University of Pennsylvania Working Papers in Linguistics

Volume 8
Issue 3 *Selected Papers from NWAV 30*

Article 5

1-1-2002

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Assessing the Acquisition of Dialect Variables by Migrant Adults in Philadelphia: A Case Study

Jeff Conn and Uri Horesh

1 Introduction

While there have been many studies describing the regional dialects of non-mobile North American speakers of English, there has been little progress toward a description of the dialect of mobile persons. That is, what happens to the dialect of a person who moves from one dialect region to another? Furthermore, while research is scarce, there is some degree of consensus that a person's dialect, especially their phonology, is solidified by early adulthood, and that very little or no alterations are made to this stable system. There have been some studies describing the acquisition of new local dialects by migrant families, but these studies focus largely on the children and very little attention is given to the adults. In her study of King of Prussia, Pennsylvania, Payne (1976) states that the migrant adults do not acquire any of the Philadelphia phonological variables, although there is some partial acquisition of phonetic variables. Kerswill and Williams (2000) discuss the creation of a new dialect by children in Milton Keynes, England, based on a variety of input dialects, but they do not discuss any change in the migrant adults' dialects. We devised our study to fill this gap by investigating the degree of acquisition of phonetic and phonological variables by migrant adults living in a new speech community.

Before we begin discussing our study, it is important to note that we are assuming that there is some continuity between speakers from a speech community with comparable ethnicities and ages. That is, we assume that a speaker who moved from one speech community to another began his/her life with the same system as a person who has remained in the original speech community. With this assumption, we can compare a person who has moved from Michigan to Philadelphia to those who have stayed in Michigan, to determine if the mobile person has altered his/her system.

U. Penn Working Papers in Linguistics, Volume 8.3 (2002)

2 Our Study

2.1 The Subjects

As part of a broader study of a middle-class neighborhood in Philadelphia, we conducted sociolinguistic interviews with two speakers who had moved to Philadelphia from Michigan. Fred Mason[1] was 43 at the time of the interview and is originally from Detroit. Loretta Ward-Calvin was 36 and is originally from Grand Rapids. They moved to Philadelphia for graduate school and college, respectively, and have been there ever since. We compared our subjects with native Michiganders and native Philadelphians interviewed within the last 5 years for the *Atlas of North American English (ANAE).*

2.2 The Variables

We chose to investigate (ow) and (æ) because these variables are developing differently in Philadelphia than in the Northern Cities. The former is a phonetic variable, as it underwent a change in pronunciation virtually across the board in Philadelphia, whereas the latter is a phonological one, as it follows a complex pattern motivated by phonetic environment and morphophonemic conditioning, as well as some lexical diffusion.

The first variable, (ow), has been fronting in Philadelphia for some time and speakers comparable in age with Fred and Loretta have a fronted, and sometimes unrounded, nucleus for (ow). This is true for all phonetic environments except before /l/, in which case it is kept distinct with a back nucleus. In the Northern Cities, the nucleus of (ow) has remained back, including before /l/ where it is not kept as a distinct class from the other phonetic environments.

The second variable is (æ). This phoneme is involved in a complex split in Philadelphia between a tense /æh/ and a lax /æ/. The environments for this split are phonetic as well as morphological. In the Northern Cities Shift, there is no split of the phoneme and the entire historical class of words containing /æ/ has moved up to high front position with an inglide, similar to, yet more extreme than, the tense /æh/ of Philadelphia.

[1] Informants are referred to by pseudonyms.

2.3 Analysis

To examine possible changes of these variables by our subjects, we conducted a 3-part analysis.

2.3.1 Phase 1: Vowel Measurement/Plotnik

For the first part of the analysis we digitized a representative amount of speech from the sociolinguistic interviews, in order to sketch the entire vowel system of both speakers (about 250-350 tokens per subject). Then, we measured the first and second formants using Kay Elemetrics' Computerized Speech Lab (CSL) and plotted these measurements in Plotnik. We performed a log mean normalization against 345 speakers that were interviewed for *ANAE,* which has proven effective in minimizing formant differences due to physiological attributes (such as age and sex of the speaker; see Labov 2001). After that, we compared our two subjects' systems with that of other speakers from their respective native speech communities. In order to account for differences due to possible sound changes in progress, we only compared our subjects to speakers of similar ages and ethnicities. We compared Fred with two men and two women living in Detroit, and Loretta with three women and two men living in the Grand Rapids area (which includes Grand Rapids, Kalamazoo, and Battle Creek). We also compared both of our subjects with one woman and one man who are native Philadelphians and who were also interviewed as part of *ANAE.* A third Philadelphian woman was also used in the comparison in a manner that will be described herein.

2.3.2 Phase 2: Statistical Analysis

The second phase of the analysis involved various statistical calculations on the normalized data to investigate the possibility of changes in the vowel formants of our two speakers. First, we coded the (ow) variable for free and checked syllables, preceding coronals, and following /l/. We coded the (æ) variable for tense and lax environments according to the Philadelphia system, as described in Labov 1989. Then we conducted t-tests on each environment to determine whether the differences between the F1 and F2 means for our speakers and those of each of the other speakers were statistically significant. In most cases we were testing the null hypothesis, namely that any difference in any of the formants was due to chance. For this hypothesis, we conducted 2-tailed, unequal variance t-tests. However, in the case of the F2 of the nucleus of (ow), we had a clearly defined alternative hypothesis, namely that our transient subjects were fronting the nucleus of that vowel,

detectable in the measurements by an increase in F2. Since in this case we could predict the direction of the change, we used a 1-tailed t-test. Unless otherwise indicated, statistical significance is at the $p < .05$ level. In some cases, however, significance reaches the $p < .01$ level.

2.3.3 Phase 3: Vowel System Analysis

The final part of our analysis was a vowel system analysis. In order to examine these variables thoroughly, it is essential to contextualize them within their respective vowel systems. By examining each individual's vowel system, not only can we see possible differences between our subjects and their Michigan and Philadelphia counterparts, but we can also see how changes to any particular phoneme may interact with other phonemes in the system.

3 Discussion and Conclusion

3.1 Loretta – A Systemic Change for (æ)

The statistical analysis for Loretta did not distinguish any significant differences for (ow) between her and the other Michigan speakers, as shown in Table 1. Her range of F2 is well within the range of the other Michiganders, with the exception of one fronted token of the word 'go', at 1,634 Hz. Examination of her vowel system indicates that her (ow) vowel space is not any different than that of the other Michiganders.

Speaker	F2 Low (Hz)	F2 High (Hz)
Loretta	801	1483
Betty E	836	1538
Julie R	773	1289
Sharon Z	831	1418
Ron R	888	1369
Bob R	908	1199

Table 1: F2 ranges of Loretta and other Michiganders

The situation with respect to Loretta's (æ) measurements appears to be more complex, as shown in Table 2. First, her overall F1/F2 means are the lowest and backest at 718 Hz and 1855 Hz, respectively. Because data were scarce for certain environments, the most reliable analyses were those conducted on all tense or all lax tokens. Loretta's F1 and F2 means for all (æ), for (æ) in the Philadelphia tensing environments, and for (æ) in the Philadel-

phia laxing environments are lower and backer than 4 out of 5 of her Michigander counterparts ($p < .05$). Based on these differences, it is clear that she is diverging from her Michigan counterparts, but there is also no evidence to support the assumption that she is developing a Philadelphian system. For example, when we compare her with the Philadelphians, as shown in Table 3, only one clear pattern emerges: her tense (æ) F1 mean (at 703 Hz) is significantly lower than those of the Philadelphians.

Numerically, it is difficult to interpret these data in a meaningful way. By examining her system on a Plotnik vowel chart, it becomes clearer that she has changed her (æ) pattern to a system different from both Philadelphia and Michigan. These systematic differences are shown in Figures 1 and 2.

Speaker	All (æ)		Tense (æ)		Lax (æ)	
	F1 Mean	F2 Mean	F1 Mean	F2 Mean	F1 Mean	F2 Mean
Loretta	**718**	**1855**	**703**	**1893**	**741**	**1790**
Betty E	637	1989	572	2119	679	1906
Julie R	638	2143	620	2398	642	2101
Sharon Z	661	2135	605	2255	698	2077
Ron R	667	1880	644	2046	672	1839
Bob R	587	2068	557	2164	603	2012

Table 2. Loretta compared to other Michiganders for (æ)

Speaker	All (æ)		Tense (æ)		Lax (æ)	
	F1 Mean	F2 Mean	F1 Mean	F2 Mean	F1 Mean	F2 Mean
Loretta	**718**	**1855**	**703**	**1893**	**741**	**1790**
Rita V	726	2013	618	2311	803	1799
Denise T	726	1857	613	2268	764	1720
Jimmy O	702	1780	636	1877	730	1739

Table 3. Loretta compared to Philadelphians for (æ)

In the Northern Cities Shift, (æ) raises to a high front position, leaving a vacancy in the low front part of the vowel space, which attracts the fronting of /ɑ/. Loretta's (æ) extends down into the bottom front of her vowel space, filling the gap that is usually left when this vowel is raised as part of the Northern Cities Shift. Subsequently, her /ɑ/ and (æ) now partially overlap. However, there is a clear distinction that in pre-nasal position, (æ) remains raised and fronted, creating a pattern that is best described as a nasal system, which is found in many parts of the United States (and is becoming the pat-

tern that younger generations are developing in the Mid-Atlantic region, as reported in Ash 2002). In it, there is a phonetic conditioning of (æ) such that before nasals, there is some tensing (which is phonetically realized as a higher and a more fronted vowel). In other environments, the vowel is lax. Loretta's lax (æ) means are different from both Michiganders and Philadelphians, with statistical significance for either F1 or F2, or both. Therefore, according to the statistical analysis as well as the vowel-system analysis, we propose that Loretta has altered her (æ) pattern to a nasal pattern, which is not the prevalent system in either Michigan or Philadelphia.

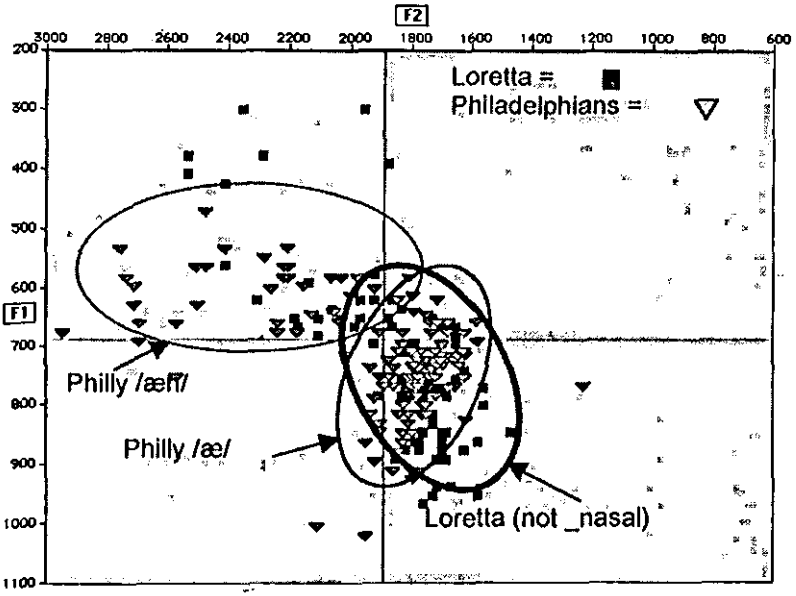

Figure 1. Loretta's (æ) tokens vs. Philadelphians' (æ)

3.2 Fred – Fronting of (ow)

Fred's speech in comparison with the four Detroit speakers shows a different pattern than Loretta's. There were no statistically significant differences between Fred's (æ) system and that of the other Detroit speakers. Regarding the Philadelphia data, Fred's mean F1 and F2 for (æ) in the Philadelphia laxing environments indicate that in such environments his (æ) is as high and front as in any other environment. An exception to this is the pre-nasal environment, which promotes the highest and frontest positions for (æ). How-

ever, he does not exhibit a nasal system, as a closer examination of his entire system shows that the space occupied by nasals is also shared by other environments, most notably voiced apical stops. These facts rule out the possibility that Fred has changed his (æ) system to accommodate to the Philadelphia pattern, or to a pattern different from Detroit.

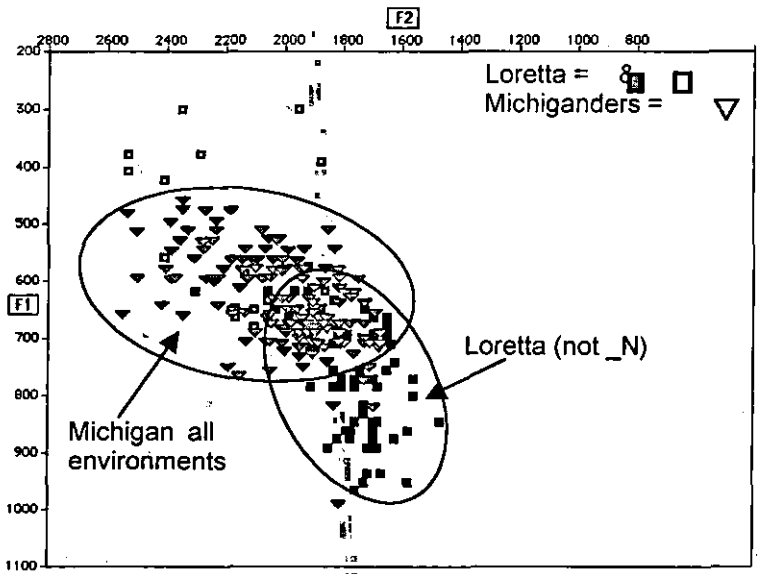

Figure 2. Loretta's (æ) tokens vs. Michiganders' (æ)

Fred's (ow) system, however, is more noteworthy. He fronts the nucleus of (ow) significantly more than the four Detroit speakers ($p < .01$). Figure 3 shows that the range of (ow) in Fred's data has expanded beyond the other speakers from Detroit. Given that the general pattern in Philadelphia is not to front the nucleus of (ow) before /l/, we examined the difference between Fred's production of (ow) and that of his Detroit counterparts both with and without a following /l/. Excluding the Philadelphia non-fronting environment had virtually no influence on the statistical significance of the difference in fronting between Fred and the other Detroiters. Within his own system, Fred shows significant fronting ($p < .01$) of non pre-lateral (ow) compared to those before /l/. This is also visible from his vowel space plot. We may conclude that while he has retained a backer realization of (ow) followed by /l/,

he has extended the pronunciation of this vowel to include much fronter positions for environments that do not exclude such fronting.

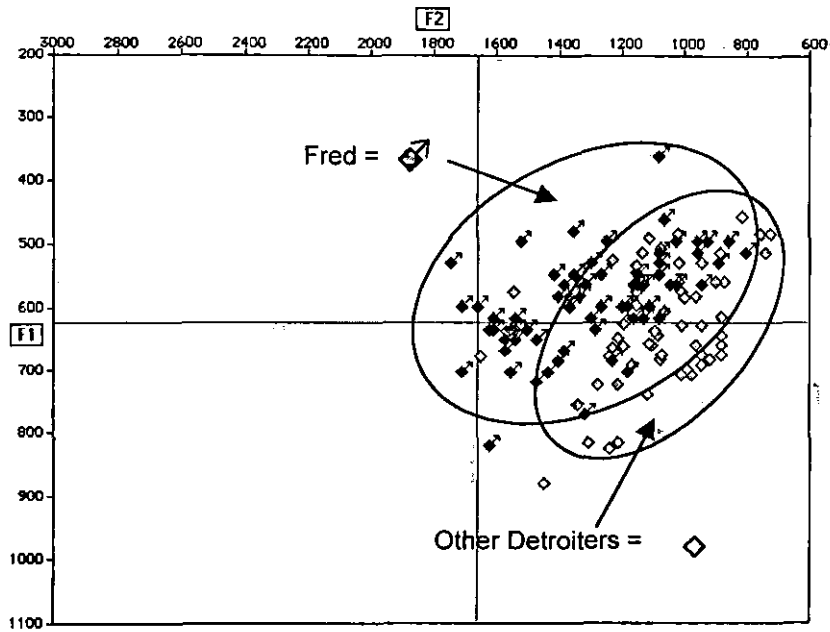

Figure 3. Fred's (ow) tokens vs. Detroiters' (ow)

Our next step was to compare Fred's (ow) to that of native Philadelphians Denise Titano, Rita Vivino, and Jimmy O'Brien of the *ANAE* project. Of these three speakers, Denise had fewer tokens of (ow), and, statistically speaking, her system is not as front, and in some cases not as high, as the norm in Philadelphia as exhibited by the other two Philadelphia speakers. Our first inclination was to exclude Denise from the comparison with Fred. However, after realizing that Fred's (ow) system is, like Denise's, significantly different from that of the other Philadelphians, we decided to run a t-test between Fred and Denise. In terms of F1, Fred's pronunciation was not significantly different that any of the three speakers. However, his F2 was significantly different from that of Rita and Jimmy ($p < .01$), but not Denise (F2 means were nearly identical: 1334 Hz for Fred; 1321 Hz for Denise). Compared to the combined mean of Detroiters (1053 Hz) and that of the Philadelphians excluding Denise (1501 Hz), Fred's mean is just slightly

greater than the midpoint between Detroit and Philadelphia. This demonstrates that Fred is no longer behaving like the Detroit speakers and has shifted toward a Philadelphia target. His performance is not as extreme as that of some Philadelphians, but his similarity to Denise, a native Philadelphian who herself is not as advanced as some of her cohorts, is a good indication that he is headed in the Philadelphia direction nonetheless. Figure 4 illustrates Fred's position in relation to the Detroit and Philadelphia means regarding the fronting of (ow).

Similar to Payne's (1976) findings in King of Prussia, the changes we have described are based in phonetics, yet have consequences for the entire phonological systems of the speakers involved.

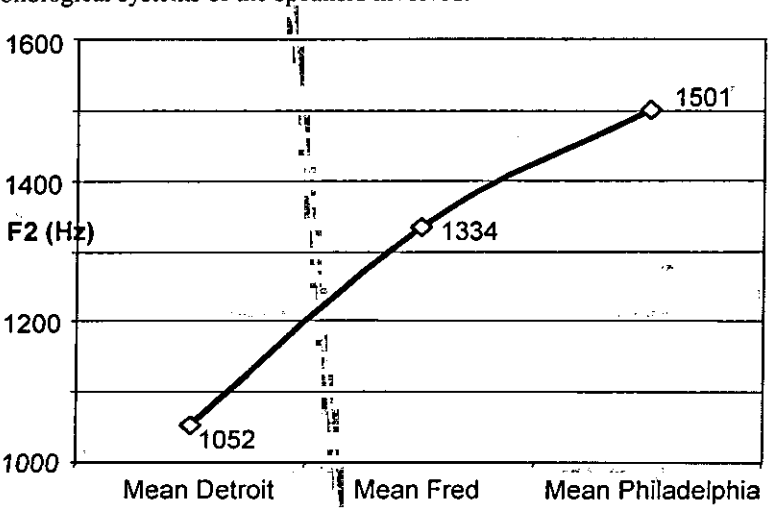

Figure 4. F2 mean for Detroit vs. Fred vs. Philadelphia (excluding Denise)

3.3 Social Influences

Now that it is clear that Fred and Loretta are altering their vowel systems with respect to the variables investigated, it is necessary to ask why. Linguistically, the fronting of back vowels is one of the principles of chain shifts described in Labov 1994. However, this does not explain the change from a Northern Cities across-the-board tensing of (æ) to a nasal system. We must turn to extralinguistic factors in order to provide possible answers to why they are changing the way they speak. In this section, we will attempt to provide a post-hoc interpretation of the social factors that might have promoted the changes we have just described.

Our two subjects are not natives to the Philadelphia speech community, but they are certainly devoted to it. They have both been in Philadelphia for over 15 years and are raising families in Philadelphia. They are also both very active in their respective churches, as well as in the neighborhood town watch association (Fred is the president and Loretta is the treasurer). Both are social workers who work with different populations of Philadelphia. The reason that they alter their systems in different ways is perhaps partly due to the populations with whom they have come into contact in their work.

Loretta has worked mostly with African-Americans in West Philadelphia, while Fred works with a more heterogeneous population in his Center City office, serving a broader community citywide. African-American Philadelphians, for the most part, do not participate in (ow)-fronting and do not share the phonemic (æ) pattern typical of white Philadelphians. Loretta's close contact with the African-American community may have provided her with a different target for linguistic change. Or at least, it has not promoted the same changes that Fred has undergone.

The reason for Fred not drastically changing his (æ) system might lie with the fact that part of the Philadelphian (æ) is phonetically similar to the raised Northern Cities (æ). So if he laxed all instances of (æ), he would be in the same situation as if he had not changed anything at all. That is, a portion of his (æ) words would be similar to Philadelphia (æ) whether he changed his system or not.

It seems that social involvement seems to play a role in the way that our subjects are modifying their systems. However, further studies are needed to compare less socially involved migrant adults with our subjects in order to discern the degree that social involvement has on the degree of linguistic acquisition of local speech community variables.

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