

The role of higher education in linguistic change

Hilary Prichard

Dissertation proposal, submitted April 25 2013

Supervisor: William Labov

1 Introduction

Sociolinguistic research has long recognized educational attainment as an important social factor. However, in a society in which a college education has rapidly become a viable option for more people, it is likely that we will soon have to reconsider how best to factor education into the quantitative study of variation. As fewer and fewer people from the white mainstream population enter the workforce with only a high school education, sociolinguistic studies will have to adapt in order to capture the changing significance of higher education.

It has frequently been the case that large-scale quantitative sociolinguistic studies simply factor in years of education completed as one of several indicators comprising a socio-economic index (SEI), rather than studying the role of education as a variable unto itself (e.g., Labov 1966, Labov et al. 1972, Conn 2005, Labov et al. 2006; see also Kerswill 2006). Conversely, the studies which *have* focused specifically on the effect of education tend to be smaller, focused on the consequences for a narrowly-defined community or school (e.g., Wagner 2008, Bigham 2010, De Decker 2006). In consequence, we know surprisingly little about the way education interacts with linguistic change. The research agenda described here returns to the insight of Weinreich et al. (1968) that linguistic changes are *embedded* in both linguistic and social structures, and asks how higher education interacts with this embedding. This dissertation will employ both quantitative corpus-based and experimental methodologies to deepen our understanding of the role of

education on three fronts, by:

1. Developing a more nuanced approach to the categorization of education, which seeks to capture the recent increase in emphasis on college education.
2. Investigating the impact of higher education on linguistic structure, i.e. the interaction with *linguistic embedding*, through the study of the effect of education on apparent-time linguistic changes.
3. Exploring the interaction between higher education and *social embedding* by studying the perception and evaluation of linguistic variables by speakers with differing educational backgrounds.

To illustrate the extent to which there has been a shift in educational attainment in recent decades, Jeff Conn points out in his 2005 dissertation that the 1970s census data upon which the study of Linguistic Change and Variation in Philadelphia (LCV, 1973-77) socioeconomic index was based listed the median education attainment in Philadelphia as 10.6 years, or less than high school. By 2005, the median educational attainment includes high school graduation. According to the most recent census estimates available,¹ nearly half (47%) of Philadelphians have some amount of higher education; 24% have at least a Bachelor's degree. Table 1 shows this change in educational attainment from the 1970 census to the present.

As a larger proportion of the population attends college, is it possible that the *type* of college attended will become a relevant social factor? Previous work on higher education (which will be discussed in greater detail below) has addressed the question of whether students alter their speech to accommodate to new norms upon attending college, but thus far I have encountered no studies which systematically investigate whether students pursuing different types of higher education realize this accommodation to the same extent. One of the goals of this research will

¹Which is the 2007-2011 U.S. Census Bureau American Community Survey 5-year Estimates: <http://quickfacts.census.gov/qfd/states/42/4260000.html>

Education completed	1970 census		2000 census		2011 estimate	
	Phila	U.S.	Phila	U.S.	Phila	U.S.
Less than High School	60%	47%	29%	20%	19%	14%
High School	28%	31%	33%	29%	34%	28%
Some College	5%	11%	20%	27%	23%	29%
College (4-year)	4%	6%	10%	16%	14%	18%
Further degrees	3%	5%	8%	9%	10%	11%

Table 1: Change in education between 1970 and 2011, U.S. Census Bureau

be to determine whether there is a quantitative difference in the effects of different types of education on speakers’ participation in and perception of community changes and norms.

This proposal is structured as follows. Section 2 will review a few key studies which indicate the breadth and variety of past treatments of education. Section 3 proposes studies to investigate the three core issues addressed in this dissertation: 3.1 describes the results of my preliminary work in developing a new type of education classification in Philadelphia; 3.2 proposes a study of data from Raleigh, N.C. which will bear on the interaction of higher education with linguistic embedding; 3.3 proposes a series of perception studies which address the question of social embedding. I will then conclude by discussing further questions raised by this research in Section 4, exploring its intersection with issues of dialect contact, second dialect acquisition, and accommodation.

2 Background

The seminal study considered here which makes use of education as part of an SEI is the LCV study which took place in Philadelphia during the 1970s. This study used a composite SEI based on scores for education, occupation, and residence value, with the following distinctions made for education: 6 - professional school, 5 - college graduate, 4 - some college, 3 - high school graduate, 2 - some high school, 1 - grade school (Labov 2001:61). The analysis of the LCV data presented in Labov (2001) treated education as one component of a three-part SEI because it was primarily

interested in the effect of social class on the variables of study, and recognized that social class is derived from a variety of sources. This study might nevertheless have devoted more analysis to the independent effect of education, if it were not for the fact that in the regression analyses of local changes in progress, the education term consistently failed to reach statistical significance, and contributed the least of the three factors to the explanation of variance (2001:181). Education proved to be a significant factor in only two of the regression analyses of stable socially-evaluated variables (negative concord in casual speech, and (ing) in careful speech; 2001:117). These results would seem to indicate that education did not play a role in Philadelphia changes in progress during the 1970s.

However, Gorman (2010) finds that this lack of significance is due to multicollinearity among the predictors submitted to regression analysis. He selects one of the LCV variables, negative concord, for reanalysis. Employing residualization of the correlated predictors and mixed-effects modeling, Gorman finds that education is in fact a significant predictor ($p < .001$): higher education levels result in less use of negative concord in the LCV data. On the basis of this finding, it is worthwhile to reconsider the significance of education in the Philadelphia changes in progress.

Indeed, more recent results from a large-scale analysis of the Philadelphia Neighborhood Corpus (2011, $n = 379$ speakers) have shown a significant effect of years of education received for several vowel variables (Labov et al. 2013). Figures 1 and 2 below, taken from Labov et al. 2013, give an example of these findings, showing the difference between white adult Philadelphians with twelve years or less of education, and those with more. In both cases there is a significant difference between the two education groups, as speakers with a high school education or less have consistently more advanced (i.e. raised along the diagonal) forms over time than speakers with more than twelve years of education. The work I present in Section 3.1 examines whether this conservative “>12” group can fruitfully be further broken down by type of college education received.

In recent years there has been increased interest in studying the effects of going to college

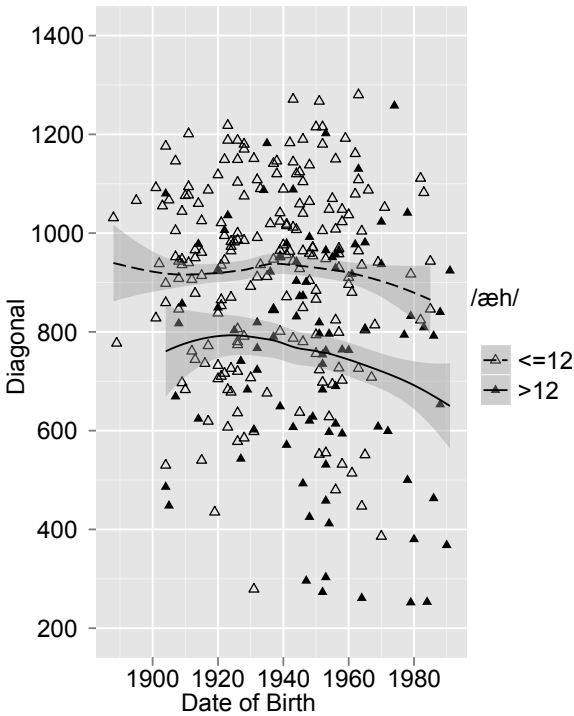


Figure 1: Change in /æh/ over time.

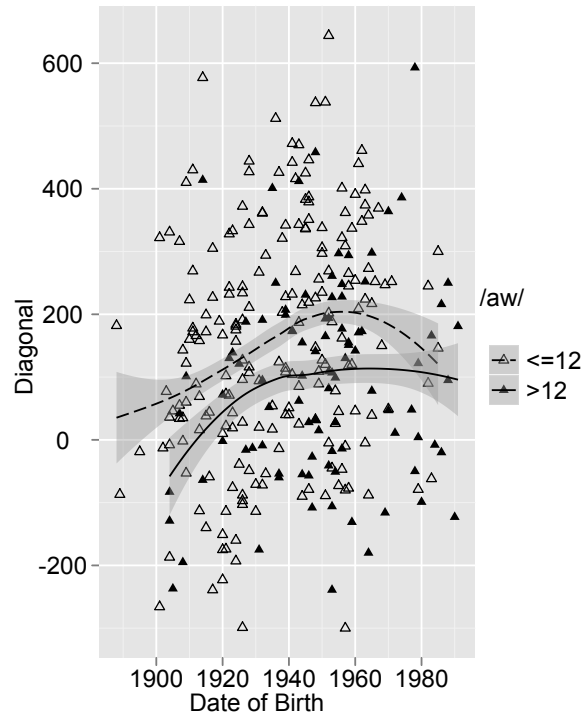


Figure 2: Change in /aw/ over time.

on adolescents' use of local dialect variables, typically framed as speakers' accommodation to changing norms. Of particular note are three studies which focus on the transition between high school and college: De Decker 2006, Wagner 2008, Bigham 2010.

De Decker (2006) interviews four students from rural Ontario twice—before and after attending an urban college within the same dialect area (what he terms “dialect zone internal migration”). This group showed an intriguing pattern with regards to the supralocal change in /æ/-retraction while in high school: they patterned with conservative rural adults in retraction-inhibiting environments, but with innovative urban youth instead in retraction-promoting environments. De Decker offers the following explanation for this finding: “They phonetically marked their status as upwardly mobile, university-bound students while at the same time, marking their ties with adult members of the community and their positive experiences with local practices” (74) —a case of “having their cake and eating it too,” we might say. Upon re-interview,

three of the four students in this group showed increased retraction in inhibiting environment, presumably as a result of weakening community ties and the adoption of the new urban norm. The fourth student showed no change in her /æ/-retraction, but was also described as being less engaged in socializing in the urban setting than her peers. De Decker thus demonstrates that orientation towards the community and local values can play a role in how speakers adapt their speech to changing norms.

Wagner's (2008) study of nine Philadelphia teens during the transition from high school to college examines the other side of the coin; she wanted to know how college attendance would influence students' participation in *local* sound changes. She found that by and large the students' use of the local variables remained stable, but that the students who *do* actively continue to participate in community changes after high school are those who maintain strong community ties, and crucially, who continue to socialize with local peers. This echoes De Decker's finding; students' continued involvement in their local community plays a large role in determining the extent to which they either adapt to new norms, or continue to participate in changes back home.

Finally, Bigham's 2010 work on accommodation by speakers of different dialects at Southern Illinois University has interesting implications for this line of research. Bigham studies seven Midlands speakers who have come in contact with Northern Cities speakers in a college setting, and concludes that the result of this contact is accommodation, *as well as* continued participation in local change. He proposes that this is possible because the accommodation occurs "not through the wholesale adoption of new forms but rather through an expansion or reduction of the range of previously existing forms."

He further offers two different phonetic mechanisms to explain how this accommodation is implemented in a speaker's vowel system. In "accommodation via expansion," the mean for a particular vowel moves in the direction of the accommodation, but the speaker maintains a wide range of variants; thus the range of variation is expanded, rather than decreased. A speaker exhibiting this type of accommodation can be thought of as "having their cake and eating it too" in

the same way as DeDecker’s speakers, since their expanded repertoire allows them to adapt their speech to either norm. By contrast, “accommodation via reduction” involves a reduction in the range of variants produced. Rather than incorporating variants from both their native dialect and the dialect they are accommodating towards, speakers exhibiting this type of accommodation “meet in the middle” between the two extremes. These two types of phonetic accommodation are explored in Prichard 2012 and Prichard and Tamminga 2012, and should certainly be considered further in the dissertation.

3 Proposed Studies

3.1 Operationalizing Education in Philadelphia

The first case study of this dissertation examines the role of education in speakers’ use of Philadelphia vowel variables. It builds on a previous small-scale study of the effects of higher education on Philadelphia vowels by Prichard and Tamminga (2012). In that study, a close analysis of synchronic data from eight speakers was conducted, and found that speakers at the highest levels of education appear to be correcting away from a marked stereotype of local speech, tense short-a, while at the same time participating in local changes below the level of awareness. The analysis was based on a four-way education categorization, which distinguished speakers with only a high school education, those who went on to attend a local community or technical college, those who attended a larger regional college, and those who attended a large national research institution (who are the group most likely to come into regular contact with speakers of different dialects). The current research will use the same education categorization and take four vowel variables as its starting point: the split short-a system, the low-back distinction, raising of /ey/ in checked syllables, and post-coronal /uw/ fronting. These variables and their relevance are briefly described below.

3.1.1 The variables

In Philadelphia, as in other parts of the country, there is a phonemic distinction between tense /æh/ and lax /æ/ (Ferguson 1972). Phonetically, the realization of these phonemes ranges from lax lower-mid [æ] to tense upper-mid ingliding [eə]. The distribution of the forms is largely predictable from the phonological environment, which is a complex set in and of itself, but short-a also shows lexical and morphological irregularity. Past research has shown that the phonetic peripheralization of the tense /æh/ class behaves like a stable variable in Philadelphia (Labov 2001:160) and bears negative social evaluation (Wagner 2008).

Similarly, Philadelphia maintains a distinction in the low-back vowels such that /oh/ (as in *thought*) is raised and peripheral in comparison to /o/ (as in *lot*). Extremely tense /oh/ is a recognizable and negatively-evaluated stereotype of New York City speech (Becker 2011, 2013), but it is unclear whether the same is true of Philadelphia. In 1970s Philadelphia, such social evaluation was “directed almost entirely at the front vowel” (i.e. /æh/; Labov 1994:343) but this issue has not been investigated since then.

These two variables are grouped together as the “stable” or “marked” variables, due to the fact that the raising of the tense vowels has more or less leveled off, and they are now available for social evaluation of the type seen with stable variables. These variables, as phonemic distinctions which may be maintained or lost by Philadelphians, are also where we will look to consider whether speakers’ education has an impact on their phonology.

As a counterpoint to the two stable variables, the other two variables investigated are current changes in progress. Together, they will be referred to as the “unmarked” variables, due to the fact that they are both changes from below which thus far do not appear to attract overt commentary or social correction.

The first such variable is the raising of the /ey/ nucleus in Philadelphia, so that *plate* sounds more like *pleat*, for example; this was identified as a “new and vigorous change” in the LCV study (Labov 2001). This raising does not occur in word-final or pre-hiatus positions (Fruehwald 2011),

so from here on, “/ey/ in a raising environment” will simply be referred to as /eyC/ (checked /ey/), as versus /eyF/ (free /ey/).

The final variable under study is the fronting of /uw/. Dramatic fronting of the /uw/ nucleus after coronal consonants (henceforth /Tuw/, as opposed to /Kuw/ elsewhere) is a widespread phenomenon found in most North American dialects (Labov et al. 2006). In Philadelphia, fronting after non-coronal consonants also occurs, but is considerably less advanced and more idiosyncratic in nature. Like /eyC/-raising this variable is an unmarked change from below, but it differs in that it is not localized to Philadelphia. Both of these unmarked variables show some effects of environment, but it has not yet been proposed that they represent actual phonemic splits.

These four variables were chosen in order to examine the possible effects of higher education on a range of variable types: one which is stable and known to bear negative social evaluation (æh), one which is stable and may prove to be likewise susceptible to evaluation (oh), one which is a local unmarked change in progress (eyC), and one which is a nation-wide unmarked change in progress (Tuw).

3.1.2 The data

The data investigated is a sample drawn from the Philadelphia Neighborhood Corpus (2011). The entire corpus consists of data collected from 1972 to 2010, which includes over 150 hours of speech from 379 different speakers, and yields more than half a million vowel tokens. Of these speakers, 139 were selected for this study, which represents the total number of white, adult, native Philadelphians for whom detailed education information (from interview reports and transcripts) was readily available. This sample is reasonably evenly divided between males and females, and includes a broad range of birth dates, with speakers born from 1901 to 1991. These 139 speakers are divided into four categories based on level and type of education received, resulting in the distribution shown in Table 2. Examples of each type of college include: the “local” colleges St. Joseph’s and Community College; “regional” colleges like Temple and Drexel; “na-

tional” colleges like the University of Pennsylvania and University of Pittsburgh. Figure 3 shows the date of birth distribution for each of these education groups, which is unfortunately skewed such that the highest category is much younger than the lowest.

Education Index	N	%
1: HS or less	85	61%
2: “local” college	28	20%
3: “regional” college	16	12%
4: “national” college	10	7%
139 total		

Table 2: Education distribution

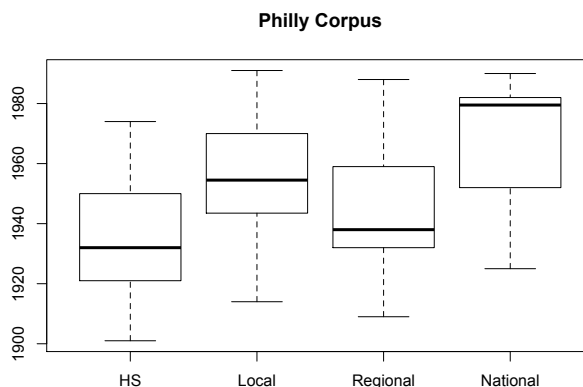


Figure 3: Education distribution by date of birth

Vowel tokens from these speakers were aligned and extracted using the FAVE suite (2011) and analyzed using R (2008). The plots which follow display Lobanov-normalized and rescaled values. Front vowels are plotted along a “diagonal” dimension rather than F1 and F2; this measure is calculated as $F2 - 2 \times F1$ and allows us to plot the overall tendency in the movement of a vowel against a second dimension (see Labov et al. 2013 for more detailed information about this measure). Speaker means which were calculated on less than 10 tokens were removed, in order to reduce the number of potential outliers due to measurement errors.

3.1.3 Results

Figure 4 displays the result of plotting the /æh/ diagonal measure against date of birth, with linear regression lines indicating the trend for each education group, as compared to change over time in /eyC/. The trend for speakers with a high school education has been to continue raising and fronting /æh/, what we might think of as the traditional Philadelphia pattern. However, speakers who were born around 1940 who continued on to higher education began to reverse that

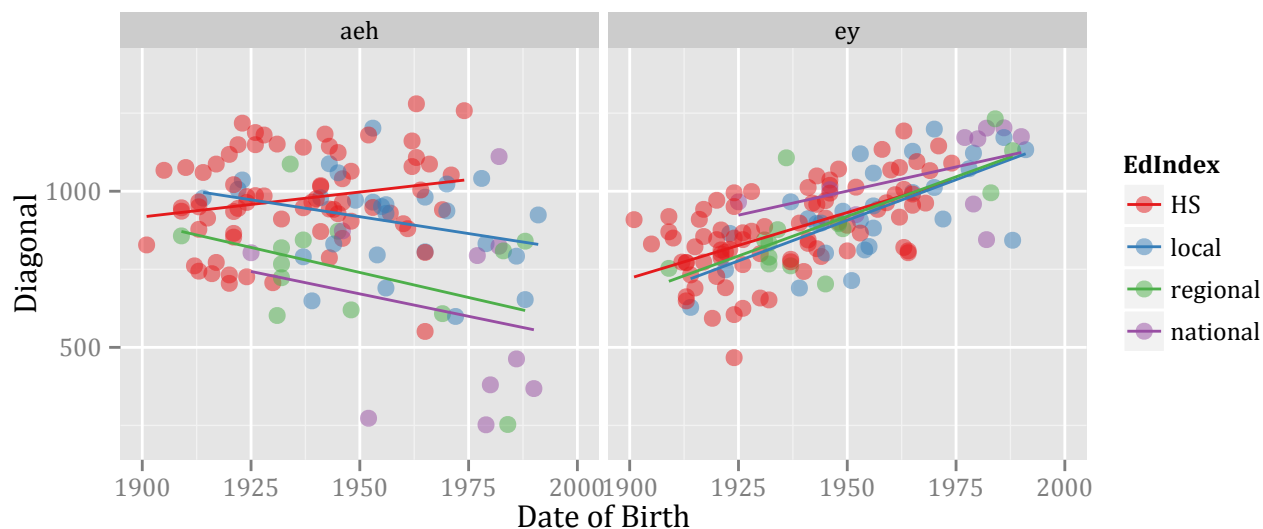


Figure 4: Change in /æh/ and /eyC/ diagonal measures over time with linear regression lines for education index

trend. Furthermore, there does in fact seem to be a gradient relationship between the education groups; after about 1950, high school and local speakers are clearly differentiated, and regional speakers are still further distanced from these two groups. Unfortunately, due to the small sample size (10 speakers), the standard error for national speakers is too great to be sure that they are different from regional speakers on this measure. Additionally, the diachronic trends of the individual groups (as shown by the regression lines in Figure 4) do not prove to be significant (Table 3). This, again, stands in contrast to the results for /eyC/, where speakers of all educational backgrounds are fronting and raising this vowel in lockstep; this is confirmed by the regression coefficients shown in Table 4.

Ed Index	Adj. R2	Intercept	Slope	<i>p</i>
1	.03	-2111.6	1.59	.09
2	.05	5137.1	-2.16	.14
3	.09	6989.4	-3.20	.17
4	-.08	6272.1	-2.87	.57

Table 3: /æh/ regression coefficients for Diagonal by Date of Birth

Ed Index	Adj. R2	Intercept	Slope	<i>p</i>
1	.33	-7283.4	4.21	<0.001
2	.43	-9230.1	5.20	<0.001
3	.51	-8968.6	5.07	0.002
4	.14	-5017	3.09	0.15

Table 4: /eyC/ regression coefficients for Diagonal by Date of Birth

The same type of analysis was conducted for the remaining two vowel variables (see Prichard 2012 for full quantitative results and discussion), with the following results: for /oh/ there is a parallel stratification by education to the findings for /æh/; speakers with national educations show the least tense realizations of /oh/, but there is as of yet no evidence that these speakers are actually merged in /o/. /Tuw/ shows no differentiation by education group, with all groups moving in lockstep, fronting /Tuw/ over time. Mixed effects modeling confirms these patterns; /æh/ and /oh/ show a significant effect of education group, while /eyC/ and /Tuw/ do not (see Table 5).

	/æh/ Diag		/oh/ F1		/ey/ Diag		/uw/ F2	
	Estimate	Pr(> t)	Estimate	Pr(> t)	Estimate	Pr(> t)	Estimate	Pr(> t)
(Intercept)	1504.13	0.29	-601.33	.08	-7753.21	<0.001	-1178.60	0.19
DOB	-0.25	0.74	0.62	<0.001	4.44	<0.001	1.44	0.01
Sex (Male)	-103.39	<0.001	12.34	.09	-20.08	0.23	-76.67	<0.001
Edu. Index	-90.33	<0.001	20.83	<0.001	-3.83	0.69	15.30	0.16

Table 5: Mixed model with fixed effects *DOB*, *Sex*, *Ed Index*, random effects *Subject*, *Word*.

The lack of significance of any diachronic trends seen in Figure 4 and Table 3 suggests that there may be something else going on with /æh/. It is possible that this result simply means that /æh/ not only behaves like, but is in fact a stable variable, subject to social evaluation and style-shifting. However, based on the findings of Labov et al. (2013), I think the situation is not so straightforward.

In the analysis presented above, vowel tokens were sorted into the tense /æh/ and lax /æ/ classes according to the rules of the Philadelphia short-a system. The assumption tied to this clas-

sification is that a speaker who is correcting away from the Philadelphia system will simply have more lax realizations of /æh/ than their traditional counterparts. This is not what Labov et al. (2013) report, however. They find that rather than correcting /æh/ across the board, speakers with higher education have moved to a nasal short-a system (wherein /æh/ occurs in pre-nasal environments, and /æ/ occurs elsewhere); it is only the tokens which are tense in the Philadelphia system but not the nasal system which are subject to correction, then. This being the case, it is no longer surprising that I found no clear diachronic reversal of /æh/ for speakers with higher education; they are not engaging in a wholesale shift away from the phonetic quality of the vowel, but rather reorganizing the structure of the short-a system.

3.1.4 Continuing this analysis

The first section of the dissertation will take the results presented above as its starting point, and continue to build the analysis on three fronts:

- **Linguistic Variables:** I will add 3 more vowel variables to the analysis, in order to present a more complete picture of education's effects on the Philadelphia vowel space: /ay/-raising, /aw/-fronting (both LCV "new and vigorous changes"), and /e/-centralization (labeled an incipient change in LCV, but a "vigorous" change by the 1990s, according to Wagner 2008). Given the complex situation surrounding the short-a system described above, the dissertation should also devote more attention to that variable.
- **Social Variables:** I will also add other socioeconomic markers to the analysis, to explore in detail the interaction between education and occupation, for example.
- **Statistics:** I will continue to explore different ways of modeling the data in order to arrive at the best fit, including a comparative study of different classification methods for education.

3.2 Education and Linguistic Embedding

While the Philadelphia Corpus has been a fruitful testing ground for the usefulness of this new education classification schema, it offers limited room to explore the impact of education on linguistic structure. With the exception of the reorganization of the short-a system and the potential for future low-back merger, the variables undergoing change in Philadelphia are relatively isolated changes in the surface phonetics, with no apparent consequences for the larger structure of the local vowel system. Therefore a different source of data must be found in order to fully investigate the question of education's interaction with linguistic embedding. The Southern dialect is a good candidate, since its defining feature is a chain shift, definitionally a series of interconnected changes in the structure of the vowel system. It is also an excellent testing ground for questions of social embedding, since Southern dialect features are known to provoke strong social evaluations. Fortunately there is corpus data available from one Southern city—Raleigh, North Carolina—which Robin Dodsworth at North Carolina State has generously agreed to let me use. The second component of this dissertation, then, will be a study of Raleigh which investigates the interaction between higher education and linguistic embedding, specifically, the reversal of the Southern Vowel Shift (SVS), while further testing the usefulness of this new education classification.

My hypothesis, based on intuitions gained from previous work in the South (Prichard 2010) as well as the current received wisdom,² is that /ay/-monophthongization is the most socially-salient Southern feature, subject to overt correction in the same way that Philadelphia tense /oh/ is. However, correction away from monophthongal /ay/ carries potential implications for the rest of the vowel system, as it has been identified as the triggering event for the SVS (Labov et al. 2006). If speakers correct their /ay/, must they necessarily correct the other changes which

²See for instance, matter-of-fact but unsubstantiated mentions such as that in Fridland 2012: “[...] /ay/ monophthongization is somewhat of a shibboleth in Southern Speech, as its use is subject to overt commentary unlike other aspects of the vowel shifts described above” (184) and Plichta and Preston 2005: “There is no doubt that /ay/ monophthongization is one of the principal caricatures of US speech” (107).

are dependent upon it? Or will we see a kind of “opacity” in these speakers’ systems, where the (perhaps) less salient reversals of the mid and high vowels remain intact, but subsequent correction has removed the condition which originally caused the reversals?

3.2.1 The variables

Figure 5 diagrams the Southern Vowel Shift; the defining series of changes in the front vowel system which are characteristic of the Southern dialect. These changes are thought to be triggered by the monophthongization of /ay/, which leaves a gap in the system of long upgliding vowels to be filled by the lowering of /ey/, and so on in a more or less pull-chain fashion.

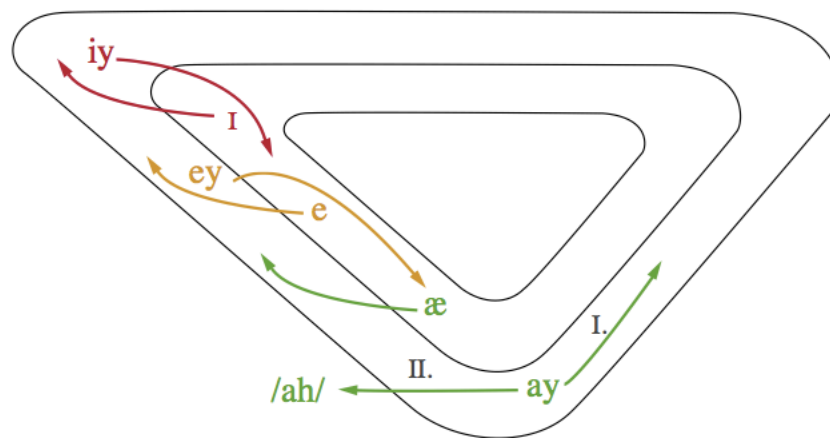


Figure 5: The Southern Vowel Shift (Labov et al. 2006:244)

These front vowels, then, will be investigated in Raleigh as those most likely to be subject to social evaluation, and therefore correction. It is widely recognized that Southern-accented speech is stigmatized, and research suggests that, of the possible vowel features involved in such evaluation, it is these front vowels that are most recognizably Southern (e.g., Heaton 2012, Fridland et al. 2005, 2004). Furthermore, Dodsworth and Kohn (2012) have found that there is an ongoing retreat from the SVS in Raleigh, though it remains to be seen who the leaders of this retreat are. Just as in Philadelphia, I will also look at some features which are perhaps less likely to be subject to socially-motivated correction, such as /uw/-fronting and the low-back merger.

3.2.2 The data

The Raleigh Corpus (Dodsworth and Kohn 2012) is slightly more of a work in progress than the Philadelphia corpus, so it looks like a fair amount of work will need to be done before a full analysis can be conducted. The preliminary demographic data presented in this section has been provided to me by Robin Dodsworth (p.c.). There is currently data available for 182 white Raleigh speakers; of those about 30 have been fully transcribed and aligned, while just the front vowels have been hand-measured for about 70 more speakers. Work is ongoing and more data should become rapidly available thanks to automatic alignment and vowel measurement.

Education Index	<i>n</i>	%
1: HS or less	21	12%
2: “local” college	15	8%
3: “regional” college	50	27%
4: “national” college	31	17%
NA*	65	36%
182 total		

Table 6: Education distribution

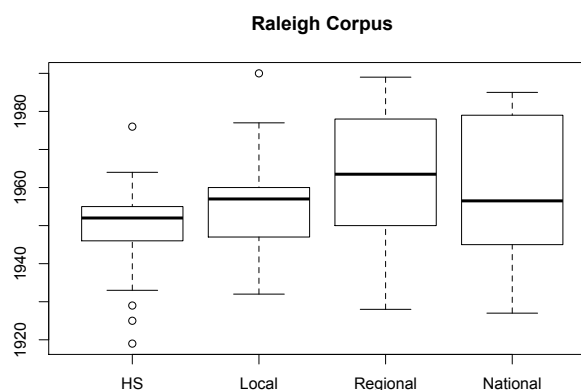


Figure 6: Education distribution by date of birth

Table 6 shows the number of speakers in each of the four education categories, while Figure 6 shows the date of birth distribution across the education groups. We can see that compared to the Philadelphia data, given in Table 2 and Figure 3, the Raleigh data is a bit more evenly distributed between education groups, and the education groups are more evenly distributed across time (so far; of course education data is yet to be entered for 65 speakers). Examples of the colleges represented include the “local” school Wake Tech, “regional” schools NC State and UNC-Greensboro, and “national” schools Duke and UNC-Chapel Hill.

*These NA’s don’t represent unknowns, but rather information that hasn’t been entered into the database yet.

3.3 Education and Social Embedding

The production results from Philadelphia so far indicate that there is in fact a differential and somewhat gradient effect of education on speakers' use of local vowels. This suggests that speakers higher on the education scale are more sensitive to the social evaluation of linguistic variables, since they show the greatest amount of correction away from local forms. However, this is currently only suggestive, as it has not yet been demonstrated that speakers at different levels of education actually differ in their awareness or overt evaluation of the variables, only that they produce them differently.

Therefore, the final portion of the dissertation will be devoted to the study of the perception of the vowel variables already studied in production. I hypothesize that speakers' sensitivity to supralocal norms as evidenced by their conservative production is mirrored in a heightened sensitivity in perception. Subjective reaction testing will be used to see if education groups do in fact differ in their perception of the variables. Proposed methodology is discussed further below, after a brief discussion of relevant background work.

3.3.1 Background

This research employs a methodology which has a long history in linguistics and psychology: the *matched guise technique*. This technique was pioneered in the 1960s by Lambert and colleagues, who employed it to study attitudes and stereotypes of French and English in Canada (e.g., Lambert et al. 1960, Anisfeld and Lambert 1964, Lambert 1967). In these experiments, recordings of bilingual speakers in a French guise and an English guise were presented to participants, who were asked to rate these "different people" on personality traits like intelligence, attractiveness, and dependability. The speakers were rated significantly more favorably in their English guise than their French guise, by both English-Canadian *and* French-Canadian participants.

Since these seminal studies, the matched guise technique has been employed to study an

enormous variety of languages and linguistic variables; see Campbell-Kibler (2006) (58-71) for a comprehensive list of matched guise studies and Clopper and Pisoni (2008) for a more general summary.

The LCV study used subjective reaction tests involving a “job suitability” measure to assess the social salience of /æh/, /aw/, /ay0/, and /ow/ in Philadelphia. The methodology differed from the original matched guise technique, in that participants were exposed to audio clips of several actually different speakers who represented various points along a continuum of the phonetic productions found in Philadelphia. Each speaker produced two guises: one containing a vowel variable, and a “zero” guise which contained no tokens of the variables. Participants were asked to indicate the highest possible job they think the speaker could hold. This was measured on a seven-point scale ranging from “no job at all” to “television personality” (Labov 2001:207). The results indicate that listeners are quite sensitive in their ability to recognize local changes in progress, as they consistently downgraded the job suitability of speakers using advanced forms of these vowels.

In his 2005 dissertation, Jeff Conn updated the LCV subjective reaction tests for two variables, /ay0/ and /aw/. Returning to a more traditional matched guise methodology, Conn’s stimuli came from two Philadelphians with sufficient linguistic training to produce tokens of /ay0/ and /aw/ which varied in their extremity. These guises were rated by participants on four scales: job suitability, friendliness, toughness, and masculinity. There were no significant results for /aw/, and the results for /ay0/ differed according to whether the guise was male or female. The female speaker’s “extreme Philadelphia” guise was rated lower in job suitability, while the male speaker’s extreme guise was rated higher on toughness and masculinity. The ‘friendliness’ scale produced no interesting results, perhaps indicating that it is not a relevant characteristic for these variables.

Turning to the Southern vowel system, several perception experiments have been carried out in recent years by Valerie Fridland and colleagues. In Fridland et al. (2004), a matched guise

study of Memphis speakers' ability to distinguish synthesized tokens as more Southern or Northern demonstrates the close link between production and perception in speakers' ability to recognize dialect features. Memphis speakers were more successful in identifying mid-front vowels as Southern, and less successful with the more geographically wide-spread /uw/-fronting shift. A follow-up study (Fridland et al. 2005) which asked speakers to identify tokens as more Southern or Northern, and then rate them on 'pleasantness' and 'education' confirmed the earlier findings, and further found that the tokens which were most recognizable as Southern, shifted /ey/ and /ow/, are generally rated as less educated and less pleasant.

Campbell-Kibler (2011) provides a recent instructive example of the utility of subjective reaction testing for identifying the indexicality of stable variables. She examines the social evaluation of the classic (ing) variable, and by including a neutral guise as well as the usual *-ing* vs. *-in* guises, discovers that the evaluation of these variants is not as straightforward as previously assumed. Rather than representing opposite ends of various style continua (such as formal/informal, friendly/unfriendly), these variants are found to index different social meanings. Use of *-ing* is associated with intelligence and education, whereas *-in* indexes informality. The converse was not found; that is, *-ing* was not found to index *formality*, for instance. Thus it is possible that variants of the same variable may independently index different social meanings, and by extension, be subject to different social evaluations. While it is not immediately obvious how this methodology could be extended to the vowel variables studied here, this is an interesting finding, and worth further consideration.

3.3.2 Proposed methodology

With regard to each vowel variable under study, there are two questions I wish to ask: what is the social evaluation of the local realization of the vowel, and how recognizable is it as characteristic of the locale? This way we will find out not only whether there is social stigma attached to local pronunciations of these vowels, but also whether that stigma is due to identification as a "local"

form, or whether it could be derived from a supralocal evaluation. For example, I mentioned earlier that the extreme realization of /oh/ bears negative evaluation in New York City; so if it is found that /oh/ bears a similar negative evaluation in Philadelphia, is it due to /oh/ being recognized as a stereotypical Philadelphia feature, or because of its association with NYC English?

The subjective reaction tests proposed here will make use of matched guise stimuli; four speakers, two male and two female, who have widely variable production of the target vowels will be selected from each corpus, and short phrases containing target vowels will be extracted for each speaker. The target vowel tokens in these phrases will then be manipulated to create two guises for each speaker: a “marked” guise (with extreme variants of the tokens), and an “unmarked” guise. These stimuli will then be presented in a rating task. This task will require participants to rate the speakers in the stimuli on a seven-point Likert scale for a variety of different characteristics.

In her dissertation, Campbell-Kibler (2006:84-5) devotes much consideration to the issue of which characteristics should be included in her rating task, highlighting the necessity of developing a location-specific set of questions, rather than employing a “standard set of qualities.” To solve this problem, she first conducted a set of pilot interviews in which small groups of listeners were presented with the stimuli and asked to describe the speaker. The interviews were guided by a series of general questions, and the responses were used to assemble a set of the most relevant qualities which emerged from the interviews.³

I plan to address this challenge in my work by employing a similar two-phase methodology. The first round of participants will be recruited through advertisement at the University of Pennsylvania and North Carolina State. This phase will involve a very general rating task administered in person, with participants first asked to provide an open response to each of the stimuli. The

³As a side note of interest, Campbell-Kibler goes on to make an observation which is particularly heartening for the current research: “In early interviews at Stanford and North Carolina State University, I determined that the evaluations were likely to be influenced by the educational background of the speakers, even (or perhaps particularly) by the prestige of the school they were attending” (Campbell-Kibler 2006:92).

task will focus on such characteristics as competence, intelligence, formality, occupation, and how local the speaker sounds. The goal of this study will be to identify the most relevant characteristics to be used in the second phase, as well as to evaluate the effectiveness of the stimuli.

The second phase will be designed based on the results gathered in the first. A more focused, less open-ended rating task will be created from the relevant characteristics which emerged in the first study. This task will be deployed in an online survey format rather than in-person. An online format is more useful for targeting a wider group of students from specific colleges in the area, as the survey could simply be distributed through departmental listservs, without the inconvenience and increased need for incentives necessitated by travel to an in-person appointment.

4 Implications & further considerations

The three different studies described above are designed to arrive at a comprehensive view of the ways in which education interacts with linguistic change. The results from work in Philadelphia so far demonstrate that education is a significant predictor of a speaker's use of phonetically-extreme marked Philadelphia variables. These results also show that it is fruitful to operationalize education not simply in terms of years, but also by the type of higher education attained.

Further investigation of the movement by young speakers away from the Philadelphia short-a system and towards the nasal short-a system promises to shed light on the way education interacts with linguistic structure, as we consider which group is leading this change, and what their motivation for doing so might be. More substantial evidence concerning the interaction of education and linguistic embedding will come from the study of the Raleigh Corpus. In searching for the leaders of the reversal of the Southern Vowel Shift, I expect to find interesting interactions with education. Finally, the proposed perception studies will contribute to our understanding of the social evaluation of local variables, and identify the extent to which these evaluations are

correlated with education.

While the current research addresses the question of how higher education influences broad groups of speakers' use of local variables, there remains the question of exactly what is happening on the level of the individual speaker. I suggest that the production differences exhibited by speakers with differing educational backgrounds begins as an accommodation process driven by social evaluation, but have yet to address definitively whether or not this could also be viewed as a mechanistic response to increased exposure to other dialects (perhaps of the type present in the cot-caught merger, as discussed by Yang 2009). Under this view, speakers with national-level education make the most extreme correction away from local forms simply because they come into contact with speakers of other dialects more frequently than speakers at more local institutions. Based on the current evidence, I think that the pattern found in Philadelphia is not the result of an automatic convergence process; the most compelling piece of evidence for this is that speakers at national universities, who come into regular contact with speakers of other dialects, do not correct away from *all* of the local Philadelphia vowel features. Presuming that a mechanistic process of accommodation affects all vowels equally (which maybe is not a valid presumption; this needs further investigation), these speakers should be correcting away from /eyC/-raising to the same extent as they are from /æh/. The situation in Raleigh may not be the same, of course, and so the question remains open for the moment.

The results of the perception experiments should prove crucial in resolving any remaining doubts about the nature of this accommodation. Clear evidence of a negative social evaluation for the variables undergoing correction, and no similar evidence for the variables which aren't, would provide strong support for the idea that this accommodation is driven by overt social factors. Conversely, if listeners of different education groups do *not* differ in their perception of these variables, we would need to rethink the possibility that there is a mechanistic explanation for the differences found in production.

5 Timeline

May-June 2013:

- Submit experimental design for IRB approval
- Continue Philadelphia corpus analysis

July-August 2013:

- Write up Philadelphia corpus analysis
- IRB approval, prepare experimental stimuli

September-October 2013:

- Begin analyzing Raleigh data
- Experimental study, first phase

November-December 2013:

- Write up introduction & background
- Experimental study, second phase

January-February 2014:

- Finish experimental study
- Continue Raleigh corpus analysis

March-April 2014:

- Experimental analysis
- Write up Raleigh corpus analysis

May-July 2014:

- Finish writing
- Aim to defend by August 2014

References

- Anisfeld, E. and W. E. Lambert (1964). Evaluational reactions of bilingual and monolingual children to spoken languages. *Journal of Abnormal and Social Psychology* 69(1), 89–97.
- Becker, K. (2011). The social meaning(s) of raised BOUGHT in New York City: A perceptual approach. Paper presented at NWAV 40, Georgetown University, October 28.
- Becker, K. (2013). Indexing coffee talkers: Social meaning and language change in New York City English. *Language Variation and Change* in press.
- Bigham, D. (2010). Mechanisms of accommodation among emerging adults in a university setting. *Journal of English Linguistics* 38, 193–210.
- Campbell-Kibler, K. (2006). *Listener Perceptions of Sociolinguistic Variables: The Case of (ING)*. Ph. D. thesis, Stanford University.

- Campbell-Kibler, K. (2011). The sociolinguistic variant as a carrier of social meaning. *Language Variation and Change* 22, 423–441.
- Clopper, C. and D. Pisoni (2008). Perception of dialect variation. In D. Pisoni and R. Ramez (Eds.), *The handbook of speech perception*, pp. 313–337. Wiley-Blackwell.
- Conn, J. C. (2005). *Of "Moice" and Men: The Evolution of Male-led Sound Change*. Ph. D. thesis, University of Pennsylvania.
- De Decker, P. (2006). A real-time investigation of social and phonetic changes in post-adolescence. In M. Ravindranath (Ed.), *University of Pennsylvania Working Papers in Linguistics 12.2: Selected papers from NWAV34*.
- Dodsworth, R. and M. Kohn (2012). Urban rejection of the vernacular: The SVS undone. *Language Variation and Change* 24, 221–245.
- Ferguson, C. A. (1972). 'Short-a' in Philadelphia English. In M. E. Smith (Ed.), *Studies in Linguistics in Honor of George L. Trager*. The Hague: Mouton.
- Fridland, V. (2012). Rebel vowels: How vowel shift patterns are reshaping speech in the modern south. *Language and Linguistics Compass* 6/3, 183–192.
- Fridland, V., K. Bartlett, and R. Kreuz (2004). Do you hear what I hear? Experimental measurement of the perceptual salience of acoustically manipulated vowel variants by Southern speakers in Memphis, TN. *Language Variation and Change* 16, 1–16.
- Fridland, V., K. Bartlett, and R. Kreuz (2005). Making sense of variation: Pleasantness and education ratings of southern vowel variants. *American Speech* 80(4), 366–387.
- Fruehwald, J. (2011). The phonological aspect of phonetic change. Paper presented at NWAV 40, Georgetown University, October 30.
- Gorman, K. (2010). The consequences of multicollinearity among socioeconomic predictors of negative concord in Philadelphia. In M. Lerner (Ed.), *University of Pennsylvania Working Papers in Linguistics 16.2: Selected Papers from NWAV 38*, pp. 66–75.
- Heaton, H. (2012). As seen on TV: An acoustic analysis of American Southern dialect. Paper presented at NWAV 41, Bloomington, Indiana, October 27.
- Kerswill, P. (2006). Socio-economic class. In C. Llamas and P. Stockwell (Eds.), *The Routledge Companion to Sociolinguistics*. London: Routledge.
- Labov, W. (1966). *The Social Stratification of English in New York City*. Washington, D.C.: Center for Applied Linguistics.
- Labov, W. (1994). *Principles of Linguistic Change: Internal Factors*. Oxford: Blackwell.
- Labov, W. (2001). *Principles of Linguistic Change: Social Factors*. Oxford: Blackwell.

- Labov, W., S. Ash, and C. Boberg (2006). *The Atlas of North American English*. Berlin: Mouton de Gruyter.
- Labov, W. and I. Rosenfelder (2011). The Philadelphia Neighborhood Corpus.
- Labov, W., I. Rosenfelder, and J. Fruehwald (2013). One hundred years of sound change in Philadelphia: linear incrementation, reversal and re-analysis. *Language* 89(1).
- Labov, W., M. Yaeger, and R. Steiner (1972). *A Quantitative Study of Sound Change in Progress*. Report on NSF Project no. GS-3287. Philadelphia: US Regional Survey.
- Lambert, W. E. (1967). A social psychology of bilingualism. *Journal of Social Issues* 23(2), 91–109.
- Lambert, W. E., R. C. Hodgson, R. C. Gardner, and S. Fillenbaum (1960). Evaluational reactions to spoken languages. *Journal of Abnormal and Social Psychology* 60, 44–51.
- Plichta, B. and D. R. Preston (2005). The /ay/s have it: the perception of /ay/ as a north-south stereotype in United States English. *Acta Linguistica Hafniensia: International Journal of Linguistics* 37(1), 107–130.
- Prichard, H. (2010). Linguistic variation and change in Atlanta, Georgia. In M. Lerner (Ed.), *University of Pennsylvania Working Papers in Linguistics 16.2: Selected Papers from NWAV 38*, pp. 141–149.
- Prichard, H. (2012). The role of higher education in socially-motivated correction: a new look at Philadelphia vowels. Ms. (Second Qualifying Paper), University of Pennsylvania.
- Prichard, H. and M. Tamminga (2012). The impact of higher education on Philadelphia vowels. In H. Prichard (Ed.), *University of Pennsylvania Working Papers in Linguistics 18.2: Selected Papers from NWAV 40*, pp. 87–95.
- R Development Core Team (2008). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0.
- Rosenfelder, I., J. Fruehwald, K. Evanini, and J. Yuan (2011). FAVE (Forced Alignment and Vowel Extraction) Program Suite. <http://fave.ling.upenn.edu>.
- Wagner, S. E. (2008). *Linguistic change and stabilization in the transition from adolescence to adulthood*. Ph. D. thesis, University of Pennsylvania.
- Weinreich, U., W. Labov, and M. Herzog (1968). Empirical foundations for a theory of language change. In W. Lehmann and Y. Malkiel (Eds.), *Directions for Historical Linguistics*. University of Texas Press.
- Yang, C. (2009). Population structure and language change. Ms., University of Pennsylvania. URL <http://www.ling.upenn.edu/courses/cogs502/YangPopulation.pdf>.