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Gritty Philadelphia: Orientation to local ideology as a predictor of sound change

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Abstract

Local orientation has been shown to influence speakers' participation in local dialect norms and ongoing sound changes since the beginning of modern sociolinguistics (e.g., Labov, 1963). I argue here that local orientation is best understood as an orientation to the ideological imagined place, rather than to the actual physical hometown itself. Analysis of the effect of orientation to the imagined Philadelphia shows that speakers' personal orientation impacts their adoption of an ongoing change. This change is best understood when orientation is considered alongside a major structural influence on young speakers—secondary school attendance—using a bipartite network analysis. The sound change under investigation, a change in the conditioning of a split in /æ/, is highly abstract and complex, making it an unlikely candidate for overt or intentional identity work. Nevertheless, a regression analysis finds strong effects of both structural influences and personal orientation on speakers' advancement in this abstract change.

Keywords: language change; local orientation; ideology of place; bipartite social networks; structure and agency

Introduction

One big mystery of sound change lies in how, on a community level, sound change sweeps along the entire community but, on an individual level, how it must be actually enacted by individual speakers. The interplay between large-scale structural influences on language change and small-scale choices made by individual speakers is critical to understanding how language change can proceed through a community. In this paper, I highlight how one of the longest standing predictors of participation in sound change— local orientation—is best understood as an orientation not to a concrete city or town, but rather as an orientation to the abstract ideologies that define that city of town; an extension of Johnstone's (2004) assertion that physical space interacts with *ideology* to create a sense of *place*.

I investigate the role of orientation to local ideology in the speech of 60 Philadelphians. In recent years, a major shift in the phonology of Philadelphia has

begun, with the local complex traditional /æ/ split being replaced by a supraregional standard nasal /æ/ split (Fisher, Prichard, & Sneller, 2015; Labov, Fisher, Gylfadottír, Henderson, & Sneller, 2016; Sneller, 2018; inter alia). The 60 speakers analyzed here are from the "transitional generation," which is driving the change. Using a bipartite social network analysis (Dodsworth & Benton, 2017), I show that the type of school that each participant attended, along with their orientation to the *ideological Philadelphia*, both influence their linguistic production.

I begin by outlining the centrality of local orientation to individuals' participation in sound change, with a focus on the abstract ideologies associated with the *local*. I then give a brief history of the ideology of Philadelphia, arguing that an orientation to Philadelphia is encompassed by the ideologies of *opposition to authority* and *grittiness*. I then introduce bipartite social network analysis and how it can account for some of the structural effects that institutions like schools can have on linguistic norms, before giving some background on the sound change in /æ/ currently ongoing in Philadelphia. Finally, I provide an analysis of how individuals' local orientation and position in the bipartite social network impact their production of /æ/, including discussion of a few outlier speakers. I end with a discussion of the importance of local ideology to local orientation in sociolinguistics.

Place, meaning, and sociolinguistic variation

Variation and local orientation

Since the beginning of modern sociolinguistics, speakers' orientation toward their hometown has played an important role in their use of locally marked dialect features (Hazen 2000; Labov 1963; Podesva, D'Onofrio, Van Hofwegen, & Kim, 2015; inter alia). Speakers who feel aligned with their hometown typically exhibit strong use of local features, while those who are more outwardly oriented do not. This phenomenon is further informed by the specific social meaning being indexed by each local orientation: alignment to any given place is predicated on a shared ideology linked to that place (Johnstone, 2010). Because the ideologies and practices of one's hometown is specific to that place, the ideologies that become linked with the concept of *local* will vary; likewise, any sociolinguistic work that appeals to *local orientation* as a predictor must be sensitive to the social specifics of that time and place (Giddens, 1984:286).

The variation in what *local orientation* indexes in different places can be seen clearly in how participants from different places talk about their allegiance to their hometown. In 1963, Martha's Vineyard (a small island off the northeast coast of the United States) was characterized by the economic pressure caused by the decline of the whaling industry and the widening gulf between traditional Yankee fishermen and wealthy summer tourists. As a result, local orientation was discussed by Yankees as a dichotomy between a traditional maritime lifestyle versus the outside world (Labov, 1963). Stanford (2009) highlighted how local orientation for Sui participants (who are part of a clan-based culture in rural southwestern China that practices exogamy) was talked about via locally socially meaningful references to food. Appalachian participants in Reed (2014:159) reference a salient feature of Appalachia when talking about their hometown—namely, the land itself. The centrality of the land is even reflected

in the term used in Reed (2014, 2018) to define local orientation: *rootedness*, which Reed defined as "connection to the conceptual Appalachia" (2018:409), and which reflects that connection to the land itself is what Reed's Appalachian participants center their ideology around. Likewise, other speech communities use terms to describe their local orientation that make reference to the salient ideology of their specific time and place.

Given that participants' local orientation will be defined in reference to the ideologies that emerge from and define their hometown, any use of *local orientation* requires an appreciation of the specific indexicality and ideologies of that *place* (Johnstone, 2010, 2004). In the current study, which analyzes a shift away from a local Philadelphia dialect feature to a more regionally unmarked feature, it is the ideology of *Philadelphia* as an indexical place that speakers will orient toward or away from. In what follows, I outline this ideology.

Ideology of Philadelphia

The ideology of Philadelphia as a place is strongly influenced by two early factors. First, it was initially settled by Quakers, a religious group that explicitly eschews hierarchical structures and is generally suspicious of human authority. While Quakers are no longer the predominant religious group in Philadelphia, Baltzell (2017:94–106) argued that echoes of Quaker ideology remain in the form of a general suspicion of authority. Second, in 1792 Philadelphia took over the title of nation's capital from the bigger and more economically important New York City to the north, only to lose it less than a decade later in 1801, when the capital was moved south to Washington, D.C. In the years since, Philadelphia's sense of being *neither New York nor DC* has developed into something of an underdog complex, which emerges time and again in Philadelphians' writing about the city: "[New Yorkers] are surely clinically insecure, for they have no reason to be insecure. Philadelphia has good reason to be insecure: New York" (Buschel, 2007:38).

Philadelphia's self-deprecation, distrust of authority, and general antisocial reputation has been going strong for over two centuries. In 1798, then first-lady Abigail Adams wrote in a letter to her sister that "These Philadelphians are a strange set of people […] They have the least feeling of genuine politeness of any people with whom I am acquainted" (Adams, 1798). This reputation for impoliteness is served hand-in-hand with what novelist Owen Wister described as a "civic instinct of disparagement" in the city, which emerges both in private conversations and in public displays. In the 1970s, for instance, Philadelphia ran a billboard (Figure 1) that proclaimed "Philadelphia isn't as bad as Philadelphians say it is."

Philadelphia's ideology was then reinforced by the industrial decline that characterized the second half of the 20th century. This is reflected in the famous Philadelphia-set Rocky films, which set Rocky up as a surrogate for the city itself: down on his luck, working class, "good-natured [and] rough-hewn" (Blumgart, 2015). Rocky's scrappy persona represented the kind of self-determined grit associated with post-industrial urban life in Philadelphia. Echoes of Rocky's rogue persona are easily found in Philadelphia sports fanaticism across the board. Philly sports fans are widely regarded as particularly rough and wild: they will boo their own team if the team is not playing

Figure 1. Billboard advertising Philadelphia, January 1970.

well, and they will burn cars in celebration if they win (Terell, 2018). As one blogger put it, "In Latin, 'Philadelphia' means 'City of Brotherly Love', but in American, it means 'City Where They Chuck D Batteries at Ballplayers'" (bill, 2015).

These indexical values of Philadelphia hold deep relevance still today, and are often aspects of the city that residents voice both overt and covert pride in. When two Canadian social scientists sent a hitchhiking robot named hitchBOT into the United States, it lasted only two weeks before arriving in Philadelphia and being promptly dispatched. Coverage of the event from non-Philadelphian sources emphasized the "cruelty" of destroying a robot whose only goal was to take selfies at famous sites, running with headlines like "HitchBOT, the hitchhiking robot, gets beheaded in Philly" (Leopold, 2015) and "Cruel Americans Murder Friendly Canadian Hitchhiking Robot" (Skipper, 2015). Philadelphian coverage of the event, on the other hand, served up a more defiant tone: "Just a Friendly Reminder that HitchBOT Got Exactly What He Deserved. Which Was Death" (Jordie, 2019) and "You're welcome, America: We Killed HitchBOT" (Weymouth, 2015), pieces that emphasize the inanity of a hitchhiking robot and praise Philadelphia for giving the social experiment a short and not-so-sweet ending. The historical ideologies of *opposition to authority* and *gritty underdog* also emerge in both the character of and reaction to Gritty, the superlatively weird mascot for the Philadelphia National Hockey League team, the Flyers (Figure 2a). Gritty's introduction to the public on September 24, 2018 was initially met with confused incredulity by Philadelphians, which rapidly changed to an open arm embrace when the rest of America responded in kind (Figure 2b).

When speakers orient toward Philadelphia as a *place*, it is this set of historical and synchronic ideologies of *opposition to authority* and *grit* that underpins that orientation. Likewise, when Philadelphians talk about their own orientation to their hometown, it is relayed through alignment toward or away from these ideologies. One participant in the current study, Justin P., articulates his positive orientation to Philadelphia through an opposition to both real and imagined authority. In response to asking if he would ever try to change his accent: "you'd have to rip this accent from my cold dead hands," evoking an image of an authority-laden Standardized American English threatening the underdog that is Philadelphia English. Throughout this paper,
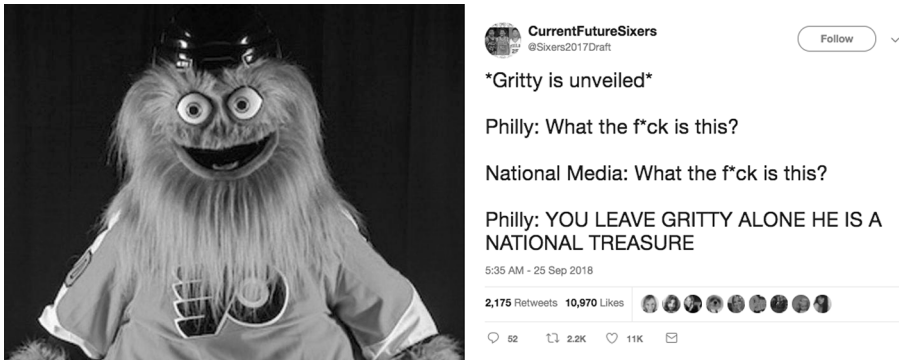
Figure 2. Panel A (left): Gritty, the mascot for the Philadelphia Flyers. Panel B (right): Tweet exemplifying Philadelphia's dual reaction first to Gritty and then to the rest of the country's reaction to Gritty.

my focus on Philadelphia-specific local orientation uses this ideology—*opposition to authority* and *grittiness*—as a qualitative measure of local orientation.

Institutions as social structure

While an individual's local orientation certainly plays an important role in determining their linguistic production, it is also important to consider the structural forces like social networks and institutional norms that provide a baseline influence for their production (Labov, 1973; Milroy, 1987; inter alia). The density of a speaker's social networks has been found time and again to play a conservative role in language change, preserving local linguistic norms through repeated interaction and reinforcement of these norms. By the same token, weak tie connections to an expanded social network may serve as a route by which new forms can be introduced into a community (Granovetter, 1973; Milroy & Milroy, 1992). Traditional social network indices within sociolinguistics and in the social sciences have ranged from collecting self-reported data about friendships (Marsden, 1990), to the researcher evaluating similarities in belief system (McPherson, Smith-Lovin, & Cook, 2001) and interaction frequency (Kossinets & Watts, 2006; Labov, 2001:Chapter 10), to an integrated analysis of multiple types of social networks that participants are a part of Sharma (2017).

A breakthrough in sociolinguistic network analysis comes from Dodsworth (2014) and Dodsworth and Benton (2017), where social networks are presented via a *bipartite network*. In a bipartite social network analysis, individual speakers are not connected directly to each other, but rather are connected to the institutions that they participate in, such as the schools that they attended. In this way, speakers are connected to each other via a shared institutional affiliation. This type of network has the benefit of capturing the generalization that while two speakers who graduated from the same school may not have a direct social tie between them, they are likely to have interactions in common and to have "encountered many of the same linguistic and cultural norms" (Dodsworth, 2019:11). In other words, educational institutions operate as a structural force which can "exist independently of the will and actions of individuals" (Block, 2013:138): students arrive to find both a social structure and sociolinguistic

norms already in place. The student may then reflexively decide to orient toward or away from these norms (Archer, 2007:4). The point here is that bipartite networks enable us to more straightforwardly characterize the structural role of institutions like schools as arbiters of sociolinguistic norms, above and beyond the role of interpersonal connections.

A similar bipartite social network using speakers and schools as the two classes of nodes was used in Labov et al. (2016) and Sneller (2018) to analyze the ongoing change in Philadelphia /æ/ that is the focus of this paper, and I will expand their analyses here. Rather than connecting individuals to their specific school institutions, Labov et al. (2016) classified schools into broader *types*, along the two axes that were relevant for Philadelphia. The first of these axes is admission type, separated into *special admissions* (a process that requires application, testing, and often in-person interviews to gain acceptance) versus *open admissions* (which does not). This distinction separates schools that are widely thought of as "elite" from those that are not. Open admissions schools primarily draw from the local neighborhood, while special admissions schools draw students from across the city. The second axis is Catholic[1] versus non-Catholic, the latter of which encompasses both public and Quaker[2] schools. Within open admissions schools, Catholic schools often have the densest interpersonal social networks, because the student population typically not only lives in the same area but also often attends the same Catholic church.

Change in Philadelphia /æ/

Before analyzing the effect of school attendance and local orientation, here I briefly outline the linguistic change in /æ/ underway in Philadelphia English. White Philadelphia English traditionally exhibits a split[3] in the /æ/ phoneme into a lax form (pronounced as [æ]) and a tense form (pronounced as [iə] or [eə]). The complex distribution of these forms has been described as both phonemic (Dinkin, 2013; Labov, 1989; Payne, 1980) and as rule-governed (Kiparsky, 1995; Labov et al., 2016; Sneller, 2018). Because the phonological status of the traditional split is irrelevant to the question at hand, in this paper I set that debate aside and focus on the fact that White Philadelphia English traditionally exhibits a conditioned split in /æ/, which is governed by a combination of phonological triggers plus some lexical specificity.

Encroaching on the centuries-long stability of the traditional white /æ/ split in Philadelphia, there has also been emerging evidence of a phonologically simpler nasal allophonic split in /æ/ in the geographic area surrounding Philadelphia (Ash, 2002) and in more recent years in younger speakers in Philadelphia as well (Labov et al., 2016; Labov, Rosenfelder, & Fruehwald, 2013; Prichard & Tamminga, 2012). In this incoming nasal system, /æ/ is tensed and raised preceding any nasal, but lax elsewhere. The nasal system has been found to be replacing local /æ/ systems in speech communities across North America, including Connecticut (Johnson, 1998), the Midlands (Boberg & Strassel, 2000; Durian, 2012), New Orleans (Carmichael, 2020), New York City (Becker & Wing-mei Wong, 2010), Michigan (Nesbitt, 2023; Wagner, Mason, Nesbitt, Pevan, & Savage, 2016), and the West Coast (Hall-Lew, 2010). In Philadelphia, the nasal system holds the social position of being a supraregional standard.

There are two important points about the change from traditional /æ/ to nasal /æ/ that will have an impact on the analysis of how school attendance and local orientation impact speakers' production of this variable. The first is that cross-generational analysis (Fisher et al., 2015; Sneller, 2018) finds that the shift from traditional /æ/ system to nasal /æ/ system occurs in three stages. In the first generation, speakers produce the traditional system. In the second generation, speakers produce variation between both the traditional system and the nasal system (meaning that they sometimes produce a given lemma according to the traditional system and sometimes according to the nasal system). In the third generation, speakers produce the nasal system only. This finding echoes the conclusion in Payne (1980) that caregiver input plays a critical role in what children acquire for /æ/.

The second important point is that the nasal system represents a shift away from local linguistic norms, because the nasal system is a supraregional standard. This means that the nasal system is more intrinsically extralocal than the traditional system, making this shift from traditional /æ/ to nasal /æ/ an excellent candidate for investigating the role of local orientation in sound change.

Methodology

Data collection

The data reported here come from two related corpora. The first is the Influence of Higher Education on Local Phonology (IHELP) corpus, which was collected by Philadelphia-raised undergraduate students at a variety of Philadelphia-based universities who were trained and supervised by myself and colleagues to conduct traditional sociolinguistic interviews (Labov, 1984) with their Philadelphia-raised family and friends between September 2013 and August 2015 (see Labov et al., 2016 for details). The IHELP corpus provides a robust snapshot into the synchronic community pattern of /æ/ in Philadelphia. The second corpus is the Investigating Mechanisms of Phonological Change (IMPC) corpus, which was conducted by myself as a follow up to the IHELP data. The IMPC corpus targeted individuals who were identified in Sneller (2018) as the "transitional cohort speakers" pushing the change in /æ/ forward, and resulted in several hours of speech from each speaker (necessary to obtain enough tokens of /æ/ in order to identify whether speakers are really producing a mixed system). The datasets largely overlap in speakers, though not completely, and result in a dataset rich in ideological stances from 60 speakers born during the transitional period, between 1982 and 2002. At the time of recording, the majority of participants ($n = 58$) were college aged, making college choice and future steps particularly salient topics of conversation, and making local orientation a prevalent topic. All participants are represented with pseudonyms, with the exception of Justin P., who requested to have his real name used in this paper, because he wanted "all the academics to know how much [he] love[s] Philly."

Classification of speakers' /æ/ systems

Here, I briefly describe how I have classified speakers' /æ/ production into one of three types of systems: (1) a traditional split, (2) a mix of both systems, and (3) the nasal split.

Determining which system a given speaker produces is somewhat complicated, as the majority of /æ/ word tokens (around 63%) are produced identically by the two systems since they share some conditioning factors. It is also complicated to identify whether a given token of a given word is pronounced as *tense* or *lax* for an individual speaker, as there is some overlap in the two vowel spaces. Procedurally, I combine insights from predictive models and sociolinguistics.

First, I train a generalized linear model for each speaker on the tokens that share tense and lax conditioning across both the traditional and nasal systems (e.g., an /æ/ followed by a tautosyllabic front nasal such as *hand* is always tense in both systems; the elsewhere condition in words like *dad* is always lax in both systems). This provides a baseline of the tense versus lax phonetic targets for each speaker. The model is then given test tokens which differ between the traditional and nasal systems, such as in open syllable words like *manage* (lax in the traditional system, tense in the nasal), words where /æ/ is followed by a tautosyllabic front fricative like *pass* (tense in traditional, lax in nasal), and lexical exceptions like *mad* (tense in traditional, lax in nasal). The model returns a probability that each token was produced in that speaker's tense or lax targets, which I then categorize as *tense* or *lax* according to a cutoff threshold (see Sneller, 2018:Chapter 4 for more details).

To this, I add insights from sociolinguistics. Specifically, tense pronunciations—much more than lax pronunciations—have historically received negative social evaluation from Philadelphians both before and during this major sound change (Labov, 2001:203; Sneller, 2018:Chapter 5; inter alia). As a result, Labov (1989:16) reported speakers hypercorrecting around 15% of their underlyingly tense tokens to a lax pronunciation. My own analysis then uses 15% as a cutoff, analyzing speakers as having either the traditional system or the nasal system if fewer than 15% of their tokens are incongruent with that system.

Speakers with more than 15% incongruous tokens are classified as mixed system speakers, with some exceptions. Since I expect mixed system speakers to produce a given lemma as sometimes tense and sometimes lax, all lexical items (or each conditioning factor, in cases where there are not multiple productions of each lemma) should be well distributed across the tense and lax pronunciation areas. If the incongruous tokens are not well distributed (e.g., if they lie only in the overlapping area between tense and lax categories, or if they lie only in the lax cloud), the speaker is not classified as a true mixed system speaker. In the data presented here, only one speaker does not align with one of the three classification systems: Jake S., who produces all test tokens as lax and who is discussed in detail in the Results section.

Analysis of local orientation

Participants' local orientation was analyzed using both quantitative and qualitative methods. As a first look into orientation, participants were given an identity survey along with their interview (Figure 3), which asked them to self-report different aspects of their identity, then rate how important each of these aspects is to them on a scale of 1 to 10. This broad-stroke approach enables us to identify some broad patterns in the data, but there are two big down sides to this approach. First, because most participants rate Philadelphia high (average score: 8.2 out of 10), it does not easily distinguish

participants' local orientation. More importantly, it is unclear whether individual participants mean the same thing by the same score; I found with some regularity that two participants may rate Philadelphia with the same high number, but display considerably different orientations to the ideology of the city in their spoken interview and in their daily expressions of self.

Peter Rain

1. Identity

We'd like to use this form to give us an idea of who you are and how you see yourself. Would you fill in the blanks with the descriptions that seem right to you and then add a number for how important this part of your identity is to you: 10 for most important, 0 for not important at all.

The country I grew up in *United States*	7
The neighborhood I grew up in *Wynnewood*	0
The city I grew up in *Philadelphia (suburbs though)*	8
My gender *Male*	3
My occupation *Student*	~~10~~ 10
My ethnicity *White, European*	2
My religion *Catholic*	7
My role in the family *Son, brother*	6

Figure 3. Example identity sheet for "Peter Rain."

These identity survey data are therefore supplemented with a detailed qualitative account of each participants' explicit orientation to the ideology associated with Philadelphia as a place. Because most participants were in college or recently graduated, Philadelphia as a place to live emerged as a salient aspect of how they selected their college and where they envision their next steps. Across interviews, most speakers align themselves quite clearly either toward or against Philadelphia in describing their college choice. Two opposing examples are shown in (1), where Hannah's choice of only applying to Philadelphia-area schools demonstrates her strong desire to stay near Philadelphia and (2), where Anita reveals her strong desire to leave the area.

(1) Hannah: I think I applied to like seven—La Salle—like you know, just the Philly schools.

(2) Anita: I did not want to go to college in Philly. […] I actually cried when I got accepted to Penn. Actually not out of happiness. I was upset.

Philadelphia's ideology as a city, rooted in opposition to and suspicion of authority, materialized in participants' interviews in narratives about their own orientation

to authority. Here, I pay particular attention to participants' evaluation of activities traditionally disapproved of by authority figures, such as underage drinking and recreational drugs, in addition to participants' reactions to being reprimanded. In (3), Orange outlines her frustration at falling short of the expectations of her boss despite her best attempts, while in (4), Katrina explicitly disapproves of the disrespect to authority shown by the high school girls she tutors. Both (3) and (4) display a positive orientation to authority. In contrast, Silva in (5) displays a positive orientation to insubordination, laughing while recounting failing a math quiz.

(3) Orange: Like I was in tears in the office, I was so frustrated. Well it's just disheartening that I do everything that like I possibly can to not miss work, and I'm still gonna get screwed over.

(4) Katrina: So I went [to an all girls public school] and I'm like oh, thinking like, okay this will be a better like Philly high school, like even though it's a public school, because it's all girls like it'll be similar. Like I'll feel like how it was when we were at [our neighborhood all girls Catholic school]. Was I like—I was completely wrong. Like the way they talked to their teachers, like. So disrespectful!

(5) Silva: If I didn't know something or if I like stopped, like, understanding what the questions were asking me, I would start to draw pictures. And once on one of his um quizzes I drew a pic- I drew a picture of him and he on the back he wrote "A for art, F for math" {laughter}

Finally, I also consider participants' remarks about Philadelphia's oft-maligned local accent, reputation for being rowdy at sports games, and local institutions like Wawa (a convenience store) and Rita's (an Italian ice store). Across participants, there is a widely shared evaluation of a Philadelphia accent as something that the outside world considers to be negative. Participants' responses to this external evaluation takes two primary forms: either accept and reify this evaluation as true and take subsequent steps to avoid negative evaluation, as Shane shows in (6), or they display an oppositional reaction to this outside evaluation, as Patrick does in (7) and David in (8). These reactions exemplify the effects of local orientation highlighted by Reed (2019): "more rooted speakers recognize possible stigma but didn't want to change. Less rooted speakers recognize possible stigma and felt compelled to change."

(6) Shane: My personality about Philly is like, I always think it's like being put down, so yeah I always think it's like in a negative way, when I say something like that. Or it makes me like, sound dumb, cause like obviously when I see other people from here like that, they sound dumb to me, so it must be worse for them.

(7) Patrick: I remember I asked some girl if she was going to cl[eːᵊ]ss and she said "what" and I said "are you going to cl[eːᵊ]ss? What are you doing right now" and she said "what is that" and I was like "CL[eːᵊ]SS! CL[eːᵊ]SS! Where a teacher teaches you." And then she's like "Oh you mean cl[æ]ss." Or "cl[ɑ]ss." "Yeah I'm going." […] There's a lot of rich snobby people just judge you, they probably think you sound dumb when you're not.

(8) David: One girl in the recitation was like "I'm from Philly and I've like- when-ever I come up here I just don't pronounce any words the way that he just did" and I was like "Wow." She purposely taught herself not to say words like *wooder*. She says like *w*[ɑ]*ter* because like, and I'm just like why would you ever do that? Don't change for the foreigners. […] I don't mean foreigners as in like, from different countries, I mean foreigners from different cities.

Taken all together, participants' reactions to outside evaluation and their affiliation toward both the place and the gritty ideology of Philadelphia coalesce into an overall picture of their local orientation, which I operationalize into five levels of alignment with Philadelphia as an ideological place, ranging from (1) *strongly not aligned* (2) *not aligned* (3) *neutral* (4) *aligned,* and (5) *strongly aligned*. Most speakers fall within the 2–4 range[4], with only 1 speaker (Justin P.) reaching an extreme end (5).

Results

The strong impact of school networks on /æ/ production are shown in a bipartite social network diagram in Figure 4, where individual speakers are represented with small dots and are color coded according to the /æ/ system they produce. Orange (light gray in print) represents the traditional /æ/ system, green (dark gray in print) represents the nasal /æ/ system, and olive (medium gray in print) represents speakers that produce a mix of both systems. One red node (labeled) represents Jake S., whose production does not fit any of these classifications. Orientation scores are also superimposed on each individual speaker's node. Speakers are then connected to the institutional nodes they participated in; in this case, the type of middle school and high school they attended. In Figure 4, these school nodes are characterized along the distinctions found in Labov et al. (2016) to be important, differentiating between Catholic versus non-Catholic and special admissions versus open admissions.

An overall glance at Figure 4 reveals the strength of influence that school system has on individual speakers' production, with special admissions non-Catholic schools dominated by the nasal system, open admissions Catholic schools dominated by the traditional system, and special admissions Catholic schools presenting the strongest mix of all types of speakers. The picture becomes even clearer when individuals' orientation to Philadelphia is also taken into consideration.

To capture the effects of both individual orientation and school attendance, a linear regression model was fit to the data, with /æ/ system as the dependent variable centered around 0 with traditional system given a value of −1, a mixed system a value of 0, and the nasal system a value of 1. Jake S. was excluded from the model, since his linguistic output could not be mapped onto one of these three systems. Model selection was done following Bates, Kliegl, Vasishth, and Baayen (2018), beginning with a maximal parsimonious model that included an interaction between Catholicity and admissions for both middle and high school as well a main effect for orientation score and gender. Removing gender increased model fit according to AIC, as did removing middle school predictors. As a result, the final model also excludes Nate V., who was in middle school at the time of recording and therefore did not have a value for high school type. The best fit model included an interaction between Catholicity and admissions, with a main effect of orientation score; results are shown in Table 1.
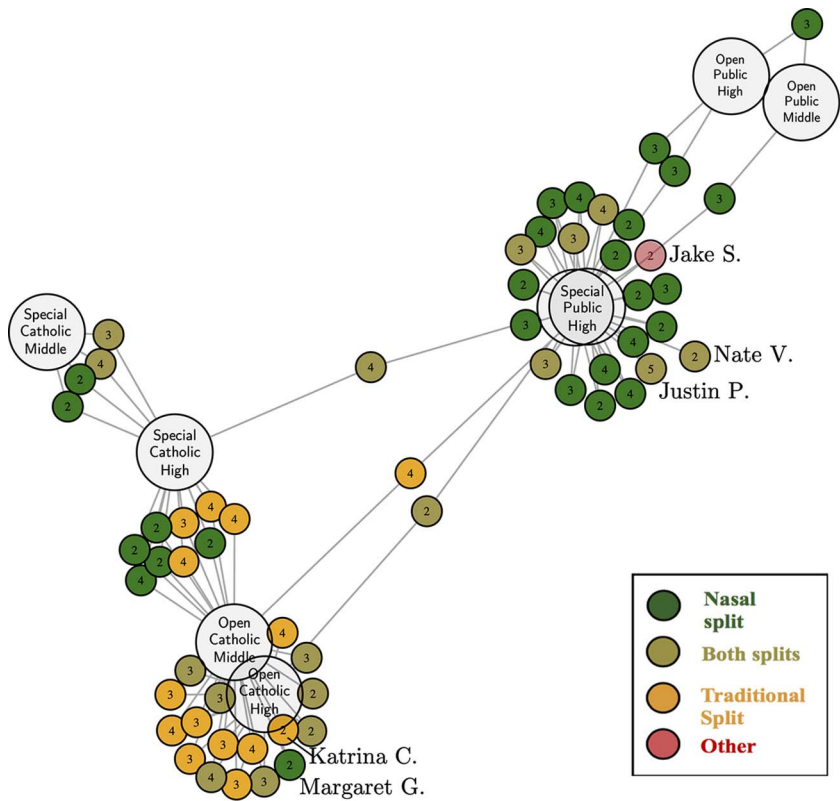
Figure 4. Bipartite social network connecting participants to their middle and high school categories. Individuals are color coded according to their /æ/ production, and their local orientation scores are superimposed on their individual nodes. Outlier speakers are named.

Table 1. Effect sizes and p-values for main effects of admissions (with special admissions as the reference level), Catholicity (with Catholic as the reference level), and orientation score (centered around 3, which represents a "neutral" orientation) and interaction between admissions and Catholicity, from linear regression model predicting /æ/ system; model adjusted $R^2 = .554$

Predictor	Estimate	Std. error	t-value	p-value
(Intercept)	.15	.15	1.01	.32
Catholicity (not Cath)	.59	.19	3.14	.003**
Admissions (open)	−.62	.19	−3.15	.003**
Orientation score	−.46	.09	−5.08	<.001***
Cath (not Cath):Admiss (open)	.87	.34	2.23	.03*

*p < 0.05, **p < 0.01, ***p < 0.001.

In Table 1, a positive estimate predicts a higher likelihood of a participant producing the nasal system. Here, the large effect of Catholicity is evident: graduates of special admissions non-Catholic schools are more likely to produce the nasal system then

graduates of special admissions Catholic schools. The structural influence of school type also emerges in the main effect of Admissions, which shows that open admissions Catholic school graduates are more likely to produce the traditional system. Importantly, however, it is not *just* a speaker's school attendance that impacts their phonology: a higher orientation score to the ideological Philadelphia predicts a higher likelihood of producing the traditional system. This can also be seen in Figure 5, which shows the predicted slopes for each of these terms. Finally, while the interaction effect between Catholicity and admissions emerges as significant, I note that this should be treated with caution, as there are only three graduates from open admissions public schools in this dataset, who all happen to produce the nasal system and have orientation scores of 3.
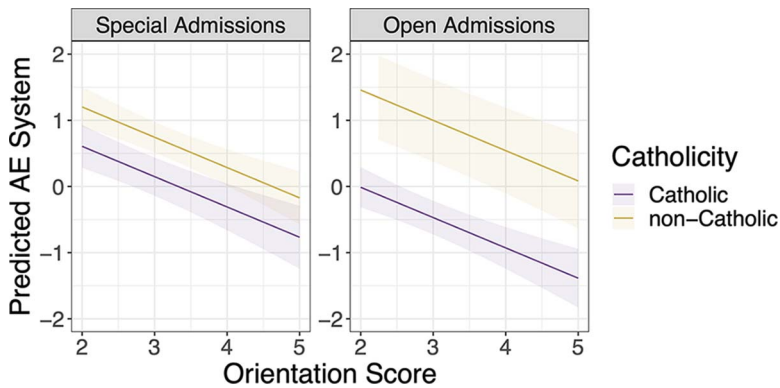

Figure 5. Model predictions for /æ/ system (−1 = traditional system, 0 = mixed systems, 1 = nasal system), based on Catholicity, admissions type, and orientation score.

The lack of graduates from special admissions non-Catholic schools in this data reflects the sociological fact that in Philadelphia, open admissions schools are highly segregated by ethnicity. Open admissions public schools have a student population that is predominantly made up of minority students (primarily Black and Latinx), while open admissions Catholic schools are predominantly white (Labov et al., 2016). A full breakdown of the number of speakers, the average orientation scores, and the average /æ/ system is shown in Table 2.

Table 2. Breakdown of total number of participants, average orientation score (higher = more aligned with ideological Philadelphia), and average /æ/ system (−1 = traditional, 0 = mixed system, 1 = nasal) by school type

School type	# participants	Avg. orientation score	Avg. system score
Open admissions Catholic	18	2.94	−.44
Open admissions non-Catholic	3	3	1
Special admissions Catholic	14	2.86	.21
Special admissions non-Catholic	24	3.12	.68

Bridge speakers and exceptional speakers

While Figure 4 and the model results demonstrate the overall influence of school attendance and local orientation on /æ/ production, there are a few speakers who are also worth examining in closer detail, to consider what additional factors might be impacting their production.

Bridge speakers is the term I use for speakers who attended one type of middle school and then transitioned into a different type of high school. These speakers are not likely the mechanism of community-wide change, for two reasons. First, Sneller, Fruehwald, and Yang (2019) found evidence that the change from traditional to nasal system was driven by contact with in-moving nasal system speakers rather than endogenously innovated within Philadelphia. Second, the pattern of changing schools is primarily unidirectional, from an open admissions Catholic middle school (higher rates of the traditional system) to a special admissions high school (higher rates of the nasal system). In other words, students are not bringing the nasal system with them to a new school, but rather are likely responding to the changes in linguistic norms that they encounter once reaching the new school. But here is where we also see the effect of personal orientation quite strongly. Consider the nine students who transitioned from an open admissions Catholic middle school to a special admissions Catholic high school. No other patterns emerged to explain their pronunciation, aside from their local orientation scores. They all attended different small local middle schools, eight of which were quite centrally located in Philadelphia. But upon reaching high school and encountering new linguistic norms, these speakers' local orientation enabled them to either move farther toward the nasal system or to retain the traditional system.

Margaret G. is the only speaker who attended open admissions Catholic schools for both middle and high school who produces the nasal system. Margaret's orientation to the ideological Philadelphia is highly ambivalent: she stayed in the city for college, but primarily because she wanted to stay close to family. At the same time, she explicitly states "I love my city" when asked how she feels about Philadelphia. But Margaret also displays a very positive orientation to authority, with most of her conversation focused on classes she enjoys and her plans for the future. At one point, Margaret presents a friend getting high as a reportable event, shown in (9), suggesting this is outside of her typical experience.

(9) Margaret: I asked him about it, do you know what he told me? Oh my gosh he told me that they—cough syrup. They like drank—they were like getting high off of cough syrup.

However, even given an analysis of Margaret as *not aligned* with Philadelphia ideologically, her nasal system production still raises questions. Given the findings in Fisher et al. (2015) and Sneller (2018) that the change from the traditional system to the nasal system occurs in three steps, we would expect a negative orientation to manifest as a mixed-system production, given her position in the social network. Instead, Margaret's nasal system production as a graduate of open admissions Catholic schools is a stark outlier in a sea of traditional system speakers. Here, her family emerges as critical to understanding this production. Margaret's mother was raised in Haddonfield,

New Jersey, a wealthy suburb just outside of Philadelphia which is particularly noted for its excellent public schools. Within the IHELP data (expanded from this dataset to include speakers born before 1985), we found that speakers who graduated from suburban open admissions schools fit closely with special admissions public school graduates in being roughly a generation ahead of open admissions Catholic schools in the change in /æ/. In this case, it is likely that Margaret's Haddonfield-raised mother may already herself be a mixed system speaker, in turn giving Margaret a different linguistic starting point than her open admissions Catholic school peers and enabling her to take the leap from mixed system to nasal system speaker, in line with her orientation.

Katrina C. has a similar schooling profile and orientation score to Margaret G., but a surprising production in the opposite direction: while she has a low Philly orientation score, Katrina nevertheless produces the traditional system. Throughout her interview, Katrina displays a positive orientation to authority and politeness, providing a negative evaluation of public school students' disrespect for their teachers in (4) above and a negative evaluation of her Philadelphia-raised college roommate's rudeness in (10).

> (10) Katrina: I was always like very too—nice, and I always chose not to fight with [her], because I knew she would kick my ass if we ever like fought. She would not be talk—like want to talk it out. She would just like throw a punch if she had to.

Katrina also displays an outward orientation more broadly. In college, she transferred from the more locally oriented St. Joseph to the more regionally oriented La Salle, and talks about wanting to do a semester abroad in Switzerland. After graduating from La Salle, Katrina went on to receive an MA from a university in the United Kingdom. Given her extralocal orientation and positive orientation to authority, Katrina's use of the traditional system is surprising. One possible explanation lies in Katrina's strong connection to her own Philadelphia dialect, as shown in (11).

> (11) Katrina: To be honest, I think the Philadelphia accent is seen as like something that's not eloquent and not—I don't know. It's viewed as a like a negative. I love my accent! I think it's a plus. I'm very like—I think it's cool. I'm like, I have an accent, like that's awesome. No, I wouldn't want to change it. I love it.

In this case, it seems that Katrina's explicit and defiantly positive orientation to a Philadelphia accent takes precedence over her orientation to authority, and this is in turn reflected in her retention of the traditional /æ/ system.

Nate V. was a 10-year-old fifth grader in his first semester of a special admissions public school when he was recorded for this project. He has a low Philadelphia orientation score but surprisingly does not produce the nasal system; instead, he produces both systems. His family's production was analyzed in close detail in Fisher et al. (2015) and Sneller (2018): his father is a graduate of special admissions public schools and a speaker of both systems, while both his older sister and older brother graduated from special admissions public schools and produce the nasal system. Nate is notable because although his orientation to the ideological Philadelphia is low, he still produces

a mix of both systems rather than just the nasal system. I propose that his use of both systems is likely the result of the stage of incrementation he was in at the time of recording: that Nate acquired both systems from his father, and has retained that mix while attending his local neighborhood public school for elementary. At the time of recording, Nate had only been attending a special admissions public middle school for 3 weeks; it is likely that this was not a long enough period for the structural influence of peer linguistic norms to have played a major role yet in his production, and that a different picture might have emerged if he had been recorded a few years later.

Jake S. is the lone point in Figure 5 whose production does not align with the traditional system, the nasal system, or a mixed system as described in my classification process. Instead, Jake's production, shown in Figure 6, exhibits what Sneller (2018) termed *phonetic mitigation*. The /æ/ tokens that receive negative social evaluation by the community as a whole (Labov, 2001:203; Sneller, 2018:Chapter 5)—that is to say, the traditionally tense tokens of /æ/ preceding voiceless fricatives, as in *class* and *after*, and the traditionally tense tokens of /æ/ in *mad, bad, glad*, are phonetically mitigated by Jake and produced within his lax phonetic space. Note that all of the prenasal /æ/ tokens produced as lax under the traditional system (in open syllables such as *stammer* and before velar nasals such as *bang*) remain lax—in other words, there is no evidence that Jake is producing any tokens according to the nasal system.
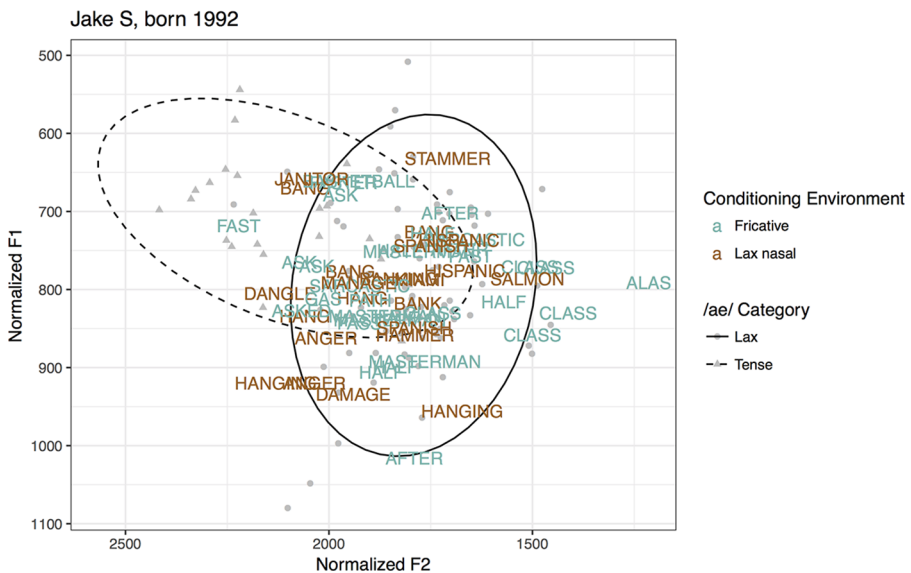

Figure 6. Phonetic mitigation in the speech of Jake S., who maintains a tense-lax distinction for unstigmatized forms, but laxes the stigmatized traditionally tense forms.

Such a step away from the traditional system is somewhat predicted by his low orientation to Philadelphia, but the actual output is still something of a mystery. Where the rest of his peers with low orientation scores across the city have taken a step from the traditional system to a variable production of both systems, Jake instead produces phonetic mitigation of only the stigmatized (tense) forms of the traditional system.

One possibility is that both phonetic mitigation and a mixed system are two different possible outcomes for a speaker whose parents produce the traditional system but who also orients strongly away from Philadelphia. If this is the case, phonetic mitigation must be considered a far less likely outcome, given the overwhelming number of speakers found to produce a mix of both systems rather than phonetic mitigation. In any case, Jake emerges as an outlier whose production does not drive the ongoing change from the traditional system to the nasal system.

Justin P. is exceptional primarily because of his extreme positive orientation to Philly and the lower-than-expected effect that this has on his production. Justin has a strongly positive orientation to Philadelphia in almost every way possible. His parents own a hoagie shop, which Justin grew up working at. He attended Temple University, noted in Prichard and Tamminga (2012) as the most locally oriented university in their sample. While there, he studied media communications, where his Philadelphia accent was often remarked upon—events that were in turn met with defiant pride, as in (12) and (13). After the time of recording, Justin went on to work as a reporter at the Philadelphia Inquirer and as a DJ on a local Philadelphia radio station, two locally oriented institutions.

(12) Justin: When we were doing the entertainment report for media performance class […] I said C- Comc[eːᵊ]st and my tech report and she called me out for that. She's like "Comc[æ]st." And I guess it's "Comc[ɑ]st." […] I say "Comc[eːᵊ]st" and I don't really wanna change it.

(13) Justin: Oh yeah they were givin' me shit in the news department for that, the people I'm with, like "You do have a—you totally have a Philly accent." And I'm like "You know what? Yes I do. I'm not ashamed of it."

In general, Justin also displays an opposition to authority. In (14), he relates a time in high school when he and a friend wrote a poem instead of completing an algebra test. He portrays himself like Silva does in (5), as laughingly unperturbed by the low grade. However, despite the overwhelmingly positive orientation to the ideological Philadelphia, Justin still produces a mix of both systems. Here, the weight of his school norms can be seen clearly; although he wholeheartedly orients toward Philadelphia, Justin was also surrounded by nasal system speakers throughout middle and high school. While he still differentiates himself from the rest of his peers by being *more Philadelphian* than most of them are, he nevertheless still variably produces both the traditional system and the nasal system. It seems that here, even in the face of very strong personal orientation, the norms encountered during middle and high school place a strong finger on the scale of his production.

(14) Justin: It was a partner test, because I guess, everybody was tanking, or just some like myself were tanking hard enough where she's like "You know what? Do the test with somebody." And so it was me and (—) and neither of us knew a god damn thing so we wrote her a poem on the test. […] We got like zero or one out of thirty but like, all the likes on Facebook meant so much more to me than any good grade on that test would've. It was like, "Oh youse like my poem? Thank you!"

Discussion

In this paper, I set out to investigate the role of individual agency on speakers' participation in an ongoing sound change. I found that speakers' individual orientation to the ideology of Philadelphia played an important role in their adoption of an incoming supraregional nonlocal linguistic form, demonstrating the strong force that personal agency plays in linguistic production. However, I also found that speakers' production is not understandable without *also* considering the effect of structural forces—in this case, being institutionally bounded through school network (Porpora, 1987). Using bipartite school networks to capture this institutional influence (Dodsworth, 2019), I found a strong effect of institutional affiliation on linguistic output.

At various points in the development of this project, I have been asked about other explanations that could be underlying the effect of school affiliation. One reviewer asks, for instance, whether speakers' religiosity could be the primary factor, as Baker-Smemoe and Bowie (2015) found for Mormon participants in Utah. The answer here is no; speakers' self-ratings on what their religion is and how important religion is to them in the self-reported identity sheets (see Figure 3) has no bearing on linguistic output. The finding overall is that there is no clear fundamental pattern from any single factor that could explain these linguistic patterns; rather, it is more likely a combination of many factors feeding into a larger difference in the sociolinguistic cultures of these school types. I have already alluded to one of these: open admissions Catholic schools tend to be smaller and comprised of speakers from denser personal networks, as students live and attend both school and church with each other. But the broader cultures of these institutions are different in multiple ways. Special admissions schools tend to have higher proportions of non-Philadelphian teachers and students with non-Philadelphian parents, meaning that the linguistic environment is more likely to be variable in the first place. They also tend to emphasize academic success more strongly, including advising high schoolers to reach out to professors at institutions like Penn to get feedback on their school projects. Another reviewer asks whether students' orientation to authority might be influenced by the culture of the type of school they attended; here, I point to Table 2, which shows that the average student orientation to the ideological Philadelphia is roughly the same across all school types (with special admissions non-Catholic schools actually showcasing the *highest* pro-Philadelphia scores). The picture that emerges is that while there are likely many factors contributing to *why* school types have different sociolinguistic cultures, in this paper the point is simply that these resulting differences in institutional culture have an impact on speakers' production.

This paper also set out to highlight the importance of understanding the specific local historical contexts in defining *local orientation* (following Baber, 1991; Giddens, 1984:286; inter alia). I have argued that *local orientation* encompasses more than just a speaker's explicit rating of their hometown, but crucially that it also encompasses the ideology linked to their imagined community (Johnstone, 2010), and speakers' orientation to that ideology as a whole (Reed, 2018). In Philadelphia, this ideology centers around a *gritty opposition to authority*. Though there are certainly additional axes to a Philadelphia-oriented identity (as we see in Katrina C.), we find in this data that *gritty opposition to authority* serves as a powerful indicator of participation in an extralocal sound change. I argue that other communities, as a result of their distinct history and

socially meaningful context, will center around different ideologies, and that it is those ideologies that speakers will orient toward or away from as a marker of local orientation. A rigorous approach to local orientation must take into account the ideologies represented by local orientation for the speakers analyzed. This, in turn, echoes the call in other dimensions of sociolinguistics to take careful stock of how social factors may differ for different populations (see Calder and King [2022] for a clear discussion of the intersection of race, place, and gender in the production of /s/).

Here I have demonstrated that both local orientation *and* the structural factor of institutional affiliation together influence individual speakers' production of /æ/. I have specifically shown that speakers who are less oriented to the ideological Philadelphia are more likely to be farther along in the change from the traditional Philadelphia /æ/ system to the extralocal nasal /æ/ system. But I have also shown that speakers' production is also constrained by the type of school they attended, over and above their own personal local orientation. This echoes the point in Carter and New (2004:12) that social structures "exist and have effects independently of our knowledge of them." Combining the insights of bipartite social networks, which enables us to capture the impact a broad institutional sociolinguistic culture, with an understanding of local orientation as being in reference to the ideological place allows us to better understand the strength of both forces on language production, language variation, and ultimately on language change.

Notes

1. The Catholic versus non-Catholic distinction was also found to be important in other US-based speech communities, as Catholic schools served as a conservative linguistic force in St. Louis (Duncan, 2018) and Chicago (D'Onofrio & Benheim, 2020).
2. The only Quaker school in this sample (Germantown Friends) operates like a special admissions public school. Like other Friends schools in Philadelphia, it has a robust application process and draws students from a wide range of backgrounds from all across the city.
3. I focus on White Philadelphian English and not Philadelphia African American English (PhAAE), because PhAAE does not exhibit the traditional /æ/ split (Labov & Fisher, 2015).
4. A subset of 10 speakers were also coded by another researcher who is native to Philadelphia and understands the ideology of *gritty opposition to authority*, to check for coding reliability. We agreed on the valence of 9 of these speakers, with some small discrepancies in the strength of the scores (e.g., some of my four scores were rated by my intercoder as a 4.5).

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