

# Economic Change and the Decline of Raised TRAP in Lansing, MI

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## 1 Introduction

This paper examines the influence of economic change on shifting away from the local raised TRAP system of the Northern Cities Shift to the supra-local nasal system in Lansing, Michigan. Though recent reports have shown that middle-class speakers are leading this shift in the dialect area, it remains to be seen when this change initiated and what the social motivations for this shift are.

Hall-Lew (2017) points out that while sociolinguists tend to focus on the impact of social change on (sound) changes in progress, less consideration is paid to its impact on reversals of those changes. Her investigation into the reversal of GOAT backing in the Chinese American community of San Francisco's Sunset District in the latter half of the 20th century led Hall-Lew to consider the dramatic social changes going on in the community at that time. She established that the trajectory of GOAT pronunciation followed the same trajectory of prestige for Chinese Americans in the Sunset District. She noted that while Chinese Americans went from being a minority group to the majority in the neighborhood from the 1950s to the 2000s, their local variant (backed GOAT) changed from being socially unmarked to marked. The indexical meanings of this local variant still very much tied to the older Chinese Americans in the District, and as phonetic properties changed, the indexical meanings changed. From this, Hall-Lew (2017) emphasized that reversing or rejecting a local change in progress is part of a speaker's reaction to major social changes in their community.

While Hall-Lew's analysis focused on the impact of changes in prestige for an ethnic community, we argue that outside of contact with non-locals, internal changes on any social dimension (class, gender, etc.) is likely to promote the reversal of a local sound change in progress. As such, this paper investigates the impact of economic changes on the reversal of the Northern Cities Shift in Lansing, Michigan. Through an apparent time analysis of the TRAP systems of Lansing natives, we find that the local pattern (raised TRAP) went from being rather unmarked, i.e., progressing in the community without class stratification or any commentary, to socially marked as the community experienced economic decline, and that this shift in markedness prompted middle-class speakers to adopt non-local patterns. We note that class stratification appears in the generation most affected by economic change in the community—the Baby Boomer generation.

## 2 Background

### 2.1 The Northern Cities Shift and the Inland North Dialect Area

The Northern Cities Shift (NCS) is the rotation of six vowels of American English: /ɪ, ε, ʌ, ɔ, ɑ, æ/ (KIT, DRESS, STRUT, THOUGHT, LOT, and TRAP).<sup>1</sup> First observed by Fasold (1969), and further elaborated by Labov, Yaeger and Steiner (1972), the NCS has been described as a chain shift in which LOT fronts towards the front of the vowel space, TRAP fronts and raises to the front periphery, which is followed by the lowering of THOUGHT, the backing of STRUT, the lowering and/or backing of DRESS, and the lowering of KIT (Figure 1).

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

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\*This project was supported by National Science Foundation BCS 1251437 and a Michigan State University College of Arts and Letters Research Award. We gratefully acknowledge our collaborators at the University of Pennsylvania, particularly William Labov and Betsy Sneller, and our student fieldworkers. Thomas Padilla and Lisa Fine provided invaluable help with the Auto Town corpus data, metadata and social history. We are also grateful to audience members at NWAV 46, 47 and the American Dialect Society, especially Aaron Dinkin and Rebecca Roeder.

<sup>1</sup>Throughout this paper, we use the lexical sets developed by Wells (1982) to refer to vowel classes.

2006). The NCS has been observed to be more advanced in large cities 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).

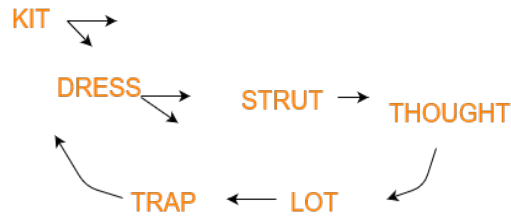


Figure 1: Northern Cities Shift vowel configuration.

Recent analyses in large and medium sized cities in the dialect area show that the NCS is in recession. Though not stated as NCS attrition, McCarthy (2011) noted stability of pre-oral TRAP and retraction of LOT in the latter half of the 20th century in Chicago. More recent analyses, however, explicitly note “reversal” or “rejection” of the NCS. The lowering and retraction of pre-oral TRAP is noted in Detroit, MI (Morgan et al. 2017), Rochester, NY (King 2017), upstate New York (Thiel and Dinkin 2017), and Syracuse, NY (Driscoll and Lape 2015) where LOT retraction is also underway. In Lansing, MI, Wagner et al. (2016) note the *continuation* of DRESS lowering, but *re-organization* of the TRAP from an NCS raised system to a nasal system, and *reversal* of LOT such that many younger speakers have merged their LOT and THOUGHT vowel classes.

Because of these changes, we note that younger generations of Inland Northerners have vowel spaces that resemble those in traditional Elsewhere shift regions (see Figure 2). The Elsewhere Shift (ES)<sup>2</sup> involves the lowering and retraction of pre-oral TRAP, KIT, and DRESS along with the merger of LOT and THOUGHT.

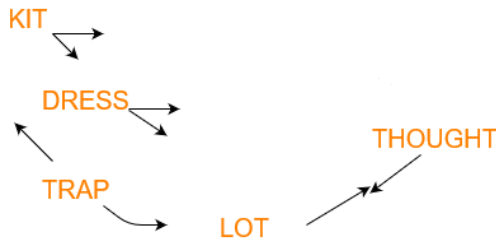


Figure 2: Elsewhere Shift vowel configuration.

For the current analysis, we focus on the reorganization of TRAP in Lansing for two reasons: (1) as one of the initial movements in the NCS chain, TRAP has been very well documented in the Inland North, and (2) unlike other vowels in the NCS chain (Savage et al. 2016), local pronunciations of TRAP have garnered negative evaluations in the Inland North.

## 2.2 TRAP systems of the Northern Cities and Elsewhere Shifts

The local NCS pattern is described as tense in all phonological contexts (Boberg and Strassel 2000, Labov et al. 2006). In other words, TRAP is situated in high-front position of the vowel space and there is no contrast between TRAP before nasal and oral consonants (Labov et al. 2006, Dinkin 2009, 2011). In the left facet of Figure 3 below, TRAP in all contexts is higher than 700Hz and more forward than 1855Hz. TRAP as part of the supra-local Elsewhere system occupies the low-

<sup>2</sup>Although this set of sound changes has been given other labels (e.g. *California Shift*, Hagiwara 1997; *Canadian Shift*, Boberg 2005; *the Third Dialect*, Labov 1991), we adopt Fridland and Kendall’s term “Elsewhere Shift” to acknowledge the similar general pattern indicated by several researchers conducting extensive acoustic analyses in various areas (e.g., Bigham 2008, 2009, Boberg 2005, Durian 2012, Fridland and Kendall 2012, Kennedy and Grama 2012).

front area of the vowel space as compared to the NCS pattern and comes in two forms: the (low) *continuous system* (Figure 3, center), where TRAP is in front of but not higher than LOT with more nasal conditioning than in the NCS raised system, and the (low) *nasal system* (Figure 3, right) where TRAP in the pre-nasal environment is more clearly separated from pre-oral TRAP in the vowel space. The continuous pattern is an older instantiation of the Elsewhere pattern for TRAP in the West, Canada, and Midlands, while speakers born in more recent generations almost exclusively exhibit the nasal pattern (see Strelluf 2014, Durian 2012, Kohn and Stithem 2015). A key finding for the current analysis is that not only have speakers in the Inland North adopted the lower variant, researchers note the emergence of the nasal pattern as well.

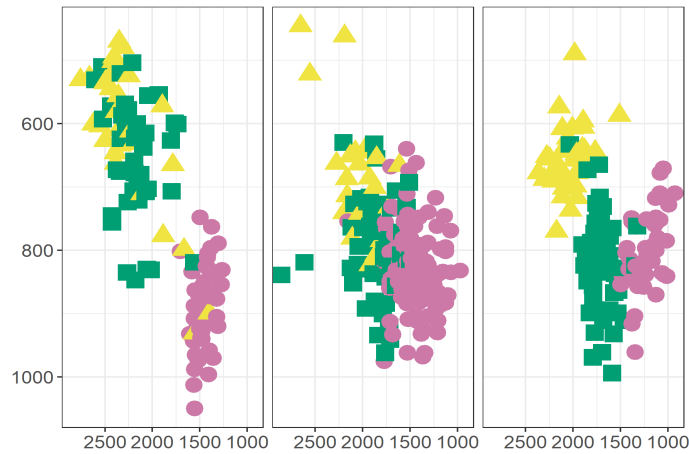


Figure 3: Three TRAP configurations: The Northern Cities raised TRAP system (left) and the Elsewhere Shift continuous (center) and nasal (right) systems. Purple circles = LOT, green squares = pre-oral TRAP, and yellow triangles = pre-nasal TRAP.

### 2.3 Social Evaluation and the Northern Cities Shift

An unmarked dialect of North American English, the NCS has been described as operating under the level of awareness (Preston 2004, Niedeiski 1999). Not only are speakers in the Inland North unaware that they have an accent, its speakers and those in the rest of the country identify it as the Standard American variety (e.g., Preston 2004). Since the first studies on the NCS in the 1970s, the dialect has remained unconditioned by style-shifting or social class, i.e., speakers of all social classes in the white community participate in this sound change, and speakers do not shift their pronunciations in formal settings as compared to informal ones (Labov 1994). More recent studies suggest that at least raised TRAP is rising to the level of a social marker in the Inland North. These studies note social stratification, overt negative comments about the local accent, and style-shifting away from raising TRAP. Social stratification is noted in Syracuse (Driscoll 2016), Lansing (Wagner et al. 2016), and Detroit (Morgan et al. 2017), where middle-class speakers are leading in retracting and lowering pre-oral TRAP over time. Overt negative comments about local speech is also noted in Syracuse (Driscoll 2016) where younger Syracusans associate raised TRAP with older speakers, referencing grandparents or older school teachers as having this *nasally, harsh/hard A accent*. One respondent described the Syracusan accent as “a hard vowel accent that I’d like to think I don’t possess” (Driscoll 2016:81). Informal discussions with young speakers in Lansing reveal the same evaluative responses. Last, young Lansingites (born in the 1990s) avoid the raised variant in more formal speaking styles (Nesbitt and Mason 2016).

Just as backed GOAT became marked in the Sunset District, raised TRAP has become so in the Inland North. Using Lansing as our case study, we will examine when raised TRAP became marked, taking into consideration any major socio-cultural changes that would have promoted stigmatization of the local dialect and its speakers. Without access to style data for earlier generations, the current analysis will focus on the emergence of social class stratification in Lansing’s urban center.

## 2.4 Lansing, Michigan

Lansing is part of “mid-Michigan”—a combination of three counties (Clinton, Eaton and Ingham) which together have a population of 464,436 (US Census 2010). The urban center of Lansing is surrounded by rural farmland so much so that the closest city with a population above 100,000 is 50 minutes south (Jackson, MI). Though Lansing is the state capital and it is home to Michigan State University, its history is tied to America’s once booming auto manufacturing industry. After Lansing’s incorporation in 1847, R.E. Olds established the Oldsmobile brand in 1883 (GM Corporate Newsroom) in the center of the city. Since then, Lansing has housed many Oldsmobile and General Motors’ assembly plants and, from 1965–1998, housed GM’s headquarters.



Figure 4: Map of mid-Michigan (Lansing, Michigan).

Lansing’s rise as an auto manufacturing powerhouse in the beginning of the 20th century brought prestige for the city and its auto workers. Workers in Lansing and in other manufacturing towns were part of the movement to gain better representation and livable wages for working-class Americans. They formed unions and fought (and won) against their employers for benefits and established the 40-hour work week. These changes brought on major life-style changes for workers in manufacturing. Many of the speakers in our sample discuss how hiring into their plant tripled their income. And with increased high-paying job opportunities for the working-class, we note increases in home ownership and consumerism (Knox and Pinch 2006), as well as a major increase in population. Lansing’s population rose from 16,485 in 1900 to 131,403 in 1970 (US Census 1900, US Census 1970), due mostly to the increase in in-migration of Michiganders from the surrounding farming towns (Fine 2004).

Manufacturing started to give way to the service sector in the latter half of the 20th century in the United States, thus dismantling the working-class way of life in once prosperous manufacturing towns (Rust Belt communities) like Lansing. The closure of most of its auto plants in the 1990s led to a continuous decrease in population from 131,403 in 1970 (US Census 1970) to 104,297 in 2000 (US Census 2000) in the city center as people moved on for better employment opportunities. Rural speakers went back to their family farms (Fine 2004) and white middle-class urban dwellers fled to the suburbs (Knox and Pinch 2006).

Since working-class identity was closely tied to Lansing’s manufacturing industry, we are apt to consider how this shift in industry has affected the social standing of people in the community. We argue that during Lansing’s rise as a manufacturing powerhouse, continuing the local speech pattern would have been beneficial, but that the decline in prestige for the city and its people would have prompted a shift in markedness for all things local—including the accent.

Historians and social demographers emphasize that the most affected generation of this economic transition in the United States were the Baby Boomers—those born 1946–1955 (Knox and Pinch 2006). This generation would have come of age (aged 20: 1966–1984) when the manufacturing industry was still prospering in Lansing and would have been the first to experience the cultural and economic changes brought on by the switch to the service industry and suburban sprawl. As such, this analysis we will do well to consider how TRAP is re-conceptualized for the Baby Boomers.

### 3 Method

The current analysis is of a subsample of data from a larger corpus of Lansing speech which included recorded oral histories with auto workers conducted in the early 2000s and sociolinguistic interviews with college undergraduates conducted in 2015 (date of birth ranging from 1907 to 1996). This paper focuses on the white urban subsample—27 white speakers who were born and raised within 10 miles of Lansing’s city center.

Demographic information for the sample is provided in Table 1 below. Since social class was defined differently in the first half of the 20th century compared to the second and since the younger sample was composed of all college students, social class was determined differently for each data set. The auto workers were assigned “middle-class” if they were in a managerial role and had received some training after high school for their job. Working-class speakers were those who were in trade positions (e.g., painters, assembly line workers, shippers) and who may have had post high school training, but that likely occurred later in their careers and did not result in major occupation/pay changes. All speakers born in the 1990s were classified as “middle-class” as they grew up in middle-class neighborhoods, their parents had middle-class occupations (e.g., daycare owner, financial planner, health inspector for the county) and they themselves were attending Michigan State University at the time of their interviews.

Birth Date	Working-Class	Middle-Class
1900 - 1925	1	3
1926 - 1950	2	2
1951 - 1975	4	2
1976 - 1997	0	13

Table 1: Speaker Demographic Distributions for Urban Lansing Sample.

The interviews were transcribed in ELAN (Brugman and Russel 2004) and passed through the FAVE suite (Rosenfelder et al. 2011) where transcriptions and audio files were time-aligned and formant measurements (F1 and F2 at the midpoint) at each TRAP token’s midpoint were extracted. After excluding TRAP tokens in function words and those that occur before /r/, average F1 and F2 values for pre-oral TRAP were generated for each speaker from a total of 2,610 tokens (1,692 pre-oral) in the sample. Separation between pre-nasal and pre-oral token clouds was measured by the Pillai-Bartlett statistic (Hay et al 2006, Hall-Lew 2010) which measures separation between the allophones by considering the distance between their two distributions and their variance. Pillai-Bartlett scores range from 0–1, where 1 indicates the most separation between distributions. The qualitative analysis of speaker means and Pillai-Bartlett scores is supplemented with an impressionistic analysis of the TRAP systems of speakers born in the Baby Boomer generation. This supplemental analysis will allow us to better determine which TRAP system each speaker has—high-front of the NCS region or low-front of the Elsewhere regions, a finding less evident in the quantitative analysis. The `dplyr` (Wickham and Francois 2016), `gridExtra` (Wickham 2017), and `tidyr` (Augie 2016) packages in R (R Core Team 2017) were utilized for data manipulation and `ggplot2` (Wickham 2009, Slowikowski 2016) was used for data visualizations.

## 4 Results

### 4.1 TRAP in Apparent Time

We begin with an impressionistic view of TRAP during the first half of the twentieth century to establish the development of the NCS raised system over three generations. Figure 5 displays the low-front vowel spaces of speakers born in 1907 (left), 1925 (center), and 1947 (right). The oldest speaker in our is Mildred Alspaugh whose vowel space is on the left. Here the pre-nasal (yellow triangles) and pre-oral (green squares) TRAP tokens are not separated in phonetic space, but fronted

past 1855Hz, and crucially only 15% of her TRAP tokens are raised above her LOT cloud. This is the system exhibited by “early adopters” of the NCS born at the turn of the 20th century in Buffalo and Grand Rapids (Gordon and Strelluf 2016)—no raising but considerable fronting.

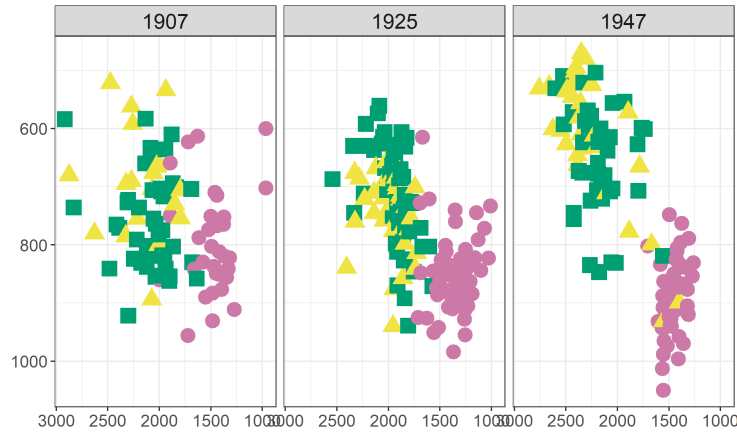


Figure 5: Low-front systems of Lansing natives born 1907 (left), 1925 (center), 1947 (right). Green squares = pre-oral TRAP, yellow triangles = pre-nasal TRAP, and purple circles = LOT.

The next generation of speakers, illustrated by Leslie Mitchell’s vowel space in the center facet, have raised their TRAP cloud. Compared to Mildred Alspaugh on the left, Leslie has many more pre-oral (green squares) and pre-nasal (yellow triangles) TRAP tokens raised higher than his LOT (purple circles) cloud. The typical Inland North raised TRAP system appears a generation later, as exhibited by Linda Maxon (born 1947) on the right. In this system, most of the TRAP tokens are significantly higher and more forward than the LOT cloud, and there is no separation between pre-nasal and pre-oral TRAP in phonetic space. In sum, the NCS raised TRAP system in Lansing began at the turn of the 20th century, as it did in Buffalo and Grand Rapids (Gordon and Strelluf 2016), and advanced in three generations to resemble the prototypical configuration characteristic of the Northern Cities Shift.

#### 4.2 Social Class and TRAP

Partitioning the sample by social class allows for a more nuanced view of how changes to the economic structure in Lansing have impacted participation in the local change in progress. To save space, the following analysis will rely on average F1, F2, and Pillai-Bartlett scores for each speaker in the sample. Average F1 and F2 values for each speaker in the urban Lansing sample are displayed over apparent time in Figure 6.

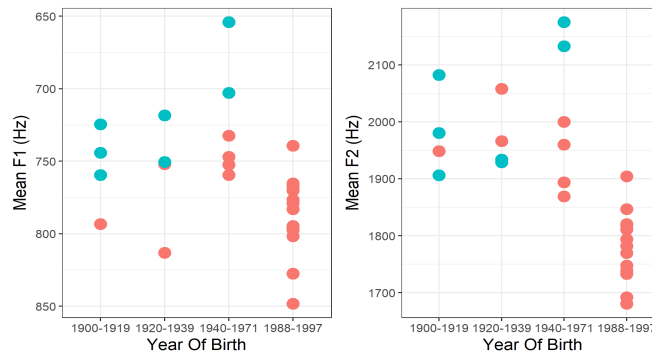


Figure 6: Average F1 (left) and F2 (right) values of pre-oral TRAP in urban Lansing from 1907-1997 (red = middle-class, blue = working-class).

We first note that the description above regarding the progression of the raised TRAP system only really accounts for working-class speakers (in blue). For them, we see an increase in raising (lowered F1) and fronting (higher F2) into the third generation. The middle-class speakers (in red), however, drive the shift away from the raised pattern, as these speakers lower and retract pre-oral TRAP. This trend continues to those born in the 1990s who have F1 values as high as 800Hz and F2 values as low as 1700Hz, which are within the range of values noted in the Elsewhere regions by the Atlas of North American English (Labov et al. 2006:192–204).

Average F1 and F2 values of pre-oral TRAP in Lansing indicate that middle-class speakers were participating in the reversal of the local pattern as early as the middle of the twentieth century. Except for one speaker who incidentally had close ties with many non-urban Lansingites while growing up, middle-class speakers born in the beginning of the 20th century were participating in the local pattern. They had average F1 values above 700Hz and F2 values above 1800Hz which are well within the range characteristic of the NCS dialect area (Labov et al. 2006:200). In the Baby Boomer generation, however, middle-class speakers distinguish themselves from the working-class by orienting away from the local pattern.

Our second indication of the emergence of a social class distinction in the Baby Boomer generation is noted in the apparent time examination of a contrast between pre-oral TRAP and pre-nasal (Figure 7). As noted earlier, aside from raising, the absence of a contrast between TRAP before nasal and oral consonants is another feature of the NCS dialect. As such, the development of a contrast is indicative of the reversal of the NCS configuration. In Figure 7, we note the development of this contrast in the middle-class community (in red) as indicated by an increase in Pillai-Bartlett scores over time. This contrasts with the maintenance of Pillai-Bartlett scores close to 0 in the working-class community, indicating maintenance of the local system. We take this as further acoustic evidence that the local system has developed into a working-class marker in Lansing, as the Elsewhere configuration more typical of western US states and Canada has been adopted by middle-class speakers.

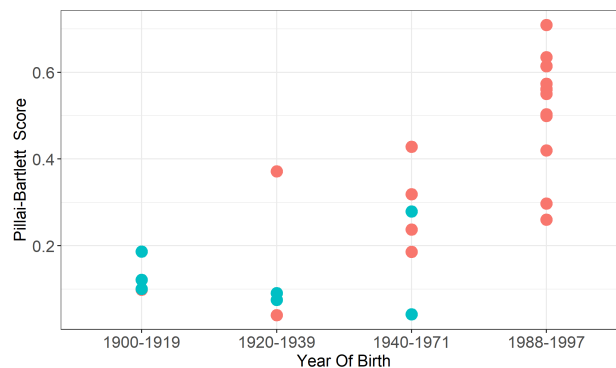


Figure 7: Pillai-Bartlett scores for Lansing, MI speakers (red = middle-class, blue = working-class).

There is no data in the sample for working-class speakers born after the 1970s, so it is unclear whether these speakers have continued advancing the raising and fronting of pre-oral TRAP. We are confident that if one were to look for vestiges of the NCS system in present day Lansing, one's best bet would be to speak to a working-class native. This is the case in Syracuse, where working-class speakers have advanced the raised pattern (Driscoll 2016). Anecdotally, it is from this social group, e.g., daycare workers, plumbers, and restaurant servers, that my colleagues and I hear NCS pronunciations (raised TRAP and fronted LOT) in Lansing. Given the results of the current analysis and these anecdotal accounts, it is highly plausible that this is the group who would have continued the local pattern. We leave this for future research.

In sum, the apparent time trends for these three measurements (F1 and F2 of pre-oral TRAP, and Pillai-Bartlett statistic), suggest that the raised TRAP pattern in Lansing went from being an urban pattern in the first half of the 20th century to a working-class urban pattern in the latter half.

## 5 Decline of All Things Local

Rural speakers were relocating to the urban center in droves during Lansing’s manufacturing boom in the earlier half of the 20th century, so the Elsewhere pattern was always there and available to urban speakers to adopt. Crucially, urban speakers do not adopt these patterns (nasal allophony and pre-oral TRAP lowering and retraction) until the point at which local prestige begins to decline in Lansing – the Baby Boomer generation.

The Baby Boomer generation is of interest to this discussion of dialect reversal because this is the first generation to have experienced the social repercussions of manufacturing decline in the Rust Belt. Before the 1970s, when Baby Boomers started in the work force, we find a rise in prestige for the community as a manufacturing powerhouse, which brought prestige for the developing NCS system. This likely garnered close associations between raised TRAP and the workers who were tied to these plants. As the economy started to decline in the 1980s, we see a decline in prestige for the local pattern such that upwardly mobile middle-class speakers adopt the supra-local pattern. This is reminiscent of the impact of social changes on local sound change noted in the Sunset District of San Francisco (Hall-Lew 2017), where a change in prestige for Chinese Americans also meant a change in evaluation of the old speech pattern.

The social and linguistic changes brought on by the abandonment of manufacturing in Lansing is likely very descriptive of the rise of supra-local patterns across the United States. Local pronunciations are being rejected in favor of supra-local patterns in New York City (Becker and Wong 2010), Philadelphia (Labov et al. 2013), various towns between Philly and NYC (Ash 2002), Cincinnati (Boberg and Strassel 2000), Kansas City (Strelluf 2014), rural Kansas (Kohn and Stitham 2015), Columbus (Durian 2012), Syracuse, NY (Driscoll and Lape 2015), Upstate New York (Dinkin 2011), Rochester, NY (King 2017), and Detroit (Morgan et al. 2017) to name a few. Though some of these towns are not “Rust Belt” towns, many of them are and more interestingly, many of them note the decline of the local pattern starting in the Baby Boomer generation. So, it is our contention that lifestyle changes brought on by a shift from manufacturing to service in the US is directly related to the rejection of local patterns across the country by the upwardly mobile.

## 6 Implications and Future Studies

The findings in this paper contribute to the discussion as to the actuation of the Northern Cities Shift. We find that the NCS developed in Lansing at the turn of the 20th century, which is later than anticipated by Labov (2010), but closer to that posited by Gordon and Strelluf (2016).

Future analyses on the NCS should consider other possible contributors to dialect attrition in the area. Though prior work has indicated that the NCS is below the level of awareness, its rise as a marker suggests that implicit (negative) attitudes toward the NCS have developed. The contribution of the current analysis suggests that the development of these attitudes is likely to have occurred in the Baby Boomer generation. Should an implicit attitudes study in the dialect area be carried out, we would expect a social class distinction in this generation such that middle-class Baby Boomers would share similar sentiments as younger speakers in Lansing and Syracuse, but that working-class speakers would be less critical. Other studies should consider style-shifting in apparent time as a measure of a change in markedness for the local pattern. If the current analysis is correct, we should find the development of a social class distribution in the Baby Boomer generation as well.

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