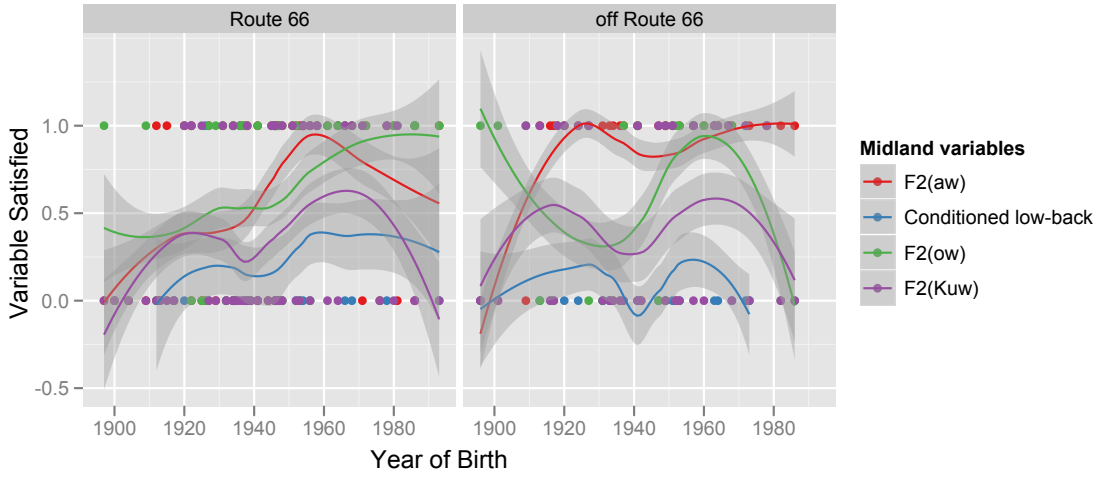

Figure 3.8 Percentage of each Midland variable satisfied over time, divided into those who grew up on Route 66 and those who did not [N=95].

much as /aw/, which becomes almost categorical for all speakers by 1920 (first for speakers off Route 66, then for Route 66 speakers around 1960). The increase in Midland features for all speakers occurs simultaneously between 1940 and 1960. /ow/ in particular becomes practically categorical by 1960 along with /aw/. The most interesting trend is that most of these variables show a slow down or reversal around 1940, in line with the development of the Midland variables in general demonstrated in Figure 3.4.

Speakers born on and off Route 66 behave very similarly in their satisfaction of individual Midland variables, which reflects the findings from Figure 3.4. The main differences are in the treatment of /ow/ and the conditioned low-back merger. Speakers off Route 66 are almost categorical in their /ow/ fronting at the turn of the century, but reverse their trend, while Route 66 speakers slowly increase from under 50% until the mid-1930's. Since both groups converge around 50% usage in the 1920's and 1930's, it is likely there was influence from both sides at once, followed by extreme fronting. As for the conditioned low-back merger: by the time Route 66 speakers begin showing that in their speech, it has already been established by those off Route 66, at around 20% of the population. Therefore, it is likely that those off Route 66 influenced Route 66 speakers in this regard as well.

Finally, comparing the NCS shown in Figure 3.7 to the Midland dialect in Figure 3.9, one of the more interesting findings is that during the first increase in Midland features (about 1900-1920), features seem strongest both in St. Louis and other cities (Peoria, Bloomington, Decatur and Champaign) rather than towns not in a MSA or Springfield. Every location in the Corridor also hits a low in average number of variable satisfied around 1940. This is also approximately the same time that the NCS hits its peak on

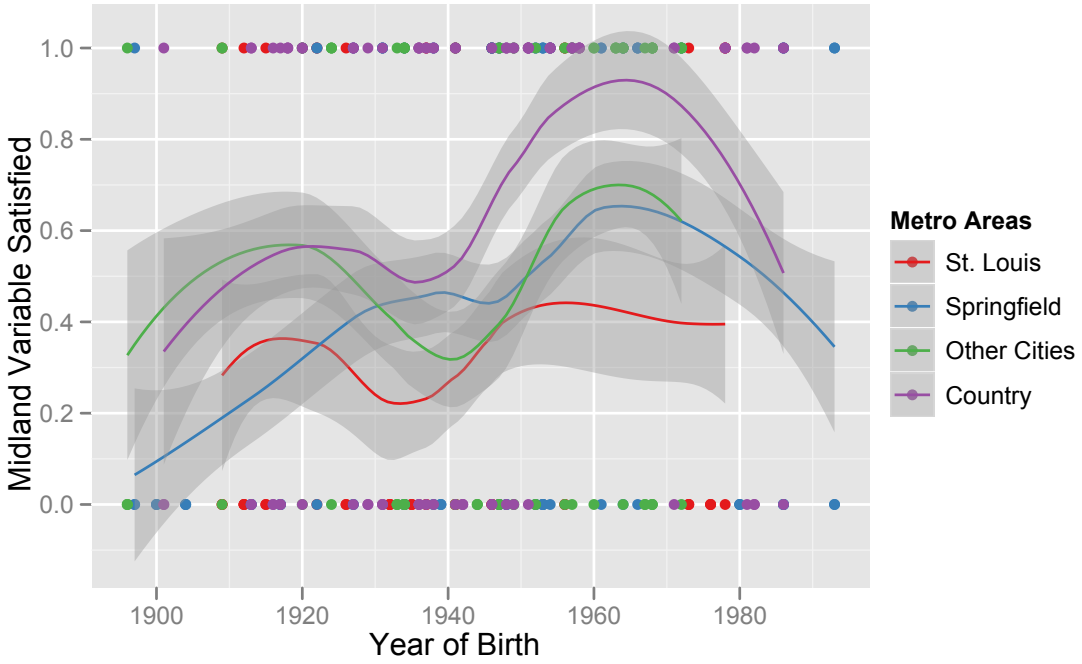

Figure 3.9 Average number of Midland criteria satisfied by MSA in apparent time.

Route 66. I will explore this connection further in Chapter 5, where I deal with the interactions between individual sounds and the dialects as a whole.

3.3 Real and apparent time

Although the population in this study is looked at as a group, the addition of archival data increases the range for the interview dates for study participants from 2 years (2011-2012) to over 40 years (1972-2012). Because of the very large range in dates, it is possible that the dialect present in the interviews collected at one point in time could differ from those collected later on. In fact, the interpretation of the current study presented in the earlier sections of this chapter is established on the idea that the children who were leading the change maintained their dialect as adults. Since Figure 3.3 and Figure 3.4 in Section 3.2 above show the same general trend, the assumption was that speakers from both this study and previously collected interviews could be used together

to look farther backwards in time than a single dataset would be able to reach. However, because the interviews were collected at different times, I will briefly explore alternate explanations.

Since there appears to be both a regular increase then decrease in the number of features over time, there are a few possible explanations for why that occurred. When data is collected at a single point in time, it is generally assumed that speakers represent the dialect that existed at the time they were acquiring language; their dialect was largely set early on and did not change over their lifespan. Because of this assumption, we are able to look backwards in time through changing dialect features. However, when speakers from different age ranges show differences in their dialect, there is the possibility that either the community or the individual are undergoing linguistic change. When it appears as though there is a change in progress in the community, it is either the result of speakers who are individually undergoing change in their own systems while the community does not (**age grading**), or because the individual maintains their linguistic features while a **generational change** is occurring. This second interpretation, change in the speech community, brings with it the assumption that the individual's dialect remains stable over time. In order to determine whether speakers change their dialect over time, one must recollect either community-level data or individual-level data at a second point in time. Although individual speakers in the current study were not interviewed at a second time, which would be considered a **panel** study, it is instead possible to compare the different studies across time as different snapshots of the community as a whole during these times. Because the NCS is dependent upon a single point in time and the

strongest forms are present in larger cities, I compared the three different sources of data in Figure 3.10, both in terms of year of birth (left) and age at the time of the interview

Figure 3.10 Average number of NCS variables satisfied by speakers from cities of 60,000 or more, divided into speakers interviewed for the three different sources in this study: new interviews (2011-2012), TELSUR interviews from ANAE (1992-1998), and archival interviews (1972-1998) [N=93[22]].

(right). In a community change interpretation, speakers would show parallel change in time according to year of birth and not according to age, while an age grading interpretation would show parallels in age but not year of birth. In comparing the two graphs, it is possible to see that the feature changes for the different datasets happen in parallel according to year of birth and not by age at the time of the interview. In fact, the feature strength for new interviews as compared to NCS strength for archive interviews is practically identical when plotted by year of birth but differ significantly when recorded by age when interviewed. The newest interviews show a spike around 55 years, the archival interviews around 65, and the ANAE data around 75. Because speakers interviewed in real time do not match up to the other datasets age-wise, an age grading interpretation is not likely. At the same time, the speakers born in a specific period of

[22] Two speakers from St. Louis were excluded from this graph because they had much stronger features than any other speakers and skewed the data in both graphs.

time appear to show the same increase and decrease of NCS features, speakers' dialects are likely stable over time. Therefore, a community change is the most likely interpretation of the data.

3.4 The role of binary and continuous variables

Despite the compelling nature of the data, particularly for the NCS, the above graphs only use the strict criteria found in the ANAE to determine if a variable is satisfied or not. For the Midland dialect, it is clear that almost all speakers show some features from the Midland and therefore the criteria, such as fronting of /aw/ and /Kuw/, are applicable in this scenario. However, of the 95 speakers in this study, only 19 satisfy any of the NCS criteria from the ANAE and 11 satisfy more than one. The number of speakers who satisfy each criterion out of 95 is listed in Table 3.1. Compared to the Midland dialect,

	Northern Cities Shift				
	AE1	O2	EQ	ED	UD
Speakers with Criteria satisfied	7	13	3	7	9

Table 3.1 Number of NCS criteria satisfied for 88 Corridor speakers.

where 82 speakers have at least one feature and 57 have more than one, it is clear and unsurprising that the Midland influence is particularly strong in the area. The number of speakers who satisfy each of the Midland criteria (/Kuw ow aw/ fronting and conditioned low-back merger) are listed in Table 3.2. The strongest variable is /aw/ fronting, which is

	Midland			
	Kuw	ow	aw	oT~hT
Speakers with Criteria satisfied	37	58	66	9

Table 3.2 Number of Midland criteria satisfied for 95 Corridor speakers.

the variable cited by Frazer (1983) as employed by men asserting their connection to the rural Midland in his study of McDonough County in Western Illinois, near the Missouri border. This only makes the Corridor (outlined in Table 3.3 below) marginally more

# criteria	% off R66	% Route 66	% ANAE IN	% other ANAE	% NYS
5	0%	2%	36%	1%	3%
4	0%	2%	26%	1%	18%
3	3%	5%	16%	3%	14%
2	3%	6%	16%	9%	42%
1	3%	12%	5%	21%	13%
0	92%	73%	0%	66%	8%

Table 3.3 Percentage of speakers with each NCS score (number of criteria satisfied) in this study's data set, compared to the ANAE and Dinkin's study of Upstate New York (Table 3.4, 66:2009).

NCS-like than places in the ANAE and less so than the NCS influence found in Dinkin's (2009) study of Upstate New York (NYS). However, considering these numbers without context (like year of birth) does not make them very comparable. If we only consider the time period with the most NCS influence, 1925-1945, those numbers change dramatically. That age group, where about 43% of speakers living on Route 66 satisfy at least one NCS criteria, is shown in the revised Table 3.4 below. In that table, the strongest NCS speakers from the Corridor are lost, but there is a dramatic increase in the percentage of speakers who satisfy 2 or 3 criteria. The largest percentage for any number of criteria is for 2-criteria speakers, which is the same as in Dinkin's study of Upstate New York and different than the Inland North speakers from the ANAE. At the same

# criteria	% Route 66[23]	% ANAE IN	% other ANAE	% NYS
5	0%	36%	1%	3%
4	5%	26%	1%	18%
3	16%	16%	3%	14%
2	16%	16%	9%	42%
1	5%	5%	21%	13%
0	58%	0%	66%	8%
At least 1	42%	100%	34%	92%

Table 3.4 Percentage of speakers with each NCS score for Corridor speakers from this study born 1925-1945 [N=19], compared to the ANAE and Dinkin (2009).

[23] Each speaker born 1925-1945 who grew up off of Route 66 had no NCS criteria satisfied.

time, the same percentage of speakers have 1 to 3 criteria on Route 66 as in the Inland North.

However, the number of speakers with NCS variables is much lower than expected based upon both the Inland North and the Inland North fringe in Upstate New York, as compared in Table 3.3. Therefore, I suggest that there could be other ways of measuring the relative height or backness of certain vowels to see if they are exhibiting NCS characteristics. The issue in determining /e/ lowering and backing mostly comes back to the issue of the lack of /æ/ raising, and to a lesser extent /o/ fronting, which I will touch upon in Chapter 5. If, for instance, instead of comparing only the F1(e) and F1(æ) as the measurement of height in the EQ criteria we used the F2-F1 formula for finding movement along the front diagonal and compare the new heights of /æ/ and /e/, 38 speakers (including the original 3) would now satisfy the EQ criteria. This method has the advantage of taking /æ/ fronting and /e/ backing into account as a part of the raising of /æ/ along the front of the vowel space and the movement of /e/. Considering the shape of the vowel space presented in Section 1.3.2, a combination of F1 and F2 could be a more accurate way to present the fronting/raising and lowering or backing of /e/. In terms of the effect of this altered EQ criteria, the pattern in Figure 3.4 remains practically identical in Figure 3.11: speakers born on Route 66 are affected by the NCS first, then this influence is transferred to other areas. The new graph in Figure 3.11 differs from Figure 3.4 in showing a slight NCS influence for those born off Route 66 between 1900 and 1925. Since this is before the paving of Route 66, it would follow that the influence of Route 66 as a conduit of the NCS would not yet be felt. If the map from Figure 3.2 was also altered to reflect approximate EQ criterion, the influence of the NCS does not

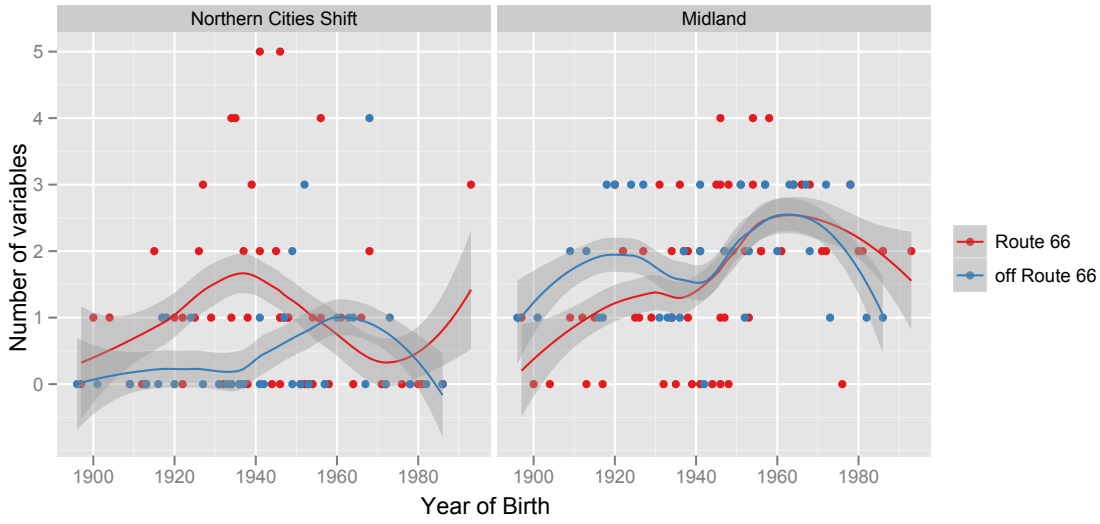

Figure 3.11 Average number of Midland and NCS variables satisfied in apparent time with EQ altered to reflect height and fronting, divided into those living on Route 66 and those living off Route 66 [N=95].

remain solely in the larger cities, but spreads throughout the Corridor, as shown in Figure 3.12. Although there are a handful of speakers off Route 66 and outside of the big cities that have NCS features (ex. Taylorville to the east and Chesterfield to the west), they are located fairly close to the Corridor and Springfield itself. Although this is not the only criterion that should be altered to show the full extent of the NCS influence in this area, it is the one that is least affected by Midland criteria. I shall touch upon the vowels that are directly affected by the Midland dialect (/æ o ʌ/) further in Chapter 5.

Looking at the map in Figure 3.12, it is clear that the historic influence of Route 66 upon these smaller towns between St. Louis, Springfield, and Bloomington is present. One possible explanation for increased direct contact between NCS speakers and locals could be the fact that car travel was slower and travelers were much more likely to eat at local diners and stay in these towns overnight. A few interviewees mentioned boarding or rooming houses that used to exist along Route 66 through the 1940's and 1950's,

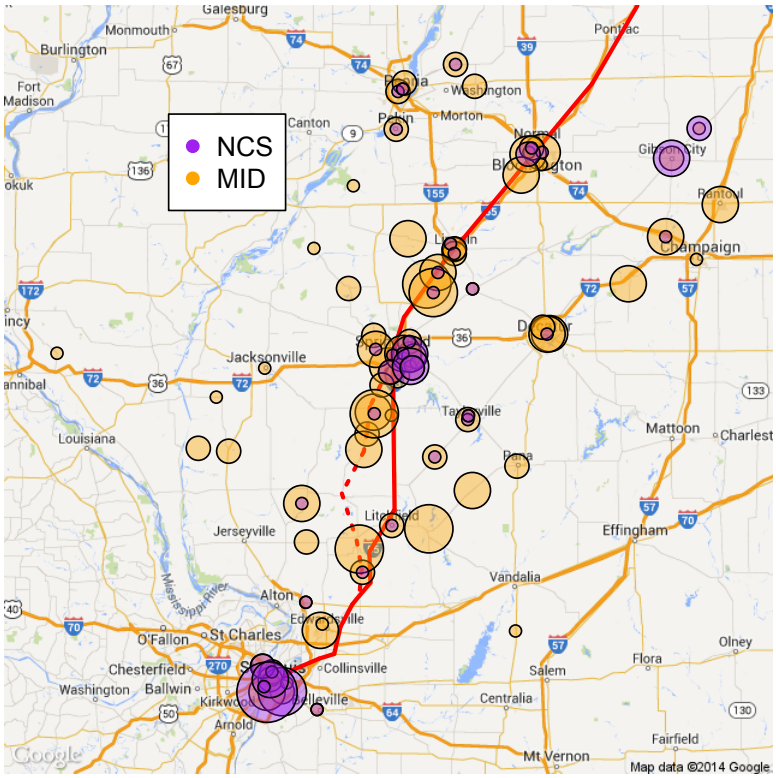

Figure 3.12 Map of number of altered NCS criteria from the ANAE (AE1, O2, UD, and ED remain the same, EQ is altered) and Midland criteria (fronting of /ow aw Kuw/ and conditioned low back merger) satisfied for each speaker.

where people who were traveling long distances could have a cheap room to stay the night along their way. This points to the likelihood that travelers would have stayed in these areas overnight, increasing person-to-person contact with service workers and locals at area restaurants or diners. Diners clearly had a local customer base, since many interviewees also mentioned the "Liars Table" described in Section 1.3.3, where older male members, usually farmers or businessmen with social clout in the community, would meet and talk.[24] Since both travelers and local residents would have used these restaurants, the possibility of direct contact was much higher. However, I shall go further into the details of the historical basis for person-to-person interaction along the corridor,

[24] The members of these "liars tables" do not solely interact with each other, as in my personal experience they were happy to speak to me or other travelers who were at these restaurants.

as well as evidence from the 1940 and 1950 censuses in section 3.5 of this chapter. In addition, traffic maps from the 1930's through the 1980's point to patterns of passenger and commercial traffic that may provide more insight into instances of direct contact.

3.5 Real time geographical change and apparent time data

In looking at age ranges before the paving of Route 66, the early years of the original alignment of Route 66, and the years afterward, it is possible to see that the location of the NCS variables follows the path of the building of Route 66. In the first map in Figure 3.13 below, NCS variables are scattered throughout the area. In the second map, during the first alignment of Route 66, speakers with NCS features became more centralized to Route 66.[25] In particular, the speaker from Staunton (on the lower half of Route 66) has features of the NCS while the speaker from Shipman to the west does not. In addition, the Springfield speakers born during this time both have strong NCS features,

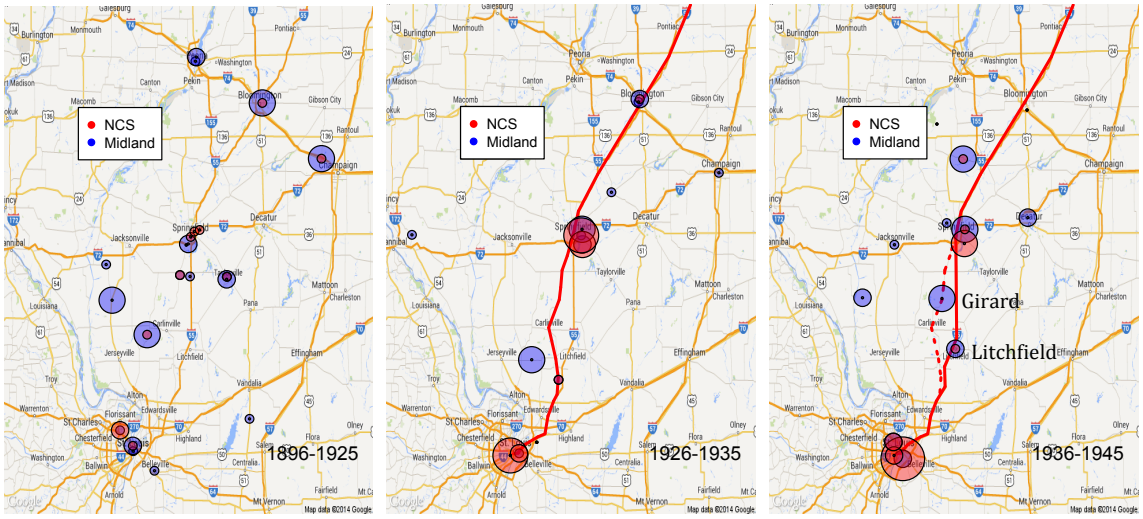

Figure 3.13 Maps showing the emergence of the NCS and Midland variables before the paving of Route 66/Route 4 (1896-1925), during its first alignment (1926-1933), and after the alignment of Route 66 was shifted eastward but the original remained Route 4 (1936-1945).

[25] Unfortunately a St. Louis native born in this time period was not available to compare with the Springfield and other Route 66 speakers.

demonstrating the concentration of the NCS on Route 66. In the last map, which shows a new alignment of Route 66, the speakers with NCS features follow the new alignment. This is particularly clear on the 1936-1945 map in the distinction between Sam M. (born 1938) from Litchfield on the new alignment who has NCS features and James D. (born 1936) from Girard who has a stronger Midland influence and no NCS features. However, the time period with the strongest NCS influence is by far the following decade (1946-1955), as shown in the next two maps in Figure 3.14 below. Although both maps

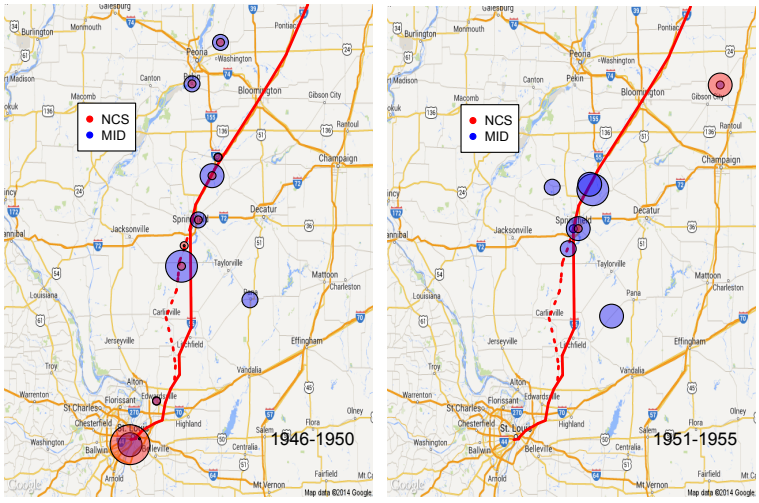

Figure 3.14 Maps showing the NCS and Midland variables after the alignment of Route 66 was shifted eastward (but the original remained Route 4) but before all towns were bypassed.

demonstrate more individuals along Route 66 with NCS features, the part of these two maps that distinguishes it most from the previous time period (the third map in Figure 3.13) is the movement of the NCS northward from Springfield, particularly starting in 1946-1950. The NCS features are at their strongest in St. Louis during this time, as demonstrated in the apparent time graph in Figure 3.7 above, which could point to influence either moving from Chicago southward, or from St. Louis or Springfield

northward. In both Figure 3.4 and Figure 3.11 above, which demonstrate NCS and Midland trends by location, as well as the first map in Figure 3.15 below, the next decade

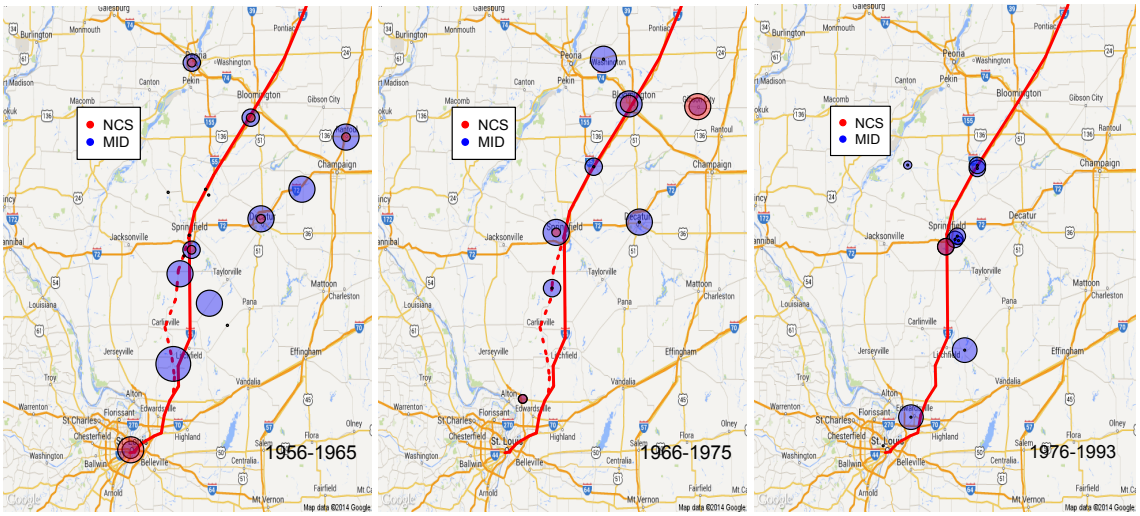

Figure 3.15 Maps showing the retreat and re-emergence of the NCS variables as well as Midland variables during and after the construction of highway bypasses on Route 66 (1956-1965 and 1966-1975), then I-55 (1976-1993).

shows a decline in NCS features overall. Therefore, the late 1950's and early 1960's mark one of three possibilities: either it is a retreat from the NCS, the tail end of this round of NCS influence, or a consequence of the growing Midland dialect region. First, since the Midland dialect hits its peak during the same time period both on and off Route 66 (see Figure 3.11 above), the NCS retreat could be the result of interference from the Midland dialect. If in addition to that there are forces that encourage the backing of /o/ or the fronting of /ʌ/, such as Midland /ʌ/ fronting or the low-back merger, the NCS would be far more likely to begin to retreat from the area. I will elaborate on this particular hypothesis in Chapter 5.

Another possibility is that this development in the Corridor could be part of a larger trend of retreat that is taking place in the US. Since this time period intersects with other periods of decline or reversal of dialectal features in Upstate New York (Dinkin 2009)

and Philadelphia (Labov, Rosenfelder & Fruehwald 2013), this could be part of a larger movement toward dialect retreat. In each of these studies, it appears that speakers born in the 1960's are retreating from some earlier change in progress. In Philadelphia, the variables /uw/, /ow/, and /aw/, which had been increasing since the turn of the century, take a turn in the opposite direction in the 1960's, particularly for women (Fruehwald 2013). In the Inland North fringe in Upstate New York, NCS features (particularly /o/) appear to be stable or increasing for those born before the 1960's, then sometime between then and the 1980's this trend reverses (Dinkin 2009). This period of dialect reversal directly corresponds with the decline in NCS features for those who grew up on Route 66 (Figure 3.4/Figure 3.11). This decrease is shown in the distinction between the second map in Figure 3.14 and the first map in Figure 3.15. The parallel trend between the Corridor in this study and the two other geographical areas in Dinkin 2009 and Freuhwald 2013 is notable and might point to a larger trend of dialectal changes that tended to reduce linguistic cultural diversity across the US during this time. However, without more evidence of a single motivation or a series of related motivations for the types of changes that occurred in these disparate locations, they do not appear to be directly related.

It is important to note that although the ANAE (among other sources) claims the Inland North to be fairly stable and resistant to outside influence, not all areas with NCS features are immune from change. The clearest example of this is Dinkin's data from Upstate New York. If a dialect change can progress from town to town, even if the change is parallel to others in a similar dialectal area, pressures in the dialect can cause change in the opposite direction to spread in the same manner. Even though completed

sound changes appear to follow a straight path from beginning to end, that does not mean that changes in progress have a one-way trajectory.

The final possible explanation for dialect retreat in the Corridor is that the population with NCS influence did not hit a critical threshold to catch on during the decades of influence after the paving of Route 66 (for those born from 1926 through the mid-1950's). Therefore, when the Inland North influence slowed, the dialect lost NCS variables. There is demonstrable NCS influence in the Corridor through the mid-1950's, enough to cause speakers from St. Louis and Springfield to both acquire multiple NCS features (Figure 3.2) and /æ/ and /e/ to move along the F1 and F2 axes. However, this influence seems to vanish for those born in the late 1950's and early 1960's. I will discuss this in the following section. I will also compare it to the situation of the low-back merger in Massachusetts. However, the lack of influence on an area that has not fully developed a regional dialect might be enough to cause a dialectal retreat.

Dinkin (2009) addresses a similar unexplained sudden retreat in NCS fringe towns, hypothesizing that the retreat of F2(o) in all areas without the low-back merger either happened simultaneously, or that it retreated in the same general geographical pattern as it appeared. We can apply this idea to the Corridor, where the methodological aim for the greatest geographical spread gives each location less consistent data in apparent time, leaving the pattern open to multiple possibilities. Dinkin concludes that influence from nearby towns is the cause of both the origin and retreat of the NCS in both the Inland North core and fringe regions, not the result of unrelated simultaneous change, but the more recent nature of the NCS influence in the Corridor might point more to a change in population movements than a change spreading through an established population.

The next part of the pattern – the increase in NCS features for those born off Route 66 in the 1950's and 1960's – might be best explained by the same forces that caused the Route 66 speakers to decrease their NCS features. If the area was not experiencing population growth but population displacement, it is very possible that instead of moving away from the area, city residents were moving from the more populated Corridor area to the rural areas surrounding it, or to nearby cities away from the main highway. I will discuss this in greater depth in Section 3.8.

3.6 Rise of the NCS and Midland through census and traffic data

Despite the many history books written about Route 66, information about population movement in the St. Louis Corridor comes mainly from local histories and limited data gathered in the census.[26] The 1940 census of the U.S. was the first census to include a question about where residents lived five years prior. Published census reports from 1940 to 1990 do not contain the level of detail, particularly on Springfield, that would be necessary to determine where Springfield (or other Illinois) residents have migrated from over the years. If there is any detail, it is about the general area of the country they came from or whether they were living in a foreign country 5 years before that point. Because the reports only show the largest metropolitan areas (generally 50,000 or more), in many of these reports, the population in Springfield is too low to appear.

The US government opens the original census records to the public 72 years after they are collected, so the 1940 census was published in its entirety online in 2012. To get a better sense of where the population of Springfield might have migrated from in the

[26] Note that in calling this area the St. Louis Corridor, I am using a linguistic distinction and not one necessarily recognized by the residents of this area themselves.

most critical years of the appearance of the NCS in the corridor, I sampled the census records from Springfield (population 75,503 at the 1940 census). An example of the census records appears in Figure 3.16 below and more detail is seen in Figure 3.17. For each of the 473 pages studied – a maximum of 40 residents including children and an average of 24 residents per page – I took a count of the number of residents who had migrated from elsewhere in the US as well as foreign countries, those who were born in the US and foreign-born. In addition, I noted the states individuals were born in and the town/county/state that residents migrated from on that page (noting a greater degree of detail for those from the Inland North and Midland).

This sample of the original 1940's census records includes about 20% of the total population: 16440 residents over 5 years old and 1100 children under 5. About 75% of all sampled Springfield residents were born in Illinois, slightly more than the percentage of all Illinois residents living in Illinois in 1940 (67%). Although almost all (95.4%) of Springfield residents over 5 were living in Illinois 5 years earlier, only 88.2% were living in Springfield five years earlier. This means that 7.3% of Springfield residents moved from elsewhere in Illinois between 1935 and 1940. The results in Table 3.5 below demonstrate the breakdown of both where Springfield residents who were not born in Illinois were born, and of Springfield residents who were living elsewhere five years ago previously lived at that time. Of all Springfield residents (including children), 14.7% were born in the US outside of Illinois (almost a quarter of whom came from Midland

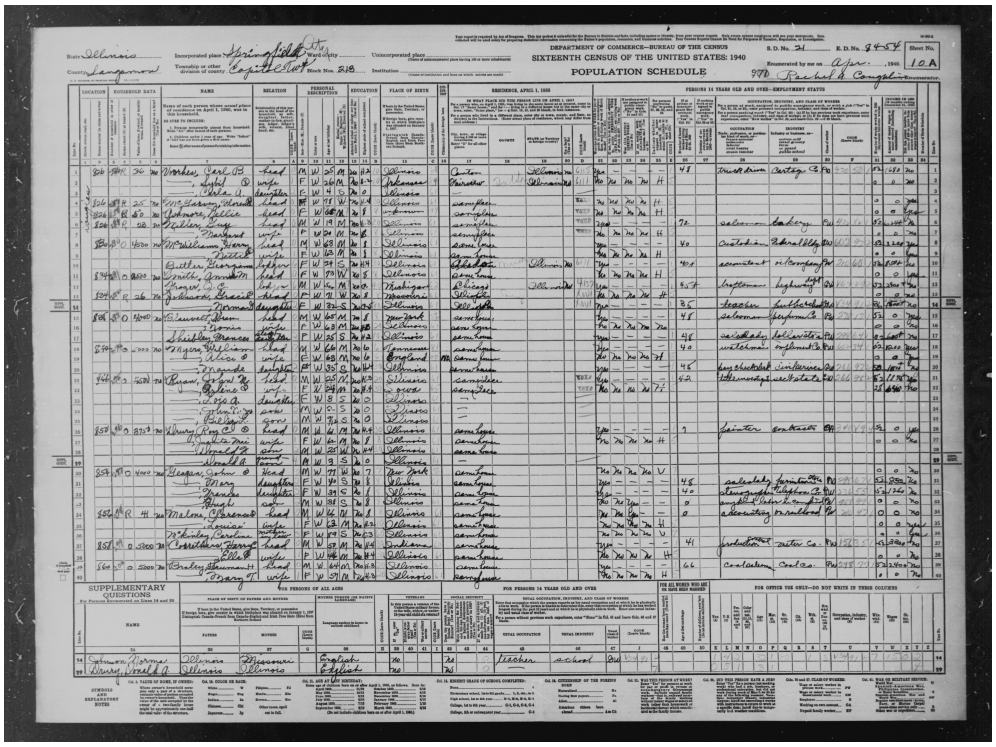

Figure 3.16 An example of an original page from the census records (schedule IL.84-54, sheet 10A, block 213).

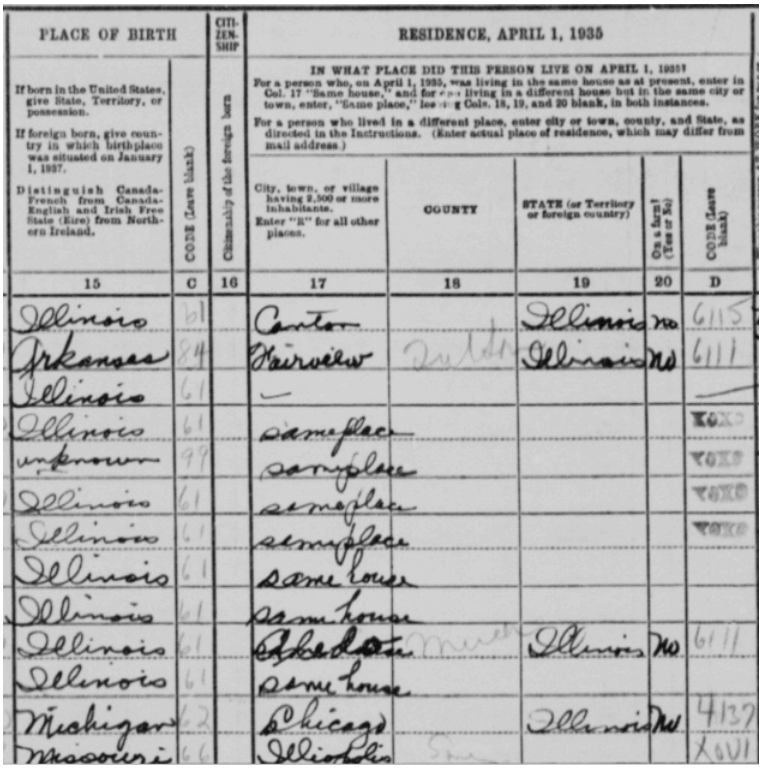

Figure 3.17 Sample of part of census record considered. In particular: place of birth and residence April 1, 1935).

	% of total US migrants in Springfield (3777 total)	% Springfield residents born outside IL (4312 total)
Other Sangamon County	6.9%	
Springfield MSA (2010)	8.4%	-[27]
Chicago MSA	4.7%	-
St. Louis MSA	3.6%	-
Inland North cities[28]	6.7%	-
All Inland North areas[29]	8.7%	4.1%
Midland[30]	6.5%	25.1%
"Upland South"	0.7%	9%
Outside of Illinois	68.4%	100%

Table 3.5 1940 census data from Springfield on residence five years prior and place of birth.

states[27]) while 9.9% were foreign-born. Of those who were living outside of Springfield 5 years previously (above the age of 5), the city with the highest percentage of migrants from elsewhere in the US was the Chicago MSA, with 4.7% (4.3% from Cook County alone, the county that contains Chicago), then St. Louis MSA, at 3.6%. The largest percentage of new residents (8.7%) migrated from the Inland North in general.[29] 6.4% had lived in cities[28] in the Inland North including St. Louis and Chicago, another 2.3% in other smaller Inland North[31] towns. This means that of the Springfield population, almost 2% of all residents had migrated from the Inland North in the past 5 years. This is

[27] The level of detail for where residents were born was only at the state level, therefore determining whether each was born in an Inland North or North was close to impossible.
[28] Inland North cities include St. Louis, MO, Chicago, IL, Buffalo, NY, Detroit, MI, Milwaukee, WI, and Gary, IN.
[29] Total Inland North include the St. Louis (St. Charles MO, St. Louis MO, St. Louis city MO, Madison IL and St. Clair IL counties) and Chicago MSAs (Cook IL, DuPage IL, Kane IL, Lake IL, Will IL, and Lake IN counties) from 1940 as well as speakers from parts of Illinois, Michigan, New York, and Wisconsin other than the cities listed above that are geographically in the Inland North area, based upon ANAE maps. The figure for those born in the Inland North includes Michigan, New York, and Wisconsin, but I will discuss different methods for approximating Inland North area of Illinois and Missouri later in this chapter.
[30] For both categories, Midland Speakers were anyone who was from Ohio, Indiana (except Gary), Missouri (except St. Louis), or Kansas, since the majority of the populations from those states would be considered Midland speakers.
[31] This excludes the Springfield Metropolitan area, which would add another 2.8%.

a little more than the amount that migrated from the Midland outside of Illinois (6.5% of new residents, 1.5% of all residents). Therefore, the migrants at that time were more likely to come from the Inland North than the Midland, which is consistent with the finding that the NCS was thriving during this time while the Midland was strong but had slightly dipped. Of those that had lived in Illinois five years previously (which is 68.3% of those who lived in the US outside of Springfield), 26.6% had lived in the greater Springfield metropolitan statistical area, 14.9% from the Chicago MSA, while each of the other MSAs or counties accounted for less than 7% each.

The difficulty in determining how many speakers were born in the Inland North is the lack of detail in the location residents were born in. Although 75% of speakers from the sample were born in Illinois, this could mean almost any percentage were born in Chicago, southern Illinois, or even northern Illinois near the Wisconsin border. Comparing residence 5 years previously to birth for various other Inland North and Midland states in Table 3.6, it is clear in every instance that the number of residents born

	Where Born	% Born outside Illinois	% of total	Elsewhere 5 years ago	% 5 years ago outside Illinois	# born / # 5 years ago	% born / % 5 years ago
Missouri	575	13.3%	3.3%	156	8.9%	3.7	1.5
Indiana	231	5.3%	1.3	39	2.2%	5.9	2.4
Ohio	132	3.1%	.8%	35	2.0%	3.8	1.5
Wisconsin	88	2.0%	.1%	36	2.0%	2.4	1.0
Michigan	88	2.0%	.1%	26	1.5%	3.4	1.4
New York	55	1.3%	-	11	.6%	5	2.0

Table 3.6 Percentage of Springfield population subset who lived or were born outside Illinois 5 years prior (1935) and ratio of those born elsewhere to those elsewhere 5 years ago.

in each state is multiple times the number of 1940 Springfield residents who lived there in 1935. If we used the total number of Inland North residents 5 years ago (327) and

assumed the highest multiple from the table (5.9, for Indiana), it would still only be 10.9% of the sampled population. Although this would only be an average for the town as a whole, on certain blocks that percentage could be higher. Therefore, in order to determine what the picture on the ground would look like, it is important to look at the neighborhood by block.

Another option to determine the possible influence from those from the Inland North using census records would be to look at those living in close proximity to each other. Each census page contained up to 40 individuals (including children under five years) who were living on the same block.[32] 116 pages of the 474 total had at least one resident from the Inland North[33] (2.5 on average). Although most of those 116 sets of 25-40 people had 5% or less who had lived previously in the Inland North, four blocks had 20% or more of adults who were in the Inland North five years prior while seven of them have above 15% previous Inland North residents. Since five of those sets of residents had children under the age of 5, it is plausible that interactions with neighbors or neighbors' children could have had an effect upon their own dialect growing up.

As Springfield's population was growing and bringing in migrants from across the Midwest, Chicago and other northern parts of the state were not gaining residents with the same momentum. In Section 1.1.3, I discussed the measure of the population center of the state. Although the movement over time is generally from Chicago, reflecting the large increase in population in the Chicago area, 1940 does not follow this pattern.

[32] This is generally the case, although some had block breaks in the middle of the page. However, I will continue as if a single census page definitively refers to those living next door or across the street from to each other.

[33] This includes speakers from St. Louis, MO, Chicago, IL (and Cook County IL), Buffalo, NY, Detroit, MI, Milwaukee, WI, and Gary, IN.

Instead, 1930-1940 is the only decade where the population center moved away from Chicago and toward the Corridor. Although a larger study of the population movements in the state would be needed to determine whether individuals were indeed moving from Chicago to the Corridor, it cane be assumed that Chicago's population was decreasing while the Corridor's population was increasing.

Census data from 1950, as presented generally in governmental reports, do not have the same level of detail I was able to cull from the 1940 original census records. Nonetheless, the 1950 census report points to a large migration of people into the area around Springfield (Brunsman 1953). The economic area that includes Springfield, Bloomington, and the surrounding smaller towns saw a 6.6% migration to the area between 1949 and 1950. It is not possible to compare that directly to 1940, but compared to the 12% migration between 1935 and 1940, it probably demonstrates a drop in migration. In fact, 36% of migrants between 1949 and 1950 came from different economic areas in the same state and the 1940 census showed the largest influx within the previous 5 years of people from the Chicago and St. Louis areas. It is likely they migrated from the Chicago area and would have arrived at the ideal time to influence the dialect of local peers during their formative dialect years.

Finally, maps of the traffic patterns from the 1930's through the 1980's can also provide some insight into the daily movements of individuals in the area. Historical traffic maps which recorded the average traffic flow in a 24 hour period were published irregularly for Illinois between 1931 and 1981 (and yearly after then). Using the major through points between the large cities around the Corridor as well as both the original alignment of Route 66 south of Springfield (also I-4) and later alignment south of

Springfield (R66/I-55), I calculated the average traffic flow in different areas of the Corridor. The results for passenger traffic can be seen in Figure 3.18. Although most segments studied appear to decrease between 1931 and 1934 (the first two maps in this

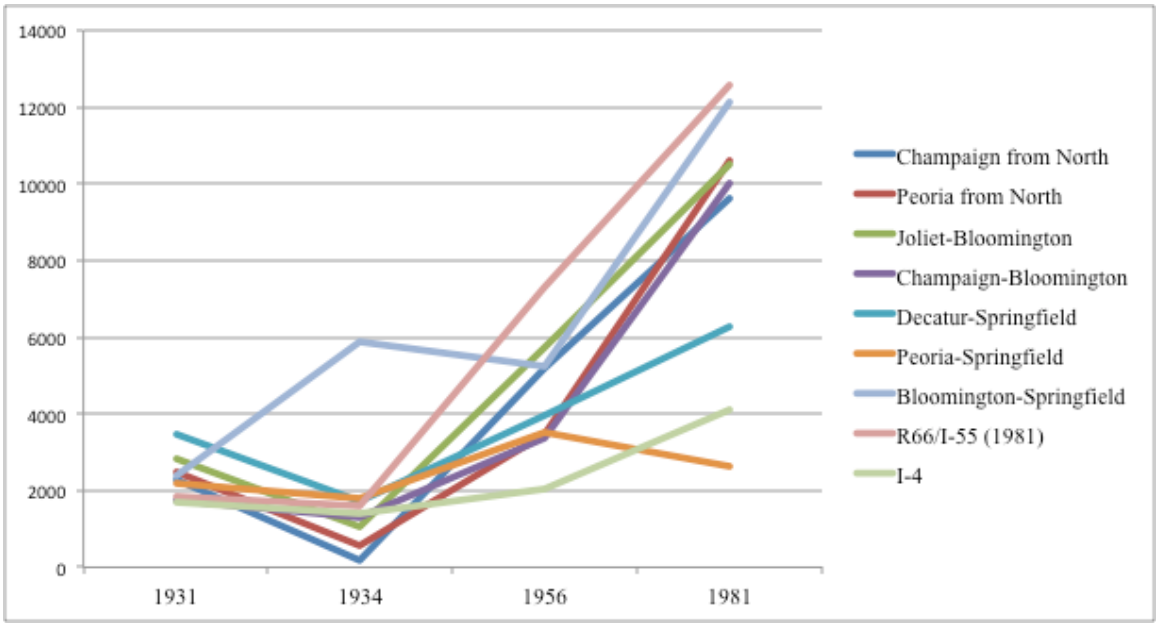

Figure 3.18 Daily average non-commercial traffic flow in the Corridor area, 1931-1981 (Illinois Division of Highways).

series), the area directly north of Springfield along Route 66 between Bloomington and Springfield, increases dramatically and far above all other segments. The pattern does not expand northward to Chicago as well (Joliet-Bloomington), but an increase in traffic could point to the importance of the Route 66 portion of the Corridor, which in this study considers mostly areas south of Bloomington. For commercial traffic, the Joliet-Bloomington segment was actually the largest in 1936, as seen in Figure 3.19. In fact, commercial traffic in each segment increases between 1931 and 1936, pointing to the possibility that passenger vehicles may have been using other roads, possibly unpaved ones, to travel to the area from the north. Finally, another possibility is that much of the regular passenger transportation in the area during the mid-1930's used local roads and

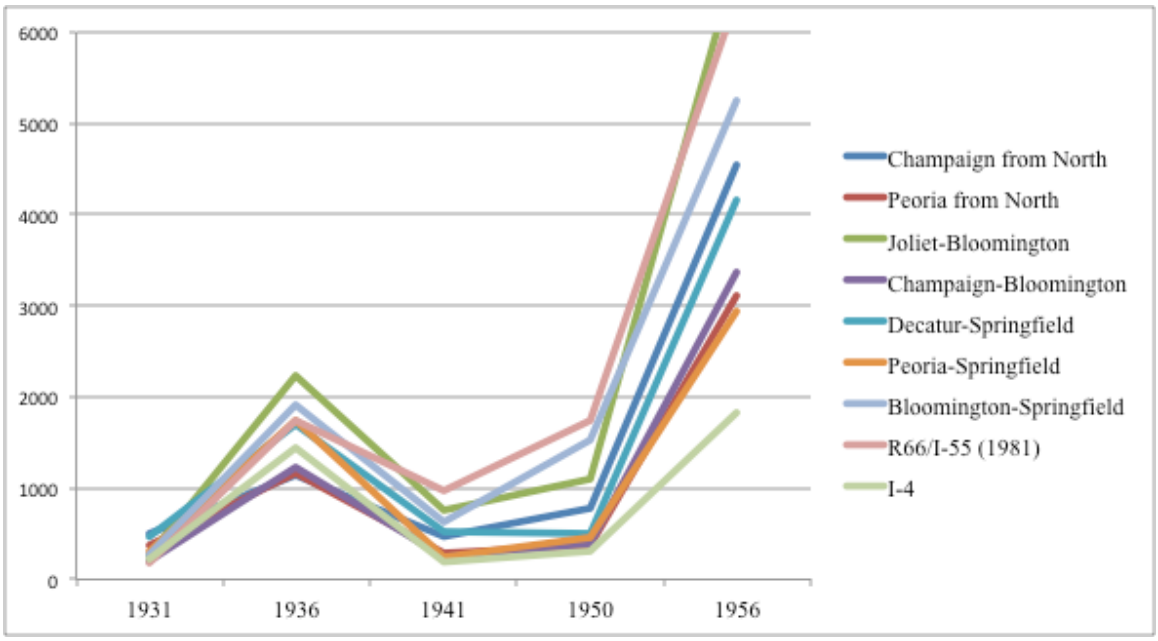

Figure 3.19 Daily average commercial traffic flow in the Corridor area, 1931-1956 (Illinois Division of Highways).

that non-local traffic was evenly split between commercial and passengers traveling through. However, the sharp increase in commercial traffic also means a boost in non-local traffic in general, which might have led to more person-to-person interaction.

Although passenger and commercial traffic differs in many ways, the change in traffic patterns from the mid-1930's to the mid-1950's for both commercial and passenger traffic is relatively parallel. In both cases, the average traffic flow increases overall,[34] pointing to the trend of increased contact between the corridor and outside areas. Therefore, although the results of the traffic maps does not conclusively point to traffic from specific areas, it does bolster the claim that there would have been more contact between the Inland North at one end of Route 66 and the Corridor as a whole.

In addition, the Peoria-Springfield passenger vehicle segment and routes south of Springfield (R-66 and I-4) remain relatively constant between 1931 and 1934, which may

[34] There are only commercial traffic maps from 1941 and 1950, so it is not possible to compare the passenger traffic to the drop seen in commercial traffic during that time.

point to passenger vehicles also using historical pathways to enter the general area. Before cars and land traffic became the main mode of transportation, water transport through the Illinois River and I & M Canal was the main way of carrying mainly goods but also people. In fact, in 1931 (five years after the paving of Route 66), passenger traffic greatly outpaces commercial traffic, pointing to the continued importance of water transport for goods. Since the main waterways were farther north of Route 66 and went through Peoria, the roads that followed that path would have also provided alternatives to the northern portion of Route 66 that followed an historically more popular throughway.

With all this information about population movements over the short and long term in the Corridor in the 1930's and 1940's, a slightly clearer picture emerges. Most people who lived in Springfield, what is assumed to be the area of greatest contact with outsiders, stayed in Springfield between 1935 and 1940, meaning that there was no great influx of Inland North speakers during this time. However, the Inland North is one of the largest if not the largest dialect area that new residents moved from: on average, 8.7% of residents were from the Inland North and in some pockets of the city they constituted 20% of the population. Most people were born in Illinois, which could mean a large percentage of Springfield residents were born in Chicago or elsewhere in the Inland North area of Illinois. Average traffic flow for both commercial and non-commercial vehicles increased along Route 66 in the 1930's and 1940's, pointing to the likelihood of increased interaction with outsiders.

3.7 Midland and NCS thresholds

The idea of a linguistic or dialectal threshold has been touched upon in other studies of dialect and language change. For Johnson's (2007) study of Massachusetts, Yang (2009)

developed a hypothesis that the number of speakers migrating into a town who had the low-back merger had to reach a certain critical mass or threshold to influence the young impressionable speakers during a time when they could still acquire the merger. In theory, if the NCS did not approach this threshold in the Corridor, a threshold that might be higher than the instance of low-back merger in Massachusetts, it would not be passed along to the next generation and therefore would not spread throughout the area. Yang's theoretical expectation was that the threshold was 21.5% for the population to attain a sustainable low-back merger. Since the actual instance of children with one merged parent was close to that amount (18% of 12th graders, 20% of 8th graders, and 23% of 4-5th graders), the expectation was that the community would hit that threshold, and this conclusion was ultimately borne out.

In the Corridor, there are two dialects present (Midland and NCS) and each follows a distinct path. For the Midland dialect, Figure 3.8 demonstrates that both /ow/ and /aw/ fronting go to completion[35] for all speakers while the conditioned low-back merger and /Kuw/ fronting oscillate up to about 60% and 25% respectively. The conditioned low-back merger has been shown to lead to the full low-back merger within a generation, particularly in Ohio (Thomas 2010, Durian 2012). However, it does not appear as though the low-back merger is rising in the Corridor: when considered together both the conditioned and unconditioned mergers are rising, but it does not appear in Figure 3.20, as though the conditioned merger is leading to the unconditioned merger, as has been the case in other Midland cities. Additionally, the unconditioned merger is below 20% of the

[35] Three younger speakers from off of Route 66 do not have backed /Kuw/, although they all have fronted /aw/, another of the stereotypical Midland features. It is possible that their increased contact with Springfield and St. Louis would make them less likely to have this feature, as two were interviewed at jobs in Springfield and one lives within the St. Louis metropolitan area.

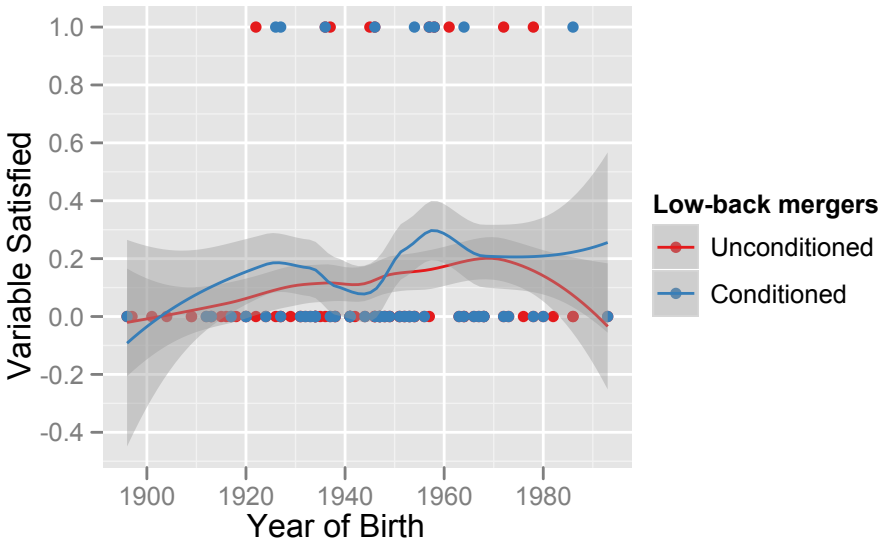

Figure 3.20 Percentage of each type of low-back merger satisfied over time [N=87].

population (the threshold in Massachusetts). Therefore, it does not appear as though the conditioned or unconditioned mergers are going to completion, but it also seems that they are not disappearing at that time.

For the NCS, which did end up retreating from Route 66, the highest proportion of speakers with a single variable, as shown in Figure 3.5, is a little under 40% of Route 66 speakers with the UD criterion at its peak. During the 1925-1945 period in Table 3.4, which was determined to be the period with the strongest NCS influence, 44% of Route 66 speakers had at least one NCS criterion. Despite the increased amount of NCS features during that period, the NCS was unlikely to survive and spread through the population, in part because it would not have had the power of Herzog's Corollary (1965) behind it nor the proportion of speakers to make a sizable dent in the population. Herzog's Corollary, that "mergers expand at the expense of distinctions," has shown itself to be an extremely strong tendency in his study of Yiddish, various places in the ANAE, Herold's (1990, 1997) study of the low-back merger in Tamaqua, PA, and Johnson's (2007) study above.

However, since the NCS criteria does not involve mergers, a different theory of thresholds, would be necessary to determine how many NCS speakers would need to be present to tip the scales of the community toward a new dialect.

The Inland North itself shows remarkable stability of dialect features – over a third of ANAE speakers satisfy all 5 criteria, and the Inland North is resisting the low-back merger. On the other hand, some boundary areas of the Inland North show cracks in that stability: for instance, the Inland North fringe in Upstate New York (where there are far more speakers that satisfy NCS criteria) is not immune from this retreat. Even though Corridor speakers during the NCS boom had almost a 50% instance of NCS and a 40% instance of the UD criterion, the dialect still retreated in a similar fashion. However, without a method of measurement for the NCS similar to the one employed by Yang for the low-back merger, it is unclear whether the retreat of the NCS in the Corridor was caused by a low percentage of speakers with NCS features.

3.8 Historical explanations for the retreat and second wave of NCS influence

After the peak of NCS influence for those born between the 1920's and the 1940's, as shown in the graphs above, the NCS influence on Route 66 retreats. Based upon comparison with other studies of diffusion, it is possible that the initial NCS influence is the result of diffusion from Inland North speakers (both adult and child) to children in the Corridor. Because the influence lasts approximately a generation, it is likely that first diffusion from the Inland North decreased and then there was not enough lasting influence for the speakers to transmit the NCS to their children, so the changes retreated. Since this theory is based more upon what is known about the diffusion and transmission

of language change and less about the history of the Corridor population, it is important to corroborate the story with historical facts from that time and place.

Fortunately, the history of Route 66 takes a sharp turn at the same point in time, as discussed in Chapter 1. In the 1950's and 1960s, Route 66 was widened from a two-lane to a four-lane highway and as a result, cars could travel more quickly through this area. As a consequence, people likely did not stop as much along the way and businesses that had previously catered to travelers no longer had that audience. This historical event could have had consequences for the transmission of the NCS to both Corridor adults and children. First of all, a lack of local traffic could have decreased the amount of face-to-face contact between those on the Corridor and outsiders, who would have mainly come from the Inland North along the northern portion of Route 66 in Illinois. Additionally, the extra population that had moved from the northern portions of the state during the great depression and into more rural areas (most of the smaller towns on Route 66 are fairly rural except for small main street areas) could have moved away because of the lack of job prospects in the area. A lull in NCS influence in an area where the NCS has not taken a firm enough hold could lead to the reversal of those features because they have not reached a threshold in the way the Inland North has, as discussed in Section 3.7.

If those with the influence were moving away from Route 66 in the late 1950's and 1960's, it is possible that they were moving to nearby towns and creating their own economic opportunities in farming and other business ventures not tied to Route 66. Many of the present-day Route 66 attractions and service industry spots, such as Doc's in Girard and Weezy's in Hamel, are actually newer incarnations of former Route 66 rest stops. In fact, some histories of Route 66 and personal accounts from interviewees

attribute the closing of local Route 66 businesses with the Highway Beautification Act of 1965, which outlawed signs along highways that would have advertised for stops along the way. If travelers did not know about these businesses, especially those on small town main streets and not directly on the highway, they would not stop and patronize them. However, the early influence would have been set and with those primary speakers with NCS features might have spread out in the nearby areas and having relatively higher linguistic influence neighbors and their own children in these smaller towns. For example, a speaker born in 1930 who grew up on the Corridor might have moved out to nearby towns and had children in their 20's, which would have been between 1950 and 1960. In this way, a secondary influence could have occurred with the children of Route 66 speakers in nearby towns. Since the towns are smaller, the linguistic effect these speakers and their children could have had was relatively larger.

Then there was the widening and bypassing of Route 66. The original intention for Route 66 was to connect the main streets of small towns between Chicago and St. Louis. However, the first four-lane bypasses (around smaller towns like Lincoln and Litchfield) were built in the 1940's and later upgrades to a 4-lane highway in the central part of the state in the 1960's and 1970's caused traffic to avoid these smaller towns altogether. The road was later officially decommissioned and this new and improved highway became I-55 in 1977.

However, because people had easier access to cars as a means of transportation, it is possible that they started to travel farther away, meaning that tourist spots in Illinois no longer held as much of an appeal. People traveling for pleasure on Route 66 would have wanted to quickly drive past Illinois and on to places out west, like Arizona or California.

Of the 2500 miles of Route 66, the length in Illinois is only an eighth of the entirety of Route 66. Even though the entirety of Route 66 was paved at about the same time, its function as a way to connect small towns across the state has died out in favor of increasingly faster highway transportation.

In sum, the changes surrounding Route 66 in the 1950's through the 1970's would have led to the decrease of influence from the Inland North. Instead of moving back to the Inland North or further along Route 66, speakers could have moved to more rural or cheaper towns resulting in a secondary influence in the towns not on Route 66. Historical accounts corroborate this series of events. However, since the census or other records of population movements are sparse for this time period, it is not verifiable at this time.

CHAPTER 4

The emergence of the nasal /æ/ system

This chapter discusses the emergence of the nasal /æ/ system in the vowel systems of the speakers in this study of the St. Louis Corridor. As an area with Inland North influence, some speakers in this dataset demonstrate /æ/ raising, particularly speakers from larger cities. However, looking at the community as a whole, it appears as though a gradual nasal system, as is commonly found in the Inland North, developed during the first half of the 20th century, followed by a distinct nasal system for speakers born in the second half of the 20th century. Although the origin of the nasal system found in the Corridor is not entirely clear-cut, the comparison of this data to evidence from other studies of nasal systems in the U.S. shows that it is unlikely to have stemmed from the Mid Atlantic /æ/ system. At the same time, it is unclear whether the intermediate gradual nasal system found in the Corridor is a result of Inland North influence.

Section 4.1 will cover the Mid Atlantic /æ/ system, as demonstrated in previous studies of New York City, Philadelphia, and Baltimore, as well as other locations across the Northeast and Midland. Section 4.2 will demonstrate the /æ/ system found in the current dataset from the St. Louis Corridor, drawing upon the historical record of the area discussed in Chapter 3 (Section 3.6). Section 4.3 will explore the possibility of a historical relationship between the emerging nasal systems in former tense/lax /æ/ systems and the pattern found in the Corridor. Ultimately, the evidence points to an unrelated emergence. Section 4.4 will consider the alternate possibility that the nasal system is a result of influence from the Inland North's gradual nasal system, Section 4.5 will cover Midland influences. Finally, Section 4.6 will discuss the implications of these

findings for the nasal /æ/ system in the St. Louis Corridor, particularly about which dialect region or regions could have prompted the Corridor dialect to adopt a nasal /æ/ system.

4.1 Previous studies of tense/lax /æ/ and nasal /æ/ systems

The progression of /æ/ raising and the tense/lax distinction has been studied in many different locations across the US, from New York City to New Orleans (ANAE, Labov 2007, and Durian 2012, in addition to other work). There are five main types of /æ/ systems mentioned throughout this dissertation. Already mentioned have been the raised /æ/ and continuous systems (characteristic of the Inland North) as well as the nasal system. Terms, geographical distribution, whether or not they are tense/lax systems, and conditioning type of the five systems appear in Table 4.1 below. As defined by Labov

Type	**Region found**	**Tense/lax?**	**Conditioning**
Raised	Inland North	No	None (all raised)
Continuous	Inland North	No	Phonetic
Nasal	Across USA	Yes	Phonetic
Mid Atlantic	NYC, Philadelphia, New Jersey	Yes	Lexical, Grammatical, Phonetic
Diffused	East Coast, Midland	Yes	Phonetic

Table 4.1 Types of /æ/ systems found in American dialects.

2007, the Mid-Atlantic /æ/ system is characterized by two separate phonemic representations of the vowel /æ/, traditionally labeled 'æ' for the lax vowel and 'æh' for tense vowel (raised along the F1 axis). Historically, the tense /æ/ class found in the US may have roots in the British "broad-*a*" class (Ferguson 1972, Labov 1994, Labov et al. 2006). Citing 300 years of evidence of this distinctive feature system (voiceless fricatives and apical nasals) in the broad-ɑ class (Jespersen 1949, Wyld 1920) and an intertwined history between Philadelphia /æ/ (or "short-a") and British broad-ɑ, Labov

1994 concludes that the historical broad-ɑ class in British English had influence on the Mid Atlantic tense/lax system. In addition, Babbitt (1896) finds evidence of a fronted and raised broad-ɑ class (ex. *can't*, *dance*, *half*) in New York City in the late 19th century (ANAE:173). In some areas, the modern reflex of the broad-ɑ class has merged with other vowel classes, such as the /ah/ class (perhaps better known as the *father* class) in Eastern New England (Labov et al. 2006:174).

The distinction between tense and lax /æ/ in these systems is based upon a combination of non-phonological and phonological conditions (Labov 1989). The Philadelphia system in particular also continues to undergo lexically motivated change (Ferguson 1972, Labov 1989, Labov 1994, Roberts 1993, Brody 2009). The classic example of this lexically diffused pattern is the /æ/ ("short-a") system in New York City. Its phonological conditions are displayed in the example on the left in Figure 4.1 below

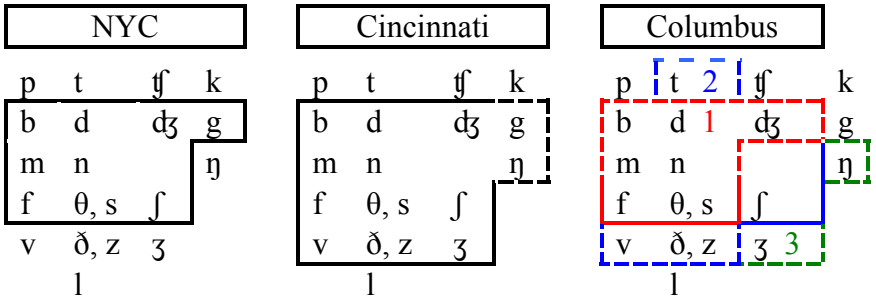

Figure 4.1 Left: NYC phonetic /æ/ pattern (Labov 1994). Center: Cincinnati /æ/ pattern for speakers born 1920-1955 (Boberg & Strassel, 2000). Right: Columbus /æ/ pattern for speakers born 1846-1854 (red), 1896-1913 (blue), and 1924-1950 (green) (Durian 2012:268).

(Ferguson 1975, Labov, 1981, 1994; Labov, et al., 2006). The non-phonological conditions that inhibit tensing are as follows (adapted from Labov 2007: 354-5):

a. Function words with simple codas are lax (e.g., 'I can') but not corresponding content words (e.g., 'tin can').
b. Open syllables are lax but not at inflectional boundaries (e.g., tense *ham* and *plan*, lax *hammer* but not *planning*).

c. Initial /æ/ is lax, but not the most common words (e.g., *aspirin* is lax, *ask* is tense).
d. Abbreviated names in phonological tensing environments (e.g., tense *Cameron*, lax *Cam*).
e. Lexical exceptions in tensing environments (e.g., tense *avenue* but lax *average*).
f. Many learned words are tensing exceptions (e.g., *alas* and *carafe* are lax).
g. The irregular verbs *ran*, *swam*, and *began* are all lax.

Along with tensing exceptions is a laxing exception: in Philadelphia (phonetic pattern not shown), *mad*, *bad*, and *glad* are tense where /æd/ is generally lax. Since Labov (2007), Dinkin (2009) and others describe other tense/lax systems lacking the lexical and grammatical conditions found in the Mid Atlantic /æ/ system as diffused, I will henceforth use the term **diffused systems** to refer to the /æ/ systems found outside of the Mid Atlantic area that show a sharp distinction between a tense and a lax vowel.

Two of these diffused systems found in the Midland also appear in Figure 4.1 above: Cincinnati and Columbus. Unlike other diffused systems, such as those in Upstate New York, the tense/lax system in Cincinnati and Columbus also includes voiced fricatives and velar nasals, although variably. However, it is possible that both the systems in Cincinnati and Columbus, despite their inclusion of additional tense environments, could have been diffused to the area from New York. In arguing for this relationship, Durian (2012) notes that it is based upon the parallel progression of similar tense-lax phonological systems and the eventual change to a nasal system, as found in other former diffused system. The Columbus system on the far right in Figure 4.1 progressed from the pattern of those speakers born in the mid-19th century in red (a pattern similar to the NYC pattern), to include more recently the environments in blue, and finally to include those in green (Durian 2012). This final pattern before it turned into a nasal system (outlined in green) is also parallel to the Cincinnati pattern in the middle configuration in Figure 4.1

(Boberg and Strassel 2000). While in Cincinnati, Boberg and Strassel found a single speaker with non-phonemic tensing exceptions, Durian did not find any for his Columbus speakers.

In considering these urban Ohio systems in addition to those found elsewhere (including his own in Columbus), Durian (2012) finds that /æ/ systems of those born before about 1940 in these geographically disparate locations have only slightly different variations of a single diffused /æ/ system. These locations include Ohio (Thomas 2010); New York State (Emerson 1891, Dinkin 2009); Pennsylvania, Maryland, Virginia, and western Tennessee (Grandgent 1892); Northern New Jersey (Labov 2007, Trager 1930); Rhode Island and Eastern Tennessee (Trager 1930); Connecticut (Johnson 1998); and New Orleans (Labov 2007).[36] Therefore, it appears as though that on the East Coast and eastern Midlands (and possibly elsewhere), the a single /æ/ system spread before 1940, possibly as early as the early 19th century, changing its tensing environments slightly as it was diffused. In fact, at what appears to be the earliest stages of each of these areas with the typical diffused systems (for those born before about 1860), the voiceless fricatives are by far the most common phonetic segment following a tensed /æ/, with apical nasals a variable second environment. This progression in phonetic environment can be seen below in Table 4.2, where the top table represents the tensing systems of the East Coast[37] and the bottom table represents the Midland areas (mostly Ohio). This progression from tensing before voiceless fricatives to many different phonetic environments in apparent

[36] For a full discussion of these previous studies and the ages that Durian approximates for the subjects in various studies, see Section 6.2 (2012:238–255).

[37] As discussed above, the Mid Atlantic system (New York City, Philadelphia, parts of New Jersey) also has lexical and grammatical tensing conditions. However, this table represents only the phonetic tensing environments for comparison to diffused and nasal systems.

time is seen in New York City, Upstate New York, and Columbus, the areas for which the appropriate time frame is available. Therefore, no matter which city was the origin of the diffused systems, each system appears to have a similar trajectory in terms of phonetic environment in the various places it is found. It would then follow that any single diffused system that would be ultimately related to the Mid Atlantic system would have raising before voiceless fricatives. However, as I will demonstrate in Section 4.3, the voiceless fricative environment does not correspond to a raised /æ/ in the St. Louis Corridor. Because of this crucial difference, I will make the argument that the nasal /æ/ system found in the St. Louis Corridor did not follow the same trajectory as these other diffused systems.

The tide of linguistic change does not stand still, as many of these phonetically conditioned diffused systems are transforming into nasal systems. For those born in about 1970 and later, the nasal system is by far the most common on both the East Coast and Midland locations where the diffused systems have been studied. In both Cincinnati and Columbus (Figure 4.1 above), as well as in New Haven, CT (Johnson 1998) and Upstate New York (Dinkin 2009), older speakers continue to have diffused systems, but younger speakers are now demonstrating a nasal system. Overviews of the various nasal systems present in American English given by the ANAE and Durian 2012 demonstrate that the emergence of the nasal /æ/ system has been found across the US. In Cincinnati, for example, the /æ/ system of speakers born before 1945 had the diffused system demonstrated in the second diagram in Figure 4.1 (indeterminate before velars). This pattern turns into a nasal system for those born after 1965, but the middle age group (born between 1945 and 1965) is classified as somewhere between the two, showing aspects of

East Coast systems		Voiceless stops	Voiced fricatives	Voiced stops			Voiced affricates	Voiceless fricatives		Apical nasals	Velar nasals
				g	b	d					
New York City, NY	1830-1840							Y	ʃ	M	
	1860-1870				Y	Y	Y	Y	ʃ	Y	
	1890-1971			Y	Y	Y	Y	Y		Y	
	1974-pres[38]									Y	Y
Ithaca, NY	1819-1840				M	M	M	Y		M	M
NY,NJ,RI,E.TN	1850-1910			Y	Y	Y	Y	Y		Y	
Hudson Valley	1926-1970				Y	Y	Y	Y		Y	
	1983-1991									Y	
PA, MD, VA	1810-1870							Y		M	
New Haven, CT	1865- 1912		M	M	M	Y	M	Y		Y	M
	1971-pres									Y	

Midland/Southern/ Western		Voiceless stops	Voiced fricatives	Voiced stops			Voiced affricates	Voiceless fricatives		Apical nasals	Velar nasals
				g	b	d					
VA and W. TN	1810-1870							Y		M	
E. Tennessee	1850-1910			Y	Y	Y	Y	Y		Y	
Center/South Ohio	1885-1910		M		M	M	Y	Y		Y	
Cincinnati	1920-1955		Y	M	Y	Y	Y	Y		Y	M
	1968-pres									Y	
Columbus, Ohio	1846-1854				M	M	M	Y	ʃ	M	
	1896-1913	M	M		M	M	M	Y		Y	
	1924-1950	M	M		Y	Y	Y	Y		Y	M
	1971-pres									Y	
Indianapolis	1929-1988[39]									Y	
St. Louis, California	1975-pres[40]									Y	

Table 4.2 Tense (Y), sometimes tense (M), and lax (blank) variables in various East Coast (above) and Midland/Southern (below) locations over time, based upon Dinkin (2009), Becker (2010), Durian (2012), Holland (2014), and studies cited by Durian (2012:247–9, 268).

the tense/lax system and the emerging nasal system (Boberg and Strassel 2000). In Columbus, an earlier, more restricted /æ/ tensing system closer to the phonetic environments of the NYC pattern gradually expanded over time to one similar to and

[38] In Becker's (2010) study of the /æ/ system in New York City, she found that the youngest Jewish and other white speakers overwhelmingly showed a distinct nasal system while other ethnic groups displayed a pattern more consistent with the traditional NYC tense/lax system.

[39] In Fogle's (2008) study of Indianapolis, there is not much detail as far as the tense/lax system is concerned. Apart from the observation that /æ/ is not tensed (a NCS variable), Fogle only notes that pre-nasal /æ/ is higher and fronter for all speakers (for height, F1(æN)=567 Hz, F1(æ)=743 Hz). Therefore, it is possible that either other tensing environments are not considered for speakers born before 1970, that all speakers do in fact have distinct nasal systems, or that there is a combination of continuous and distinct nasal systems in the area.

[40] In Holland's (2014) study of the California vowel system, exact years of birth were not noted, but ages at the time of the study were given. Holland states that "younger" people were more likely to have the nasal system, but does not give an age at which it enters the system, but 1975/1980 is about the beginning.

concurrent with the Cincinnati one (the third in Figure 4.1). As in Cincinnati, the youngest Columbus speakers (those born after 1968) appear to have an emerging nasal system (Durian 2006:276). This pattern aligns with many of the other studies cited in the East, Midland, and South (244) as well as in California (Holland 2014), where speakers born after about 1971 (slightly later for California) have been shown to also have nasal systems. Therefore, it appears that there are two theories for what occurred: either the nasal system spread almost simultaneously throughout the area, or they independently changed because of a tendency that already existed in these vowel systems. One way to determine which of these is more likely is to find a location where the diffused system did not exist prior to the development of the nasal system, with speakers born around 1970. I will demonstrate in Sections 4.3 and 4.4 that the Saint Louis Corridor is one such example of a nasal system that appeared concurrently with these other systems and yet did not stem from a Mid Atlantic or a related diffused /æ/ system.

Many dialects across the country appear to have concurrent emerging nasal systems; however, the geographical distribution of the nasal /æ/ systems is unclear. ANAE, for instance, shows that the nasal system is strongest in the upper Northeast. And although the nasal system is present in the speech of many Midland speakers, it is much stronger in the Midland area outside of the St. Louis Corridor; in fact, only a single St. Louis speaker demonstrates the nasal system (2006:176). Another phonetic tensing category ANAE considers is voiced stops. Most of the Northeast (outside of the Mid Atlantic diffused system areas) as well as the Midland and Inland North show an /æ/ system that is gradual. Although the following environments are not distinct, they do show a hierarchy, where nasals are above voiced stops, which are in turn higher than voiceless stops, and /æd/ is

generally higher than /æg/. The last finding, that n>d>g, is reversed in Canada and the North west of those areas: in Wisconsin, Zeller (1997) found a merger of /eyg/ and /æg/ to be taking place, where /æg/ is raising. The reason given in the ANAE and other sources for the opposite configuration, namely d>g, is a diffused system's relation to the NYC tense/lax pattern. However, as will emerge from this data, it is unlikely that /æd/ raised above /æg/ in the Corridor is a holdover from an older diffused /æ/ pattern.

4.2 Emergence of the nasal system in the St. Louis Corridor

As discussed in the previous chapter, pre-oral /æ/ raising, the first and arguably strongest feature of the Inland North, began to appear in the Corridor but quickly vanished. When we examine the NCS influence, the lack of pre-oral /æ/ raising in the Corridor is striking. However, since that vowel class does not include /æ/ before nasals (Labov et al. 2006, among others), it follows that we should also compare pre-oral /æ/ to pre-nasal /æ/. An impressionistic look at the data shows that there are a handful of speakers who demonstrated a distinct nasal system (14 speakers, or about 15%) and more who show a gradual /æ/ system with nasals at least slightly higher than other /æ/ tokens (29, or about 30%). However, when the data from the St. Louis Corridor is viewed together by year of birth, appears as though /æ/ has progressed into a nasal pattern within the past century. Additionally, the data from this study show a gradual emergence of the nasal system in the Corridor as a whole, demonstrating that this phenomenon is not constrained by geographical or other external factors. Although the emergence of a nasal system is not uncommon in the US, the nasal system in the Corridor shows one possibly

unique[41] feature: it did not emerge from the diffused system. This is a departure from the origin of the nasal system in other places in the Northeast (Evanini, Dinkin 2009, Becker, Johnson 1998, etc.) and Midland (Boberg and Strassel 2000, Durian 2012), as detailed in Section 4.1 above.[42] When comparing the height of pre-nasal and non-pre-nasal means using F1(æ), it is clear that there is a gradual increase in the distance between the two for the population as a whole in apparent time. As Figure 4.2 demonstrates, the pre-nasal /æ/

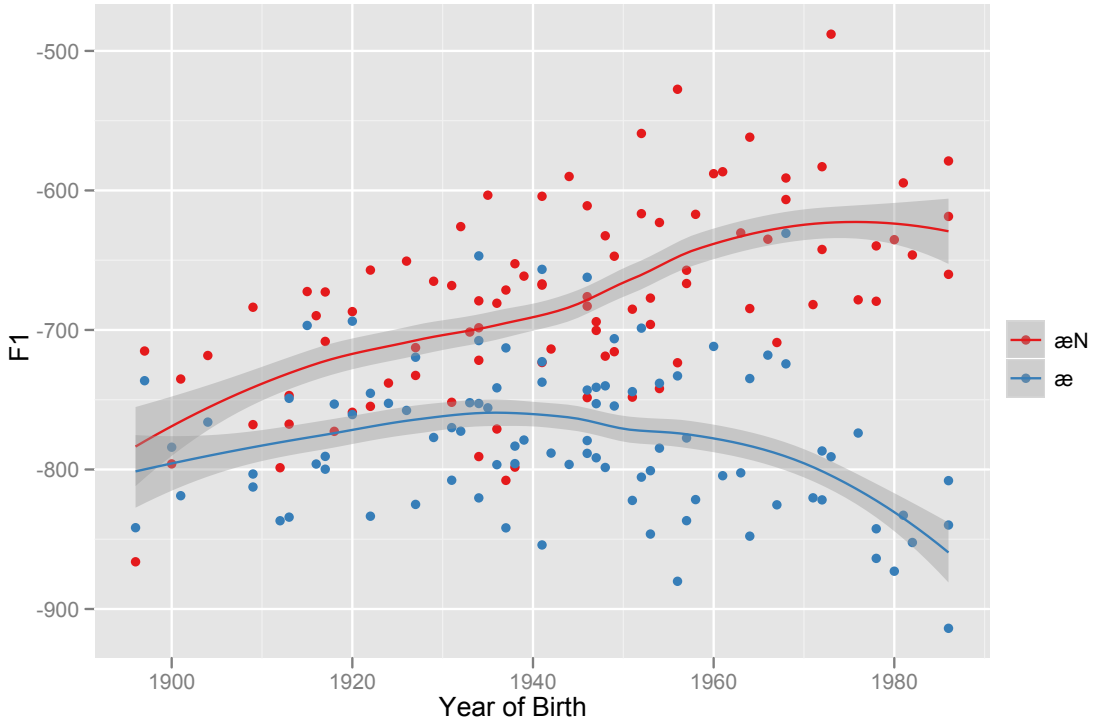

Figure 4.2 Distance between æ and æN heights over time [N=95].

means (in red) raise and diverge from the pre-oral (non-nasal) /æ/ means (in blue) over time. Conversely, the pre-oral /æ/ means increase slightly through the 1920's, remain at

[41] It is unclear from Fogle's (2009) study of Indianapolis whether there is an increased presence of the nasal system in younger speakers with another earlier pattern or if all speakers have the nasal system. She found the difference in F1(æ) and F1(aeN) to be 175 Hz and the F2-F1(æN) and F2-F1(æ) difference to be 500 Hz, which is the average for those in my study born in 1970.

[42] As for Holland's (2014) California study, speakers were only born as early as the mid-1950's and the NYC tense-lax system was not discussed.

about the same height, then decrease for those born 1940-1950 and after 1960. The pre-oral /æ/ lowering that seems to be increasing quickly for those born in the 1970's and 1980's may be a demonstration of the "adolescent peak" phenomenon (Labov 1994, Tagliamonte and D'Arcy 2009). As discussed in Section 1.2.1, Tagliamonte and D'Arcy in particular show through a number of case studies how younger speakers, particularly as they hit the peak age of 17, demonstrate incrementation and show a peak in the usage of variables undergoing active sound change. Tagliamonte and D'Arcy contend that these teenage speakers are the most advanced because their usage of the variable is first acquired through transmission from their parents, then teenage speakers undergo vernacular reorganization by exposure to slightly older peers, whose language use they model then overshoot, carrying the change further along. Therefore, it appears that the nasal /æ/ system is a current change in progress, but since it also appears as though /æN/ does not continue to rise after 1970 but stays around 650 Hz, the pre-nasal /æ/ has hit a ceiling while pre-oral /æ/ continues to drop. Going back to its position in the NCS, if one considers that the raising of pre-oral /æ/ is one of the first stages of the NCS, it would appear that pre-oral /æ/ began to rise along with pre-nasal /æ/ then was pushed lower as the /æ/ system became a nasal system. I will discuss this possibility and the repercussions it might have had on the system as a whole in Chapter 5.

The timing of the introduction of the nasal system into the Corridor might point to a broader trend across multiple dialect areas, since the 1970's appear to be a pivotal turning point elsewhere as well. However, the specific gradual trend found in the Corridor does not mirror the general progression of the introduction of a nasal /æ/ system that has appeared in other Midland cities. For instance, the patterns found in Cincinnati (Boberg

and Strassel 2000) and Columbus (Durian 2012) show an entirely different progression: a traditional tense-lax system, as specified in the middle tense/lax system in Figure 4.1 in Section 4.1, gradually gave way to a nasal system. Although the switch to a nasal system comes after a more gradual progression where it is likely that the tensing environments changed independently, the initial tensing environments were influenced by the diffused /æ/ system. Unlike in other Midland cities, which show a diffused system with tense and lax categories, Corridor speakers are more likely to show a gradual /æ/ system than a divided one: of 95 speakers, 29 show a gradual system, as compared to 14 with a nasal system and 7 with a raised pre-oral /æ/. In fact, while the pre-nasal /æ/ mean appears to raise gradually over time, individuals also change from mainly a continuous nasal system or no distinction between pre-oral and pre-nasal /æ/ to a nasal system.

In addition to considering the F1 value of /æ/, which forms the basis for the AE criterion from the ANAE, it is important to note that /æ/ moves along the F1 and F2 axes. In fact, in Labov (2014), the diagonal movement of /æ/ using both the F1 and F2 distances is measured using the formula F2-2*F1. Using that formula in Figure 4.3, it is possible to see that over time the type of nasal system switches from continuous to separated nasal systems with some overlap. Most importantly, it seems as though once the nasal and continuous systems appeared in the region (for speakers born in the late 1950's and later), almost all /æ/ systems conformed to either system.[43] In addition, only three speakers (born 1946, 1951, and 1962) were found to have an nd>g, a type of continuous system, as noted in the ANAE.

[43] Three additional speakers from the younger group were not included in the graph above for lack of nasal /æ/ data points (less than 3).

However, the difference between the diagonals in Figure 4.3 below is not the only index Labov (2014) uses to describe the difference between pre-oral and pre-nasal means.

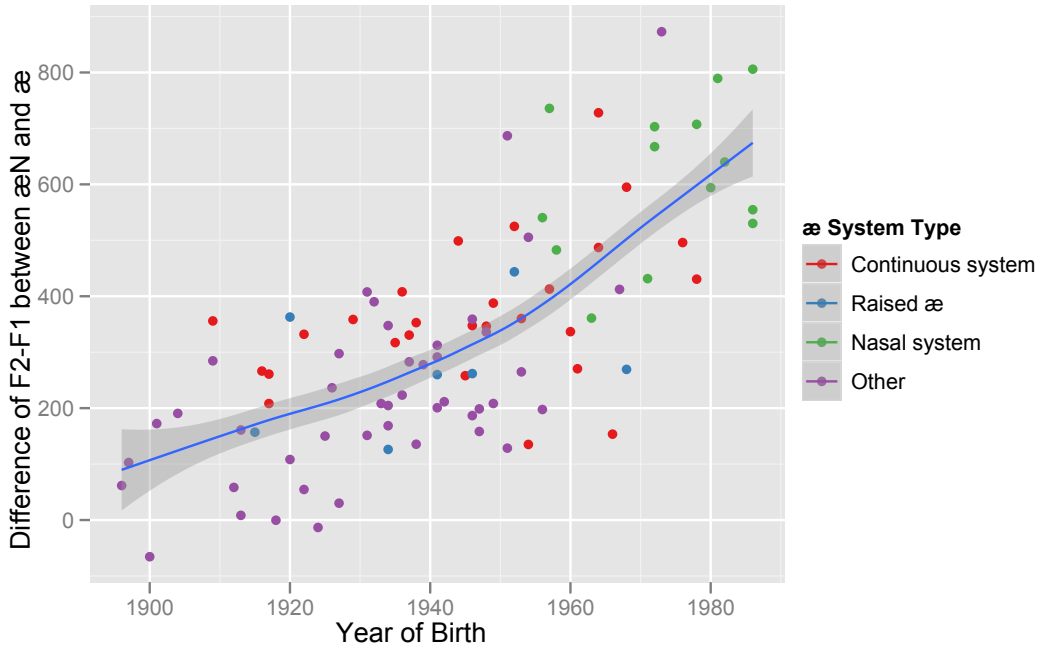

Figure 4.3 Difference in height and backness between pre-nasal /æ/ and oral /æ/ in apparent time[44] with different /æ/ systems identified [N=94].

In fact, he introduces another method of determining how far apart pre-nasal and pre-oral /æ/ are from each other: Ashman's *D*. Ashman's *D*, the formula displayed in Figure 4.4,

$$D \equiv \frac{|\mu_1 - \mu_2|}{[(\sigma_1^2 + \sigma_2^2/2]^{1/2}}$$

Figure 4.4 Ashman's *D*, a measure of bimodality.

uses the means and standard deviations of two sets of values (here pre-oral and pre-nasal values for each individual) to determine the bimodality for each speaker (Ashman, Bird, & Zepf, 1994; Gnedin, 2010). In the data from the Philadelphia Neighborhood Corpus, Labov found a range of bimodality scores for the nasal system from 0.02 to 7.91. In the

[44] The data does not include the speaker from 1993, whose extreme outlier status skews the data set.

current study, bimodality scores ranged from .03 to 4.25, as shown in Figure 4.5. Although most scores are fairly low, including some of those with nasal systems and scores of about 1.5, and the bimodality score increases gradually over time, there is a slight increase in the late 1960's and early 1970's. Both Figure 4.3 and Figure 4.5 show

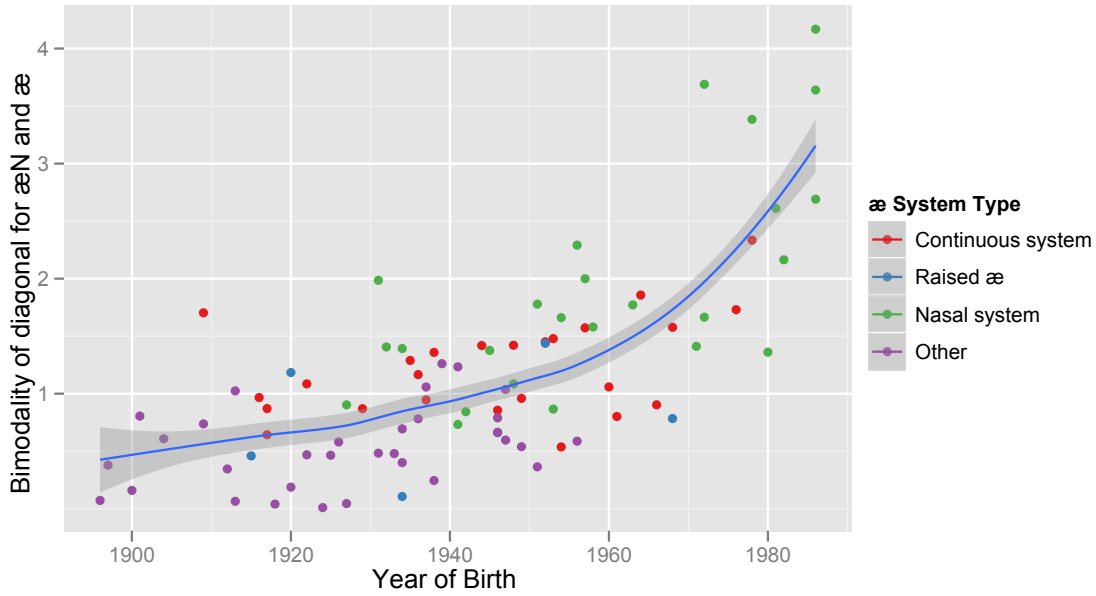

Figure 4.5 Bimodality of pre-oral and pre-nasal /æ/ by year of birth [N=94].

the same speakers with the same /æ/ system distinctions. However, the increase in Ashman's D in Figure 4.5 shows a sharper increase around 1960 than the difference in diagonal F2-F1 means in Figure 4.3. Since this distinction appears around the same time as speakers are adopting the nasal system (green dots in Figure 4.3 and Figure 4.5), the Ashman's D scores may be a better indicator of the distinctiveness between the pre-nasal and pre-oral tokens than the difference between the diagonal means alone. On the whole, however, the two graphs are fairly similar.

Since voiced stops are generally tensed in diffused systems, as seen in Table 4.2 above (especially /æd/), it is not unexpected that this environment might appear to have

higher rates of tenseness than other environments. However, to determine whether the /æ/ system in the Corridor is related to those diffused systems in the Northeast and Midland, the first step would be to divide /æ/ into the following phonetic environments that have tensed /æ/ in various diffused systems, including nasals, voiced stops, and voiceless fricatives. That way, it would be possible to determine whether there was any evidence of tensing in other environments before the gradual or distinct nasal systems appeared. I shall explore this line of reasoning in the next section.

4.3 Relationship Between the Corridor System and the Diffused System

Considering that the explosion of the nasal system in the St. Louis Corridor corresponds temporally to other nasal systems in the Mid Atlantic, Midland, and Northeast, it is possible that this nasal system is related to the nasal systems found those other dialects. In fact, it is not entirely unexpected for a diffused /æ/ system to be found in a Midland area. For instance, in their study of Cincinnati, Boberg and Strassel (2000) found a "Mid-Atlantic" diffused /æ/ phonetic tensing pattern for older speakers, generally those born before 1945 but including a few born between 1945 and 1965. The second finding was that younger speakers (born after 1965) turned this tense/lax pattern into a nasal system (tense before nasal segments and lax before oral segments). In designing their study, Boberg and Strassel elicited tokens from five different following phonetic environments

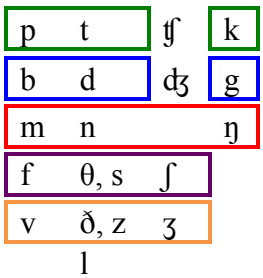

Figure 4.6 Following consonant categories from Boberg and Strassel (2000:115).

(Figure 4.6): voiceless stops (green), voiced stops (blue), nasals (red), voiceless fricatives (purple), and voiced fricatives (orange). These are mainly based upon the distinctive feature systems found to be tense in other studies of diffused systems. When the /æ/ data from the Corridor is divided into the categories Boberg and Strassel used in their study and displayed according to individual speakers' means, an interesting pattern emerges, as seen in Figure 4.7. In the early stages of the separation of the nasal system in the St.

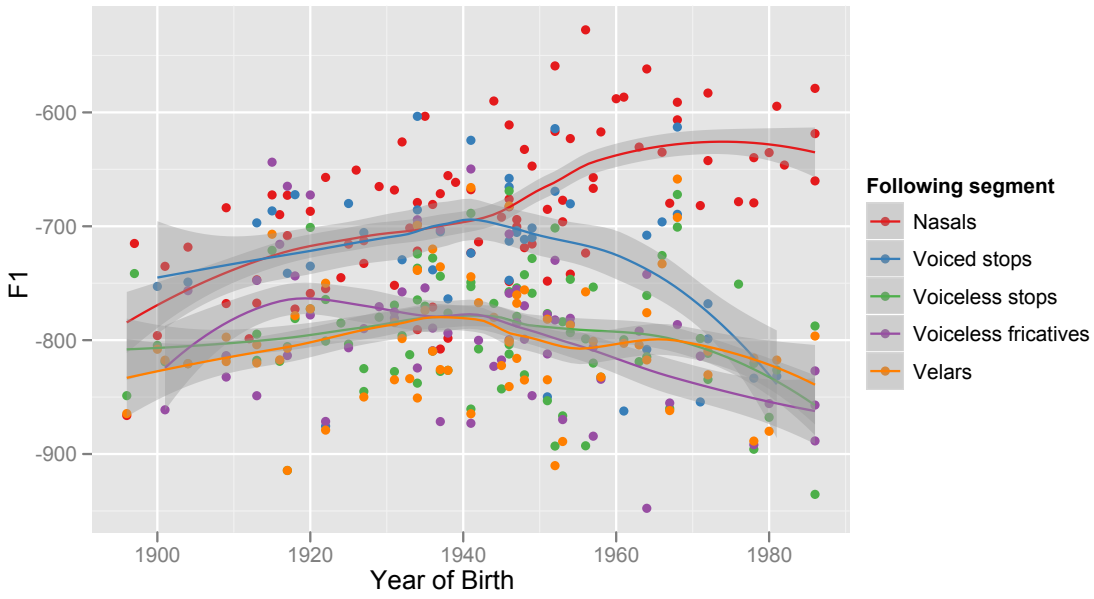

Figure 4.7 The means of F1(æ) for each speaker (with a minimum of 3 tokens for each) by year of birth, divided into following segment class [N=95].

Louis Corridor, /æ/ before voiced stops (in blue) are raised slightly lower than but at the same rate as those before nasals (in red). For those born between 1900 until the 1950's, tensing increased before voiced stops along with nasals. Voiceless stops and fricatives also raised, but around 1930 both split off. Voiced stops raise along with nasals until the 1950's, when the tensing of voiced stops drops to the same levels as other following phonetic environments (voiceless stops and fricatives) while nasal tensing continues to

increase. It is at this point in the development of the nasal system that a few examples of nd>g and n>d>g also begin to appear. This pattern exists both in the Inland North NCS system, where raised oral /æ/ is present, and in other areas with continuous /æ/ systems; therefore, the nd>g or n>d>g tendency does not necessarily prevent the raising of oral /æ/. Despite the fact that nd>g or n>d>g are not characteristics of the tense/lax type systems, the presence of a handful of speakers with this characteristic does not by itself rule out influence from a Mid Atlantic or diffused /æ/ system.

Although other Midland cities have certain characteristics of the diffused systems, Corridor speakers do not share many of these distinctions. In fact, the finding that voiceless fricatives are not tensed in Figure 4.7 above shows that this system is likely unrelated to the diffused systems of the Northeast and Midland. In each /æ/ system from the Northeast and Midland, for instance, voiceless fricatives are tensed for each system before 1870, along with apical nasals in systems from the late 19th century. Voiced stops are also tensed in some systems from the late 19th century and early 20th century. Therefore, if speakers had acquired the diffused system along with other Midland areas, tensing before fricatives would have been expected early on in the data, continuing throughout the first half of the 20th century. However, although voiceless fricatives were only slightly less influential as a tensing environment than voiced stops until the generation born in the mid 1920's, they do not continue to be a tensing environment for those born after that date. This is not necessarily a definitive finding for the St. Louis Corridor as a whole, as the birth years of speakers only go back as far as the beginning of the 20th century and speakers are from a range of communities instead of multiple individuals from a single metropolitan area. However, it certainly points to the

probability that the nasal system in the St. Louis Corridor did not emerge from the diffused system, as the Columbus and Cincinnati systems likely did. In the case of Springfield, there are enough speakers from the city proper or the larger metropolitan area (17 and 25 respectively) born across a range of ages to draw this conclusion.

An important characteristic of the Mid Atlantic system and diffused systems is that their tensing and laxing environments do not adhere to a single natural class, but the combination of natural classes (along with non-phonological exceptions) that creates a distinctive feature system. In some of the Mid-Atlantic and diffused systems detailed above, single consonant environments are used as approximate equivalents to the specific phonemic environments in place of a larger natural class. The most commonly tensed phonetic environments in the traditional tense/lax system are nasals and voiced stops. In their study of Cincinnati, Boberg and Strassel use the apical nasals (or "front nasals") /n m/ and the voiced stop /d/ to represent nasals and voiced stops (for both elicitation purposes and in their analysis). Figure 4.7 is altered to include those subsets in Figure 4.8, indicated with dashed lines, demonstrating how well those specific following segments represent their corresponding categories. In general, the overlap of the 95% confidence intervals between the major classes and their subsets in Figure 4.8 below indicates that subsets of classes are not significantly different than the major classes they represent. Boberg and Strassel in particular use anterior nasals as their nasal category because velar nasals produced "indeterminate results" (2000:116). Since most of the studies detailed in Table 4.2 above show no velar nasal tensing (and those that show some tensing find it only variably), it is likely that velar nasals are not a common tensing environment. Another substitution category like this is /_d/ to represent voiced stops, and

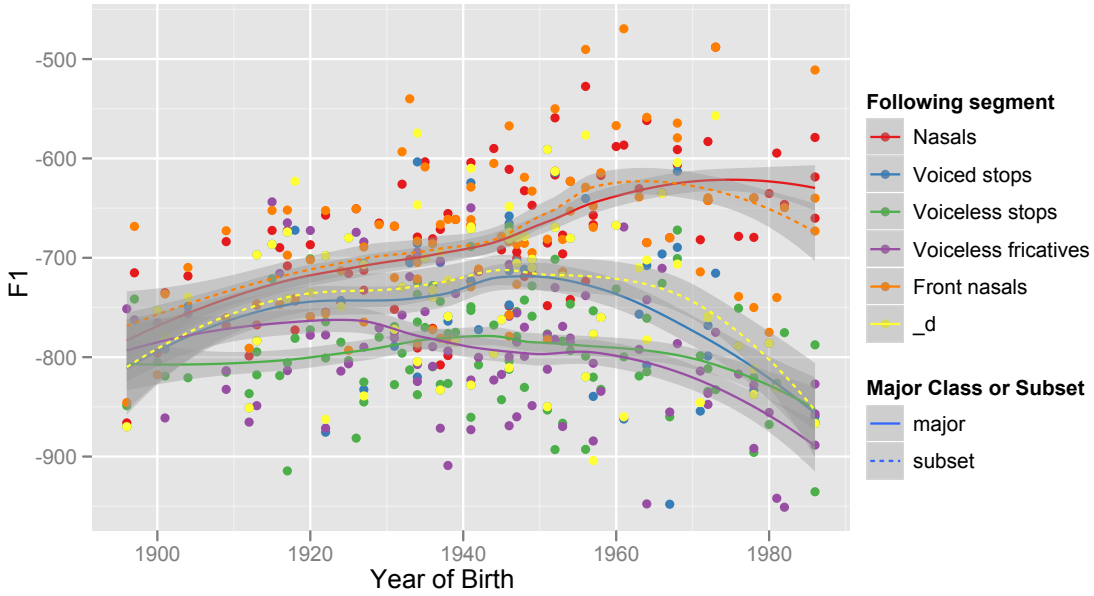

Figure 4.8 The means of F1(æ) for each speaker (no minimum number of tokens) by year of birth, divided into major classes of following segments; subsets of major classes are indicated with dashed lines [N=94].

again Boberg and Strassel also substituted /_d/ for the voiced stops category. Although voiced stops include /d b g/, there are four times as many tokens of /æd/ than /æg/ in the current data set. Additionally, as compared to the 70 speakers who have /æd/ tokens, only 30 speakers have even one /æg/ token, and only 2 of those 30 speakers have more than 3 tokens of /æg/. This means that even for the few speakers who have /æg/ tokens, the probability of those means being outliers is much higher. Despite this, it appears in Figure 4.9 that /_g/ tenses with /_d/ in apparent time and begins to fall to the lax category at the same point, after about 1950. As discussed earlier, the velar nasal environment /_ŋ/, demonstrated in Figure 4.9 below is slightly lower than the nasal category, about at the same height as the voiced stops before 1950. However, when /_d/ and /_g/ begin to fall, /_ŋ/ raises along with apical nasals. Although only a third of speakers had examples

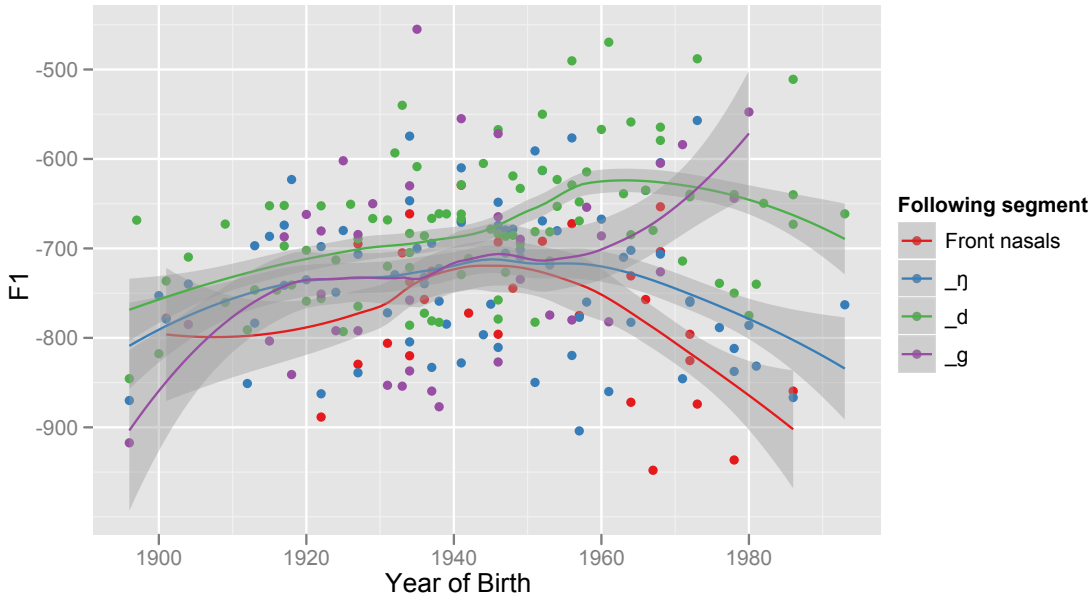

Figure 4.9 The means of F1(æ) with following voiced stops for each speaker (no minimum number of tokens) by year of birth, divided into apical nasals, velar nasals, /_d/, and /_g/ [N=94].

of velar nasals, it appears as though /_ŋ/ might account for some of the raising of the nasal system, as when the voiced stops fall, the velar nasals rise even higher than the apical nasal environment.[45] The most interesting pattern in this diagram is that when /_d/ and /_g/ begin to drop and the nasal system takes over, /_d/ is slightly higher than /_g/. However, I would argue that this is due to phonetic forces separate from the traditional tense/lax system found in the Northeast.

From the comparison between tensing systems in Table 4.2 above, it appears as though in the Mid Atlantic system the voiceless fricative environment /f θ s ʃ/ is the first and most consistent tensing environment. However, as seen in Figure 4.6 above, voiceless fricatives on their own are not a stronger tensing category for Corridor speakers

[45] Although there are no studies I am aware of that treat /æ/ before velar nasals without voiced velar stops in the Inland North, my own experience is that in the Chicago area, many speakers raise /æ/ before velar nasals above other environments. This could be related to the raising of /æ/ before voiced velar stops in Wisconsin and Canada, or a combination of that plus generalized nasal raising.

than nasals or voiced stops. At the same time, it is important to note that in many of the tensing categories in diffused systems elsewhere where voiceless or voiced fricatives were tensed, alveopalatal fricatives /ʃ/ and /ʒ/ were not necessarily tensing environments. In fact, if voiceless alveopalatal fricatives are found to have higher /æ/ tokens, this could represent another phenomenon entirely. In McCarthy's study of Chicago speakers, /ʃ/ was given its own category because she found that some speakers had a "tendency to insert a front glide following the vowel nucleus" of /æ/ (2010:105). Pre- palatal fricative and pre-voiceless non-palatal fricative means are considered in Figure 4.10. The two appear to differ in the amount of raising they demonstrate, particularly in the early half of the 20th century. This in itself is not surprising, as NYC speakers born before 1870 and Columbus speakers born 1846-1854 show tensing before non-palatal fricatives but not before /ʃ/. Except for a slight difference between 1920 and 1940, voiceless fricatives (/f θ s ʃ/) and the subset of non-palatal voiceless fricatives (all except /ʃ/) are interchangeable. Looking again at /æ/ raising before 1930 (in Figure 4.10 below), speakers were tensing /æ/ before voiceless fricatives at about the same rate as those before voiced stops. Again, this finding is unsurprising given that only a few diffused systems show a distinction between these categories and all are from speakers born before 1870. On the other hand, /æ/ before palatal fricatives[46] /ʃ ʒ/ started off more lax but hits their tensing peak around 1930, where /æ/ tokens before palatal fricatives were tensed more than those before voiced stops. In considering the highest pre-palatal fricative tokens, it is important to note that unlike in McCarthy's data, none of the raised /æʃ/ tokens from the current dataset demonstrate front glides. Therefore, any of the effects in the Corridor from this

[46] Only two tokens of the voice palatal fricative environment /æʒ/ appear in the data. Therefore, for all intents and purposes, "palatal fricatives" and "voiceless palatal fricatives" are interchangeable.

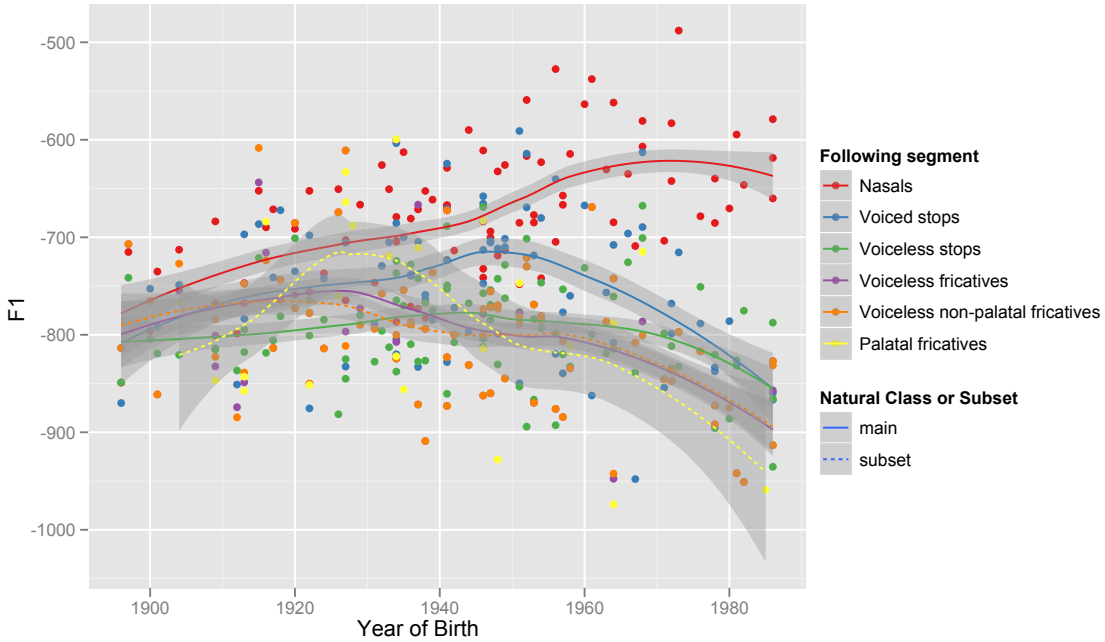

Figure 4.10 The means of F1(æ) for each speaker (no minimum number of tokens) by year of birth, divided into following segment classes, including subsets of non-palatal voiceless fricatives and palatal fricatives.

particular Chicago influence are not direct. Since the /æʃ/ tensing demonstrated above peaked at about the same time as other NCS variables, it is possible that this was yet another influence of Chicago and other portions of the Inland North. If McCarthy's observation about /æʃ/ upglides is true of Chicago speakers as a whole at that time, /æʃ/ raising in the Corridor could be a result of reanalysis by speakers of /æ/ upglides as raising. At the same time, Chicago is not the only location where /æ/ upglides before alveopalatal fricatives are found. Both Central Ohio speakers born before 1930 (Thomas 2001:83) and informants in the *Pronunciation of English in the Atlantic States* born in the mid-19th century in Connecticut and New Hampshire (Kurath and McDavid 1961) have been described as having upgliding /æ/ before alveopalatal fricatives. Therefore, although the spike in /æ/ tensing before alveopalatal fricatives in the Corridor is

interesting, it is not clear whether it would be a reanalysis of Midland or Inland North influence.

The most compelling evidence for the distinction between the traditional tense/lax type systems and a new phonetically-driven intermediate system on the way to a nasal system in the Corridor is the trajectory of the nasal velar environment /æŋ/. There are very few tense/lax systems with tense velar nasals and not tense voiced velars (the exception being Emerson's 1891 study of Ithaca, NY speakers born 1819-1840). Therefore, when /æg/ drops along with /æd/ in its class of voiced stops, it would follow that if this is still a vestige of the diffused system, velar nasals might fall along with them. However, velar nasals increase along with the rest of the nasal class, which points to the conclusion that it truly is a nasal system.

Another possible gap in the /æ/ data in this study is that there were too few voiced fricative tokens from the speakers to accurately portray its progression in apparent time. However, no other study of tense/lax systems has found /æ/ to be tense before voiced fricatives without also being tense before voiceless fricatives (Durian 2012:248-9) and the speakers in the current study do not tense /æ/ before voiceless fricatives. Since it would be highly unlikely for the speakers in this study to demonstrate a pattern that does not exist in any attested diffused system, it would follow that /æ/ before voiced fricatives would pattern with voiceless fricatives and be lax.

Following from the above reasons, I contend that the /æ/ system in the Corridor does not appear to be historically related to the Northeast or Midland tense/lax systems. Voiced stops, which are fairly commonly tensed in the diffused system, do appear to raise with nasals above other categories early on in the Corridor (Figure 4.7 and Figure 4.8).

The unexpected raising of /æʃ/ may have roots in the /æʃ/ upgliding found in the Midland and Northeast (Kurath and McDavid 1961, Thomas 2001). However, since this particular feature might also have roots in Chicago (McCarthy 2010), this is not persuasive evidence for Midland or Northeast influence. However, the most compelling evidence against a diffused system origin comes from the lack of raising found in voiceless stops. Since voiceless stops are tensed in every diffused tense/lax system in Table 4.2, it is difficult to imagine a diffused system lacking that crucial tensing category. Even the broad-ɑ system discussed in Section 4.2, which is likely to be the origin of the American tense/lax systems, contained voiceless fricatives. Therefore, I conclude that the St. Louis Corridor's /æ/ system was not influenced by the diffused tense/lax systems found in the Northeast and Midland.

4.4 Possible Inland North Origins for the Corridor Nasal System

In the previous section, I argued that the nasal system's rise in the St. Louis Corridor was not related to the Mid Atlantic and diffused tense/lax /æ/ systems. Scholars (Labov 2007, Dinkin 2009, Durian 2012) have argued that the historical tense/lax systems and many of the current nasal system on the East Coast and Midland are connected. The diffused system in other Midland Cities have been shown to have origins in either the diffused systems from the Northeast or the Mid Atlantic system itself (Boberg and Strassel 2000, Durian 2012). These nasal systems that appeared in former tense/lax system areas were either the result of proximity to nasal systems or came from the tense/lax system itself. Since in the previous section I concluded that the Corridor's /æ/ system is unrelated to the Mid Atlantic and diffused systems, the question remains as to how the nasal system grew in the Corridor.

First, although speakers born in the later half of the 20th century have a more distinct nasal system, speakers with raised pre-nasal /æ/ born before then have a continuous system /æ/, as was shown in Figure 4.3 above. Since both the nasal system and the continuous systems are found across the U.S. (Labov et al. 2006:182), there is no clear origin for either stage of this process. In fact, Durian (2012) demonstrates that a number of other studies show continuous raising patterns in the interim between a diffused system from the Mid-Atlantic and a nasal system. For Columbus itself, Keiser et al. (1997) in a previous study attributed a continuous system with slightly raised nasals to the Northern Cities Shift. As Durian's data show, the continuous and distinct nasal systems in Columbus were more likely to have stemmed from direct contact with other nasals systems or as a phonetically-motivated development of the tense/lax system itself. Since the previous section demonstrates that the Corridor was unlikely to have a diffused system, the only applicable option for the Corridor would be contact with another nasal system.

In the ANAE, nasal systems and continuous /æ/ systems with raised nasals, particularly those with n>d>g or n>d,g, appear scattered across the US. The exceptions to this are the South, where Southern breaking and nasal systems alone are quite common, and the Inland North, where we find the NCS raised system (ANAE:182). With raised nasals geographically scattered across the country, the fact that this nasal system appeared in the Corridor is not unforeseen and, as Durian (2012) contends for Columbus, likely the result of contact with a nasal system. However, what is unique about this data set is the sharp rise of /æ/ before alveopalatal fricative /ʃ/.

As discussed briefly in the previous section, McCarthy's (2010) study of Chicago speakers found a front glide between /æ/ and an alveopalatal fricative /ʃ/. McCarthy's first speaker who consistently inserts a front glide in /æʃ/ was born in 1919, which is around the same time as the first speaker in the Corridor with F1(æʃ)<700 Hz (Jesse L., born 1916 in Vernon, IL). As stated previously, the raised /æʃ/ tokens in the current data set do not have upglides. Two examples of the spectrograms of such raised /æʃ/ tokens are shown in Figure 4.11 below. The speaker on the left, Frank, and the speaker on the

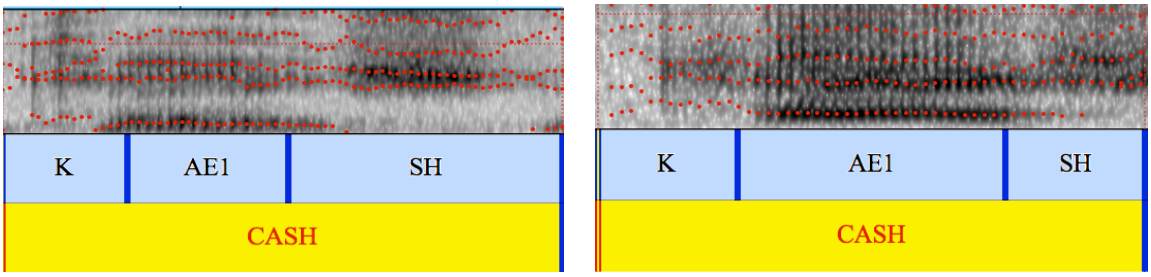

Figure 4.11 Spectrograms for two examples of 'cash' with raised /æ/: on the left is Frank, born 1927 in Shipman, IL; on the right is Jesse L., born 1916 in Vernon, IL.

right, Jesse L., both demonstrate very raised /æ/ tokens (F1=664 Hz and 684 Hz respectively). At the same time, neither shows a variable F1 line. The rest of the speakers with raised /æʃ/ tokens whose spectrograms were available had the same type of pattern. As shown in Figure 4.12, which replicates Figure 4.7 from above but singles out the /_ʃ/ environment, the younger speaker Frank fits right into this spike of /æʃ/ raising. Comparing /_ʃ/ to the other tensing environments, it is clear that it has a far different trajectory than the other environments. During the NCS peak identified in the previous chapter and the period of upgliding identified by McCarthy, /æʃ/ raises from the

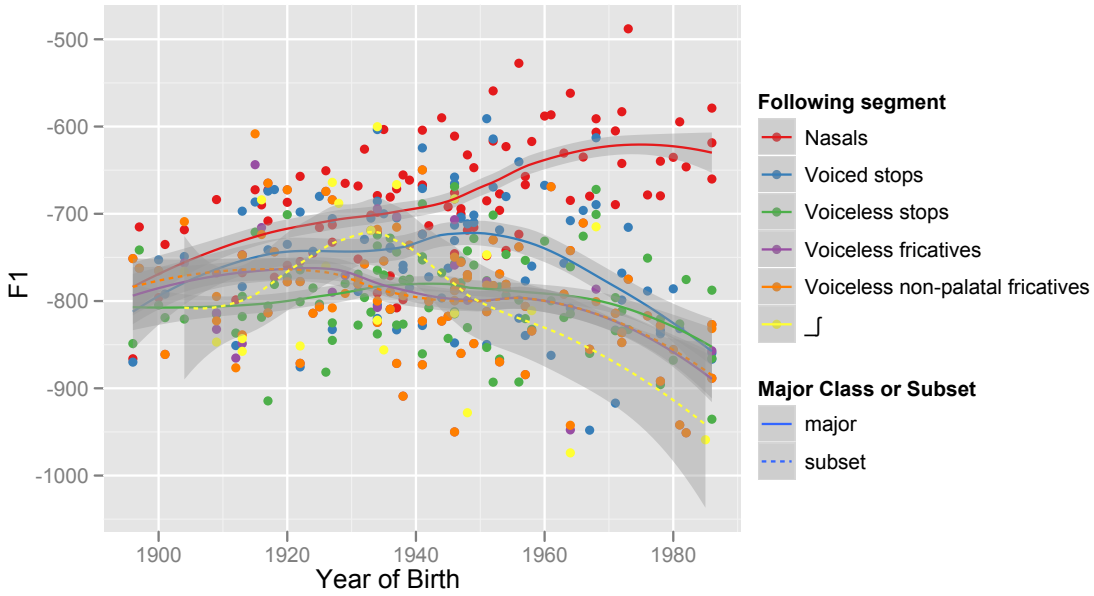

Figure 4.12 The means of F1(æ) for each speaker by year of birth, divided into major classes; voiceless fricatives are further divided into non-palatal fricatives and /_ʃ/ [N=94].

environment with the lowest /æ/ tokens to one of the highest. There are a few possibilities on how /æʃ/ raising could have suddenly appeared in the Corridor. First, it is possible that /æʃ/ tensing (or upgliding) appeared simultaneously in Chicago (and possibly other Inland North cities) and the Corridor without any direct or indirect relationship. However, since no other apparent time studies of /æ/ raising or tensing have yet identified /æʃ/ raising specifically, it is unlikely that this is a coincidence.

Second, tensing of /æʃ/ could have been an early characteristic of Chicago /æ/ raising (and the NCS) that spread down the Corridor with increased contact. Since it is possible to see in Figure 4.12 that the spike in /æʃ/ raising mostly coincides with the Route 66 heyday of the 1920's and 1930's in Figure 3.4 in the previous chapter, this theory holds water. However, it is interesting to note that of the five speakers born in the 1920's and

1930's with very tensed /æʃ/, a good number of these speakers[47] did not actually grow up on Route 66. In fact, although two grew up in Springfield, the two others whose spectrograms are shown above (Jesse L, born 1916, and Frank, born 1927) both grew up on different sides of Route 66 on farms.

As a final possibility, Chicago speakers could have acquired /æʃ/ tensing from another area, possibly the Mid Atlantic, at the same time as the Corridor speakers acquired it. Since there is no evidence specifically about how /æʃ/ raising (or upgliding) entered the Chicago dialect, it is hard to prove if the same source is responsible for both. McCarthy entertains the idea that this could be a remnant of the Mid Atlantic or Northeastern systems (2010:107–8) and cites Thomas's (2001) finding that /æ/ shows a front upglide before both alveopalatal fricatives for Central Ohio speakers born before 1930. Since Durian (2012) and Boberg and Strassel (2000) have also found that the /æ/ systems of Columbus and Cincinnati also have roots in the tense/lax system of the Mid-Atlantic, this influence could have spread as far as Chicago and the Corridor as well. However, considering that Section 4.3 concluded that it is unlikely that the Corridor's /æ/ system came from the diffused system, this is not a very compelling scenario.

4.5 Midland-only influence

One important characteristic of the emergence of the nasal system in the Corridor is the fact that it shows no distinction between Route 66 and off Route 66 speakers. The Midland features generally do not show the same location distinction in terms of Route

[47] Although she arguably had a raised nasal system Shirley B., who was born in 1933 in Champaign, also had a fairly high /æʃ/ and its average was farther front than other following segments, but a closer look at her /æ/ system reveals that she had a raised nasal system with other classes of following segments around the same height.

66 that NCS features show (as demonstrated in Figure 3.4 in Section 3.2). When considering the nasal system in terms of the general location speakers grew up in, there is very little distinction between Route 66 speakers and off Route 66 speakers as a whole, as shown in **Error! Reference source not found.**. If the emergence of the Corridor nasal system was a result of

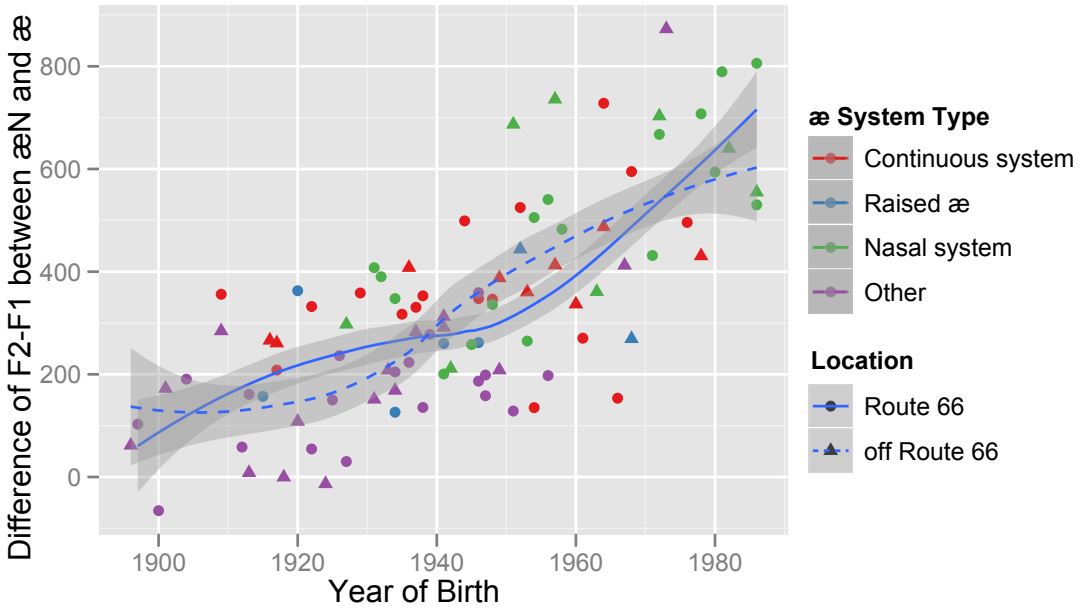

Figure 4.13 Difference in height and backness between pre-nasal /æ/ and oral /æ/ in apparent time with different /æ/ systems identified and speakers distinguished by location [N=94].

influence from the Inland North, it would be expected to show some distinction between Route 66 and off Route 66 speakers, as argued in Chapter 3. In the previous section, I argued that the nasal system was not the result of influence from the diffused systems, which appear in Midland and Northeastern dialects. However, the finding that the Corridor is adopting the nasal system as a single speech community is similar to the trajectory of the Midland features and not the NCS features suggests that the root of the nasal system in the Corridor was not primarily or solely the Inland North.

At the same time, the lack of differentiation between speakers from different locations in the emergence of the nasal system does not conclusively point to an origin in the Midland. The nasal system, although present in many areas throughout the Midland, is present in many different areas of the country. In Section 4.3, I presented two different hypotheses for the simultaneous emergence of the nasal system in different regions of the country. Either it happened because these dialects all felt the same external influence or because a tendency that already existed in all systems was activated. I demonstrated in Section 4.4 that the Corridor did not have a diffused system before it acquired a continuous or nasal system. Therefore, I contend that the nasal system trajectory in the Corridor is evidence that there could have been separately formed systems across the country with the same tendency toward nasal systems that activated almost simultaneously. In sum, the nasal system could have been an influence of the Midland dialect, but it could also simply be a tendency of American dialects to form the nasal system and it does not take much to tip the scales to a nasal system.

4.6 Conclusions

In this chapter, I outlined an overview of the existing studies that touch on both the diffused /æ/ system and the emerging nasal /æ/ system in the U.S. Some of these studies, particularly those in Ohio cities, showed the nasal system as evolving from the diffused /æ/ system. Evidence of this connection is apparent as early as the turn of the 20th century, including the similarity between the distinctive feature system for older Columbus and Ohio speakers and diffused systems in the Northeast.

The nasal system appears gradually in the St. Louis Corridor in apparent time, moving from a continuous /æ/ system to a nasal system. Outside of the Corridor, nasal

systems in the Northeast, Mid Atlantic, and Midland appear to be a progression from the diffused system; however, the nasal system found in the St. Louis Corridor does not appear to follow that same progression. None of the speakers showed a traditional tense-lax system before the period where the nasal system appeared. /æ/ before the most common tensed following segment (/_d/) acts almost identically to other voiced stops and ultimately does not demonstrate raising prior to the introduction of the continuous system. Most importantly, /æ/ does not raise before voiceless fricatives, which is unlike every other example of the diffused system, including systems in the Midland. Therefore, I rule out the diffused system as the force behind the nasal system in the St. Louis Corridor.

The continuous nasal system seems to be a medial stage before the nasal system in the St. Louis Corridor. Since the continuous system is common throughout the Inland North, demonstrated in other studies of the Inland North, it is possible that the nasal system was a result of influence from the Inland North (and NCS) on the St. Louis Corridor. Particularly striking is the unexplained raising in /æʃ/ for those born between 1915 and 1940, which parallels a finding of McCarthy's for upglides in the same environment as their contemporaries in Chicago. This time period also overlapped with the raising of pre-oral /æ/ in the Corridor, discussed in Chapter X. Therefore, the finding for /æʃ/ raising in the Corridor gives more credence to the hypothesis laid out in previous chapters, that the Inland North's dialect influenced the Corridor during this specific period of time.

On the other hand, when it comes to the origin of the nasal system in particular, it is unlikely that formed in the Corridor solely because of contact with the Inland North.

Evidence from after that time period shows a great divergence between the two, as the Corridor went on to develop a nasal system and the Inland North has yet to do the same. There is evidence of influence from the Inland North (Chicago in particular) in other aspects of the Corridor dialect before the nasal or continuous systems began appearing in the Corridor. However, there is no direct link between the /æ/ or /æʃ/ raising from the Inland North and the development of the nasal system in the Corridor. In addition, the finding that the emergence of the nasal system in the Corridor continues as though the area is a single speech community and does not show distinctions for Route 66 and off Route 66 speakers suggests that the Inland North is not solely responsible for its development. Although it is possible that this is a Midland influence and not a diffused system, it is also possible that American dialects in general have a tendency toward the nasal system and that it takes very little to tip the scales toward the nasal system.

CHAPTER 5

Subtracting the Midland influence from /æ/, /o/, and /ʌ/

In this chapter, I will discuss the status of the vowels /æ/, /o/, and /ʌ/ for all of the St. Louis Corridor speakers that are included in this corpus. Each of these vowels is affected by forces from the Midland and NCS dialects, as well as the nasal /æ/ system, which is not geographically-bound. I first use the nasal system to demonstrate how one dialect feature can impede another, namely the raising of pre-oral /æ/. By calculating the effect of the Midland using vowel changes found strictly in the Midland, then using those to approximate the effect one should be seeing in the vowels simultaneously acted upon by the NCS, I determine what the effect might have been without the effect of the Midland. First, in Section 5.1, I will discuss generally the types of interference one dialect feature can have upon another, as shown in previous studies in the U.S. Section 5.3 concerns the raising of pre-nasal /æ/ and corresponding effect upon the raising of pre-oral /æ/. In Section 5.4, I consider the possible effects of the Midland conditioned low-back merger on /o/ fronting in the NCS. Section 5.5 explores the opposing forces of Midland /ʌ/ fronting and NCS /ʌ/ backing and how other Midland features can be used to determine an overall "Midland dialectal effect." Finally, in Section 5.6, I consider the effects of the results from the previous sections on the NCS criteria from the ANAE and determining the real effects of the Midland and NCS on Corridor speech. The Midland effects can also be subtracted out of the NCS criterion to classify more speakers as having NCS features and increase the influence of the NCS in real time.

5.1 The collision of dialects

One of the peculiarities of the Midland and NCS dialects is that their specific features cover many of the same vowels. For instance, the rival difference that proves this point the most is the fronting of /ʌ/ in the Midland dialect while it is backed in the NCS. Additionally, the low-back (or "cot-caught") merger has taken over much of the Midland and other parts of the country, but that generally involves the backing of /o/, which is fronted in the NCS; and the lowering and fronting of /oh/, which is not uniform across the Inland North (Labov 2006 et al.). Finally, the raising of /æ/ is possibly the most common change and argued to be the first change of the NCS, and the nasal /æ/ system, while not considered a key part of the Midland dialect, is present in other Midland cities, especially in Ohio, as well as in the Northeast. Since these opposing forces account for four of the six vowels in the NCS, the question is whether the NCS could be present in Corridor speech despite these linguistic hurdles and whether there are ways to subtract out these influences from each other. There is evidence that dialectal overlaps can lead to interference in dialectal change and growth. Dinkin (2013) finds that when individual vowels have influences from two distinct dialects, one can be impeding the growth of another whether there is evidence of the dialectal change in an individual's speech or not. The vowels Dinkin used are applicable in this study (nasal /æ/ system vs. /æ/ raising, low-back merger vs. /o/ fronting) and it is clear that the same tendencies are present at this dialect boundary. Dinkin in particular mentions that although these competing tendencies appear to hamper NCS influence, vowels that are unaffected, such as /e/ or /ʌ/, are more likely to show NCS influence.

Of course, it is possible for the NCS changes to overcome the impeding tendencies and become a true mixed system. One ANAE speaker, Phyllis P. from Rutland, Vermont has integrated both the low-back merger and the fronting of /o/ into her system so that both /o/ and /oh/ are fronted. As can be see in her vowel chart in Figure 5.1, Phyllis

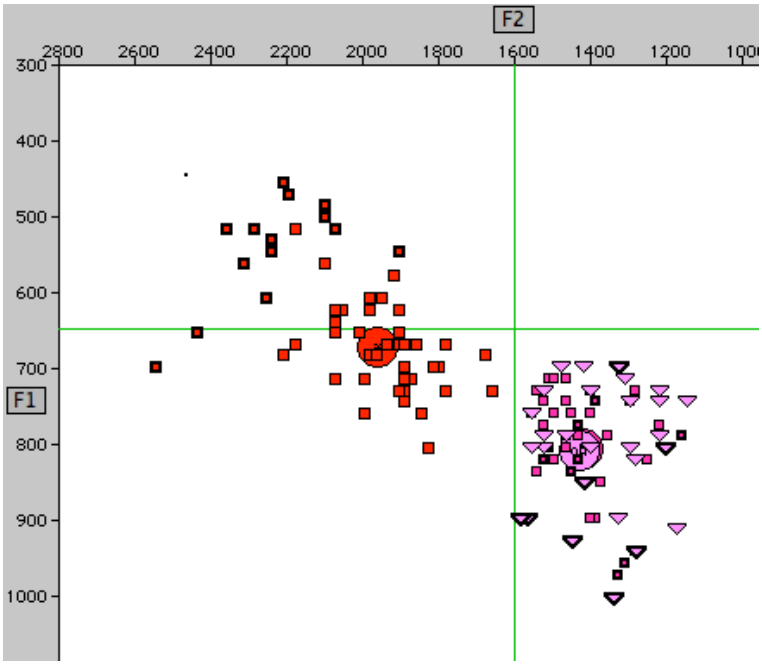

Figure 5.1 /æ o oh/ of Phyllis P (born 1942 in Rutland, Vermont), with nasal tokens highlighted.

not only has a /o/ mean fronted past 1450 Hz (pink squares), but a nearly identical low-back merger (/oh/ is represented by inverted pink triangles). Additionally, her nasal /æ/ tokens (highlighted red squares) are separate from the non-nasal tokens (non-highlighted red squares), meaning she has both a raised /æ/ and a nasal system, as do a handful of other speakers from the ANAE. At the same time, there is only one speaker from the Corridor study, Sheila (born 1952 in Melvin), who has both a continuous nasal /æ/ system and a raised /æ/ determined by the ANAE criteria AE1 (F1=647). As shown in her vowel chart in Figure 5.2, her pre-nasal /æ/ tokens (highlighted) are raised and fronted above non-nasal /æ/ (plain). This would make her /æ/ system a raised NCS one in terms of the

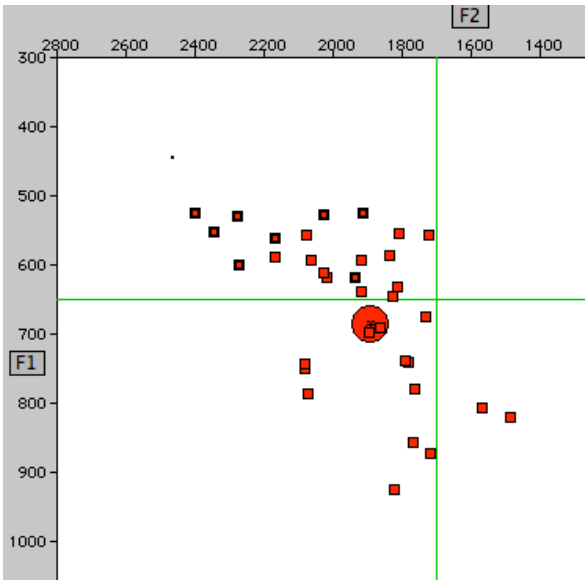

Figure 5.2 /æ/ system of Sheila (born 1952 in Melvin, IL) with highlighted nasal tokens.

AE1 ANAE criteria, possibly a continuous n>d>g system, but not a nasal /æ/ system. Therefore, although it is not impossible for speakers to have instances of both a nasal and raised /æ/ system (F1(æ)<700Hz) or a low-back merger and fronted /o/, it would require a strong NCS influence to overcome.

In the next three sections, I will explore the effect these different dialects may be having upon speakers in the Corridor. I start out with the pre-nasal /æ/ and pre-oral /æ/ because it has been discussed in previous work; in particular Dinkin (2009) has considered other pre-oral /æ/ measures for speakers with the NCS from the Hudson Valley area of New York, another area that has seen the introduction of pre-nasal /æ/. There is less precedent for measuring/o/ and /ʌ/, so I use different tools to determine the dialectal effect these vowels might be demonstrating. For /o/, I look at the distance between the subset of vowels that fall under the conditioned merger and non-conditioned vowels. For /ʌ/, I depend mainly upon the presence of the other fronted Midland vowels

/ow uw aw/ and subtract an overall influence upon /ʌ/. Although the results from these three vowel interactions do not demonstrate a clear-cut effect from one dialect onto another, I will use these different ways of considering hidden effects to first show that there is more influence from the Inland North in this area than the original ANAE criteria would indicate, and second explore different methods of ferreting out what is a dialectal effect in areas of dialect overlap.

5.2 Influence of the nasal /æ/ system on the raising of pre-oral /æ/

The nasal /æ/ system is not a strictly Midland development, but as covered in Chapter 4, other studies have found that Midland cities (Cincinnati, Columbus, and Indianapolis) show an increase in the nasal /æ/ system for younger speakers (Boberg and Strassel 2000, Durian 2012, Fogle 2008). The data from this study shows a gradual emergence of the nasal system in the Corridor. When comparing the height of pre-nasal and pre-oral (or other environment) means using F1 (as in Figure 2 in Section 4.3) or F1 in addition to F2, it is clear that there is a gradual increase in the distance between the two over time. As Figure 5.3 demonstrates (using the diagonal height formula F2-2*F1 from Labov (2014) pre-nasal /æ/ has been raising over time as well as fronting while pre-oral /æ/ slightly raised and fronted, then lowered and backed. A continuous system with higher nasal tokens does not necessarily prevent the raising of non-nasal /æ/ and speakers can in theory have a raised /æ/ as well as an even higher raised /æN/. However, the raising of nasal /æ/ and the existence of a nasal system is a strong pressure for pre-oral /æ/ raising to overcome.

Dinkin (2009) notes that in the NCS fringe areas of the Hudson Valley, there is far less /æ/ raising than one would expect based upon other NCS criteria. He hypothesizes

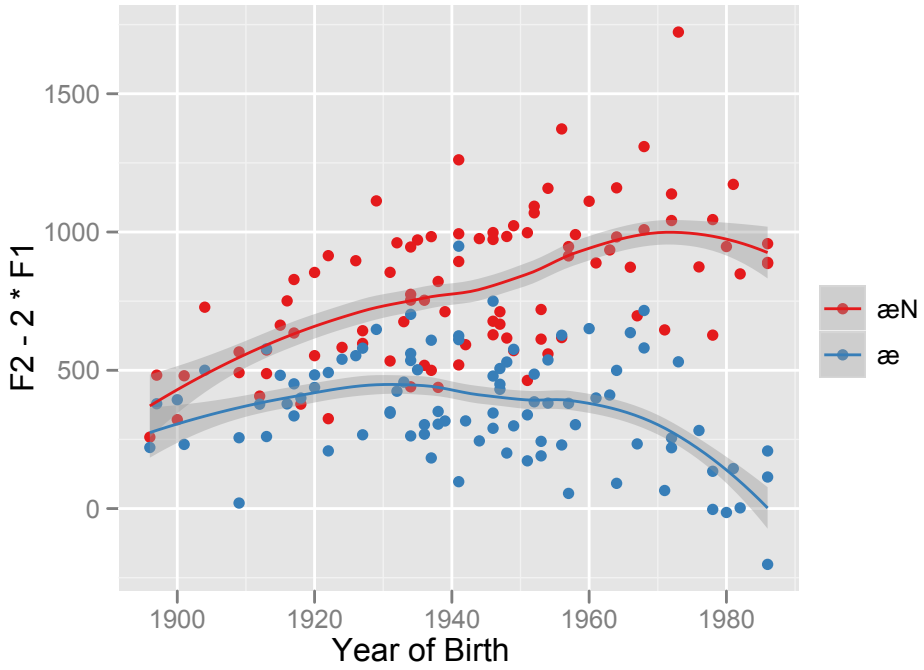

Figure 5.3 Distance between the diagonal heights of æ and æN over time [N=92].

that the pre-nasal /æ/ in a nasal system is a separate allophone than /æ/ and can therefore prevent the oral allophone from raising to the position of the pre-nasal /æ/ (2009:197). It appears as though the introduction of the nasal system into the Corridor, possibly from other Midland cities, could be preventing non-nasal /æ/ from raising for Corridor speakers as well. For most of the Corridor speakers with raised oral /æ/, they might not have the continuously raised system typical of raised /æ/ speakers from the Inland North, but one where the nasal is fronted instead of raised. Darlene D., an ANAE speaker[48] from Bloomington, has an F1(æ) mean of 696 Hz and a mean F1(æN) of 686 Hz, but has statistically distinct F2 values ($p<.005$), as shown in Figure 5.4. Since /æ/ raising is a crucial part of two separate ANAE criteria for the NCS – AE (æ raising) and EQ (æ~e reversal) – the prevention of pre-oral /æ/ raising could have had a larger effect upon the

[48] Although she was recorded with the ANAE, Darlene D.'s formants were measured using the FAVE suite for this study.

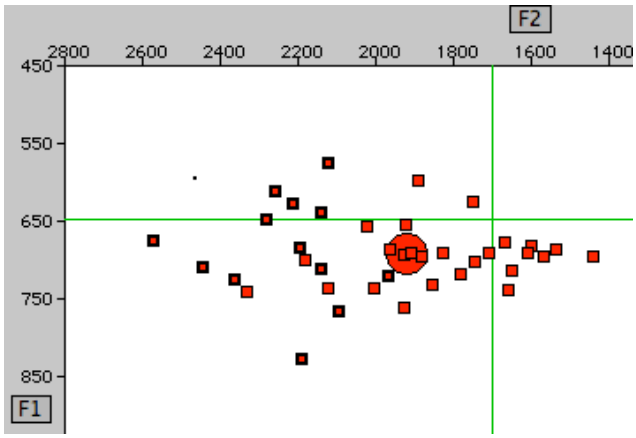

Figure 5.4 /æ/ system of Darlene D., born 1920 in Bloomington, IL. Nasal tokens are highlighted.

spread of the NCS in the Corridor. Therefore, if pre-nasal /æ/ is blocking the raising of pre-oral /æ/ and therefore preventing the satisfaction of AE and EQ criteria, we would expect that despite contact and influence from the Inland North, the Corridor might not have many of the features of the Northern Cities Shift.

Since the ANAE criteria AE and EQ depend upon the measurement of F1(æ), the blocking of /æ/ raising by nasal /æ/ appears to be a nail in the coffin for a great deal of the NCS in the Corridor. However, the absolute F1 formant value of non-nasal /æ/ is not the only way to determine height in a nasal system. In fact, since the ANAE was published, a few alternative methods of determining its relative height in a vowel system have been explored. First, as mentioned earlier in this section, Labov has used the F2-2*F1 measure in to find the movement of /æ/ along the front diagonal of the vowel space (2014:5). This formula has the advantage of considering both F1 and F2 while putting greater weight on the raising of F1(æ) more than its fronting along F2. In examining the trend found in that calculation (shown in Figure 4.2 above) and that of F1 alone (Figure 4.2 from Chapter 4), the same basic trend is found.

Another calculation of F1 alone is found in Dinkin's study, where he determines the raised nasal system to be one where the mean of F1(æ) is more than two standard deviations above the mean of F1(o). This is because Dinkin considers /o/ to be the physical bottom of the vowel system (2009:171). Although this was not explored in the ANAE, where absolute F1 values of /æ/ were sufficient for Inland North speakers, it can be applied to the current study. Using this new criterion for Corridor speakers, including both those speakers with the nasal system and those with a continuous nasal system, six more speakers[49] would be considered to have raised /æ/. Of those with the continuous nasal system, Judy H. (born 1937 in St. Louis), Patricia D. (born 1922 in St. Louis), Kent R. (born 1966 in Springfield), Robert B. (born 1935 in St. Louis), and Don G. (born 1938 Springfield) have a relatively raised /æ/. At the same time, none of these have a high enough F1(æ) to have technically satisfied the AE1 criteria. The presence of some speakers and the absence of others (most notably, speakers with a distinct nasal system and a raised pre-oral /æ/, of which there is none in this study) is not enough to determine cause and effect. However, it does demonstrate that both gradual nasal systems and raised pre-oral /æ/ systems like those found in the Inland North can and do exist in the Corridor.

As discussed in the previous chapter, the raising of pre-nasal /æ/ that appears in the Corridor is not related to the Mid Atlantic split system that has led to the simultaneous introduction of the nasal system in areas east of the Corridor. The presence of tensed /æʃ/ for speakers born in the 1920's and 1930's in particular point to another type of system

[49] In addition, Walt H., Marilyn R., Virginia R., and Joyce H. all have a mean of F1(æ) that is more than two standard deviations above the mean of F1(o). However, a Pearson's t-test and visual check did not determine them to conclusively have nasal or continuous systems. However, Virginia R. and Joyce H. both have F1(æ)<700Hz and are therefore included in the original raised /æ/ criterion.

that could have eventually led to nasal raising. Although the Corridor speakers may not have the same general characteristics of the Mid Atlantic system, their nasal system did appear for a similar age group. When it comes to the classification of individual speakers' systems, most of the split nasal system speakers are younger (10 out of 14 born after 1970, none before 1950) and most of the continuous system speakers are older (27 out of 29 born before 1970, 15 before 1950). Each of the raised F1(æ) speakers (both ANAE criterion and Dinkin's standard deviation method) with continuous systems were born before 1970 (the youngest two, Kent R. and Virginia R., were born in 1966 and 1968 respectively), which points to the possibility that the separation of the nasal /æ/ from oral /æ/ into a distinct nasal system interfered with the raising of /æ/. In addition, most of the raised continuous speakers were born between 1920 and 1940, which overlaps with the proposed period of NCS introduction to the area. Therefore, although the system diverged from the Inland North raised F1(æ) and continuous nasal system, it seems to follow logically that there was some influence from the Inland North to create this system.

When the various /æ/ systems found in the Corridor are combined onto a single map of the area, some new patterns emerge. Figure 5.5 demonstrates the geographic distribution of the three /æ/ systems (nasal, continuous, and raised) as well as the combined raised systems (nasal and continuous). Although neither nasal nor continuous systems are concentrated in specific locations or areas, there is very little overlap. Of the

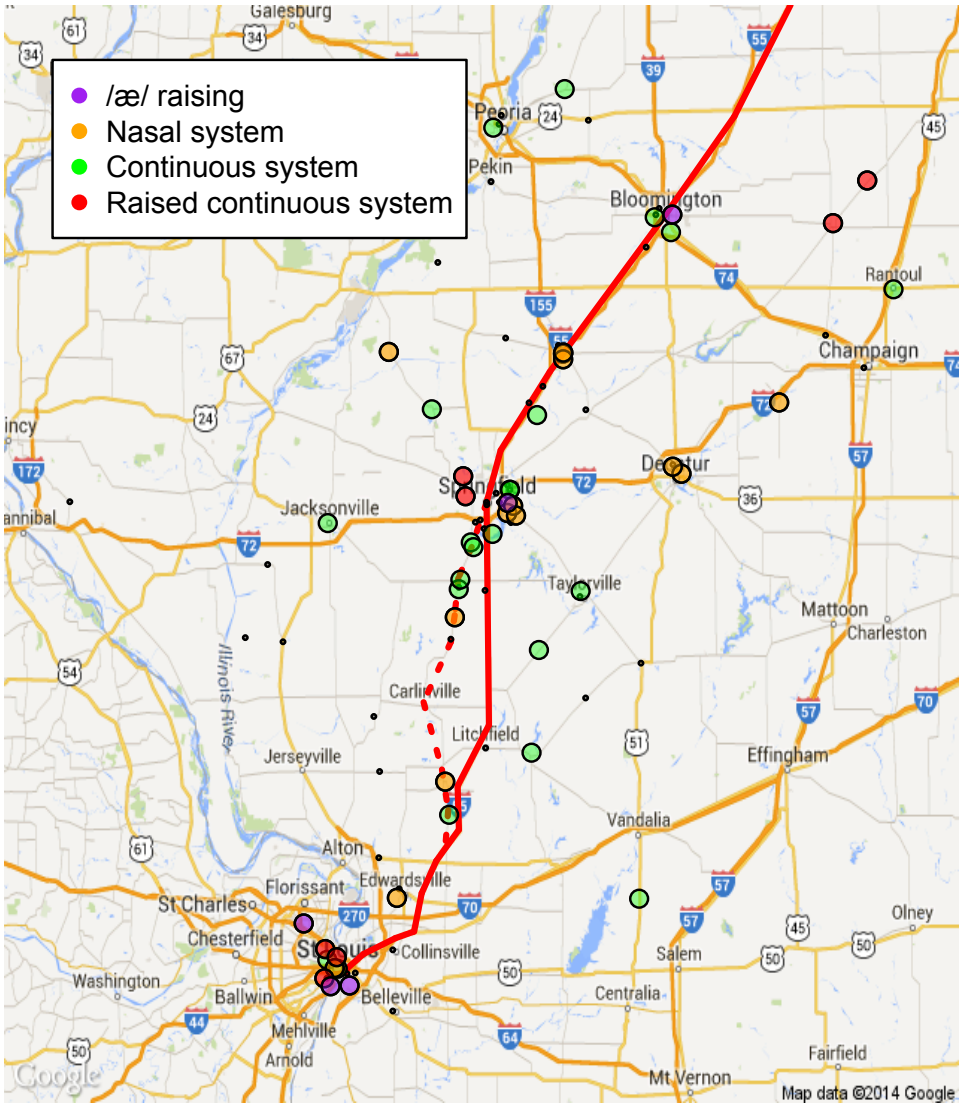

Figure 5.5 Nasal systems in the Corridor. Red line is Route 66 (hatched line is the 1926-1940 alignment) [N=95].

14 speakers in the current study with a /æ/ nasal system[50], none have a raised non-nasal /æ/, either by using the ANAE F1(æ)<700 Hz criterion or Dinkin's method of /æ/ ~ /o/ distinction (F1(æ) is above F1(o) by two standard deviations of F1(o)). Of the 29

[50] Nasal systems were determined by finding a p-value<.05 of a t-test of nasal and non-nasal tokens for each speaker, then by plotting each of those /æ/ system and determining which had the most distinct sets of tokens, allowing for a couple of phonetically mis-categorized tokens in each category. The 14 speakers with nasal systems all have an F1 p-value<.005 and F2 p-value<.05. These did not include continuous systems, where nasals are higher and fronter than other tokens but are not separate (Labov et al. 2006; Labov 2010; Dinkin 2013).

speakers with a continuous /æ/ system, only two speakers (Sheila, whose /æ/ system appears in Figure 5.2, and Virginia R), have an oral F1(æ) mean that satisfies the ANAE criterion (F1<700 Hz). An additional five speakers show a nasal system with a relatively raised /æ/ (using Dinkin's method). Most of the seven raised /æ/ means are in larger cities (St. Louis, Springfield, and Bloomington) while continuous systems are scattered. Sheila and Virginia R., the two speakers with continuous systems that satisfy the raised /æ/ criterion from ANAE, were born later on (1952 and 1968 respectively) and both grew up in the Champaign area.

One important difference between the data from the Corridor and Dinkin's data from the Hudson Valley of New York is the existence of raised nasal systems. While quite a few speakers in Dinkin's data set demonstrate raised nasal systems, not a single speaker from the Corridor shows a raised nasal system. Dinkin proposes a possible explanation for the distinction between low nasal systems and raised nasal systems in his study: that speakers with the low nasal system have a phonological distinction between the pre-nasal and pre-oral categories, while raised nasal systems have only a phonetic distinction. Dinkin points out that the presence of an allophonic or phonemically-distinct segment in itself does not prevent another from moving into the same space, since mergers are somewhat common. However, a synchronic rule that differentiates between two allophonic segments would likely block them from merging (2009:198). In fact, Dinkin finds a geographical distinction between the raised nasal and low nasal systems, as the raised nasal systems generally appear in the Inland North areas (fringe and core) and the low nasal systems mainly appear outside that area. In addition, he hypothesizes that the raised nasal systems were created by a rule ordering, where first the continuous /æ/

system is raised, followed by the raising of the pre-nasal /æ/, while the low nasal systems resist the raising of /æ/ because the rule order is reversed and there are no continuous /æ/ systems (203). Unlike the Hudson Valley, the Corridor does not have an existing nasal system, so the same theory of blocked /æ/ raising does not apply. At the same time, not a single person in the Corridor developed a raised nasal system, which bolsters Dinkin's theory of rule ordering in the case of raised nasal systems (general raising of continuous systems followed by the nasal distinction).

Although Dinkin hypothesizes that the existing nasal system blocks /æ/ raising in the Hudson Valley, the same cannot necessarily be said for the reversal of /æ/ raising in the Corridor. Unlike the Hudson Valley, the Corridor is not historically an Inland North area geographically situated near an area with an existing nasal system. As shown above, the nasal system appears in the Corridor just as the raised /æ/ system begins to appear. On the other hand, the /æ/ systems are consistent with the Hudson Valley, since the raising of /æ/ does bring along with it higher NCS scores overall. On average, raised speakers have a higher NCS score than continuous raised speakers, followed by those with continuous systems. It is still possible that the growth of the nasal system in the area prevented further growth of /æ/ raising (and in theory the rest of the NCS), but the phonological blocking shown in the Hudson Valley is not present in the Corridor.

If it is true that pre-nasal /æ/ is preventing the raising of /æ/ for those with nasal or continuous systems, it also raises the question of why speakers without raised nasal allophones do not demonstrate raised pre-oral /æ/. The NCS and Midland dialects appear to mainly spread geographically in apparent time in slightly different directions, as demonstrated in the distinction between the two in Chapter 3 (Section 3.1 in particular).

If the nasal system spread from the Midland dialects, especially since other Midland cities have shown nasal /æ/ systems, it would follow that the NCS raised /æ/ would be allowed to grow in areas that had not felt the effects of a Midland nasal system. However, in Section 4.5, I concluded that the Corridor did not appear to have the same characteristics as the other Midland cities (Cincinnati and Columbus in particular) that have origins in the diffused East Coast /æ/ system. At the same time, there is evidence that the Corridor was first affected by the Midland dialect, not the NCS, as shown in Figure 3.2 from Section 3.2, combined in a single graph as Figure 5.6 below. In the

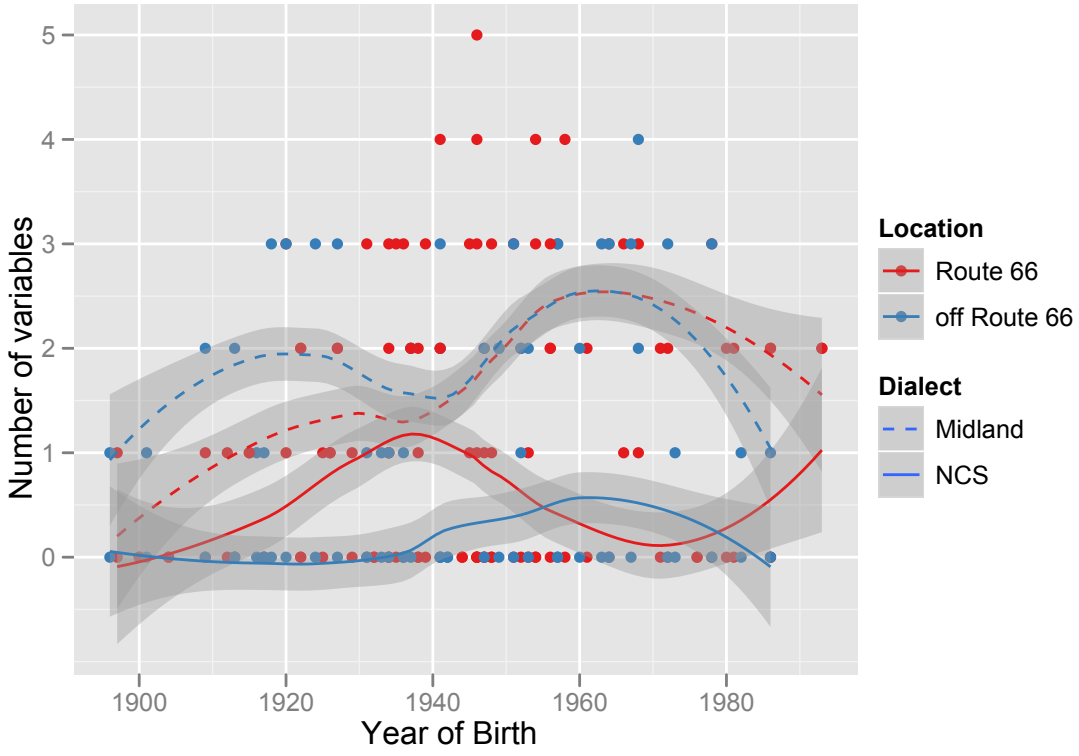

Figure 5.6 Average number of Midland and NCS variables satisfied in apparent time by year of birth, divided into those living on Route 66 and those living off Route 66 [N=95].

graph, it is possible to see that the Midland dialect, shown with dashed lines, began appearing off Route 66 before the data in this study and on Route 66 a few years

afterwards in apparent time. In comparing that to the NCS in the figure to the left, only Route 66 speakers are participating in these sound changes and then only after those same speakers had started adopting the Midland dialect. What is most striking about this diagram, however, is the relationship between the peak in NCS features for Route 66 speakers and the decrease in Midland features for all Corridor speakers. In the Midland case alone, one can argue that one part of the population lagged behind the other, then caught up and followed the same trajectory by about 1940.

This diagram along with other evidence leads to the question of whether the entire Corridor, including on and off Route 66/I-55, should be considered a single speech community. In the case of the nasal system in Chapter 4, I came to the conclusion that the nasal system entered the Corridor as if it was a single speech community with little to no distinctions between geographically distinct or socially salient groups of speakers. Although nasal systems are found in some Midland cities (Durian 2012, Boberg and Strassel 2000) and continuous systems are common in the Inland North (Labov et al. 2006 among others), evidence on whether the nasal system is a distinctly Midland or NCS feature is mainly inconclusive, but points more to a relationship with the Inland North. There are some slight distinctions between the development of the nasal system for those who grew up on Route 66 and those who grew up off Route 66. The pattern found in the Corridor as a whole, as shown in Figure 4.2 above in particular, is a slightly raising pre-oral /æ/ that drops and a pre-nasal /æ/ that gradually increases in apparent time. Although the general pattern does not change radically for Route 66 versus off Route 66, the slight differences do show some interesting distinctions. Looking at the two groups of speakers side by side in Figure 5.7 below, the most compelling difference

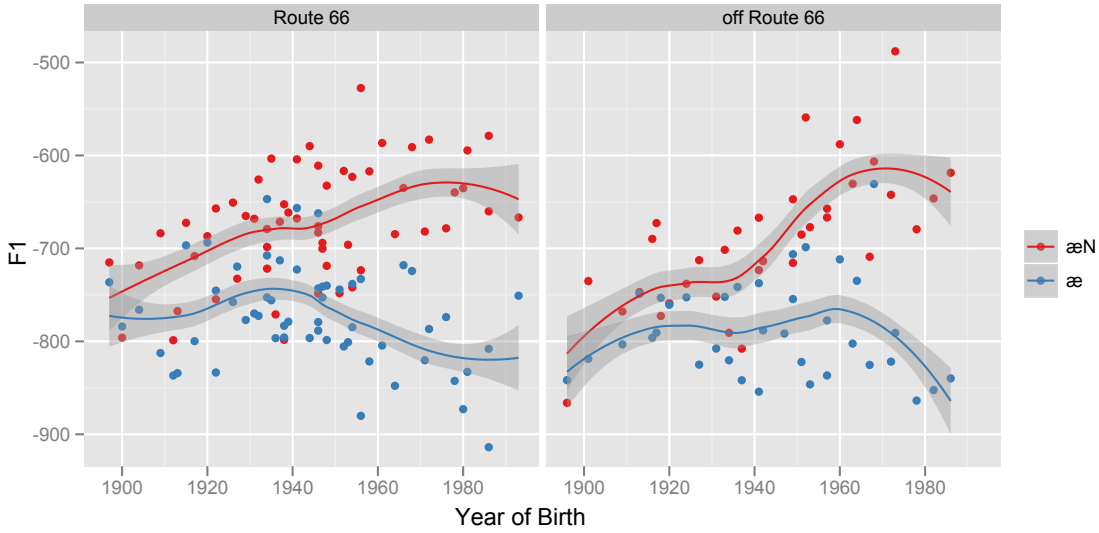

Figure 5.7 Height of F1 over time for pre-oral /æ/ and pre-nasal /æ/, divided into speakers who grew up on Route 66 and those who did not [N=93].

is in the raising of pre-oral /æ/ by year of birth. Although Route 66 speakers initially have a higher F1(æ) with its average lower than 750Hz in the 1930's (as compared to lower than 775Hz for off Route 66 at about the same time), pre-oral /æ/ does not rise again for Route 66 speakers while off Route 66 speakers (on the right) see a slight pre-oral F1(æ) rise in the 1950's along with the pre-nasal means. However, the split in pre-nasal and pre-oral means diverged for both groups fairly early on and around the same time, which leads me to conclude that speakers from both areas were affected by the nasal /æ/ system. At the same time, it does appear that the separation between pre-oral and pre-nasal /æ/ was slightly different for Route 66 and off Route 66 speakers: Route 66 speakers' nasal system appeared to be pre-oral and pre-nasal means moving away at about the same pace, while off Route 66 speakers' systems was because of a sharp rise in pre-nasal /æ/.

Considering all the evidence for whether or not a nasal /æ/ system blocks the raising of pre-oral /æ/, the evidence is leaning towards the possibility but is not a clear cause and

effect. As has been demonstrated, the nasal /æ/ means appear to be raising as a whole while the group's oral /æ/ means do not. It does not appear to be a few older individuals or areas leading this trend nor is it an abrupt jump from no nasal system to distinct nasal system: individual speakers' patterns in apparent time show a smooth transition from none to gradual to distinct. My data also appears to be consistent with the patterns Dinkin (2009) found in Upstate New York on the Inland North fringe there, which leads to the likelihood that speakers responded to the same input (nasal /æ/ system) in the same general manner (lowering of pre-oral /æ/). Finally, the distinctions in how the systems grew over time on and off Route 66 could point to how they each were affected either by the same dialectal source or two sources working in tandem. Therefore, it is likely that the nasal /æ/ system blocked the raising of pre-oral /æ/.

5.3 Nasal /æ/ blocking the æ ~ e reversal

Although the raising of pre-oral /æ/ is one key aspect of the NCS, it is not the only criterion in the ANAE that uses the status of /æ/ to determine participation in the NCS. Another possible consequence of the nasal system blocking the rise of oral /æ/ would be the failure of the /æ/ and /e/ vowels to reverse. This criteria, called the EQ1 measure of the NCS (Labov et al. 2006), concerns the raising and fronting of pre-oral /æ/, which is generally agreed upon as an early feature of the NCS (see Section 1.3.2 for a discussion of the stages of the NCS), and the lowering and backing of /e/, which is usually one of the later changes. As discussed in Section 5.2, Dinkin (2009, 2013) found that the nasal /æ/ system of New England blocked the raising of /æ/ to the raised position found in the Inland North and therefore above /e/. In the current study, only one or two Corridor speakers satisfy the EQ1 measure if one is considering speaker's vowel means. When

calculating vowel height as F2-F1[51] (Figure 5.8) instead of comparing F1 and F2 of each vowel, it appears that /æ/ is fairly close to /e/ on the front diagonal of the vowel space until about 1960, then lowers away from /e/. Since F2(æ) is farther front than F2(e) for 90% of speakers in this study (but not all of them), it is primarily the lack of raising of /æ/ (the F1 measure) that interferes with satisfying the EQ1 criterion. In fact, only three speakers (Walt H., born 1941 in St. Louis; Martin H., born 1946 in St. Louis; and Virginia R., born 1968 in Gibson City) satisfy the EQ criterion, and two of the three also satisfy the AE criterion. Since it is possible that the introduction of the nasal /æ/ system in the Corridor may have prevented the raising of /æ/ and may have obscured the movement of /e/, I propose a few ways to reintroduce the relationship between /æ/ and /e/

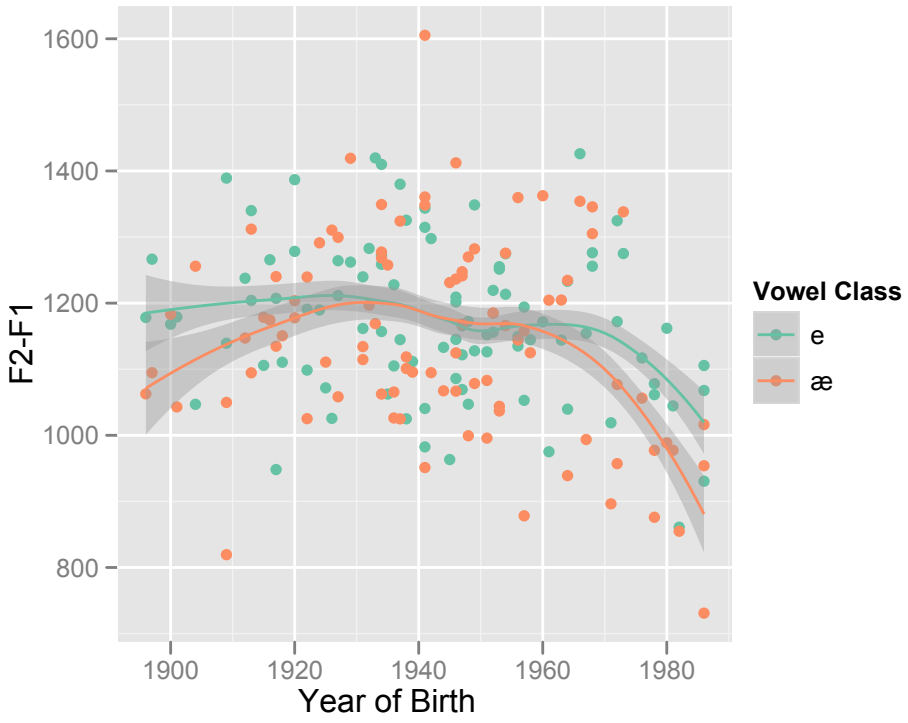

Figure 5.8 Vowel height of /æ/ and /e/ of speakers by year of birth [N=95].

[51] When height was calculated as F2-2*F1, the heights of /æ/ remains higher than /e/ and they do not reverse.

(EQ criterion), particularly along the F1 axis, without requiring the raising of /æ/.

One way to reintroduce the relationship between /æ/ and /e/ movement into the existing ANAE criteria would be to determine the lowering of /e/, which is part of EQ. If the AE1 cut-off for /æ/ raising (700 Hz) were used to indicate /e/ lowering (F1(e)>700), 23 speakers (24%) would satisfy the new criterion. If /æ/ fronting, or F2(æ)>F2(e), were considered along with the lowering of /e/ below 700Hz, then 17 speakers (75% of those with lowered /e/) would be considered to satisfy this criterion. None of these speakers, though, would satisfy the AE1 raising criterion of F1(æ)<700Hz and only one satisfies the original EQ criterion. Considering the breakdown of all speakers into these categories (/æ/ fronting, /æ/ raising above /e/, /æ/ raising above 700 Hz, and /e/ lowering below 700 Hz) plus comparing the diagonal heights of /æ/ and /e/ (as presented in Section 3.2) in Table 5.1, a few trends appear. First, for just over half of speakers, /æ/ is fronted

		F2(æ)>F2(e) (æ front)	F2(æ)<F2(e) (æ back)
F1(æ)<F1(e) (EQ criterion)	F1(e)<700Hz (not lowered e)	2	0
	F1(e)>700Hz (lowered e)	1	0
F1(æ)<700Hz (raised æ, AE criterion)	F1(e)<700Hz (not lowered e)	6	1
	F1(e)>700Hz (lowered e)	0	0
F1(æ)>700Hz (not raised æ)	F1(e)<700Hz (not lowered e)	51	14
	F1(e)>700Hz (lowered e)	17	6
(F2(æ)-F1(æ))> (F2(e)-F1(e))		28	

Table 5.1 Distribution of F1 and F2 characteristics of /æ/ and /e/ [N=95].

without /æ/ raising or /e/ lowering (51 speakers). Most of the 7 speakers with a raised /æ/ (and therefore satisfy the AE criterion) also have /æ/ fronted before /e/ (6 speakers), but none have a low /e/ (/e/ >700 Hz). Since 17 speakers with /æ/ fronted also have a

lowered /e/ (compared to 6 without a fronted /æ/), it appears that a combination of /e/ lowering and /æ/ fronter than /e/ may be a substitute for EQ, focusing more on the movement of /e/ than /æ/. When comparing each speaker according to these three characteristics (/æ/ raising above 700 Hz, /e/ relatively backed, and /e/ lowering below 700 Hz) in real time, as in Figure 5.9, it is possible to see that /e/ lowering (in green) does

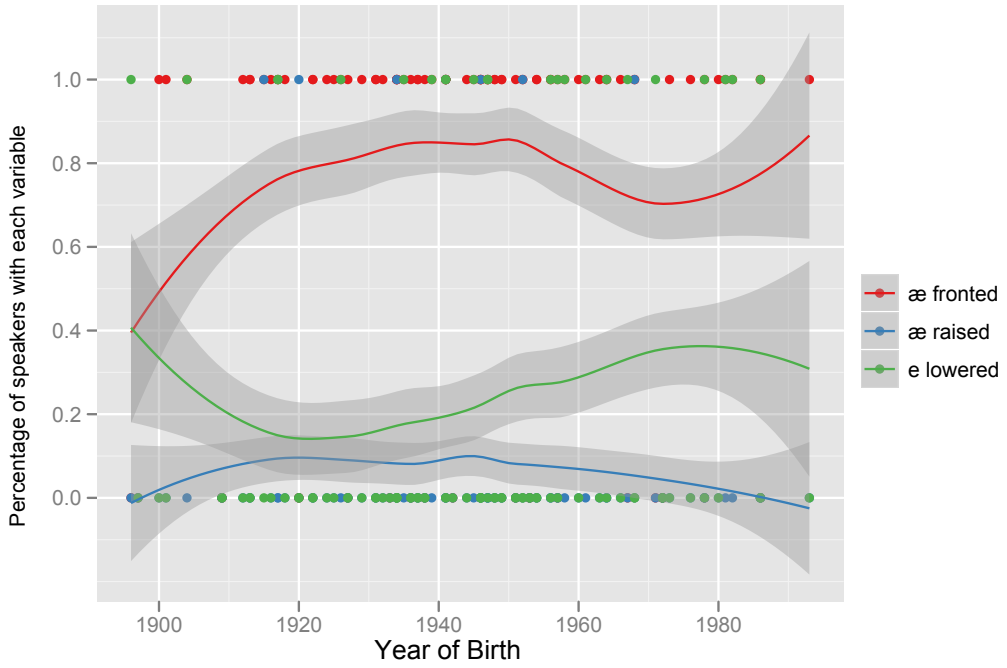

Figure 5.9 Percentage of Corridor speakers with F2(æ)>F2(e) (red), F1(æ)<700 Hz (blue), and F1(e)>700 Hz (green) [N=95].

not follow the same path as the other two. In fact, /e/ lowering began[52] to increase in the late 1940's and continued into the 1970's, later than many of the other NCS changes. However, when looking closer at the subsets of speakers with F1(e)>700Hz ("/e/lowered") divided into whether /æ/ is forward of /e/ or vice versa in Figure 5.10,

[52] The initial high instance of /e/ lowering around the turn of the century is due to 2 speakers (Jim J., born 1896 in Peoria and Burt H., born 1904 in Springfield) and therefore may not be tied to a larger trend.

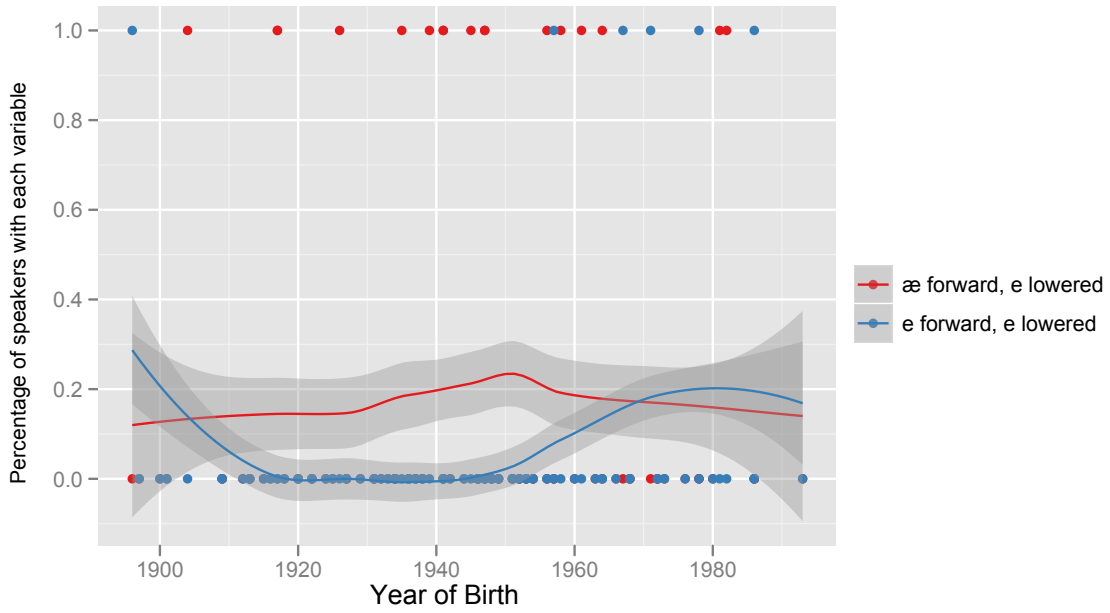

Figure 5.10 Percentage of Corridor speakers with F2(æ)>F2(e) and F1(e)>700 Hz, or F2(e)>F2(æ) and F1(e)>700 Hz [N=95].

there are more speakers who also have a /æ/ farther front than /e/ (in red) than a farther front /e/ (blue) from the 1920's through the 1950's. In fact, between 1896 and 1957, not a single speaker has /æ/ farther back than /e/ and a lowered /e/. The discrepancy between the two groups of speakers (fronted /æ/ vs. fronted /e/) could be related to the fact that many speakers with a fronted /æ/ in general (noted with the red line in Figure 5.9 above) and that there is a smaller pool of speakers with /e/ farther front than /æ/ in general. On the other hand, between 15-20% of speakers had /e/ farther front during this period, so the fact that not a single speaker had F1(e)>700 makes it likely that a lack of /e/ lowering would be related to the lack of fronting and raising of /æ/.

However, although these different ways of approaching the EQ criterion have their merits, none of them appears to follow the trend found for the other NCS variables. When both the above possible alternatives for EQ (F2-F1 reversal measure, F(e)>700Hz measure, and the F2(æ)>F2(e) + F1(e)>700Hz measure) were added to the NCS criteria

in Figure 3.5 from Section 3.2, it is clear that neither shows the same pattern as the NCS. In the resulting graph, Figure 5.11, none of the variations on the EQ criteria (noted with

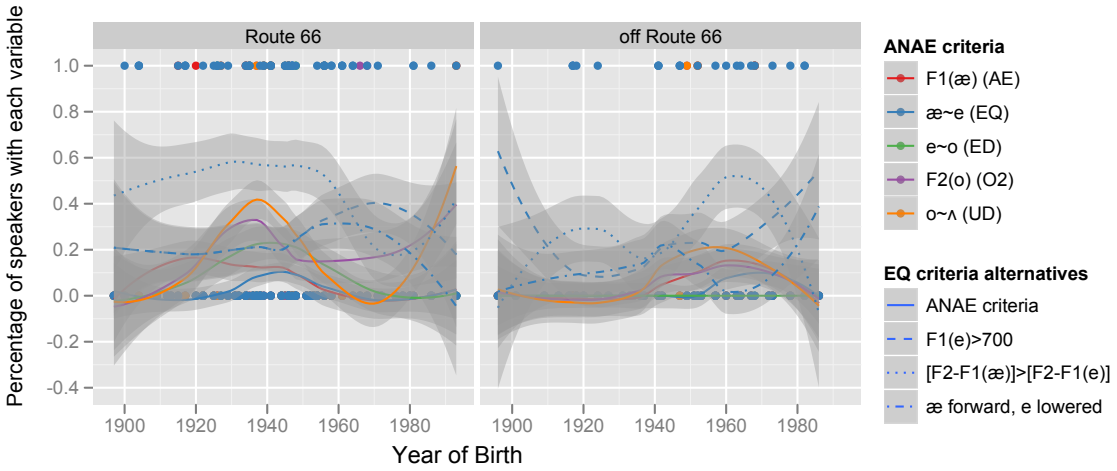

Figure 5.11 Percentage of each ANAE NCS variable satisfied over time, divided into those who grew up on Route 66 and those who grew up off Route 66 and percent of variable satisfied for alternatives for the EQ criterion (æ~e reversal) [N=95].

different line types in blue) matches the general trend of NCS variables in the Route 66 group. In fact, although the EQ criterion from the ANAE (the solid blue line) shows the lowest instance of the possible EQ measures, it mirrors the other NCS variables both on and off Route 66. Therefore, although the lack of /æ/ raising in the corridor might be preventing the lowering of /e/ from being recognized, none of the alternative EQ measures appears to be a more accurate representation of the NCS EQ criterion.

5.4 Conditioned low-back merger and /o/ fronting

Since two NCS criteria from the ANAE, O2 and UD, depend upon the fronting of /o/, it is also important to consider the forces acting upon /o/. Namely, one must consider the presence of the conditioned low-back merger in the Midland and its possible backing effects on /o/. Although the separate movement of /o/ forward and /oh/ forward and downward are both a part of the NCS, the ANAE notes that the fronting of /o/ is

geographically tied to the Inland North while the fronting and lowering of /oh/ is not as strong a feature in the Inland North (2006:197). According to the ANAE, the Midland (and the Inland North) are generally areas where speakers do not have the low-back merger (except for isolated areas, such as Pittsburgh), or it is in "transition." As discussed in Section 1.3.1, studies from other locations in the Midland have shown to be in various stages of the merger. Speakers in Indianapolis and Cincinatti demonstrate a conditioned merger (Fogle 2008, Boberg and Strassel 2000), and in Northern Ohio and Columbus a conditioned merger in older generations leads to a full merger for younger speakers (Thomas 2010, Durian 2012).

In this study, it appears that the unconditioned merger is not a result of the conditioned merger. Among the 95 Corridor speakers, there are 10 with an unconditioned low-back merger[53] born between 1900 and 1971, and their mean year of birth is 10 years before the mean of those with a conditioned merger. When those with the conditioned merger or conditioned merger are displayed on the map in Figure 5.12, it is clear that these types of mergers cover distinct geographical areas. Specifically, the unconditioned low-back merger is present in Springfield, to the west of the Corridor, in small Route 66 towns, and in small towns around Decatur. The conditioned merger, on the other hand, appears in the vowel systems of Route 66 speakers as well as the vowel system of one speaker who grew up slightly to the west of Route 66.

As mentioned above, this is not the first study of geographical areas with NCS influence to have some possible interaction between /o/ fronting and the low-back

[53] Speakers were determined to be merged if a two-sided Pearson t-test of /o/ and /oh/ (excluding those following laterals) returned a p-value > .05 and a visual test confirmed. Additionally, 9 speakers of 95 were excluded from the unconditioned merger t-test and 43 speakers were excluded from the conditioned merger t-test because there were not enough /o/ or /oh/ tokens to perform t-tests for these speakers.

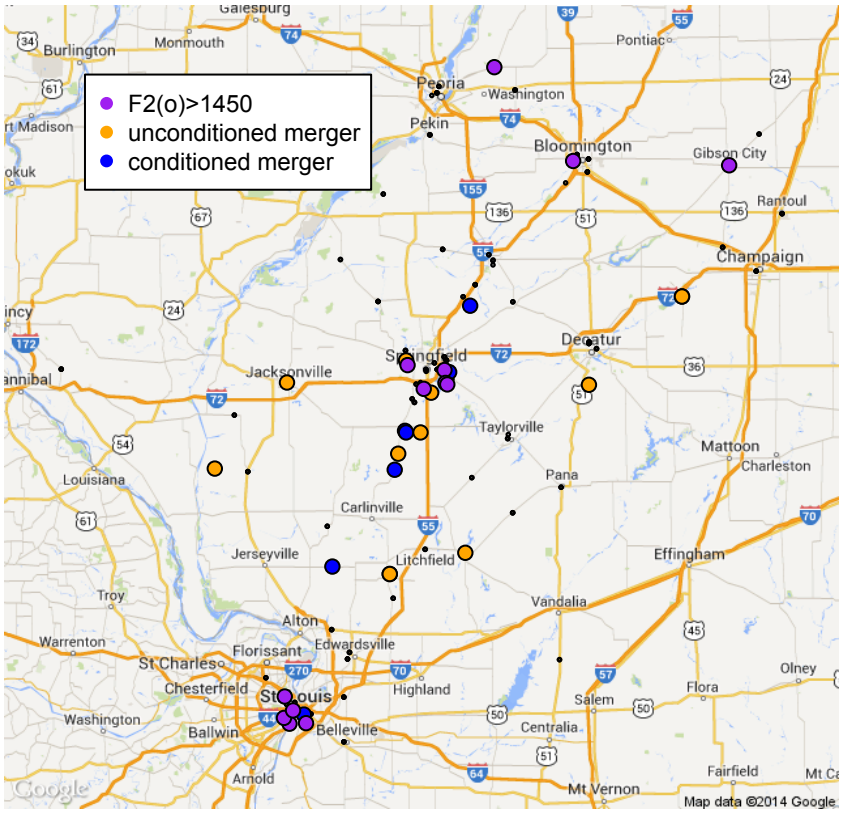

Figure 5.12 Speakers with the conditioned and unconditioned low-back merger and fronted /o/. All 95 speakers had /o/ tokens and appear on the map, but not all 95 speakers had enough tokens in each category (minimum of 3 for each vowel) to consider whether they had the above characteristics. Therefore, 86 speakers underwent a t-test for the unconditioned low-back merger and 52 for conditioned mergers. Speakers without any of the three above characteristics are noted as small black dots.

merger. In his study of Upstate New York, Dinkin (2009) found dialects in locations that did not have the merger or were transitional to show some interference between the movement of the F2(o) on the low-back merger. Specifically in the case of contact between /o/-fronting and the low-back merger, Dinkin states:

> "…having /o/ fronter than 1450 Hz in conjunction with other NCS sound changes is not enough to prevent [the low-back merger]…and having the entire NCS chain-shift structure is not enough to prevent it" (304).

Therefore, although there might be some interaction, he found there to be minimal evidence that such a direct causality would exist between the two unrelated sound changes. If mergers, unconditioned or not, do not appear to coexist with fronted /o/ in a

Corridor speaker's system, one possibility for this study is that the conditioned low-back merger is actually preventing the fronting of /o/ for some speakers. In Upstate New York, Dinkin was mainly looking at areas where speakers already had the NCS system and the low-back merger was the incoming change. By contrast, the results from this study have indicated that the Corridor was not a NCS dialect area before the Midland dialect – either the Midland dialect appeared first or they appeared around the same time. For /o/ in particular, it appears that the conditioned low-back merger, unconditioned merger, and /o/ fronting appear around the same time in the Corridor. This is shown in Figure 5.13 below, where there is not a single speaker in the dataset who demonstrates a

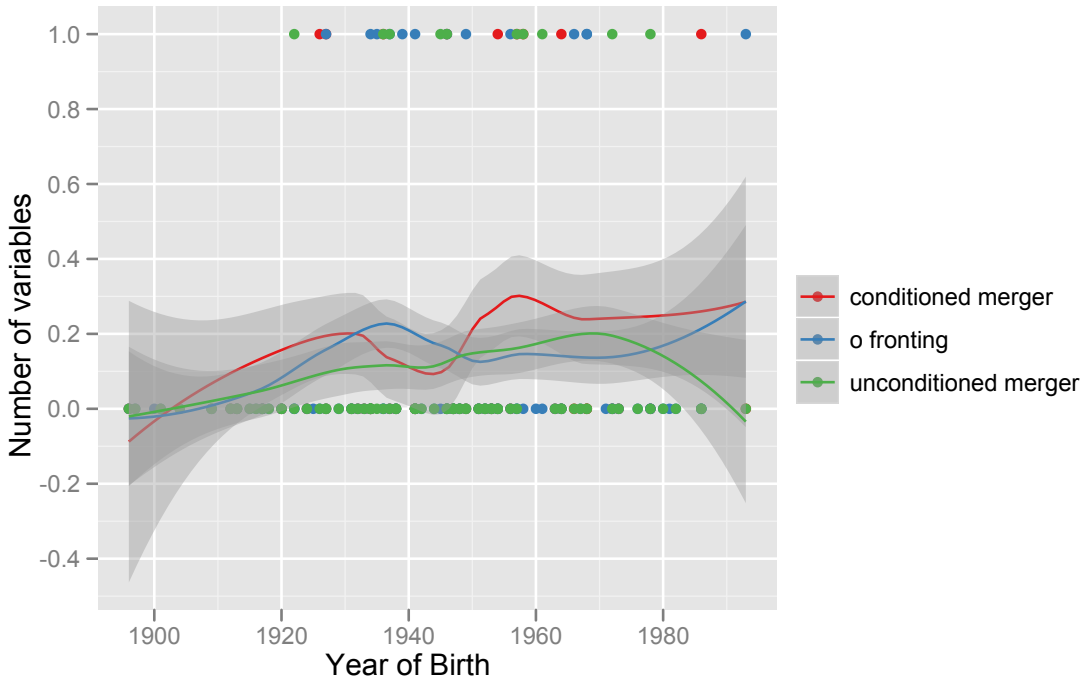

Figure 5.13 Percentage of speakers with conditioned low-back merger, /o/ fronting (F2(o)>1450 Hz), or an unconditioned low-back merger [N=95].

low-back merger or /o/ fronting before the 1920's. In fact, despite there being very few speakers with overlap (three speakers with the unconditioned merger also have a merger with the conditioned variables), the trajectories of these three features indicate that for the

speech community as a whole they are not distinct from one another (the 95% confidence intervals overlap). There are some slight differences in demographics and geographical distribution, as younger males show more /o/ fronting and younger females show more mergers, but for most part are not significant differences.

The next question is if speakers with a merger show a significantly farther back /o/ than those without. The 9 speakers who have a conditioned low back merger have an average F2 value of 1166 Hz and the 10 with an unconditioned merger have an F2 of 1164 Hz, which are both fairly far back. When we look at the F2 values of those without a merger, their average F2(o) is farther forward than those with any merger (a 166 Hz difference), which is expected. As would be expected, those with conditioned mergers are even farther backward than those without (a 175 Hz difference) while those with unconditioned mergers have an F2 only slightly farther back than those without (a 141 Hz difference). It is possible to conclude that conditioned mergers could be interfering with the fronting of /o/, leaving the O2, UD, and ED criteria of the NCS less effective at discerning speakers with NCS features.

However, unlike other vowel changes like the fronting of /o/ that operate on a single dimension, merging or distinctness in the case of the low back merger is determined by both F1 and F2. One way to determine the effect of the low-back merger on F2(o) would be to establish a second F2 value of /o/ by only using tokens that are not in the conditioning environment (meaning /o/ tokens that are not before voiceless stops or laterals). In fact, there are 5 speakers in the Corridor whose F2(o) without pre-voiceless stop (and lateral) /o/ tokens is greater than 1450 Hz: Harold B., born 1909 in Peoria, IL; Wilma C. born 1917 in Taylorville, IL; Walt H., born 1941 in St. Louis, MO; Roy C.,

born 1948 in Broadwell, IL; and Evelyn, born 1957 in Morrisonville, IL. Adding these speakers to the 13 that satisfy the O2 criterion in the map in Figure 5.12 above, the pattern for /o/ fronting expands outside of Route 66 cities to towns east and north of Route 66, as shown by the new /o/ fronting speakers in Figure 5.14. Although the

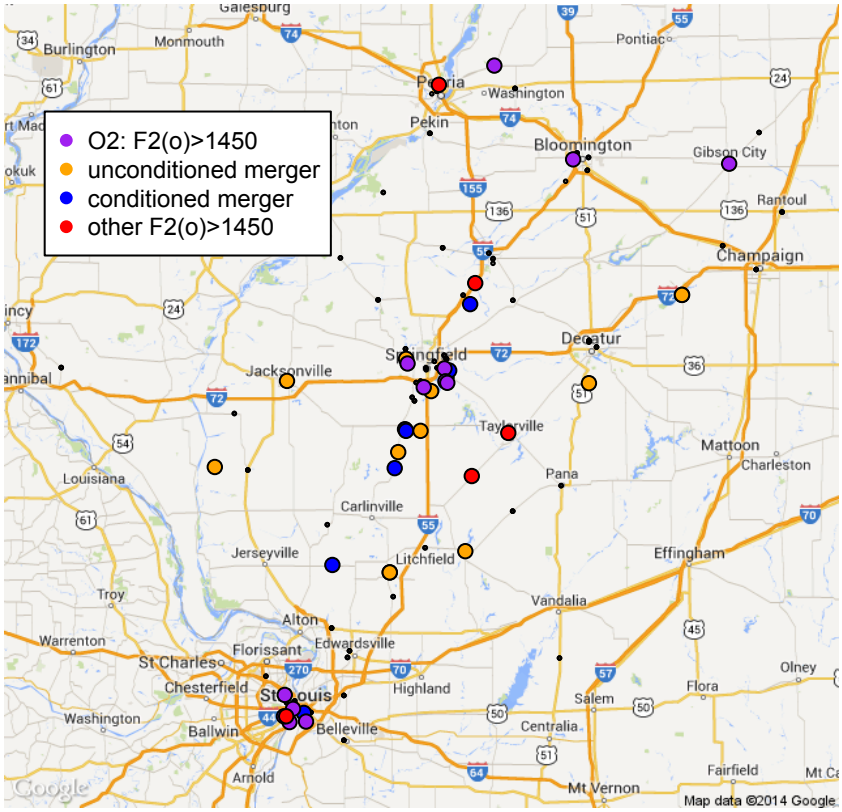

Figure 5.14 Speakers with the conditioned and unconditioned low-back merger, fronted /o/, and fronted /o/ excluding conditioned merger environments [N=95 for F2(o), N=86 for conditioned mergers, N=52 for conditioned mergers, N=94 for other F2(o)].

speakers with this alternate O2 measure are geographically spread out, those speakers born in the time period of NCS influence (roughly 1920-1950) were the only speakers who grew up on Route 66. Therefore, of all the possible alternate or additional measures of /o/ fronting, this appears to be the most promising. In fact, when this alternative was added to the original O2 criterion and compared to the NCS criteria in Figure 5 from Section 3.2, this new NCS. In the resulting graph, Figure 5.15, it is possible to see that

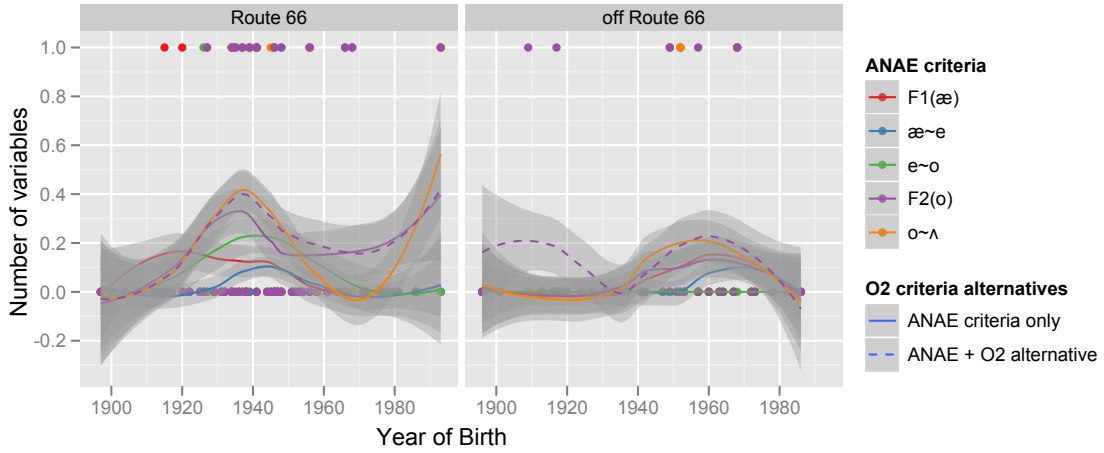

Figure 5.15 Percentage of each ANAE NCS variable satisfied over time, divided into those who grew up on Route 66 and those who did not [N=95], and a percent of variable satisfied for O2 plus those who satisfy the criterion with their pre-non-lateral, pre-non-voiceless-stop tokens alone [N=94].

the additional speakers with the subset of /o/ where F2(o)>1450 Hz is close to the original O2 criterion but also follows the original ANAE criteria as a whole, at least for Route 66[54] speakers. Therefore, if any additional measures were to be considered for speakers who satisfy the O2 /o/ fronting criterion, I would submit this option. Therefore, because it is possible to exclude the conditioning environment, these speakers whose conditioned vowels might show signs of affecting the vowel class as a whole can be considered without the environment with ties to the Midland dialect.

5.5 Midland /ʌ/ and the UD criterion

Although circumstances like conditioned mergers affect vowel classes unevenly, when it comes to /ʌ/, it is impossible to demonstrate Midland and NCS influence because both are acting upon the vowel in equal but opposite directions. The Midland tendency is to

[54] For speakers who grew up off of Route 66, this modification of the O2 criteria does include a few speakers that were born before 1920 that do not show any other NCS variable. One of these is from Peoria, a large city near the north end of Route 66 and one from Taylorville only has 1 /o/ token that is before non-voiceless stop, non-lateral tokens, so their measurement may not be accurate.

front /ʌ/ while the NCS involves /ʌ/ backing. Therefore, when trying to disentangle the /ʌ/ fronting from the /ʌ/ backing, an approach like the one used above for /o/ fronting and the conditioned low-back merger is not possible. In the case of the UD criterion (o~ʌ reversal), the fronting of /o/ and the interaction of the conditioned low-back merger (as discussed in the previous section) are also factors to consider.

Previously in this chapter, I have also considered how NCS /æ/ raising and /o/ fronting may have been influenced by the Midland pre-nasal /æ/ system and conditioned low-back merger and the implications those complications arise for these related changes. /ʌ/ is located directly in the center of a tug of war between both dialects. In comparing F2(ʌ) over time against the F2 of other vowels that are fronted in either dialect in Figure 5.16 (/aw ow Kuw/ in the Midland, /o/ in the NCS), it is possible to see that every vowel except /ʌ/ demonstrates some level of movement over time. Even /o/ shows some level of movement between 1100 Hz and 1300 Hz over time (although the majority of that is before 1930). However, /ʌ/ is stuck firmly in place between 1450 and 1550 Hz, which in the ANAE would be considered to be in the center of the vowel space (Labov et al. 2006:266). If the data is divided into speakers who grew up on or off Route 66, a similar pattern emerges for both groups, as seen in Figure 5.17.

What might be happening is that these two changes in progress (Midland /ʌ/ fronting and NCS /ʌ/ backing) are evening each other out into an intermediate form. There are

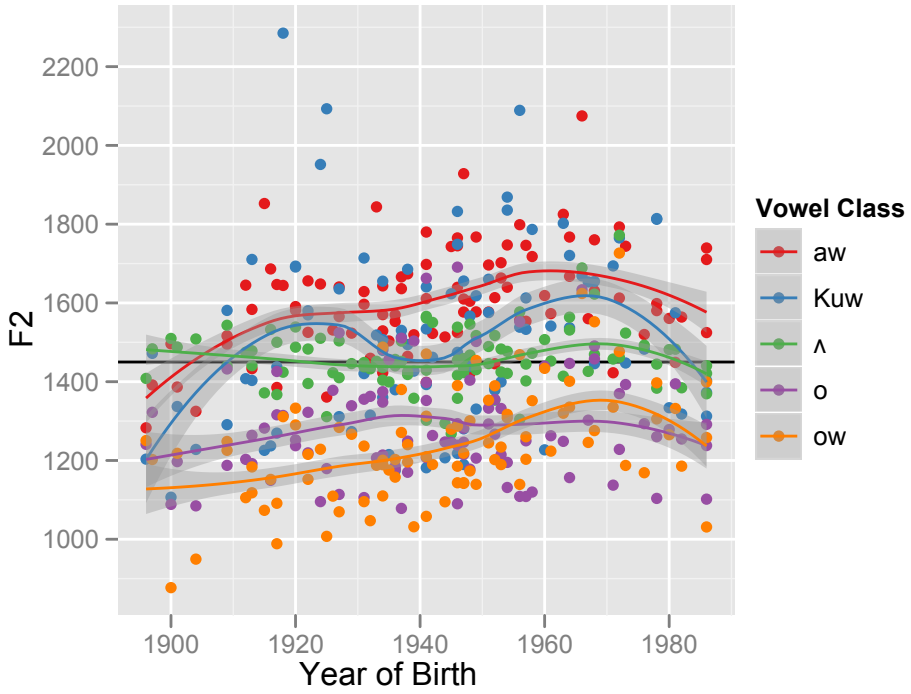

Figure 5.16 Average of F2 over time of /ʌ/ compared to three Midland (/aw ow uw/ and one NCS vowel (/o/) with a line at F2 =1450 Hz for comparison [N=95].

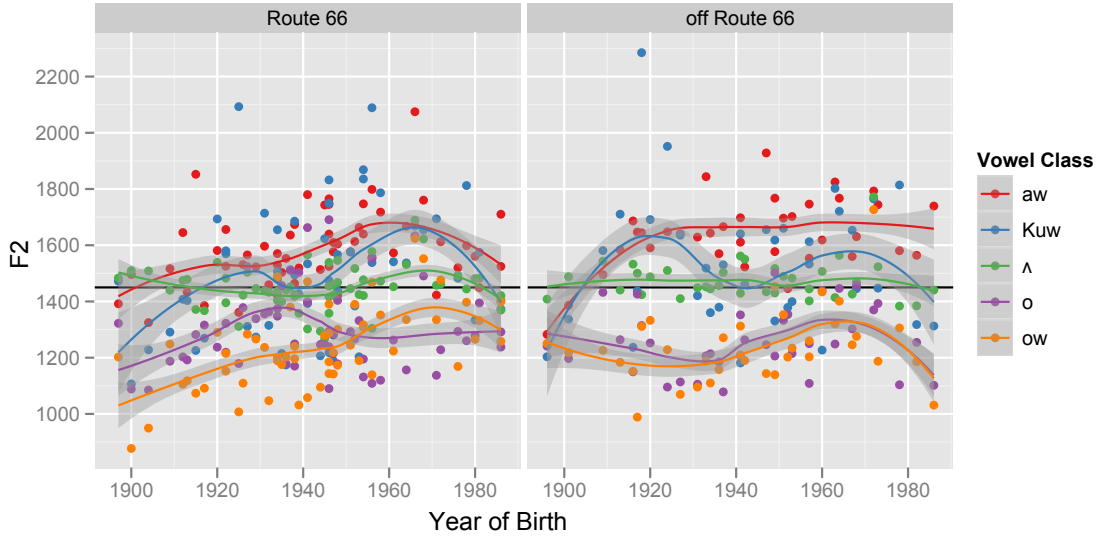

Figure 5.17 F2 values, divided into speakers who grew up on Route 66 (Corridor) and those that grew up off Route 66 with a line at F2 =1450 Hz for comparison [N=95].

other examples of interacting dialects where the presence of two competing forms have resulted in the emergence of an intermediate form. In reanalyzing data from the Survey of

English Dialects (Orton and Tilling 1969), Chambers and Trudgill (1980) find that in the dialect boundary in the Fens, speakers show variable use of the northern [ʊ] and southern [ʌ] forms in addition to a new "fudged" or intermediate form [ʏ]. Britain (1997) attributes this intermediate stage to a few factors, including the wide variety of pronunciation within the community, lack of phonological or lexical conditioning environments in areas where the sounds are split, and neighboring areas with only /ʊ/. The same type of process may be occurring in the Corridor, where these two forms, fronted and backed, may be forming a single intermediate form in the new dialect. However, unlike in the Fens, the two sounds are changes in progress themselves that are moving away from each other, not two existing forms. Therefore, it might follow that the NCS backing of /ʌ/ and the Midland fronting of /ʌ/ might be blocking one other from moving out of the central F2 space. Because unlike /æ/ and /o/ it is not possible to subtract /ʌ/ from itself, another option to determine the true value of /ʌ/ would be to subtract the NCS or Midland effect using another vowel as a guide.

ANAE notes that the linked behavior of /ʌ/ and /ow/ on opposite sides of the North-Midland dialect boundary is the sharpest distinction along this boundary. For ANAE speakers, both /ʌ/ and /ow/ are fronting in the Midland in apparent time ($p < .05$ for both). In fact, of the 23 Midland speakers outside of Illinois with F2(ʌ)>1450 Hz, 20 (or 87%) have a /ow/ mean fronter than 1200 Hz as well (for comparison, about 55% of speakers from the Corridor study with fronted /ʌ/ had fronted /ow/). Additionally, the relationship between /ʌ ow/ and /o/ is parallel: for all the Midland ANAE speakers and speakers from my own data where /ow/ is fronter than /o/ (31 speakers), /ʌ/ is also fronter than /o/; at the same time, speakers for whom /ʌ/ is farther back than /o/ (the 9 speakers who satisfy the

UD criterion), /ow/ is also farther back than /o/. The ANAE demonstrates that in the Inland North, both /ow/ and /ʌ/ are farther back than /o/ while in the Midland, /ow/ and /ʌ/ are both farther front than /o/ (Figure 5.18). However, in this map, the Corridor aligns mostly with the Inland North[55] in this regard, either with /o/ values that are farther front than both /ow/ and /ʌ/ (5 of 9, blue in the map), or /o/ is farther front than one and not the other (3 of 9, yellow in the map). Taking the same criteria as the map in Figure 5.18 below and applying them to the current study in Figure 5.19 below, it is possible to see that in fact most speakers (53, in yellow) do not conform to either the Midland pattern or the NCS pattern. In comparison, in the current data set, about a third of speakers have both /ow/ and /ʌ/ more fronted than /o/ (Midland-type configuration) while 10% have both /ow/ and /ʌ/ back behind /o/ (NCS-type configuration). Most[56] of the NCS-type speakers (/ow ʌ/ backed, in blue) are concentrated in St. Louis and Springfield while the Midland-type speakers (/ow ʌ/ fronted, in red) are scattered throughout the area, including those along Route 66. It is not that different than the map from ANAE in Figure 5.18 below with one exception: the increased presence of Midland-type parallel /ow ʌ/ fronting. Looking at the age frame of the speakers with NCS-type parallel /ow ʌ/ backing, the speakers unsurprisingly mostly appear in the 1925-1950[57] age range of the height of the NCS influence established in previous chapters. This would put relative /ow ʌ/ backing as another possible measure of NCS that points to the same period of influence from the Inland North.

[55] There is one Corridor speaker with Midland-type configuration on the northern end of the corridor from Bloomington, IL.
[56] The one exception is Sheila, a speaker from suburban Champaign who is the younger than the rest of the speakers with /ow ʌ/ farther back than /o/.
[57] The one speaker who falls just outside this age range is the one speaker not from Springfield or St. Louis (Sheila, born 1952, Melvin).

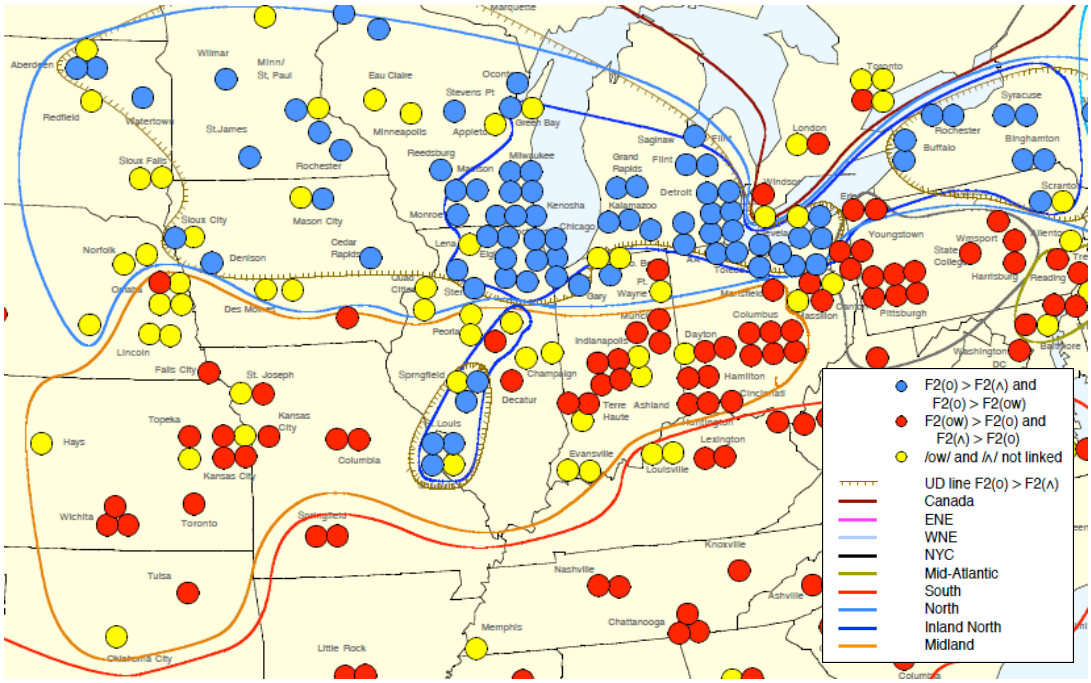

Figure 5.18 The parallel relationship between /ʌ/ or /ow/ with /o/ (modified from Labov et al. 2006:144).

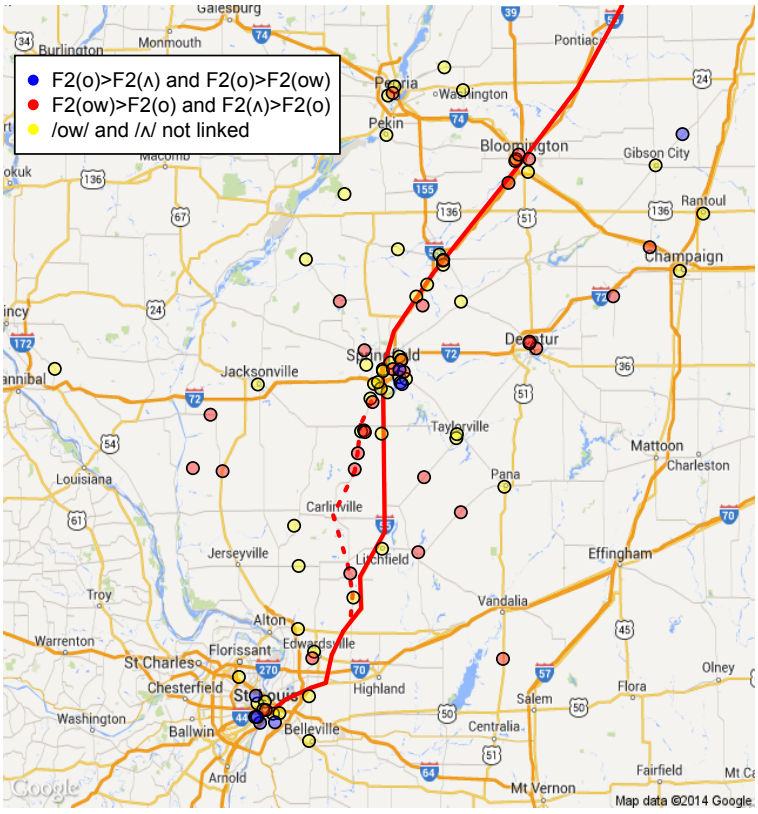

Figure 5.19 The parallel relationship between /ʌ/ or /ow/ with /o/ in the St. Louis Corridor [N=95].

Although /ʌ/ (and /ow/) move in parallel to /o/ for almost half of speakers in the Corridor, /ʌ/ does not generally move in parallel with /ow/ over time. Speakers increasingly front /ow/ between 1900 and 1970 while /ʌ/ shows only a small window of increased fronting later on after 1960, as seen in Figure 5.20. In fact, despite the large change in /ow/ fronting over time, /ʌ/ is stable around the 1450 Hz line (in black). If /ʌ/ and /ow/ tend to act in parallel, it is likely another force is acting upon /ʌ/ to keep it slightly backed. At the same time, /o/ is farther front than /ow/ (and farther back than /ʌ/, which is considered neither NCS or Midland) until the 1950's, when the trend slightly reverses and the Midland feature of /ʌ ow/ farther front than /o/ appears. When comparing the same variables in terms of location (off vs. on Route 66), an interesting

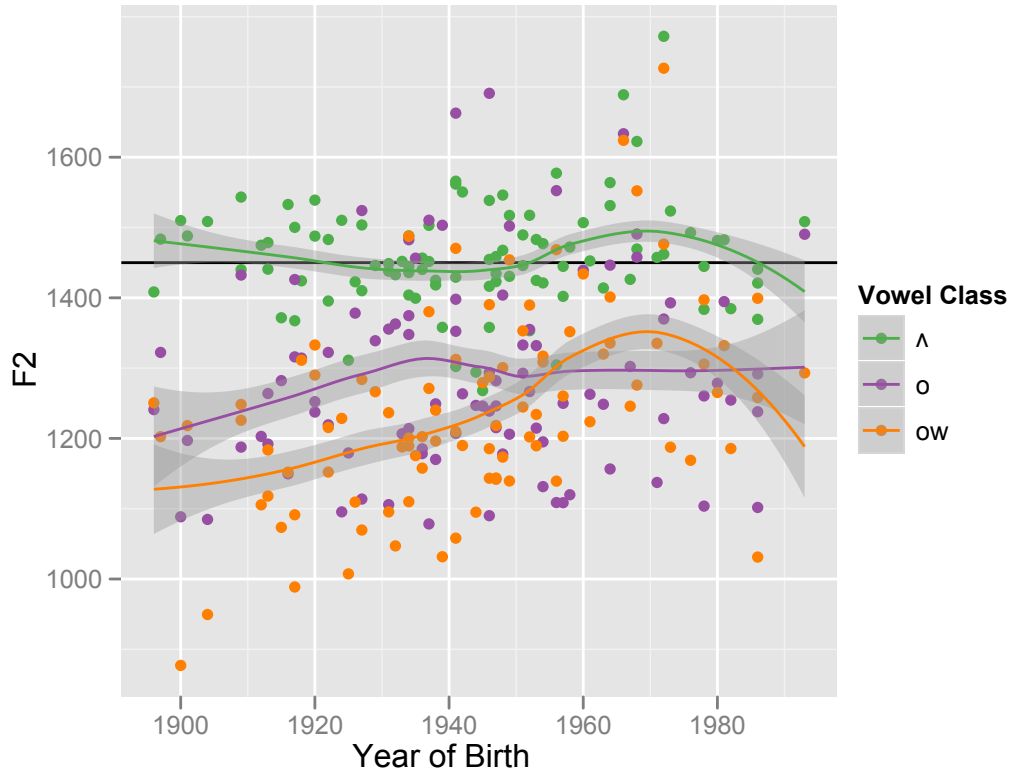

Figure 5.20 F2 of /ʌ/, /o/, and /ow/ for all study Corridor speakers [N=95].

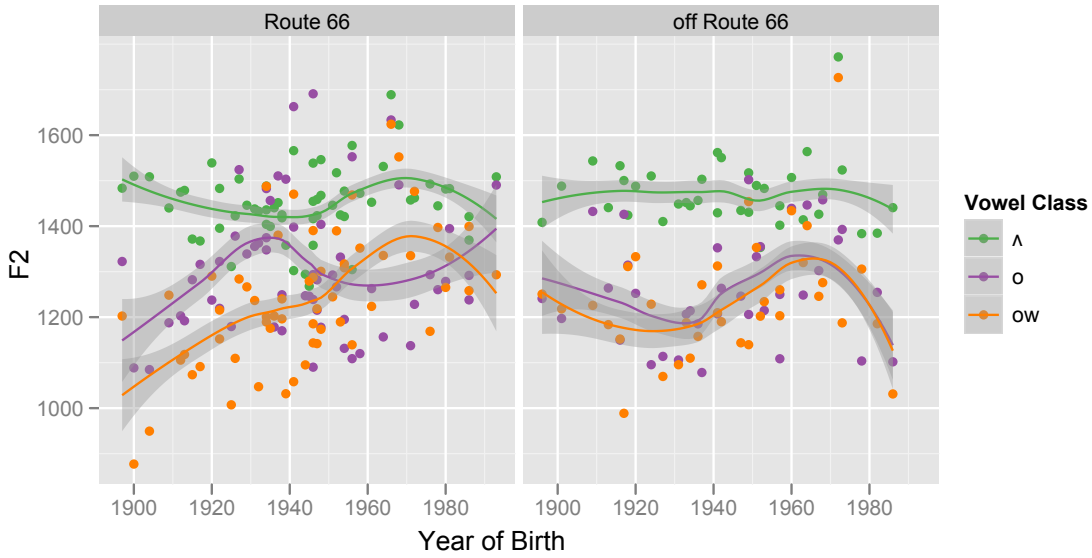

Figure 5.21 F2 of /ʌ/, /o/, and /ow/ for all study Corridor speakers, divided by location [N=95].

relationship between /o/ and /ow/ emerges. Although the ANAE considers /ʌ/ and /ow/ to be linked in the Midland/NCS distinction, /o/ and /ow/ are nearly identical in backing for those living off Route 66, as can be seen in Figure 5.21. Most interestingly, there seems to be very little effect upon F2(ʌ) in either location. It might follow from this that the UD criterion in the Corridor is dependent upon the NCS fronting of /o/ and not the backing of /ʌ/.

Since F2(ow) shows more change over time in this study than /ʌ/, it would follow that the ANAE finding of the parallel nature between /ʌ/ and /ow/ as well as other fronted Midland vowels could be explored to find the effect of the spread of the Midland dialect on /ʌ/. In the ANAE (see Figure 5.18), it appears as though /ʌ/ and /ow/ are not both farther forward or both farther back than /o/ for most speakers in the Corridor, which is not consistent with what is seen generally in the Midland.[58] Since the fronting of /ʌ/ and

[58] Those born in the 1960's do appear to have a slightly Midland pattern (both /ʌ/ and /ow/ farther forward than /o/).

/ow/ is connected and NCS /ʌ/ backing is likely prevented in part by Midland /ʌ/ fronting, it would follow that speakers with very fronted /ow/ would be showing the effects of Midland /ʌ/ fronting. Since both dialectal forces have directly opposite effects on /ʌ/, one way to take away some of the Midland effect would be to subtract the fronting of /ow/ past the criterion point (1200 Hz) from /ʌ/. For example, a speaker with F2(ow)=1400 Hz and F2(ʌ)=1500 Hz would have an altered F2(ʌ) value of 1300 Hz (1500-(1400-1200)=1300), but another speaker with F2(ow)=1100 Hz would have an unchanged F2(ʌ). The results of this altered F2(ʌ) along with /ow/ and /o/ appear in Figure 5.22. In comparison to Figure 5.20, where /ʌ/ crosses the 1450 Hz line (NCS criterion for /o/ fronting in O2) on three separate occasions, /ʌ/ in Figure 5.22 becomes progressively further backed over time. Although /ʌ/ does not reverse with /o/, it gets very close. When this is divided into Route 66 vs. off Route 66 speakers, as in Figure 5.23, a few

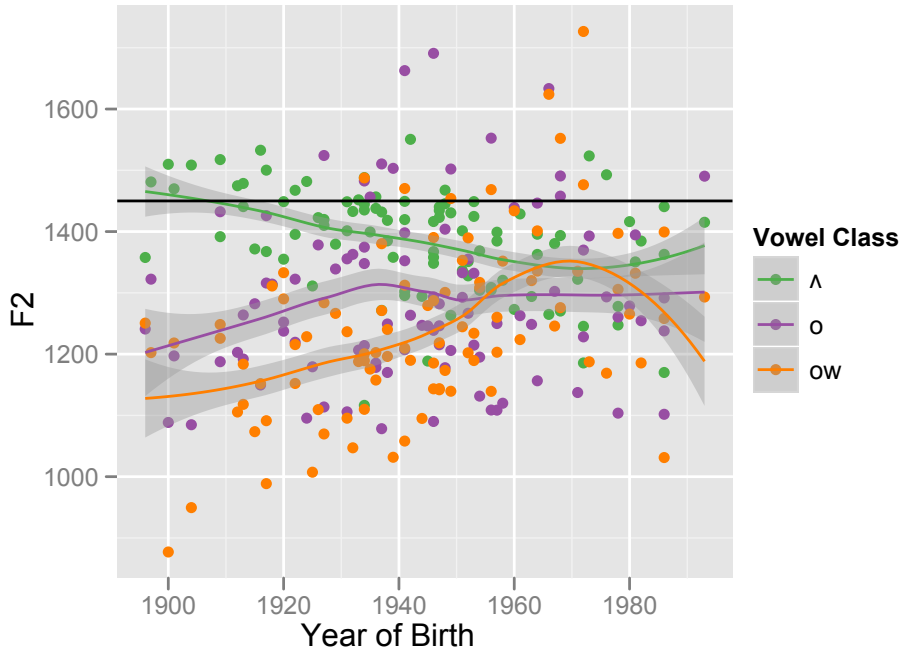

Figure 5.22 F2(o) and F2(ow) by speaker's year of birth alongside the altered F2(ʌ) [N=95].

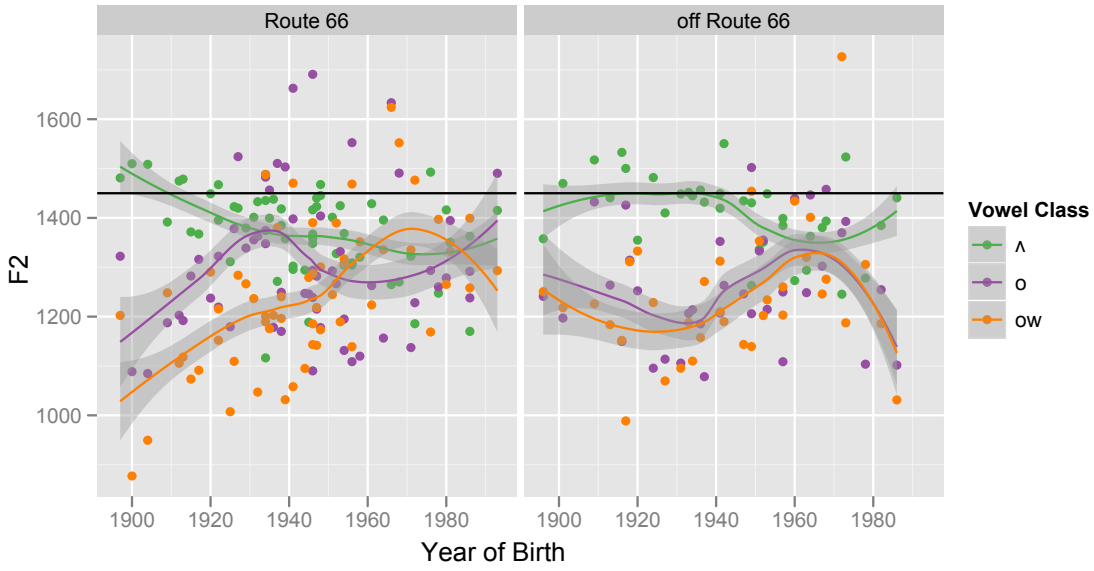

Figure 5.23 F2(o) and F2(ow) means by speaker's year of birth alongside the altered F2(ʌ), divided into speaker's location in relation to Route 66 [N=95].

observations can be made. First, not only does /ʌ/ back further on Route 66 than off, but between 1920 and 1945, /ʌ/ is consistently on the F2=1450 Hz line and does not become farther backed until the 1940's. In the same time period, /o/ on Route 66 is much farther fronted and, although it does not pass the F2=1450 Hz line, it does overlap with /ʌ/. As far as the parallel /ʌ ow/ measure, altering /ʌ/ in this way does not transform one segment of the population to be more similar to the Midland or NCS. In addition, the alteration of /o/ in the previous section also is not strong enough to fix this issue, as seen in Figure 5.24. In fact, doing so has more of an effect upon the off Route 66 speakers, bringing /o/ slightly (but not significantly) in front of /ʌ/ around 1960.

By comparing /ʌ/ to /ow/ for Corridor speakers and altering F2(ʌ) to subtract out the estimated Midland fronting of /ʌ/, it is possible to see more speakers showing the UD criterion (ʌ~o reversal). Although /ʌ/ does see a substantial change in the direction of what one would expect based upon influence from the NCS, /ʌ/ and /o/ only move

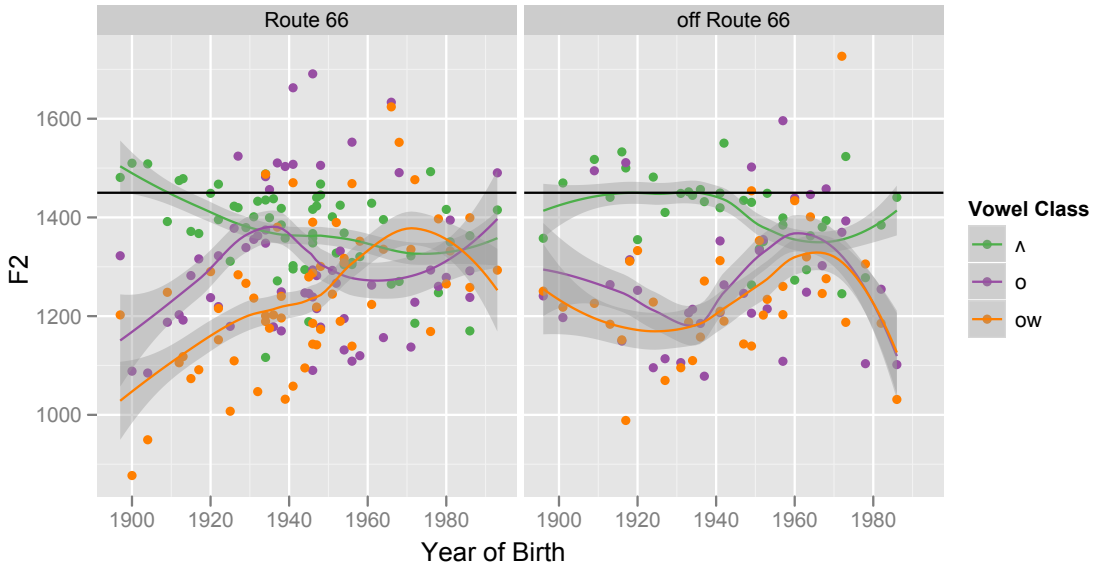

Figure 5.24 F2(ow) means by speaker's year of birth alongside the altered F2(o) and F2(ʌ) values, divided into speaker's location in relation to Route 66 [N=95].

enough to come into contact and not enough to overtake the Corridor. Therefore, even with altering the values of /ʌ/ to account for the Midland influence, we can still see that /ʌ/ and /o/ do not reverse and the finding of NCS influence and retreat is still intact.

5.6 Conclusions and revised NCS criteria

In the beginning of this chapter, we considered the small numbers of NCS criteria that were satisfied by Corridor speakers in this study. In studying the opposing effects on these vowels by both the NCS and Midland features (and the nasal /æ/ system entering the Corridor), it appeared likely that there was some interference going on between the Midland and NCS features themselves that may be obscuring the true effect the NCS had on the area. Since the ANAE criteria were meant as a way to measure NCS features using the findings of the ANAE itself and we do not stick to these strict criteria guidelines, it is possible that more criteria are satisfied in the Corridor than previously presented. In Table 5.2, I present the number of speakers who satisfy these new criteria

Speakers with criterion satisfied	AE1	O2	EQ	ED	UD	OW	KUW	oT~ohT	AW
Original criterion	7	13	3	7	9	58	37	9	66
Altered criterion	12	18	3 (no change)	9	28				

Table 5.2 Number of speakers with NCS and Midland features satisfied, plus those with the alterations from this chapter.

alongside the original counts of NCS criteria satisfaction. Altering the NCS criteria in a number of ways to account for other dialectal factors, although in varied ways, had the effect of increasing the number of speakers with each criterion in a variety of different ways.

In looking at the raising of /æ/ and increased presence of the nasal system in Corridor speakers, it became clear that the nasal system was preventing the raising of /æ/ and therefore interfering with both the AE1 and EQ criteria. By using the secondary raising criterion by Dinkin (2009) involving the height difference between /æ/ and /o/ in terms of standard deviations, 5 more speakers were determined to have the AE1 criteria. The EQ criterion alternatives (F1(e)<700Hz, F2(æ)>F2(e) + F1(e)<700Hz, or F2-F1(æ)>F2-F1(e)) were not as effective at determining what /e/ lowering would be on its own.

For O2, the conditioned low-back merger found in the Midland appeared to be interfering with /o/ fronting. In order to counter this, I looked at the /o/ tokens that were not followed by voiceless stops (meaning not in the conditioning environment). In doing this, I found an additional five speakers whose F2(o)>1450 Hz and thereby satisfy the criterion. Furthermore, two speakers who previously had not satisfied the ED criterion (F2(e)-F2(o)<375 Hz) with their unaltered F2 now satisfy the ED criterion using these new F2(o) values.

Finally, in considering the opposing forces of Midland /ʌ/ fronting and NCS /ʌ/ backing, I found that the parallel nature of /ʌ/ and /ow/ found in both the NCS and the Midland could play a role. Since /ow/ fronting is a separate Midland feature documented in both the Midland in general and the town of Farmer City, within the bounds of the Corridor, it followed that one could use it as a guide, subtracting its excess fronting from /ʌ/. By doing so, I found an additional 19 speakers with F2(ʌ)<F2(o), making it the most popular measure of the NCS in the Corridor.

In remeasuring the effect of the NCS on Corridor speech, an additional 13 speakers gained at least one NCS variable while 6 others gained at least one new satisfied criterion. The distribution of these newly fulfilled NCS criteria by year of birth and location relative to Route 66 appear in Figure 5.25 below. Despite almost a third of speakers now having at least some NCS influence, the original pattern is mostly kept, but amplified for both Route 66 and off Route 66 speakers. In addition, now instead of the NCS influence almost entirely disappearing for Route 66 speakers for those born around

1970, the NCS features decrease but do not disappear entirely. Since younger speakers also fulfill these criteria, an entire disappearance and re-emergence would seem unlikely. The NCS peak in the 1930's is still there and now overlaps with the Midland features, showing an even closer relationship between the two.

One new finding from these new features is the emergence of two off-Route 66 speakers born before 1920 with NCS features. Although these two speakers are from different towns that are over 50 miles apart, they were both born within a year of each other and both show the new UD criterion (F2(ʌ)<F2(o)). Although two lone speakers from separate sides of the Corridor do not prove some early NCS influence, the fact that

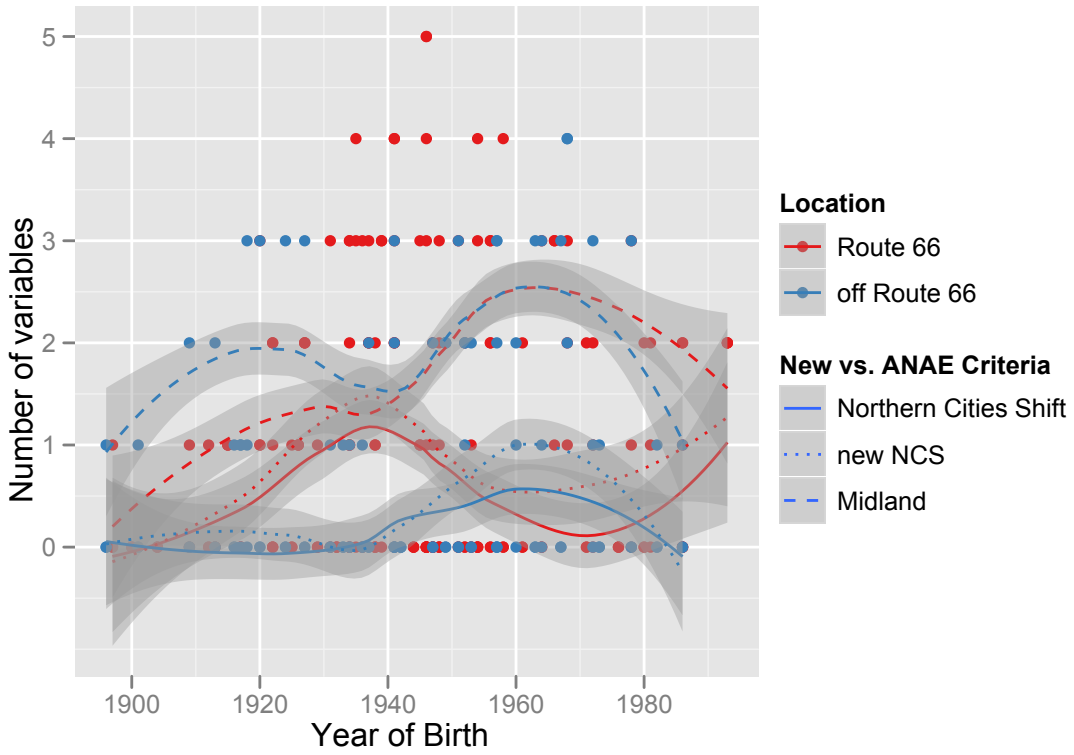

Figure 5.25 Average number of ANAE Midland and NCS criteria in addition to the altered NCS criteria satisfied by year of birth, divided into those living on Route 66 and those not living on Route 66 [N=95].

they are similar in many ways is intriguing.

Overall, though, the influence that might have been felt from the Inland North does not take on a new character or increase to an extreme degree. The NCS influences the Route 66 area of the Corridor, then retreats, followed by influence spreading to the surrounding areas. Because the Route 66 influence does not entirely disappear with the new criteria measures, the transfer from Route 66 to the surrounding areas does seem more plausible. Most importantly, though, the findings from this chapter indicate that there may in fact be some interaction between the Midland and NCS in the Corridor, as I contend in earlier chapters. While I explored the force of the Midland upon the NCS in this chapter, there is clearly some influence from the NCS temporarily interfering with

the spread of the Midland. The small retreat of the Midland dialect features for those born between about 1930 and 1945, when the NCS was at its peak, is very likely reflecting this same interference. However, unlike the NCS, the Midland dialect goes on to flourish in the entire area, taking away any mild distinctions between Route 66 and the surrounding areas. Therefore, although the NCS and Midland dialects may come into contact in the Corridor and spread through the same population, the two dialects affect the Corridor dialect in very distinct ways.

CHAPTER 6

Conclusions

6.1 Population movement and the NCS dialect

When setting out to research the St. Louis Corridor, one of the primary goals was to determine whether the NCS existed in the Corridor dialect and the extent of the dialectal influence. The data from previous studies, such as ANAE, Bigham 2010, and Murray 2002, had shown some NCS influence, but the previous studies also demonstrated key differences between Corridor data and the NCS in the Inland North. Once I had resolved whether there had been NCS influence, the next step would be to determine when it entered the area's dialect, how it had done so, and where it came from.

The question of actuation remains murky for the NCS itself, with some indication of how it spread so evenly throughout the Inland North (as discussed in Section 1.3.2). However, the new data from the Corridor showed that most of the NCS features followed the same path over time, with NCS features that can be categorized as older or newer in the Inland North showing little temporal distinction. The addition of new interviews from speakers representing a variety of ages and birthplaces gave a more detailed picture of influence and retreat. Instead of a steady change over time or uneven influence, what I found was a temporally constrained period of NCS influence on the dialect, followed by a sudden retreat and a period of lower NCS influence. Route 66, the first paved highway in the state, was intended to connect small towns and provide an easier to navigate path between Chicago and St. Louis, and ultimately Chicago and the West. When comparing the dialect along the path of Route 66 to the surrounding areas, the finding was even stronger: not only was the initial influence found only in speakers born on Route 66

between the time of its paving and its eventual bypass of the small towns, but the later influence was mainly speakers not found on Route 66. This meant that not only was the evidence of NCS constrained to a very short period of time, but to an area with a shared history of movement. In addition, the later influence, which was not as strong, could have been a result of other mechanisms of dialect spread. Stanford and Kenny (2013) argue that a simple density of interactions can explain the effects of dialect spread, that as long as enough speakers with the dialect features interact with those without, the effects of the dialect spread show in the affected area. Considering the difference in size between Springfield and the towns surrounding it, the secondary influence from Springfield to the area around it may just come down to a matter of the frequency of interaction increasing.

When considering the pattern by which the NCS spread in the Corridor, the history of Route 66 was also not the only corroborating evidence. This rise and fall pattern of the dialect mirrored population data and descriptions of population movement from the same time: the population moved away from Chicago and the big city centers near the Great Lakes and towards the center of the state, where farms made food more plentiful. Farmland has always been an important part of the culture in the Corridor and agriculture continues to be a big business throughout the area. In addition, the data analyzed in this study corroborates evidence found in social histories and the census: the population center of the state moved southwest for the first and only time in the history of the census. This meant that either a large segment of the Chicago population was moving away or people were flocking to the center of the state, or both. At that point, roads on

Route 66 were more manageable and provided a place for these migrants to find a new home.

The nature of dialect studies is that they are generally constrained by the age of their oldest participants. The same patterns exist in each data set, shown through the comparison in Section 3.2 of the newest data in Figure 3.3 to the data from all sources (new interviews, ANAE data, and oral histories) in Figure 3.4. However, the new data on its own is not capable of the same level of detail. If the only available interviews were those collected in 2011 and 2012, the conclusions in this dissertation would have been somewhat different. For instance, the oldest speaker from the set of interviews collected in the course of this study was born in 1922 and was almost 90 years old at the time of the interview. Although he was a long-time resident of Springfield and had a great deal of interaction with outsiders, he demonstrated no NCS features. Because the data in this study reached farther back in time than the NCS influence on the Corridor, it is possible to see the entire arc of the dialectal change in progress. In fact, in comparing the three separate data sources (new interviews, ANAE, and oral histories) according to year of birth in Section 3.3, the three sources of data show a parallel development, while a similar graph showing speaker's age at the time they were interviewed diverged greatly. Because of this, I was able to conclude that dialect change was happening at the community level while age grading was not occurring. Although the strongest period of NCS influence occurred in the 1920's, which I would have found in my own data, additional interviews allowed for a more nuanced picture of the dialect based upon a greater number of data points. In fact, it was in combining the multiple sources of data

that I was able to go back farther and into more detail that I would have been able to with recently-collected interviews alone.

6.2 The St. Louis Corridor dialect

The first goal of this study, to determine the influence of the NCS, does not fully describe the linguistic situation because it does not take into account the other Corridor dialect influence, the Midland. While this study shows a very clear picture of movement and retreat of the NCS, the Midland dialect situation is not as clear-cut. The Midland dialect has not previously been presented as a cohesive dialect but a disjunctive combination of features and predictably shows more variation than the NCS. In Section 6.2.1, I will discuss the implications for the differences found between the two and what this means about the sources of the two dialects. This leads to the question of dialect boundaries and how effective the existing views of boundaries are at describing the relationship between the two dialects. In Section 6.2.2, I describe a new denotation for the type of dialect spread found in the Corridor, a dialect boundary "breach." Finally, I discuss in Section 6.2.3 the roles speech communities play in the Corridor dialect.

6.2.1 Dialect sources

One of the central questions of this dissertation is to determine the origin of the two main dialects present in the Corridor. Past research on the Corridor has not focused on the origin the Midland dialect in the area, but the ANAE, Stanford and Kenny (2013), Bigham (2010), and Murray (1993, 2002) all assume the NCS variables spread because of influence from Chicago. Since Chicago is the closest Inland North city and the NCS is an Inland North feature, this is a logical conclusion. Because all five NCS criteria were

found in the study and not simply a subset (Figure 3.5 in Section 3.2), I concluded that the origin of the NCS was in the Inland North. However, there is very little distinctive evidence about these features that point to Chicago as its origin. In the course of charting the nasal system of the Corridor in Chapter 4, I did find /æ/ fronting and a large spike in the raising of /æʃ/ that corresponded with the general trend of the NCS vowels. In her study of early NCS speakers from Chicago, McCarthy (2010) finds that /æ/ fronting preceded /æ/ raising. Additionally, McCarthy shows that /æʃ/ upgliding is an early Chicago feature, but this feature is not only from Chicago or Inland North: Kurath and McDavid also found /æʃ/ upgliding in the Midland. Although it is likely that the NCS would have spread from Chicago directly, there is no distinctive linguistic evidence that points uniquely to that connection.

The Midland dialect, on the other hand, does not show a distinctive path but a general growth throughout the entire area over the course of the study. The Midland features do not appear to follow a straight path over time, particularly in the fronting of the conditioned low-back merger and the fronting of /Kuw/ (/uw/ after non-coronals). However, the features as a whole do not show demographic or geographic differences. One of the biggest differences between the spread of the Midland dialect and the NCS is that the Midland shows no preference for larger cities. In fact, it appears the feature changes are led by speakers who grew up outside of large metropolitan areas. Additionally, the feature that is undergoing the most change elsewhere in the Midland (namely the conditioned low-back merger) does not appear to be gaining in the region. In addition, the main two patterns shown in other Midland cities, the conditioned merger giving way to the unconditioned merger and the diffused /æ/ system being replaced by

the nasal /æ/ system, do not seem to occur over the time period studied. Therefore, it appears as though the rise of the Midland dialect in the Corridor did not originate in the other cities of the Midland. Additionally, it does not appear as though the nasal /æ/ system in the Corridor results from the diffused /æ/ system, meaning it is unlikely to have direct influence from areas with the diffused system.

6.2.2 Dialect boundary vs. "dialect breach"

The types of dialect boundaries that exist in situations of dialect contact have a variety of implications for patterns of dialect spread. Because the NCS and the Midland dialect co-exist in the same geographic area (and sometimes within the vowel system of a single individual), the type of dialect boundary that seems most appropriate is an overlapping boundary. However, in most cases of overlapping dialect boundaries, one boundary is moving toward another, overlapping at the edges, and possibly pushing one further back. In the Corridor, however, the Inland North-Midland boundary farther north appears to be mostly intact. Instead of one dialect area slowly encroaching upon another, analysis of the NCS in the Corridor dialect long-distance diffusion mainly between larger cities. At the same time, the progression of the NCS through the Corridor does not follow the path gravity or cascade models, from the largest city to the smaller ones in succession of size and distance. St. Louis during the 1940's was more than ten times the size of Springfield and Springfield is a third of the way from St. Louis to Chicago. With those characteristics, either model would predict that St. Louis would have obtained the NCS features first, but they are about the same in both locations.

Because the NCS shows these characteristics in the Corridor, I propose instead that the boundary between the NCS and the Midland would best be characterized as a **dialect**

"**breach**." Instead of proceeding as a dialect front, the influence keeps the original boundary intact and instead shows focused influence for a few decades before retreating. This convergence of dialects does not leave a lack of dialect features or generalized features in its wake, but retains the original Midland features. In addition, unlike the overlapping boundary found at the edges of the Inland North in Upstate New York, where Dinkin (2009) finds that the NCS slowed but did not stop the spread of the nasal system, the Midland features actually reverse for a time but then continue in an upward trajectory.

6.2.3 Speech community

The idea of a speech community is important in this dissertation, mainly because it appears as though the area is simultaneously two speech communities and one single speech community. When it comes to NCS influence, the area on Route 66 generally acts as one speech community (to varying degrees). The changes apply to Route 66 and off Route 66 speakers during different time periods. In fact, it appears as though the change first affects one speech community (Route 66) then as it is losing steam, the other speech community (off Route 66) picks up those same variables to a lesser degree. However, the community as a whole acts in a different way when it comes to Midland variables and the nasal system. The Midland variables do not appear to respond to location, town size, or any of the demographic characteristics of the Corridor. In fact, for the nasal system, the progression is seamless from no nasal system to a gradual nasal system and finally to a nasal system. There is a short period of time in the early development of the Midland dialect when the Route 66 speakers lag behind the off Route

66 speakers, but even then the growth of the dialect for the two groups is heading in the same direction.

6.3 The role and interaction of variables

Although the population and the history of the Corridor play an important role in shaping the dialect in the Corridor, the specific vowels of the two dialects also show some interesting interactions. With the exception of the low-back merger, the dialect features show continuous movement, not binary features. However, in order to consider the features together, the NCS and Midland criteria transform these continuous variables into binary features. In Section 6.3.1, I will discuss the continuous nature of the features themselves and the alternative solutions created for measuring these features using binary distinctions. The features in these two dialects show overlap at the phonetic level, where multiple forces act upon these vowels simultaneously. Because of this, we might not be seeing the true effects of each dialect for these vowels. In Section 6.3.2, I will discuss the interactions found between individual vowel features and in the NCS and Midland dialects and conclusions drawn about the effects that may be obscured.

6.3.1 Continuous vs. Binary data

In this dissertation, 8 out of the 9 features looked at were continuous in nature. Only one of the criteria used in the graphs comparing NCS and Midland dialects is at its root a binary feature (the low-back merger). The other 8 were all continuous variables with binary distinctions fit onto them. For instance, although /æ/ raising is on a continuum from low in the vowel space to near the mid or high vowels, the ANAE considers F1(æ)<700 Hz to be raised and anything greater than 700 Hz to not be raised. Although

some of these distinctions are relative (particularly the F2 reversal of /ʌ/ and /o/), most contain a numeric F1 or F2 value as a guidepost.

This type of analysis is useful in looking at a number of variables at once and allowing comparison between the dialect features of speakers on a comparable scale. Without binary features, for instance, it would not be possible to plot the two dialects on a map at the same time, nor would comparisons between features that move along the F1 or F2 axis only. The primary finding of this study, that NCS features show up at a specific point in time and retreat in addition to coinciding with a temporary Midland reversal, would not be as robust without the ability to compare all these variables at once.

However, most of the vowel movements of the variables in the Corridor happen gradually and not all at once. This method of reducing features to binary criteria has the drawback of allowing speakers with some influence to be categorized as non-adopters. Although technically they do not satisfy the strong NCS or Midland criteria, as categorized by the ANAE, they still show some movement towards these targets. The graphs that show F1, F2, or a combination of F1 and F2 on the y axis over time do allow a closer look at the vowels themselves. However, the findings from those graphs alone are not as robust.

6.3.2 Variable interaction

Another aspect of this study was the interaction between features at the level of the vowels themselves. In looking at multiple dialect features at once (for example Figure 3.4 from Section 3.2), it was apparent that the rise of the NCS was somehow interacting with the Midland features and causing them to reverse their upward trajectory. In addition, the rise of the nasal system (found in the Midland but not considered a Midland

criterion) appeared to be blocking the raising of /æ/. Looking more closely, it became apparent that there were individual vowels that were being acted upon by both dialects. Midland /ʌ/ fronting and NCS /ʌ/ backing was the most extreme example of this (despite the fact that /ʌ/ fronting was not included in the Midland variables and therefore did not directly appear on graphs of binary features), but the conditioned low-back merger and /o/ fronting also appeared to be interacting. Although the Midland features were not interfering with /e/ lowering, the one measure of /e/ lowering, EQ, was also likely affected by the blocking of /æ/ raising.

In modifying the NCS criteria in Chapter 5 to correspond more to the relative movements (in the case of /æ/ raising) or pulling apart the influence of both dialects upon a single vowel (for /ʌ/ backing, /e/ backing or lowering, and /o/ fronting), I was able to show an even greater NCS effect. At the same time, the general pattern for the NSC by year of birth remained. Therefore, although there may be some direct interaction between specific vowels or the dialects as a whole, the findings remain. In sum, although the binary criteria presented in this dissertation may not account for the full range of NCS or Midland effects, it does seem as though the pattern they show is present for both the ANAE criteria and modified criteria based upon relative movement and vowel interaction.

6.4 Finding the paths of linguistic influence

At the outset of this project, I had a general sense that the NCS had come from the Inland North, likely Chicago, and the Midland dialect was spread through the area in some other way. These conclusions were borne out through the collection and analysis of data, but not quite in the ways expected at the outset. Most importantly, what was found was not a

change that was slowly taking hold in the communities, becoming stronger with age, or following the scales of population. For the NCS, it was transportation that likely brought the dialect, while for the Midland, the spread is so even that it is unclear how exactly it entered the system. In this section, I discuss the findings as they pertain to transmission and diffusion, contact and how it brings about linguistic change, and how I used non-linguistic variables to bring more explanatory power to the findings.

6.4.1 Transmission and diffusion

As discussed in Chapter 1, there are two main ways in which dialect features are spread within or between populations. Dialect diffusion generally applies to the spread of variables from adults to other adults, while transmission is the faithful reproduction by children of their parents' or caretakers' features. Each has its own characteristics, mainly that transmission to children maintains a level of phonemic detail not reproduced by adult learners and that children incrementally propel a change further than the adult generation.

Because the NCS features on Route 66 appear rapidly and disappear after a generation, it is likely that child adopters played a role in its growth. Yang (2009) contends that once there is a certain percentage of the population with a feature (in the study he was considering, this was the low-back merger), a threshold is hit and the feature spreads throughout the dialect. The retreat of the NCS could then be considered a failure of that generation to transmit the dialect to their children, as well as the disappearance of the initial diffusion influence. However, because speakers have kept these features throughout their adulthood without any additional influence, it is likely that they adopted these features in childhood, possibly from diffusion from adults or other children in their peer group, and that this was a child-led change.

On the other hand, the Midland dialect does not show a similar pattern. In fact, the dialect features become increasingly stronger and more prevalent over time. Because of this incremental change, it is likely that however the changes might have come about in the Midland dialect, they are now a part of the dialect of the parents' generation and have been faithfully transmitted to their children.

6.4.2 Types of contact

One of the issues explored in this dissertation was the effect of direct and indirect contact on the spread of the NCS in the Corridor. Many studies, including the model in Stanford and Kenny's (2013) work, depend upon direct contact and transmission to account for language change. Based upon the types of opportunities present in the Corridor for direct contact, such as local businesses that cater to travelers, it is possible that extended periods of contact with Inland North speakers could have had an effect upon individuals' dialects. Within the community, there has been a strong tradition of men from different socioeconomic levels interacting on a daily basis. Their daily meetings at Liars Tables at local diners would have given many opportunities for grown men to interact with relative newcomers to the community who in theory could have brought with them the NCS.

Another possibility for direct contact depends upon the strong connections among community members and particularly the role of neighborhoods. This is especially important in cities and small towns, where neighborhood kids played on a regular basis and adults interacted and helped each other out. Even farmers who lived miles apart knew their close and distant neighbors well and helped each other out during times of need, such as a fire or a crop failure. This heightened sense of community, which is tied

to the social network model advanced by Milroy (1980), may have contributed to language change in the direction of the newest speakers from the Inland North.

6.4.3 Using Social Variables in Dialect Studies

This study of the St. Louis Corridor is primarily a linguistic study, looking at specific variables found in neighboring dialects. However, I also explored quite a few non-linguistic variables with bearing on the social situation in the Corridor in conjunction with the linguistic ones. For instance, census data gave a clearer picture of who was moving into Springfield in the late 1930's and where those individuals were born. Of course, the level of detail was not ideal, as a person born in Chicago and a person born in southern Illinois were both registered in the census data as having been born in Illinois. However, the migratory data from the 1940 census backed up many of the findings from the linguistic data. Most notably, that a good percentage of the migrant population had moved from the Inland North, more so than the general Midland area. In addition, the calculations of the population center of the state, based upon census records, gave the same general picture for the 1930's, that the population was moving away from Chicago and toward the center and southwest of the state.

Another piece of corroborating evidence was the traffic patterns in the Corridor. The history of the area shows when Route 66 was paved, rerouted, and widened, but data from historic traffic maps showed the daily average traffic flow in the area. With this information, I was able to see just how much movement occurred on each of the segments of Route 66 over time. That, along with the general history of the road, gave a more complete picture of how daily movements might have looked back in the first half of the century.

However, this non-linguistic information does not account for the spread of Midland features throughout the Corridor. If the population was generally moving along Route 66, then it would follow that areas along Route 66, particularly the big cities, would see a greater number of Midland features. In this sense, the area acts as a single speech community with very little distinction among location, population, or demographics. Therefore, the Midland dialect is not a change driven by population movements and historical events, but likely one that spread from parent to child, becoming stronger over time through incrementation. Therefore, although some dialects can be modeled through population density, distance, or other factors, the Midland dialect in the Corridor is an example of a modern day gradual spread throughout a large geographic area.

6.5 Future directions for research in the Corridor

This dissertation answers a number of questions, about both the St. Louis Corridor in particular and the nature of dialect spread and interaction in general. This area, which has resisted description, now has one possible explanation for its unique status as a NCS enclave in the Midland region. At the same time, there are a number of areas that this dissertation was not able to cover. The geographic spread, while it covered a large area, did not touch upon the area between Bloomington (the north end of Route 66 in the current study and Chicago), a distance of almost 150 miles. The lack of a large city center makes this area unlikely to have NCS features, but it is not out of the realm of possibility. Another segment of the population this study did not focus on was younger speakers. Bigham's (2010) study of college students found that younger speakers from the Corridor do have NCS-like features in their speech. This younger group, while not at the front of this dialect change, would show the current situation in the Corridor and

answer the question of whether the adolescent peak is indeed responsible for the trends that might be found for the youngest speakers in this study.

Another mostly unanswered question pertains to the threshold of dialect change. Because there are very few mergers and splits in the data, and even fewer that only affect one dialect or another, in dealing with the Corridor it may not be possible to use the type of calculations that Yang (2009) used for the low-back merger in Massachusetts. However, since it appears as though the retreat of the NCS in the Corridor may be a result of not reaching a minimum threshold of speakers, this is a path worthy of exploration.

Finally, the census data presented in Section 3.6 gives a small peek into the migration situation of the late 1930's in Springfield. However, the records for the towns on (and off of) Route 66 are also available. Analyzing those and comparing the makeup of migrants to a place like Springfield to the smaller nearby towns may give some more insight into why these features appeared in some locations and not others.

APPENDIX A

Interview Materials

Sample Recruitment Texts

In person interviews:
Hello, my name is Lauren Friedman and I am a graduate student at the University of Pennsylvania. As part of my research on this area, I am interviewing people who grew up around here, asking them about their childhood, family history, language use, and experience living in this area. Do you have a few minutes to talk to me? The interview can be as long or as short as you like. Would it be ok if I recorded this conversation?

Over the phone for interview referrals:
Hello, my name is Lauren Friedman and I am a graduate student at the University of Pennsylvania. As part of my research on this area, I am interviewing people who grew up around here, asking them about their childhood, family history, language use, and experience living in this area. [Name of acquaintance] told me you might be able to help me out with that. Do you have a few minutes to talk to me, either on the phone or I can meet you somewhere? The interview can be as long or as short as you like. (If interview is over the phone:) Would it be ok if I recorded this conversation?

Email interview referrals:
Dear ___,
Hello, my name is Lauren Friedman and I am a graduate student at the University of Pennsylvania. As part of my research on this area, I am interviewing people who grew up around here, asking them about their childhood, family history, language use, and experience living in this area. [Name of acquaintance] told me you might be able to help me out with that. Do you have a few minutes to talk to me, either on the phone or I can meet you somewhere? The interview can be as long or as short as you like. Please email me back at lfri@sas.upenn.edu or by phone at (847)769-3594. I will be in the [name of town] area for the next [week, few days, etc.] and I hope to hear back from you before I leave. Thank you!
Lauren Friedman

A TELEPHONE SURVEY OF SOUND CHANGE IN PROGRESS IN NORTH AMERICAN ENGLISH

Linguistics Laboratory, University of Pennsylvania

---ST LOUIS CORRIDOR VERSION---
(FOR THE AREA BETWEEN CHICAGO AND ST. LOUIS IN ILLINOIS)

0. Approach.

Hi, my name is _____. I'm calling from the University Pennsylvania in Philadelphia. We're doing research on communication between people from different parts of the country, so we're looking for people who grew up in one place to tell us a little about how people say things in your area. Did you grow up in _____? *If yes*: Can you take a few minutes now to answer some questions?

(*If unsure or want more information:* People across the country are talking to each other more and more, and at the same time we know that local accents are getting more different, in spite of the fact that we all watch the same TV programs. We want to find out how people talk in each region of the country and whether local ways of talking are changing in any way.)

In order to be able to keep track of everything you can tell us, I need to be able to make a tape recording of this conversation. Is that all right with you? (*If informant is hesitant*: I can assure you that this information is used only by our research group for our reports about general trends in American English, and no information identifying individuals is ever released. *If still hesitant*: If we come to a question you don't think you want to answer, just tell me and we'll skip it.)

Turn tape recorder on

This phone interview is being conducted to learn more about how people say things in your area [and you were chosen because of your location]. The interview will take about 15 minutes of your time and you will be one of approximately 30/60 participants. I will ask you a series of questions first about demographic information and about specific words. There are no known risks or benefits. Your participation is voluntary and you may drop out at any time. If you agree to participate, you have the right to only answer the questions you choose to answer. This will be recorded but your identity will be kept confidential and erased before this interview is shared with other researchers. If you have questions or concerns regarding this research, you can contact the PI William Labov at the University of Pennsylvania. Do you have any questions? Do you agree to voluntarily participate in this survey?

1. Residential and Language Background.

Confirm place of birth: Now, were you actually born in _____?

Full residence history and approximate ages in each location.
Where mother born.
Where father born.
Languages spoken in family while growing up.
Second language learning.

2. Conversation.

2.1 Communication Experience and Travel:

- Have you noticed that people in different parts of the country talk differently from yourself? What sort of differences have you noticed?
- Have you ever had a problem understanding people in other parts of the country because of their accent or because of different words they used?
- Where have you travelled?
- Have you been to Canada? Did they talk differently there?

2.2 Local Color:

- What's your town like? Would you say it's a nice place to live?
- What do most people do for a living in your area?
- Are there any big local industries?
- Is the economy doing OK?
- Are people moving in or moving out?
- What do you do for fun on the weekends?
- What other cities do you go to for recreation or shopping? (*Pick 2 or 3 largest cities in vicinity and explore the choice between them for different activities.*)

2.3 Chicago and St. Louis:

- When you think of Chicago, what is the first thing that comes to mind? What about for St. Louis?
- Do you have any favorite sports teams? **Kansas City Chiefs (fb), Royals (bb); St. Louis Rams (fb), Cardinals (bb), Blues (h); Chicago White Sox (bb), Cubs (bb), Bears (fb), (Black)hawks (h)**
- When growing up, did you have friends that were from St. Louis or Chicago?
- Do people from your area ever identify as being from St. Louis? Or from Chicago?

3. Wordlists.

Now I'm going to ask you to say a few things for me that will help us with our study.

a) First of all I'd like you to count for me from 1 to 10.
b) And would you please say the days of the week?
c) And now could you please list as many articles of clothing as you can think of.

If necessary, elicit:

- PANTS: what's another word for slacks or jeans?
- COAT: what's another word for jacket? (longer, dressier)
- HAT/CAP: what would you wear on your head?
- BOOTS: what does a construction worker or a cowboy wear on his feet?

d) And now could please tell me what sort of things people around your area eat for breakfast, especially if they go out for a big breakfast on the weekend?

If necessary, elicit:

- EGGS: What are omelettes made of?
- BACON/SAUSAGE/HAM: What meats do people eat with eggs?
- TOAST: What do you put butter or jam on?
- COFFEE/TEA: What do people drink with breakfast?
- PANCAKES/HOTCAKES/FLAPJACKS:

Are there any special local foods or dishes that your area is known for?

e) And finally could you list as many farm animals as you can think of?

If necessary, elicit:

-DUCK(S): what (other) kinds of bird might you find on a farm?

4. Formal Elicitation of Linguistic Variables.

Now I need you to say certain words, but I don't want to say them first because that may influence the way you say them. So I'll ask you questions that get you to say the words and then we'll talk about whether certain words sound the same or different to you. OK? (It's not a test or anything; it's just a way of getting you to say certain words. I'll give you as many clues as you need.)

4.1 (o-oh):

a) If a mother deer is called a doe, what would you call a baby deer? [FAWN]

b) What's another word for sunrise, or for the first part of the day when the sun's just coming up? [DAWN]

c) Do those words rhyme? (Could you use them to rhyme in a poem?)

d) Can you think of any boy's names that rhyme with those words? [DON, RON, JOHN?]

If necessary, elicit:

- DON: What's the first name of Walt Disney's famous duck? What's short for that?

e) Does that name sound the same as the word for *sunrise* you just said? (If someone said those two words to you over the phone, could you tell them apart?)

f) Can you say them again for me? (*If necessary*: which one was first?)

g) What's another boy's name that starts with D and ends with N? [DAN]

a) What's the past tense of *catch*? (Like if today I catch the ball, yesterday I ...?) [CAUGHT]

b) What's the opposite of *cold*? [HOT]

c) Do those words rhyme?

d) Can you say them for me one more time?

if these rhyme
a) What do you call a circular mark? A polka _? [DOT] (SPOT works too)
b) What's the past tense of "buy"? [BOUGHT]
c) Do those words rhyme?
d) Can you say them for me one more time?

a) What does a child put on his foot before he puts his shoe on? [SOCK]
b) What's another word for *speak* that starts with a T? (Like what we're doing on the phone right now.) [TALK]
c) Do those words rhyme?
d) Can you say them for me one more time?

a) What's the opposite of *shorter* (if you're talking about the height of people)? [TALLER]
b) How much money do four quarters make? [DOLLAR]
c) Do those words rhyme?
d) Can you say them for me one more time?

a) What's the opposite of *off*? [ON]
b) *If the informant made a distinction between* DON *and* DAWN: Going back to the two words we had before, the guy's name spelled D-O-N and the girl's name D-A-W-N, which of those would you say the word ON sounds like?

4.2 Semantic Differentials (1):

Now I have a few questions about the meanings of different words. Tell me, in your opinion,
a) What's the difference in meaning between a BUNK and a COT?
b) What's the difference between a HOME and a HOUSE?
c) What's the difference between a POND and a POOL?
d) What's the difference between a DECK and a PORCH?
e) What's the difference between to SIT and to SET?
f) What's the difference between a MOUSE and a RAT?
g) What's the difference between a SPOT and a SPECK?
h) What's the difference between a TOAD and a FROG?
i) What's the difference between a COTTAGE and an ABODE?
j) What's the difference between a THOUGHT and a DOUBT?

4.3 Lexicon:

a) What's the general term you use for a carbonated beverage in your area? [POP, SODA, COKE, etc.] (*If unsure*: if you were going to buy a can of Coke or Pepsi or Sprite out of a machine, what would you call the machine?)
b) What do you call it when you prepare meat outside over a charcoal fire in the summertime? [GRILL(ING) (OUT), BARBECUE, COOKOUT]

c) Do grilling and barbecuing mean the same thing? *If no*: what's the difference? [SAUCE]
d) *If not already answered:* What kinds of things would you barbecue? Grill?
g) What's a nickname for an internet start up company? [DOT-COM]

4.4 (i-e/_N):

a) What would you use to sign a check with? [PEN]
b) What would you use to fasten a cloth diaper? (A safety ...) [PIN]
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.

(*If* pin *and* pen *are close or the same*:
a) If you gave a book to Mary you'd say I gave it to *her*; if you gave it to John you'd say I gave it to ... [HIM]
b) What do you call the bottom part of a dress where it's folded up and sewn in place? [HEM].
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.)

4.6 (ah-oh-ow/_r):

a) What kind of animal runs in the Kentucky Derby (what does a cowboy ride)? [HORSE]
b) What do you call the way you feel when your throat is kind of scratchy and sore so you can't talk very well? [HOARSE]
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.

(*If* horse *and* hoarse *are close or distinct*:
a) What do you call the first part of the day, before noon? [MORNING]
b) When someone is grieving because somebody close to them has just died, you say they're in ... [MOURNING].
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.)

a) What's the thing that runs between an electrical appliance and the wall socket? [CORD]
b) What's the thing you write *Happy Birthday* or *Merry Christmas* on? [CARD]
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.

(*If* cord *and* card *are close or the same*:
What's the building a farmer keeps his animals in? [BARN]
What do you say happened to you on the day of your birth? You were ... [BORN]
c) Do those words sound the same to you?

d) Say them again for me and tell me which one's which.)

4.8 (uw/[+cor]_ vs. uw/[-cor]_):

a) What's the place where animals are kept? [ZOO]
b) What does a ghost say? [BOO]
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.

a) What do you call a mountain of sand? [DUNE]
b) If the earth revolves around the sun, what revolves around the earth? [MOON]
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.

a) What are the different spaces of a house called? [ROOM]
b) What's the sound an explosion makes? [BOOM]
c) Do those words sound the same to you?
d) Say them again for me and tell me which one's which.

4.9 æ before voiceless stops and anterior voiceless fricatives:

a) Two of what make a whole? [HALF]
b) What's a covering you wear on your head? [HAT]
c) Do those words sound the same to you?
d Say them again for me please?

a) If something is funny, how do people react? [LAUGH]
b) If you're sitting down, what's the area on top of your legs? [LAP]
c) Do those words sound the same to you?
d Say them again for me please?

a) What is the green stuff on a lawn? [GRASS]
b) What is a rodent that's like a big mouse? [RAT]
c) Do those words sound the same to you?
d Say them again for me please?

6. Personal History/Demographic Data:

Those are all the language questions I have for you. Now I just need to ask you a couple more things so that we can place you properly in our sample.

a) What year were you born?
b) Where did you go to high school?
c) What were the main racial and ethnic groups in your school? (*approx. %, if appropriate*)
d) What's your own family's ethnic background? (--> *conversation*?)

e) What is/was your father's occupation? Your mother's? (--> *conversation*?)
c) Did you take any schooling beyond high school? What, where?
d) What's your occupation? (--> *conversation*?)

- Do you enjoy your job?
- What exactly does it involve?
- So tell me, since you're an expert in this, I've always wondered ...?
- *etc., as appropriate*.

7. Continuing Contact:

There's just one other thing I'd like to ask you to do. As you can tell, we try to get everybody we talk to to say certain words and the easiest and quickest way to do that is to mail out a list of words that people can read back to us over the phone, which takes about five minutes. If I mailed you a wordlist and then called you back in a couple of weeks, do you think you could spare five minutes to read me the list over the phone? *If yes*: Great, then I'll just need to get your name and address so I can send you the list. ... What would be a good time to get hold of you?

Well, once again, my name is _____, and I'm at the University of Pennsylvania in Philadelphia, and I'd like to thank you very much for the time you've taken to do this interview. You've really been a big help!

8. Answers to closing questions:

Q: So what's this study all about again?

A: This is a survey of changes in the way American English is spoken across the country. We're interested in finding out what changes are going on in different regions and how fast they're progressing. For instance, one of the things I was asking you about was how you said words like *hot* and *caught*, or *sock* and *talk*. This is one of the major differences between the way people talk in different parts of the country. Most people in the West say those words the same, as do people in Canada and in a couple of other areas (Pittsburgh and Boston), whereas people in the South, the Midwest and the East mostly say them different. We want to know where the borders are between these areas and whether they are shifting: our research suggests that the area where people say *hot* and *caught* the same may be slowly expanding.

Q: Why is this important?

It's important for several reasons. First, it's important to linguists, who want find out more about the way language changes. (Like how did the English language evolve from Old English to the language of Shakespeare to the language of today, and why do Americans talk differently from British people?) Second, it's important to people who study dialects, because while major European countries, like Britain, France and Germany, have national maps of linguistic variation the U.S. does not. Our project is the first attempt to study differences in the sounds of regional speech across the whole country. Third, it's important in developing more effective teaching methods, either in teaching English to adults or in teaching reading and spelling to children. (These strategies need to be sensitive to dialect variation, such as whether or not children will make a difference between *pin* and *pen*.) Fourth, it's important to the speech technology industry, because if computers are going to be taught how to understand human language, they have to be able to cope with different dialects. (Example: a computer at the phone company that needs to understand callers from one area who say *Don* and *Dawn* differently and callers from another area who say them the same.) We can provide some of the information that the computer designers need to create effective speech recognition technologies.

Q: Who is paying you to do this?

A: Our work is supported by a combination of public and private sector funding. We have grants from the National Science Foundation and the National Endowment for the Humanities with matching funds from a telecommunications technology company called Bell-Northern Research.

Q: What are you going to do with the results?

A: Eventually, we're working towards the publication of a *Phonological Atlas of North America*, which will include a series of maps showing how people talk in different parts

of the country. In the meantime, we'll be publishing papers on various aspects of our research in academic journals and making presentations at conferences.

Q: Can I see some of your results?

A: Certainly. I'd be happy to send you a couple of maps showing some of our results so far.

Example In-Person Interview Questionnaire
(example questions adapted from TELSUR and Q-Gen-II modules)
Linguistics Laboratory, University of Pennsylvania
St. Louis Corridor Version

Personal History/Demographics:
1. What year were you born?
2. Where did you go to high school?
3. What were the main racial and ethnic groups in your school? (*approx. %, if appropriate*)
4. What's your own family's ethnic background? (--> *conversation*?)
5. What is/was your father's occupation? Your mother's? (--> *conversation*?)
6. Did you take any schooling beyond high school? What, where?
7. What's your occupation? (--> *conversation*?)
8. How long has your family lived in the area?

Games:
1. Going back to the time when you were a kid, 10-12 years old, what were some of the games you used to play after school, on the street (or in a lot)?
    How did you play that?
2. Do you play any games where everybody hides and you have to go out and find 'em? How do you play that here?
    What are the rules?

Danger of Death:
1. Have you ever been in a situation where you were in serious danger of getting killed (where you said to yourself, "This is it!")
    What happened?
2. Was there ever anything that happened when you were growing up that you couldn't explain?
    Were there any spooky places you wouldn't go at night?

Dreams:
1. Did you ever have a dream that really scared you?
    What happened?
2. Do you remember your dreams?
    Do you dream in color?
    [For bilinguals] What language do you dream in?
3. Do dreams mean anything?
    Did you ever have a dream that you thought meant something?

Communication/neighborhood:
1. Who are the five people that you see most often on the block?
2. Who do you ask to baby-sit your kids?
    Do you know the family?

Who do you refer them to in case of an emergency?

3. Did you ever have a big fire on the block, like a house really burn down?
Where? Did you see it?
Did people in the neighborhood help out? With food, clothes, a place to stay?

Hometown, Chicago, and St. Louis:
1. What's your town like? Would you say it's a nice place to live?
2. What do most people do for a living in your area?
3. How often do you visit bigger cities in the area?
4. When you think of Chicago, what is the first thing that comes to mind? What about for St. Louis?
5. Do you have family in Chicago or St. Louis?
6. When growing up, did you have friends that were from St. Louis or Chicago?
7. Do people from your area ever identify as being from St. Louis? Or from Chicago?

Word List:
Interviewee will be given a list of words and asked to say them aloud. This list will mirror the phone interview list

FAWN	SIT	PEN
DAWN	SET	PIN
CAUGHT	MOUSE	MORNING
HOT	RAT	MOURNING
SOCK	SPOT	BARN
TALK	SPEC	BORN
DOLLAR	TOAD	ZOO
ON	FROG	BOO
BUNK	COTTAGE	DUNE
COT	THOUGHT	MOON
HOME	DOUBT	LAUGH
HOUSE	POP	LAP
POND	SAUCE	GRASS
DECK	DOT-COM	

Minimal pairs of words:
Would you please read each pair of words, and then say whether they are THE SAME or DIFFERENT?
DAWN / DON / DAN
BOT / BOUGHT
HIM / HEM
HOARSE / HORSE
CARD / CORD
ROOM / BOOM (other than the first letter)
HALF / HAT (other than the last letter)

APPENDIX B

95 Speakers Analyzed in this Study

Interview year	Pseudonym	Year born	Age	Gender	Area	Direction	Location Grew up in
2012	Abby	1957	55	Female	Between	East	Monticello, IL
1972	Albert M	1917	55	Male	Route 66	Center	Springfield, IL
2012	Alexander W	1953	59	Male	Route 66	Center	Springfield, IL
2012	Alice	1951	61	Female	Off Far	East	Nokomis, IL
2011	Amy T	1971	41	Female	Route 66	North	Lincoln, IL
1995	Andrea K	1972	23	Female	Big Cities	East	Decatur, IL
2011	Anne C	1929	83	Female	Route 66	South	Staunton, IL
2012	Archie G	1948	64	Male	Route 66	Center	Springfield, IL
2012	Arnold	1946	66	Male	Route 66	North	Lincoln, IL
1994	Arthur K	1934	60	Male	Big Cities	Center	Springfield, IL
2011	Autumn K	1981	31	Female	Route 66	North	Lincoln, IL
2011	Barb A	1961	51	Female	Big Cities	Center	Springfield, IL
2011	Bea L	1976	36	Female	Big Cities	South	St. Louis, MO
1989	Bill M	1920	14	Male	Off Far	West	White Hall, IL
2012	Bob	1931	81	Male	Off Far	West	Plainville, IL
1978	Burt H	1904	74	Male	Big Cities	Center	Springfield, IL
2012	Christine	1947	65	Female	Route 66	Center	Springfield, IL
1992	Christine W	1960	32	Female	Big Cities	West	Peoria, IL
2012	Cindy	1982	30	Female	Rte 66 (Rte 4)	South	Virden, IL
1986	Cordelia E	1913	73	Female	Around SPR	East	Taylorville, IL
2012	Curtis K	1934	78	Male	Between	East	near Mount Pulaski, IL
1994	Curtis W	1949	45	Male	Off Far	West	Metamora, IL
1995	Darlene D	1920	92	Female	Big Cities	north	Bloomington, IL
2012	Don G	1938	74	Male	Route 66	Center	Springfield, IL
1990	Doris B	1913	85	Female	Route 66	Center	Springfield, IL
2012	Doug	1973	39	Male	Off Near	West	Bethalto, IL
2012	Elaine	1953	59	Female	Around SPR	West	Petersburg, IL
2012	Emily	1980	32	Female	Route 66	Center	Springfield, IL
2012	Evelyn	1957	55	Female	Off Near	East	Morrisonville, IL
2011	Fran S	1941	70	Female	Between	West	New Holland, IL
2012	Frank	1927	85	Male	Off Far	West	Shipman, IL
2012	Hannah	1937	75	Female	Off Far	West	Hillview, IL
1985	Harold B	1922	63	Male	Big Cities	West	Peoria, IL

2012	Harold J	1963	49	Male	Big Cities	East	Decatur, IL
2012	Herbert	1936	76	Male	Around SPR	West	Jacksonville, IL
1983	Irene S	1900	83	Female	Big Cities	Center	Springfield, IL
1996	Irene T	1926	70	Female	Route 66	South	St. Louis, MO
1994	Irma L	1918	18	Female	Off Far	West	Chesterville, IL
2011	Jack C	1986	25	Male	Route 66	north	Lincoln, IL
2011	James D	1936	76	Male	Rte 66 (Rte 4)	South	Girard, IL
2011	Jason B	1993	19	Male	Big Cities	Center	Springfield, IL
1995	Jeremy W	1964	31	Male	Big Cities	East	Rantoul, IL
1986	Jesse L	1916	10	Male	Off Far	East	Vernon, IL
1984	Jim J	1896	12	Male	Big Cities	West	Peoria, IL
2012	Jo	1964	48	Female	Rte 66 (Rte 4)	South	Auburn, IL
2011	Joe S	1922	90	Male	Big Cities	Center	Springfield, IL
1994	Joyce H	1941	53	Female	Big Cities	South	St. Louis, MO
1994	Judy H	1937	57	Female	Big Cities	South	St. Louis, MO
2011	Karen G	1978	34	Female	Route 66	South	Edwardsville, IL
1998	Kent R	1966	32	Male	Big Cities	Center	Springfield, IL
1995	Kirk S	1968	27	Male	Big Cities	north	Bloomington, IL
2012	Lanie N	1954	58	Female	Route 66	Center	Springfield, IL
2012	Laura	1986	26	Female	Route 66	Center	Springfield, IL (birth-9, Riverton, IL 9-18)
1997	Leo M	1915	62	Male	Route 66	South	St. Louis, MO
2012	Lillian H	1949	63	Female	Off Far	East	Pana, IL
2012	Lloyd	1947	65	Male	Route 66	South	Edwardsville, IL
1980	Lloyd B	1924	56	Male	Off Far	East	Winchester, IL
1978	Loretta G	1901	30	Female	Off Far	West	Winchester, IL
1973	Louis M	1931	42	Male	Route 66	Center	Springfield, IL
2012	Lucy	1942	70	Female	Around SPR	West	Nilwood, IL
2012	Mabel	1952	60	Female	Rte 66 (Rte 4)	South	Chatham, IL
2012	Madge	1944	68	Female	Big Cities	north	Bloomington, IL
1984	Marie B	1897	12	Female	Route 66	South	Divernon, IL
2012	Marilyn R	1934	78	Female	Big Cities	north	Bloomington, IL
1994	Martin H	1946	48	Male	Big Cities	South	St. Louis, MO
1995	Mary M	1909	86	Female	Big Cities	South	St. Louis, MO
2012	Maude	1967	45	Female	Big Cities	West	Eureka, IL
2012	Melissa	1982	30	Female	Around SPR	West	Kilbourne, IL
1995	Moira O	1934	78	Female	Big Cities	north	Bloomington, IL
2012	Nathan M	1941	71	Male	Big Cities	East	Decatur, IL

2012	Nellie	1946	66	Female	Route 66	South	Auburn, IL
2012	Odessa	1932	80	Female	Route 66	South	Collinsville, IL (Cincinatti, OH birth-4)
1986	Otto K	1912	74	Male	Route 66	South	Collinsville, IL
2011	Pat L	1939	73	Male	Big Cities	Center	Springfield, IL
1993	Patricia D	1922	71	Female	Big Cities	South	St. Louis, MO
2012	Phil	1951	61	Male	Route 66	North	Elkhart, IL
2012	Rhonda	1958	54	Female	Route 66	South	Benld, IL
1998	Robert B	1935	63	Male	Route 66	South	St. Louis, MO
1994	Rose M	1956	38	Female	Big Cities	South	St. Louis, MO
2012	Roy C	1948	64	Male	Route 66	North	Broadwell, IL
2011	Sam M	1938	74	Male	Route 66	South	Litchfield, IL
2012	Sheila	1952	60	Female	Off Far	East	Melvin, IL
1980	Shirley B	1933	47	Female	Big Cities	East	Champaign, IL
2012	Tad	1947	65	Male	Big Cities	West	Pekin, IL
2011	Tim A	1986	26	Male	Around SPR	East	Rochester, IL
2012	Veronica	1978	34	Female	Off Near	East	Hillsboro, IL
2012	Vicky C	1949	63	Female	Route 66	North	Elkhart, IL
2011	Virginia P	1946	66	Female	Route 66	South	East St. Louis, IL
1993	Virginia R	1968	25	Female	Off Near	north	Gibson City, IL
2011	Walt H	1941	71	Male	Big Cities	South	St. Louis, MO
1994	Weston K	1927	67	Male	Big Cities	Center	Springfield, IL
2011	Will F	1956	55	Male	Route 66	North	Shirley, IL
1986	Wilma C	1917	69	Female	Around SPR	East	Taylorville, IL
1991	Bertha H	1925	66	Female	Route 66	South	Auburn, IL
1981	Paul D	1945	36	Male	Route 66	Center	Springfield, IL

Additional Speakers not Analyzed in this Study

Interview year	Pseudonym	Year born	Age	Gender	Area	Direction	Location Grew up in
2012	Carrie	1944	68	Female	Route 66	center	Springfield, IL
2012	Dawn R	1940	72	Female	Off Far	west	Canton, IL
2012	Jean G	1927	85	Female	Off Far	west	Canton, IL
2012	Francis W	1925?	87?	Male	Between	west	Mason City, IL
2012	Daisy J	1932	80	Female	big cities	east	Decatur, IL
2012	Frank	1927	85	Male	Off Far	west	Shipman, IL
2012	Millie	1946	66	Female	Route 66	south	Carlinville, IL
2012	Susan	1972	40	Female	Route 66	center	Springfield, IL area
2012	Kathy W	1955	57	Female	Route 66	south	Springfield, IL (Chatham, IL 6-9, Sherman, IL 10)
2012				Female	not Corridor	N/A	Rockford, IL
2012				Female	not Corridor	N/A	Iowa
2012	Meredith	1982	30	Female	Route 66	north	Atlanta, IL
2012		1977	35	Male	not a single area	N/A	Multiple locations in central Illinois
2012		1961	51	Male	not a single area	N/A	Chicago, IL (teen years in Jacksonville, IL)
2012				Female	not Corridor	N/A	Chicago, IL
2012				Female	Off Far	west	Petersburg, IL
2012	Beth			Female	around SPR	west	Pleasant Plains, IL
2012	Louise	1955?	57?	Female	not a single area	N/A	multiple 0-10, Springfield, IL 10 to present
2012				Male	not Corridor	N/A	-
2012	Ida		2012	Female	Between	east	Forsyth and Argenta, IL
2012	Celeste	1943?	69?	Female	big cities	east	Decatur, IL (born Detroit, MI)
2012	Arthur B	1939	73	Male	big cities	east	Decatur, IL
2012	Keith	1948?	64?	Male	big cities	east	Decatur, IL

2012	Babette	1971?	41?	Female	big cities	east	birth-10 elsewhere, 11-present Decatur, IL
2012	Helen	1947	65	Female	around SPR/off far	east	Edinburg, IL
2012	Michelle	1979	33	Female	Route 66	north	Lincoln, IL birth-15, then multiple
2012		1945	67	Female	big cities	N/A	St Louis, MO, Peoria, IL
2012	Cynthia	1952	60	Female	around SPR	west	Tallula, IL
2012	Elaine	1953	59	Female	around SPR	west	Petersburg, IL
2012	Ruth	1914	98	Female	around SPR/off far	west	Woodson, IL
2012	Maureen	1928?	84?	Female	around SPR/off far	west	Lynnville, IL
2012	Audrey	1991	21	Female	around SPR	west	Jacksonville, IL
2012				Male	not Corridor	N/A	
2012	Mary Lou	1925	87	Female	Route 66	south	Auburn, IL
2012	Nancy	1952	60	Female	Off Far	west	Roanoke, IL
2012		1955	57	Female	not Corridor	N/A	Milwaukee, WI birth-junior high, Bloomington, IL junior high-present
2012	Opal	1984	28	Female	big cities	north	Normal, IL
2012	Ellen	1955?	57?	Female	Off Far	east	Gibson City, IL
2012	Addie	1980	32	Female	Around SPR/off near	east	Pawnee, IL
2012	Clara	1979	33	Female	Off Near	east	Hillsboro, IL
2012	Ester	1945	67	Female	Off Near	east	Raymond, IL
2012	Rosemary	1935	77	Female	Route 66	south	Collinsville, IL
2012	Linda E	1956	56	Female	Off Near	east	Belleville, IL
2012	April	1974	38	Female	Route 66	south	Collinsville, IL
2012	Marla	1960	52	Female	Route 66	south	Carlinville, IL
2012	Howard	1945	67	Male	Off Near	west	Wood River (birth-11) Palmyra (11-18)
2012	Madison	1989	23	Female	Route 66	south	Gillespie, IL
2012	Dotty	1928	84	Female	Route 66	south	Edwardsville, IL
2012	Sally	1929	83	Female	Route 66	south	Edwardsville, IL
2012	Trudy	1980	32	Female	big cities	east	Kankikee, IL birth to 6, Champaign, IL 7 to present
2012	Gary	1980	32?	Male	big cities	east	Champaign, IL
2012	Joseph	1928	84?	Male	big cities	east	Champaign, IL

2012	Betsy	1955	57	Female	Off Near	east	Hillsboro, IL
2012	Bridget	1944	68	Female	Off Far	east	Greenville, IL
2012	Breanna	1990	22	Female	Off Far	east	Breez, IL birth-6, Greenville, IL 7-present
2012	Carol	1937	75	Female	Route 66	center	Springfield, IL
2012	Minnie	1920	92	Female	Route 66	center	Springfield, IL
2012	Henry	1939	73	Male	Route 66	south	Virden, IL
2012	Caitlin	1990	22	Female	Route 66	south	Chicago, IL birth-5, Chatham, IL 6-present
2012	Olivia	1977	35	Female	big cities	west	East Peoria, IL
2012	Angela	1944	68	Female	Off Far	west	Kane, IL
2011	Ruth F	1941	70	Female	-	-	Oklahoma
2011	Elizabeth F	1956	55	Female	Route 66	-	Springfield and Bloomington, IL
2011	Martha J	1940	71	Female	Off Far	west	Alton, IL
2011	Aaron J	1935	76	Male	Off Far	west	Alton, IL

BIBLIOGRAPHY

66 University Online. Illinois Route 66 Maps. Accessed May 8, 2011. URL http://www.route66university.com/maps/illinois.php

1940 U.S. Census, Sangamon County, Illinois, population schedule, City of Springfield, enumeration district (ED) 84-6 through 84-19; digital images, FamilySearch (http://www.familysearch.org : accessed January 20, 2014).

Allen, H.B. 1964. The Primary Dialect Areas of the Upper Midwest. In *Readings in Applied English Linguistics, 2nd Edition*, ed. by H.B. Allen, 201–69. New York: Appleton Century Crofts.

Ashman, K.M., C.M. Bird, & S.E. Zepf. 1994. Detecting bimodality in astronomical datasets. *The Astronomical Journal* 108:2348–2361.

Babbit, E.H. 1896. The English of the lower classes in New York City and vicinity. *Dialect Notes* 1:457–64.

Baranowski, Maciej. 2008. The Southern Shift in a marginally Southern dialect. *University of Pennsylvania Working Papers in Linguistics* 14:35–43.

Becker, Kara. 2010. Social conflict and social practice on the Lower East Side: A study of regional dialect features in New York City English. Doctoral Dissertation, New York University.

Bloomfield, Leonard. 1933. Language. New York: Holt.

Bigham, Douglas S. 2010. Correlation of the Low-Back Vowel Merger and TRAP-Retraction. *University of Pennsylvania Working Papers in Linguistics* 15:21–31.

Boberg, Charles and Stephanie M. Strassel. 2000. Short-a in Cincinnati: A Change in Progress. *Journal of English Linguistics* 28:108–126.

Britain, David. 1997. Dialect contact, focusing and phonological rule complexity: the Koineisation of Fenland English. *University of Pennsylvania Working Papers in Linguistics* 4:141–169.

Brod, Ray and Larry G. Haigh. 2011. Update of Larson and Soot's "Centers of Population and the Historical Geography of Illinois."

Brody, Stephanie. 2009. The status of planets: Development and transmission of Philadelphia short-a. Paper given at *Penn Linguistics Colloquium 33*, Philadelphia, PA.

Brugman, H. and A. Russel. 2004. Annotating Multimedia/Multi-modal resources with ELAN. Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands. In *Proceedings of LREC 2004, Fourth International Conference on Language Resources and Evaluation*. URL http://www.lat-mpi.eu/tools/elan

Brunsman, H.G. 1953. United States Census of Population, 1950. Bureau of the Census.

Callary, R. E. 1975. Phonological change and the development of an urban dialect in Illinois. *Language in Society* 4:155–170.

Canal Corridor Association. 2004. The I&M Canal Shapes History.

Cassity, Michael. 2004. Route 66 Corridor National Historic Context Study. National Park Service: Santa Fe, New Mexico.

Cedergren, Henrietta J. 1988. The spread of language change: Verifying inferences of linguistic diffusion. In *Language spread and language policy: Issues, implications, and case studies*, ed. by Peter Lowenberg, 45–60. Washington, DC: Georgetown University Press.

Chambers, J.K. 1992. Dialect Acquisition. *Language* 68:673–705.
Chambers, J.K. and Peter Trudgill. 1980. Dialectology. Cambridge: Cambridge University Press.
Cleveland Daily Banner Staff Reports. 2010. Liars Table holds straw poll on county, state primary elections. Accessed on November 5, 2014. URL http://www.clevelandbanner.com/view/full_story/8862255/article-Liars-Table-holds-straw-poll-on-county--state-primary-elections
Comerford, Michael Sean. 2014. Elvis the Mark, Carny Kids and the Showtown Allstars. Accessed on November 5, 2014. URL http://www.huffingtonpost.com/michael-sean/elvis-the-mark-carny-kids_b_4813449.html
Davis, Carole McReynolds. 2011. Starkville Café. In *Starkville Daily News*. Accessed on November 5, 2014. URL http://www.starkvilledailynews.com/node/4818
Dinkin, Aaron. 2008. Settlement patterns and the Eastern boundary of the Northern Cities Shift. Paper presented at the *American Dialect Society Annual Meeting*, Chicago, January 2008.
Dinkin, Aaron Joshua. 2009. Dialect boundaries and phonological change in upstate New York. Doctoral Dissertation, University of Pennsylvania.
Durian, David. 2012. A New Perspective on Vowel Variation across the 19th and 20th Centuries in Columbus, OH. Doctoral Dissertation, The Ohio State University.
Eckert, Penelope. 1988. Adolescent social structure and the spread of linguistic change. *Language in Society* 17:183–208.
Emerson, Oliver Farrar. 1891. The Ithaca Dialect: A Study of Present English. *Dialect Notes* 1:85–173.
Erickson, Kurt. 2011. Census: Population center of state moving toward Chicago. Accessed on May 2, 2011 URL http://www.pantagraph.com/news/state-and-regional/illinois/article_5cb6ec0a-7378-11e0-9bfa-001cc4c002e0.html.
Fasold, Ralph 1969. A sociolinguistic study of the pronunciation of three vowels in Detroit speech. Georgetown University mimeograph.
Ferguson, Charles A. 1972. "'Short *a*' in Philadelphia English." In *Studies in Linguistics: in honor of George L. Trager*, ed. M.E. Smith, 260–274.
Fogle, Deena. 2008. Indianapolis, Indiana: A prototype of Midland convergence. *University of Pennsylvania Working Papers in Linguistics* 14:135–148.
Frazer, Timothy. 1983. Sound Change and Social Structure in a Rural Community. *Language in Society* 12: 313–328.
Frazer, Timothy. 1986. Microdialectolgy: Internal Variation in a LANCS Community. American Speech 61:307–17.
Fruehwald, Josef. 2013. The Phonological Influence on Phonetic Change. Doctoral Dissertation, University of Pennsylvania.
Gal, Susan. 1980. Language Shift: Social Determinants of Linguistic Change in Bilingual Austria. New York: Academic Press.
Gnedin, Oleg Y. 2010. Quantifying bimodality. Unpublished manuscript.
Gordon, M.J. 2001. Small-town values and big-city vowels: A study of the Northern Cities Shift in Michigan. Duke University Press for American Dialect Society, #84.
Grandgent, Charles. 1892. "Haf" and "haef." *Dialect Notes* 1:269–275.
Green, Paul M. 1987. Legislative Redistricting in Illinois: An Historical Analysis. Illinois Commission on Intergovernmental Cooperation.

Gurian, Scott. 2002. Liars' Table [Radio broadcast episode]. All Things Considered. Broadcast August 12, 2002.
Habick, Timothy. 1980. Sound Change in Farmer City: A Sociolinguistic Study Based on Acoustic Data. Doctoral Dissertation, University of Illinois.
Habick, Timothy. 1993. "Farmer City, Illinois: Sound Systems Shifting South." In *Heartland English: Variation and Transition in the American Middle West*, ed. T. Frazer, 97–124.
Heritage Research. 2013. Route 66 in Illinois: 2012/13 Update and Expansion of the Original 1994/95 Survey. In *High Speed Rail/Review of Illinois Route 66 Resources*. Menominee Falls, WI: Heritage Research, Ltd.
Herzog, Marvin I. 1965. The Yiddish Language in Northern Poland: Its Geography and History. Bloomington: Indiana University Research Center in Anthropology, Folklore, and Linguistics.
Holland, Cory. 2014. Shifting or Shifted? The state of California vowels. Poster presented at the *Sound Change in Interacting Human Systems biennual meeting*, Berkeley, California, May 2014.
Holmquist, Jonathan. 1988. Language Loyalty and Linguistic Variation: A study in Spanish Cantabria. Dodrecht: Foris.
Illinois Bluebook 1975–1976. Past Illinois Capitols. Accessed May 1, 2011. URL http://www.ilstatehouse.com/past_capitols.htm.
Jacewicz, Ewa, Robert Allen Fox, and Joseph Salmons. 2011. Cross-generational vowel change in American English. Language Variation and Change 23:45–86.
Jespersen, Otto. 1949. A Modern English Grammar on Historical Principles. Volume I: Sounds and Spellings. London: George Allen & Unwin.
Johnson, Daniel Ezra. 1998. The tensing and laxing of short 'a' in New Haven, Connecticut. B.A. thesis, Yale University.
Johnson, Daniel Ezra. 2007. Stability and change along a dialect boundary: The low vowels of Southeastern New England. Doctoral Dissertation, University of Pennsylvania.
Kaszynski, William. 2003. Route 66: Images of America's Main Street. McFarland: Jefferson, North Carolina.
Keiser, Steve Hartman, Frans Hinskens, Bettina Migge, and Elizabeth Strand. 1997. The Northern Cities Shift in the Heartland? A study of radio speech in Columbus, OH. *The Ohio State Working Papers in Linguistics* 50:41–68.
Kerswill, Paul & Williams, Ann. 2000. Creating a new town koiné: children and language change in Milton Keynes. *Language in Society* 29:65–115.
Kurath, Hans, and Raven I. McDavid, Jr. 1961. Pronunciation of English in the Atlantic States. Ann Arbor, MI: University of Michigan Press.
Labov, William. 1972. Sociolinguistic Patterns. Oxford: Blackwell.
Labov, William. 1984. Field methods of the Project on Linguistic Change and Variation. In Language and Use, ed. by J. Baugh & J. Sherzer, 28–53. Englewood Cliffs: Prentice Hall.
Labov, William. 1989. The child as linguistic historian. *Language Variation and Change* 1:85-98.
Labov, William. 1991. The three dialects of English. In *New ways of analyzing sound change*, ed. P. Eckert, 1–44. San Diego: Academic Press.

Labov, William. 1994. Principles of Linguistic Change: Internal Factors. Cambridge, MA: Blackwell.
Labov, William. 2001. Principles of Linguistic Change: Social Factors. Malden, MA: Blackwell.
Labov, William. 2002. Driving Forces in Linguistic Change. URL http://www.ling.upenn.edu/~wlabov/Papers/DFLC.htm
Labov, William. 2007. Transmission and Diffusion. *Language* 83:344–387
Labov, William. 2010. Principles of Linguistic Change, Cognitive and Cultural Factors. Malden, MA: Wiley-Blackwell.
Labov, William. 2011. Plotnik 10.1. URL http://www.ling.upenn.edu/~wlabov/Plotnik.html
Labov, William. 2014. The role of African Americans in Philadelphia sound change. In *Language Variation and Change* 26:1-19.
Labov, William, Sharon Ash, and Charles Boberg. 2006. The Atlas of North American English. New York: Mouton de Gruyter.
Labov, William, Ingrid Rosenfelder, and Josef Fruehwald. 2013. One Hundred Years of Sound Change in Philadelphia: Linear Incrementation, Reversal, and Reanalysis. *Language* 89:30-65.
Labov, William, Malcah Yaeger & Richard Steiner. 1972. A Quantitative Study of Sound Change in Progress. Philadelphia: U. S. Regional Survey.
Larson, A. and S. Soot. 1973. Centers of Population and the Historical Geography of Illinois. *Bulletin of the Illinois Graphical Society* 15:34–52.
Lasley, Paul. 2004. Cupid at the Liar's Table. In *Glimpses - Iowa's Rural Legacy, Recollections and Commentary*, ed. by the Iowa Farm Business Association Foundation. Trafford Publishing: Bloomington, Indiana.
Lobanov, Boris M. 1971. Classification of Russian vowels spoken by different listeners. *Journal of the Acoustical Society of America* 49:606–08.
Marckwardt, Albert. 1957. Principle and subsidiary dialect areas in the North Central States. Publication of the American Dialect Society 27:3–15. Tuscaloosa, AL: University of Alabama Press.
McCarthy, Corrine. 2010. The Northern Cities Shift in Real Time: Evidence from Chicago. *University of Pennsylvania Working Papers in Linguistics* 15:101–110.
Milroy, Lesley. 1980. Language and Social Networks. Oxford: Basil Blackwell.
Monroe, B. S. 1896. The Pronunciation of English in the State of New York. *Dialect Notes* 1:445–56.
Murray, Thomas. 1993. "The Language of St. Louis, Missouri: Dialect Mixture in the Urban Midwest." In *Heartland English: Variation and Transition in the American Middle West*, ed. T. Frazer, 125–136.
Murray, Thomas. 2002. Language variation and change in the urban Midwest: The case of St. Louis, Missouri. *Language Variation and Change*, 14:347–361.
The Oral History Program of The State Historical Society of Missouri. Accessed April 11, 2014. URL http://statehistoricalsocietyofmissouri.org/cdm/landingpage/collection/ohc
Orton, H. and P. M. Tilling. 1969. Survey of English Dialects: Volume 3: East Midlands and East Anglia. Leeds: Edward Arnold.

Payne, Arvilla. 1976. The Acquisition of the Phonological System of a Second Dialect. Doctoral Dissertation, University of Pennsylvania.
Payne, Arvilla. 1980. Factors controlling the acquisition of the Philadelphia dialect by out-of-state children. In *Locating language in time and space*, ed. by W. Labov, 143–178. Orlando: Academic.
Roberts, Julia. 1993. Hitting a moving target: Acquisition of sound change in progress by Philadelphia children. *Language Variation and Change*, 9:249-266.
Rosenfelder, Ingrid, Josef Fruehwald, Keelan Evanini, and Jiahong Yuan. 2011. FAVE (Forced Alignment and Vowel Extraction) Program Suite. URL http://fave.ling.upenn.edu
Sankoff, Gillian and Hélène Blondeau. 2007. Language Change across the Lifespan: /r/ in Montreal French. *Language* 83:560–588
Schultz, Eric. 2014. Duffy's Deli closes: No more Famous White Chili, Dagwood sandwiches, or Liar's Table. Accessed November 30, 2014. URL http://blog.al.com/breaking/2014/03/duffys_deli_closes_no_more_fam.html
Shuy, Roger, Walt Wolfram, and William K. Riley 1966. A Study of Social Dialects in Detroit. Final Report, Project 6-1347. Washington, D.C.: Office of Education.
Stanford, James N. and Laurence A. Kenny. 2013. Revisiting transmission and diffusion: An agent-based model of vowel chain shifts across large communities. *Language Variation and Change* 25:119-153.
Stockwell, R. & Minkova, D. 1997. On drifts and shifts. *Studia Anglica Posnaniensia* 31, pp. 283–303.
Tagliamonte, Sali A. and Alexandra D'Arcy. 2009. Peaks Beyond Phonology: Adolescence, Incrementation, and Language Change. *Language* 85:58–108.
Thomas, Charles K. 1935–37. Pronunciation in Upstate New York. *American Speech* 10:107–12, 208–12, 292–97; 11:68–77, 142–44, 307–13; 12:122–27.
Thomas, Erik R. 2010. A Longitudinal Analysis of the Durability of the Northern-Midland Dialect Boundary in Ohio. American Speech 85:375–430.
Trager, George L. 1930. The pronunciation of "short a" in American Standard English. *American Speech* 5:396–400.
Trudgill, Peter. 1974. Linguistic change and diffusion: description and explanation in sociolinguistic dialect geography. *Language in Society* 4:215–246.
US Census Bureau. Census of Population and Housing, 1790–2010. Accessed May 1, 2011. URL http://www.census.gov/prod/www/abs/decennial/
Wood, Thomas. 1996. University of Illinois Springfield Oral History Collection Appendix: Abstracts of Untranscribed Tapes. URL http://www.uis.edu/archives/appendix.htm
Wyld, Henry Cecil. 1920. A History of Modern Colloquial English. New York City: E.P. Dutton and Company.
Yang, Charles. 2009. Population Structure and Language Change. Unpublished manuscript.
Zeller, Christine. 1997. The investigation of a sound change in progress: /æ/ to /e/ in Midwestern American English. *Journal of English Linguistics* 25:142–155.