Reversal and Re-Organization of the Northern Cities Shift in Michigan

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1 Introduction

In this paper we provide some initial observations on the status of the Northern Cities Shift (NCS) in Lansing, Michigan. It has recently been reported for some other urban centers that the NCS is no longer a generational change in progress, but is in decline (Dinkin 2009, Driscoll and Lape 2015, Friedman 2014, McCarthy 2011). Using apparent time data from two sources (sociolinguistic interviews and an oral history collection) we show that the NCS may be disappearing in Lansing too. However, it is not undergoing straightforward reversal of the entire chain shift. Rather, we observe multiple processes at work, such as *continuation* of the trajectory of change for DRESS, *reversal* of change for LOT and *reorganization* of the system from raised to nasal for TRAP. We discuss these findings in relation to the possible history of NCS transmission and diffusion in Lansing.

1.1 The Northern Cities Shift

The Northern Cities Shift (NCS) is the rotation of six vowels of American English: /ɪ, ɛ, ʌ, ɔ, ɑ, æ/ (KIT, DRESS, STRUT, THOUGHT, LOT and TRAP).[1] First observed by Fasold (1969), and further elaborated by Labov, Yaeger and Steiner (1972) and Eckert (1988), the NCS has been described as a chain shift in which TRAP fronts and raises, after which LOT fronts towards the space previously occupied by TRAP; this is followed by the lowering of THOUGHT, backing of STRUT, the lowering and/or backing of DRESS, and the lowering of KIT (Labov 1994:177–199). In recent years, there has been considerable discussion regarding the temporal ordering of these steps in the chain, and the mechanisms by which the NCS may have been actuated and diffused (see e.g., Dinkin 2011, Durian and Gordon 2014, Gordon 2000, Labov 2010, McCarthy 2010). As such, the Northern Cities Shift continues to be a rich locus of ongoing dialectological research, to which this paper makes a contribution.

The NCS is the defining characteristic of the Inland North: a dialect area stretching from Iowa in the west, to parts of upstate New York and Pennsylvania in the east (Labov, Ash and Boberg 2006). The NCS has been observed to be more advanced in large cities (hence the name) such as Chicago, Detroit and Buffalo, and it is assumed to have proceeded via a cascade model of diffusion (Callary 1975) from larger to ever smaller cities (Friedman 2014, Ito 2001). Lansing, which we describe in the next section, is not a major city, and so was not expected to manifest a very advanced NCS system. Nonetheless, we were surprised by the conservativeness of the Lansing vowel configuration, both in the present and in the past.

[1]Throughout this paper, we use the lexical sets developed by Wells (1982) to refer to vowel classes.
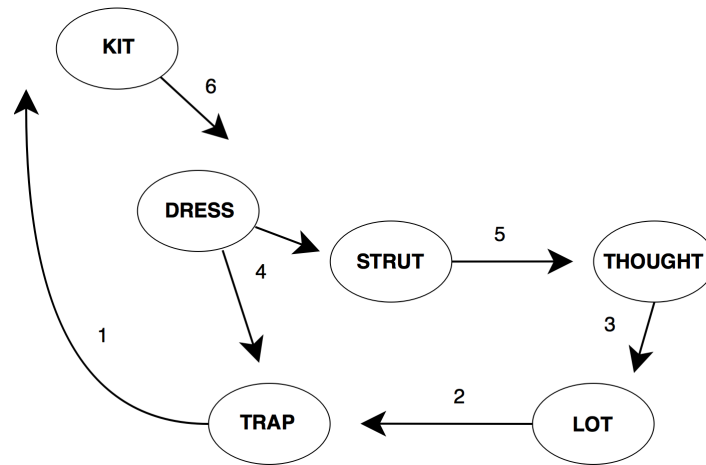
Figure 1: Northern Cities Shift vowel configuration.

1.2 Lansing, Michigan

Lansing is the capital of the state of Michigan, located approximately one hour west of Detroit and three hours east of Chicago, IL. Lansing is located in Ingham County, which together with Eaton and Clinton counties comprise the metropolitan area of Greater Lansing.[2] It is a mid-size city of 114,000 inhabitants (U.S. Census 2010). In the first two-thirds of the twentieth century, Lansing was home to a thriving car manufacturing industry. Like other Michigan automotive cities, it has since experienced a decline in its fortunes, as well as in its population size, which peaked at around 130,000 in 1970 (U.S. Census 1970). In the 21st century, however, Lansing has undergone some modest positive economic transformation, thanks to such initiatives as the opening of a new General Motors assembly plant in 2001 (GM Corporate Newsroom 2016) and the relocation of the national headquarters of an insurance company to Lansing in 2011 (Lacy 2016).

The city of Lansing is approximately 60 percent White, 24 percent Black, and 12 percent Latino. However, in the Greater Lansing area as a whole, the population is, on average, 80 percent White (U.S. Census 2010). Despite the fact that the White population constitutes the majority ethnic group in Greater Lansing, there has been no substantial investigation of local White phonology. Previous studies have reported on the speech of Black speakers (Jones 2003) and Mexican American speakers (Roeder 2006, 2010) in Lansing. Only a small number of White speakers were included for purposes of comparison. The present study therefore constitutes, to our knowledge, the first large-scale sociolinguistic study of the vowel system of the White population of Greater Lansing.

2 Method

The current analysis is based on two data sources: sociolinguistic interviews conducted in 2014 (IHELP)[3] and oral histories collected in the mid-1990s and 2000s (Auto Town). Combining vowel formant measurements from these two data sets provides a view of Lansing speech for a total of 62 speakers over a century of apparent time.

2.1 Data Sets

To date, the IHELP corpus contains 60 sociolinguistic interviews with native English speaking

White and African American young adults who grew up in Greater Lansing. The current analysis will focus on 29 of the 55 white speakers (21 female, 8 male) whose recording quality was amenable to acoustic analysis. Interviews were conducted by freshmen undergraduates from Michigan State University and Lansing Community College, who were themselves from Greater Lansing. Conversation topics included college life, how often they returned home for visits, travel history, and course of study and future plans, among others. Speakers also completed three formal tasks: a grammatical differential (e.g., *What's the difference between "I could've run that race"* and *"I could've ran that race"*), a semantic differential (e.g., *What's the difference between a cot and a bed?*) and a word list.[4]

The Auto Town recordings were obtained from an archive of oral histories of former auto plant workers of the Local 602, Fisher Body and Diamond REO assembly plants in Lansing, MI.[5] The current corpus includes data from 21 speakers (9 female, 12 male) who were born and raised in the Greater Lansing area (date of birth 1907 to 1971).[6] A summary of the demographic information from the speakers in our corpus of IHELP and Auto Town speakers is provided in Table 1.

Data Set	Birth Date	Male	Female
Auto Town	1900–1925	4	2
Auto Town	1926–1950	4	3
Auto Town	1951–1975	4	4
IHELP	1976–	8	21

Table 1: Speaker demographic information.

2.2 Acoustic Analysis

Interviews were transcribed and time-aligned in ELAN and then passed through the FAVE suite. Normalized vowel measurements (normalized F1, normalized F2, duration) were extracted.[7] A total of 153,143 primary-stressed vowel tokens were included in the analysis presented here. Quantitative analyses and visualizations of the data were performed in the R statistical environment (R.C. Team 2013).

3 Results

3.1 DRESS

DRESS is continuing to shift in the expected direction of the NCS in apparent time. Figure 2 shows continued movement both back and down respectively, though there is considerable inter-speaker variation in both F1 and F2.

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[4]The word list can be viewed at http://www.msu.edu/~wagnersu/IHM1-WL.pdf.

[5]The archive of G. Robert Vincent Voice Library Collection is available to the public through the Michigan State University library (https://vvl.lib.msu.edu/).

[6]There is an uneven distribution of social characteristics between the younger IHELP speakers and older Auto Town speakers. We therefore also created a subsample of 27 speakers from the two corpora, balanced as far as possible by age, sex and social status. For social status classification, we separated the speakers in the IHELP sample according to college type (public research university or community college), and the Auto Town speakers according to worker level (worker or manager), as information on schooling for this group was not available for all speakers. This captures a basic contrast across the datasets between speakers who have more education and potentially more occupational prestige, versus those with less education and potentially less occupational prestige. We found no trends in the wider unbalanced sample that were substantially different from those in the balanced subsample.

[7]Function words ("stop words") that are most likely to produce a reduced vowel were excluded from the calculation of vowel means. Likewise, tokens in the following phonological contexts were excluded: tokens with following liquids; following nasals (TRAP only); preceding glides; preceding obstruent-liquid clusters (cf. Labov, Ash and Boberg 2006) were also excluded.
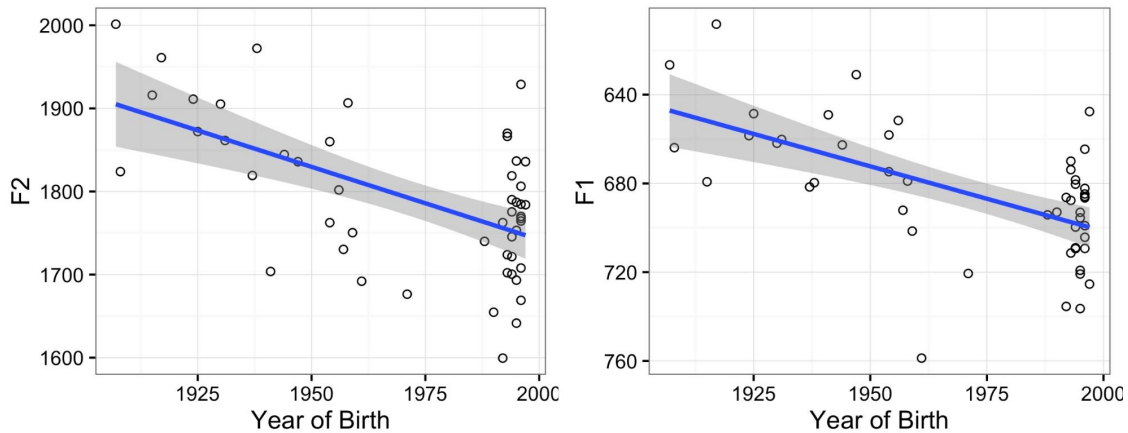
Figure 2: Mean values for the F2 and F1 of DRESS by year of birth for Lansing, MI speakers.

3.2 LOT

In contrast, the fronting of LOT (Figure 3) appears to be experiencing a slight reversal in apparent time. While some of the youngest speakers replicate older speakers' mean F2 range of 1350 to 1500 Hz, a sizeable group of speakers cluster around the 1300 Hz mark, about 50–100 Hz further back than the average AutoTown speaker's realization of this vowel. Furthermore, we have observed that a few of the IHELP speakers exhibit the low-back merger of LOT and THOUGHT.
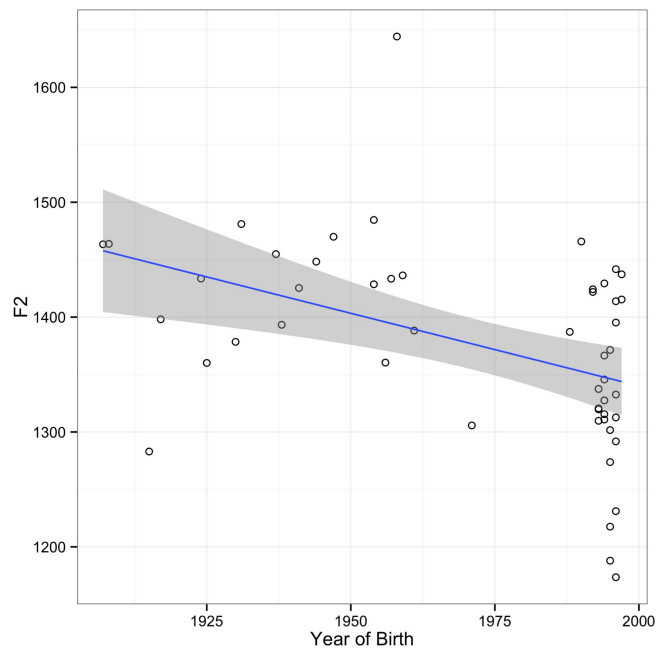

Figure 3: Mean F2 values for LOT by year of birth for Lansing, MI speakers.

This may be the direction in which the Lansing speech community is headed. These findings mirror those reported in Chicago (McCarthy 2011) and Syracuse (Driscoll and Lape 2015) although the reversal here appears to be much weaker than in those cities.

3.3 TRAP

The trajectory of TRAP in apparent time is somewhat more complex than that of the other vowels. Figure 9 shows three different speakers' TRAP-configurations, arranged left to right by year of birth. On the left is the configuration for Jack Down, born in 1924. Although he has the expected raised system for the NCS (Labov, Ash and Boberg 2006, Dinkin 2011), which shows no phonetic tendency for raising pre-nasal above pre-oral tokens, the mean F1 for this vowel is somewhat below what has been found elsewhere (e.g. Labov, Ash and Boberg 2006).
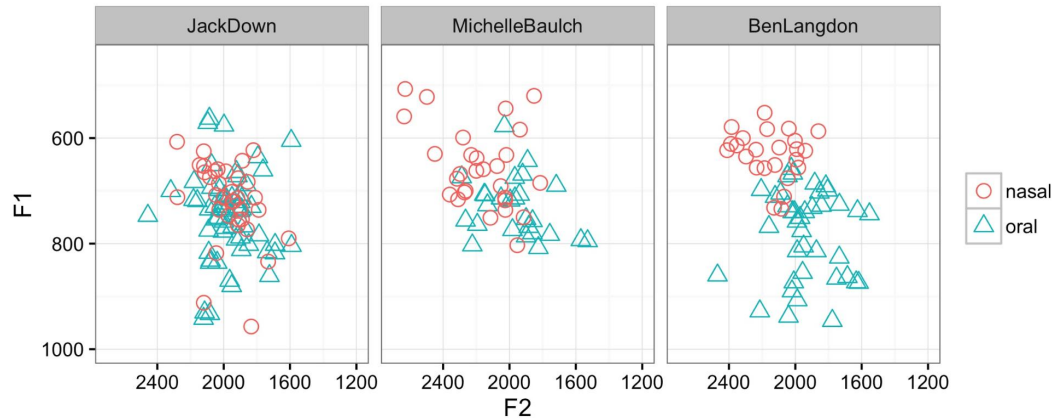

Figure 4: Three distinct TRAP-configurations from Greater-Lansing: Jack Down (born 1924, multiple college degrees), raised system; Michelle Baulch (born 1971, multiple college degrees), continuous system; Ben Langdon (born 1994, community college student), nasal configuration.

Not all of the Lansing speakers exhibit the expected raised system, however. As we move forward in apparent time, continuous TRAP-systems (Dinkin 2011) become more common, like the configuration of Michelle Baulch, born in 1971, shown center, Figure 4. In this system, although there is still a large degree of overlap between pre-nasal and pre-oral token clusters, there is a tendency for pre-nasal tokens to be more raised than pre-oral tokens.

Moving ahead even further in apparent time to speakers born in the 1990s, we encounter another TRAP-system. On the right in figure 4 is the distribution for Ben Langdon, born in 1994. Here we see a strong distinction between pre-nasal and pre-oral tokens, a clear example of the nasal TRAP-system found in the majority of US dialects today (Labov, Ash and Boberg 2006).

TRAP appears to be undergoing an allophonic split in apparent time whereby pre-nasal tokens are rising above the position they held for older speakers like Jack Down. At the same time, pre-oral TRAP has become lower and backer for younger speakers. This change in progress was also partially observed by Roeder (2010), who described raising before nasals as especially "dramatic," for young, Lansing-raised, English-monolingual Mexican Americans and for a small comparison sample of young White speakers.

Figure 5 shows the apparent time shift to this more nasal-like TRAP-system. We calculated Pillai scores using the R statistical environment. The Pillai statistic measures the difference between two clusters of vowels: low scores (approaching zero) indicate a large degree of overlap between two clusters, while higher scores (approaching 1) indicate a very small degree of overlap. Using this statistic, we measured the distinctiveness between pre-nasal and pre-oral means for each speaker.
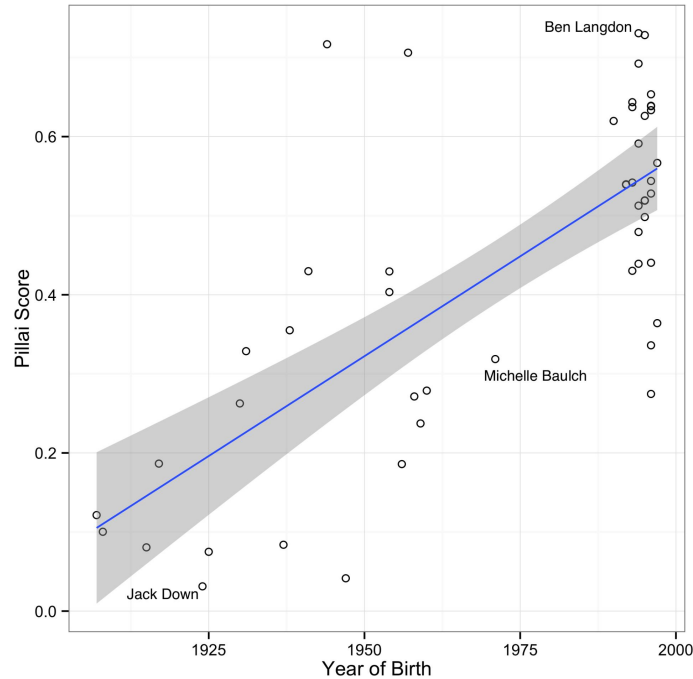
Figure 5. Pillai scores for TRAP by year of birth for Lansing, MI speakers.

The degree of distinctiveness between pre-nasal and pre-oral means increases with increasing year of birth, indicating that Greater Lansing speakers are gradually shifting from a raised to a nasal TRAP-system. Recall that Jack Down showed virtually no difference between pre-oral and pre-nasal TRAP. He has an extremely low Pillai score of 0.07. Ben Langdon, by comparison, has a high Pillai score of 0.73, indicating very little overlap.

4 Discussion/Conclusion

Putting together the apparent time data for DRESS, LOT, and TRAP, we have seen that these three vowels exhibit continuation, reversal and re-organization, respectively. Figure 6 plots the means for all six NCS vowels by dataset (IHELP and Auto Town). The continuation of the backing and lowering of DRESS is clear in apparent time, with the most vigorous change being lowering. LOT, by contrast, exhibits some reversal of the expected Northern Cities Shift fronting, although its starting position among speakers born in the early 20th century was not particularly fronted to begin with. TRAP exhibits neither unidirectional progress nor reversal. Instead there is a reorganization of the conditions on raising before nasal consonants: from a phonetic tendency to something approaching allophony.
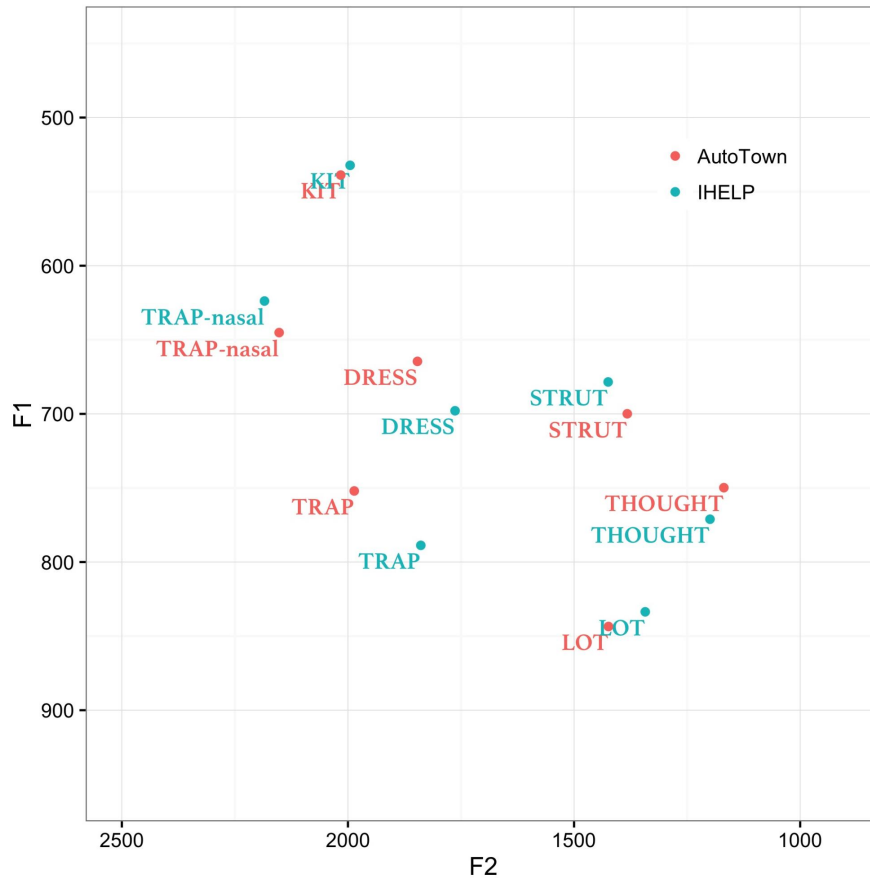
Figure 6: Mean F1 and F2 vowel measurements by dataset.

The growing TRAP allophonic split is evident in the Auto Town and IHELP corpus means displayed in Figure 6. Pre-nasal TRAP has risen modestly in apparent time, but there has been substantial lowering and backing of pre-oral TRAP. A similar shift from a local TRAP-system to the nasal allophonic system has also been observed in Philadelphia (Labov et al. 2015). In both cases, it may be that young, college-educated speakers are simply adopting the wider US English norm. Young speakers in the Lansing area may be likewise orienting to external norms as they reverse the fronting of LOT. Of all the NCS vowels, only TRAP-raising and LOT-fronting have attracted any overtly negative evaluation, while LOT-fronting was demonstrated in a recent study to be heard as 'accented' by young adult listeners (Savage et al. 2016). Rejection of local speech in favor of non-local speech may be the driving force behind the reversal of LOT and re-organization of TRAP. This would be especially consistent with previous accounts of Michiganders' strongly-held belief that they are speakers of a standard, or "average, normal" dialect (Preston 2004, Niedzielski 1999). The desire to maintain this symbolic capital might be pushing Lansing speakers to retreat from LOT-fronting as it becomes more noticeable to speech community members.

Yet if Lansing area speakers are indeed shifting away from the NCS towards a less regional variety, then what accounts for the continued lowering and backing of DRESS? We offer three speculative answers. First, the reversal or loss of a chain shift may involve the disconnection of its components. Individual vowels come to be evaluated independently, and they consequently undergo reversal or other changes at different rates. Under this scenario, lowered DRESS has simply been evaluated positively, while e.g. fronted LOT has not. Second, the NCS may not be reversing uniformly in Lansing (as it is in Syracuse), because it was never uniformly present in Lansing. Lansing maintained very strong ties to its rural hinterland in the early 20th century, even as the automobile industry transformed the city into a more urban space (Fine 2004). Unlike in other

automotive cities, a large proportion of Lansing automobile workers maintained family farms, regularly commuting long distances from farm to factory. Others moved into the city to work in the automobile factories, but moved back to the countryside at the first opportunity. It may be that as the NCS diffused via adults to Lansing from other cities, such as Detroit, there was not enough stability in the city's resident population to create the conditions for adult-to-child transmission of the NCS. This made the Lansing NCS system something like the one observed by Dinkin (2013) for the "Inland North Fringe" area of upstate New York. Third, and finally, it seems likely that at least college-educated speakers in Lansing are orienting to the "third dialect" attested in Canada (Clarke, Elms and Youssef 1995) and the western US (Labov, Ash and Boberg 2006). Lowering of DRESS is a feature of this dialect, while fronted LOT is not. Indeed, LOT remains in the low back space, where it merges with THOUGHT: a merger that is already complete for a few of our IHELP speakers. Likewise, a nasal TRAP-system is another feature of the "third" English dialect. It happens that Lansing speakers are also fronting the GOOSE vowel, in line with Western and many other US English speakers. In short, we can account for the IHELP speakers' vowel configuration almost entirely if we assume they are abandoning the NCS for a competing system. However, we do not observe the remaining pieces of the "third dialect" system. There is only minimal fronting of STRUT and no lowering of KIT in apparent time. Closer examination of our data by individual vowels may help us to understand why this is the case, and we leave this for future work.

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