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# The Apple Doesn't Fall Far From the Tree: Incremental Change in Philadelphia Families

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## **Abstract**

This paper considers the relative influence of the family and peer group on an individual's grammar in a comparison of three female undergraduates at the University of Pennsylvania. Automatic vowel measurement is used to assess the degree of participation of these young women and their families in the local phonology. While each woman's vowel system contains less markedly Philadelphian features than her family members', in no case is there an abrupt jump from the Philadelphia system to an unmarked system. We therefore conclude that the phonological reorganization in progress in Philadelphia, specifically the emergence of the nasal short-a system, is accomplished via an intermediate weak-system stage.

# The Apple Doesn't Fall Far From the Tree: Incremental Change in Philadelphia Families

Sabriya Fisher, Hilary Prichard, and Betsy Sneller\*

## 1 Introduction

This paper examines an incremental change away from a vowel sub-system associated with the Philadelphia dialect. The Philadelphia short-*a* system is a well-studied complex feature of Philadelphia English which has recently been undergoing a change in the speech of some young Philadelphians (Labov et al. 2013). Previous work has found that speakers who have pursued higher education at nationally-oriented universities in the Philadelphia area are leading a retreat away from the traditional Philadelphia short-*a* system (Prichard and Tamminga 2012). However, the relative influence of parental and peer vowel systems on the speakers participating in this particular retreat has received little attention to date.

To that end, this paper takes a detailed look at three Philadelphia families, each with a daughter currently enrolled as an undergraduate at a nationally-oriented university in Philadelphia. This data is drawn from the Impact of Higher Education on Local Phonology project (IHELP). Data from all three families demonstrates a movement away from the local Philadelphia short-*a* system and toward the supra-regional standard nasal short-*a* system. However, the degree of each daughter's retreat is tempered by the vowel systems of her parents. This finding sheds light on the interplay between transmission and peer incrementation in phonological reorganizations, suggesting that phonological reorganization may require a convergence of peer influence over several generations in order to reach uniform completion at the community level.

## 2 Background

### 2.1 Parents vs. Peers

Previous studies have shown that while children initially acquire the vocalic system of their parents, these early acquired patterns tend to be lost unless they are reinforced by the peer group. Lacking this reinforcement, children tend to match peer input by adolescence (Labov 1972, Kerswill and Williams 2000). However, complex vowel systems are more difficult for children past the critical period to acquire. Payne (1980) demonstrated that children whose parents were not native to Philadelphia were unable to fully acquire the morphological conditioning governing the Philadelphia short-*a* system, despite successfully conforming to peer input in less complex features of the Philadelphia dialect. Payne (1980) thus shows that while children do tend to match peer input, parental input still plays an important role in acquiring complex phonological systems.

There is also evidence that during a change in progress, children's grammatical systems can be projections of their parents' systems. In their study of the development of the reduced form of future marker *bai* in Tok Pisin, Sankoff and Laberge (1980, cited in Labov 2001) found that children's rates of use of unstressed *bai* directly reflected their parents' rates of use. That is, parents who used higher rates of the reduced form compared to their generation had children who also used higher rates of unstressed *bai* compared to their peers. Though the entire community was moving toward the new, reduced form, the younger generation did not converge toward more similar rates of use; rather each individual child's use was an extension of the pattern they had initially acquired from their caretakers.

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## 2.2 Higher Education

Taking a more abstract approach to the idea of peer influence, previous studies have also shown that language use can be affected by education, even after adolescence. For example, De Decker (2006) conducted a panel study of four young women from a small town in Ontario who attended college in Toronto and Waterloo. Two of the four women produced a more retracted short-*a* over time, shifting their production to match their urban-oriented peers. Additionally, the type of college attended has been shown to affect whether local speech norms are maintained or abandoned. Prichard and Tamminga (2012) identified four distinct groups of speakers in their study of higher education in Philadelphia based on both the level of education and the localness of the institution. They found that the Philadelphia short-*a* system and the low back distinction were more likely to be maintained at locally-oriented universities and less likely to be maintained at nationally-oriented universities.

The current study builds on these previous findings in order to further elucidate how the initial parental pattern acquired by children affects a later transition to a new peer pattern. We examine the productions of three young women and their families, with an aim to demonstrate that both parental input and peer influence have a profound effect on linguistic output.

## 2.3 Philadelphia Short-*a* Systems

Much work over the past 30 years has been devoted to the complex traditional Philadelphia short-*a* system (see e.g., Ferguson 1972, Kroch 1996, Labov 1989, Labov et al. 2013). The traditional short-*a* pattern of white Philadelphians splits the short-*a* class into tense tokens that are raised along the front periphery (sounding like [e<sup>ɔ</sup>] and represented as /æh/) and lax tokens that remain low and front (sounding like [æ], and represented as /æ/). The split between tense /æh/ and lax /æ/ is conditioned by a combination of both phonological and morphological factors as shown in Table 1.

Condition	Example	Category
Tautosyllabic front nasals	MAN	tense
Tautosyllabic front voiceless fricatives	PASS	tense
Lexical items	BAD	tense
Intervocalic nasals	MANAGE	lax
Word initially	ASPIRIN	lax
Learned words	ALAS	lax
Function words	AND	lax
Class 3 strong verbs	RAN	lax
Elsewhere	SAD	lax

Table 1: Conditioning factors for the Philadelphia split short-*a* system.

This split can be seen in Figure 1, which shows the production of Celeste S., a prototypical white Philadelphian. In the vowel plots presented throughout this paper, blue tokens indicate words that are tense in the traditional white Philadelphia short-*a* system, while red tokens indicate words that are lax in the traditional white Philadelphia short-*a* system, and tokens preceding a nasal consonant are highlighted in black. 95% confidence ellipses are also drawn around each speakers' tokens to highlight category distinctions in their vowel distributions. Figure 1 clearly shows a wide split between the tense tokens and the lax tokens. By contrast, the traditional short-*a* system of African American Philadelphians can be categorized as a neutral short-*a* system, typical of most varieties of AAVE (Labov 2014, Labov and Fisher 2015). A prototypical example is shown in Figure 2.

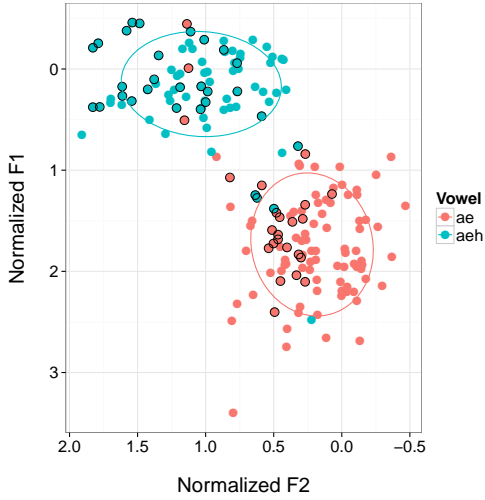


Figure 1: Philadelphia short-*a* system.

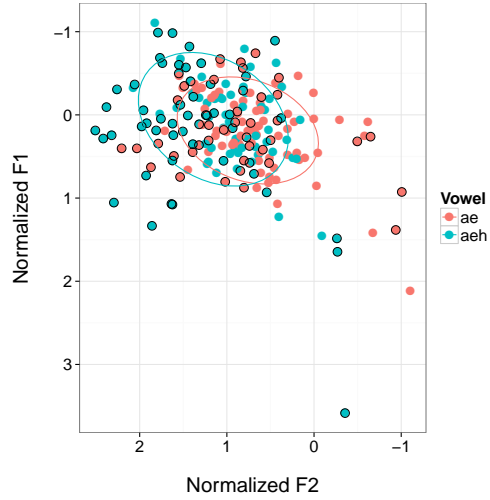


Figure 2: Neutral short-*a* system.

In addition to the two traditional Philadelphia short-*a* systems exemplified above, recent work in Philadelphia has also identified a third short-*a* system: the nasal short-*a* system (Labov et al. 2013, 2015). Some speakers born around 1985 and after have abandoned the traditional Philadelphia split or neutral system in favor of the more geographically widespread nasal system, in which tokens are tense before all nasal consonants and lax elsewhere (Labov et al. 2006). Figure 3 depicts the short-*a* split in a prototypical nasal system speaker.

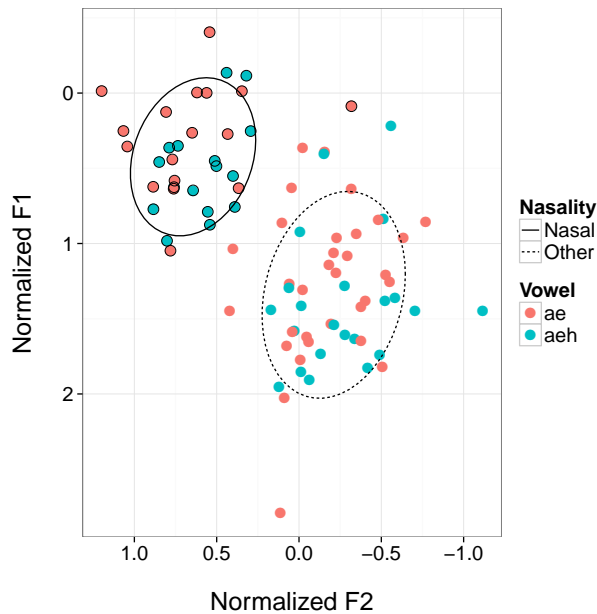


Figure 3: Nasal short-*a* system.

The shift from the traditional white Philadelphia short-*a* system (henceforth Philadelphia system) to the nasal system involves a restructuring of the phonological and morphological rules governing tense and lax tokens, resulting in a less complex allophonic split. Conversely, the shift from the traditional African American Philadelphia neutral short-*a* system (henceforth AAVE system) involves an imposition of new conditioning factors, creating an allophonic split where one did not previously exist.

In the present study, we examine the shift from either the Philadelphia or the AAVE short-*a* system to the nasal short-*a* system by tracing the progression of this shift in each of the three families analyzed.

### 3 Methods

The primary data for this study comes from sociolinguistic interviews conducted as part of the IHELP project. For this project, undergraduate students from Philadelphia families were trained to conduct interviews with friends and family members who were born and raised in Philadelphia. These interviews were designed to elicit both salient Philadelphia linguistic features as well as overt attitudes towards the city and its dialect. Interviews were manually transcribed, and vowel measurements were extracted using the FAVE suite (Rosenfelder et al. 2014). Formant measurements were then normalized using the vowel-extrinsic, speaker-intrinsic Lobanov (*z*-score) method.

Finally, two Pillai scores were calculated for each speaker’s short-*a* distribution: one which measures how well the distribution is described by the traditional Philadelphia short-*a* categories, and a second which does the same for the nasal short-*a* categories. Pillai is a MANOVA statistic that has previously been used by sociolinguists to measure distinctness between two vowels undergoing a merger-in-progress (Nycz and Hall-Lew 2013, Hay et al. 2006). We use it here as a descriptive measure of conformity to the different short-*a* splits attested in Philadelphia. Pillai scores range from 0 (no distinction in euclidean distance or dispersion) to 1 (complete distinction in both F1-F2 space and dispersion); thus scores near zero indicate that a speaker’s short-*a* distribution is not well-described by the selected system.

## 4 Results by Family

### 4.1 The Lyons Family

The Lyons family is an Irish-Italian American family from Northeast Philadelphia. Christine, a 20-year-old undergraduate at the University of Pennsylvania, was an interviewer for the IHELP project. Analyzed here are her father Antonio (age 55), her mother Theresa (age 55), and her two brothers, John (age 22) and Rocco (age 15). While Christine attends a nationally-oriented university, her two brothers both attend more locally-oriented schools: John attends Temple University, while Rocco attends a local Catholic high school.

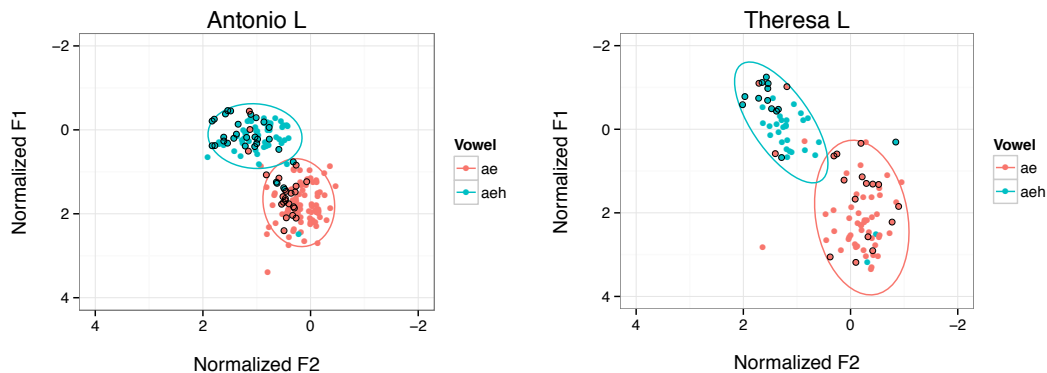


Figure 4: Phila Pillai = 0.74, Nasal Pillai = 0.12. Figure 5: Phila Pillai = 0.62, Nasal Pillai = 0.11.

The Lyons family parents both exhibit the Philadelphia short-*a* split, as shown in Figures 4 and 5. Both Antonio and Theresa maintain a robust distinction according to the Philadelphia system. In the figure captions, we report speakers’ adherence to both the Philadelphia system and the Nasal system by their Pillai scores for each system. It should be noted that although Pillai scores

range mathematically from 0 to 1, actual productions do not reach either extreme. Therefore, the Philadelphia Pillai scores of Antonio and Theresa serve as a benchmark for a robust distinction.

The differential schooling of the Lyons family children, combined with their clearly Philadelphia short-*a* system parents, make them an excellent case study for the relative influence of family input and peer input on speakers' vowel productions. Among the Lyons children, we begin to see a retreat from the robust split exhibited by their parents. Figures 6 and 7 show the vowel systems of the two Lyons sons, Rocco and John. Both young men's distributions of short-*a* tokens are better characterized by the Philadelphia system than the nasal system, although they also show a smaller phonetic distance between the tense and lax tokens than their parents.

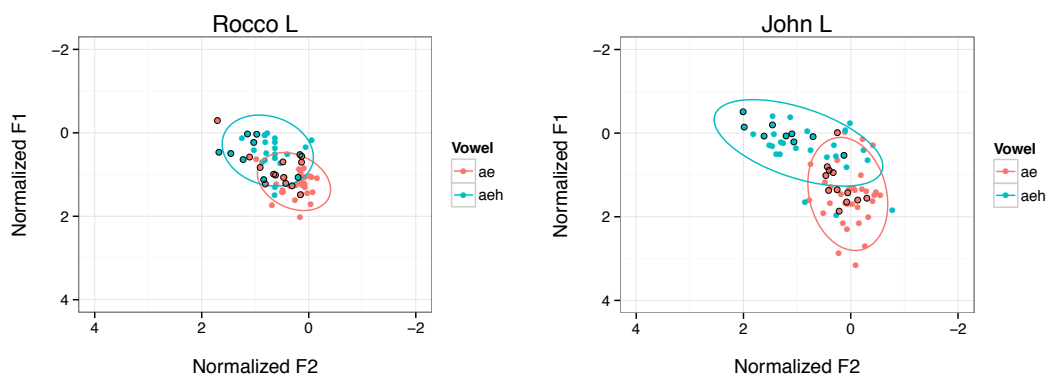


Figure 6: Phila Pillai = 0.45, Nasal Pillai = 0.15. Figure 7: Phila Pillai = 0.51, Nasal Pillai = 0.06.

On the other hand, Christine, the daughter attending the University of Pennsylvania, shows a different pattern from that of her brothers. Her tense and lax short-*a* classes are much closer in phonetic space, so that her productions do not clearly conform to either the Philadelphia or nasal short-*a* system. This is reflected in her Pillai scores (Philadelphia = 0.33, Nasal = 0.26). Figure 8 plots 95% ellipses around her short-*a* tokens according to the Philadelphia system, and Figure 9 plots ellipses around her short-*a* tokens according to the nasal system, clearly showing that the distributin of tokens is not well categorized by either system. Unlike the other members of her family, Christine exhibits an intermediate system that partially conforms to both the Philadelphia and the nasal system. We describe this production as a “weak” Philadelphia system.

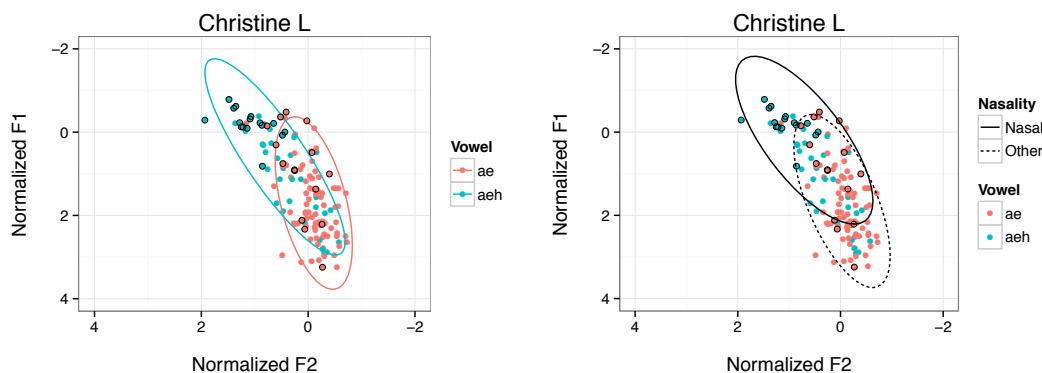


Figure 8: Philadelphia Pillai = 0.33.

Figure 9: Nasal Pillai = 0.26.

The Lyons family thus demonstrates the interplay between parent and peer influence. In all cases, the children have less extreme Philadelphia short-*a* systems than their parents. Rocco and John both attend locally-oriented schools, and their vowel productions still clearly fit the Philadelphia pattern. Christine, on the other hand, produces short-*a* tokens that only weakly conform to

the Philadelphia system. Because she attends a nationally-oriented university along with nationally-oriented students from across the country, the peer influence on Christine is qualitatively different than the peer influence on her brothers, who are surrounded by more locally-oriented peers. We argue that this difference in peer influence has pushed Christine’s short-*a* productions to be less robustly Philadelphia and more intermediate. These results fall in line with Prichard and Tamminga (2012), who found that speakers at nationally-oriented universities are more likely to abandon their local phonology in favor of supra-regional norms like the nasal short-*a* system; however, Christine’s production has not completely diverged from that of her parents, demonstrating the strength of their initial influence.

#### 4.2 The Vos Family

The Vos family exemplifies the transition to the nasal system displayed by young Philadelphians. Our interviewer was Percia, a 19-year-old University of Pennsylvania student, who interviewed her 53-year-old father Harry and 10-year-old brother Nate. The Vos family is of Jewish and Persian descent. Percia’s mother, a non-native speaker of English, was not included in the study since non-native features are typically disregarded by second-generation children in acquisition (Labov 2007).

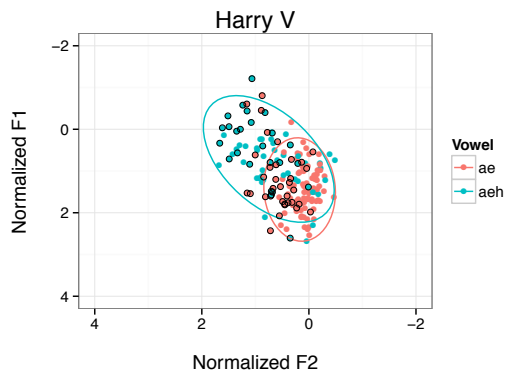


Figure 10: Philadelphia Pillai = 0.29.

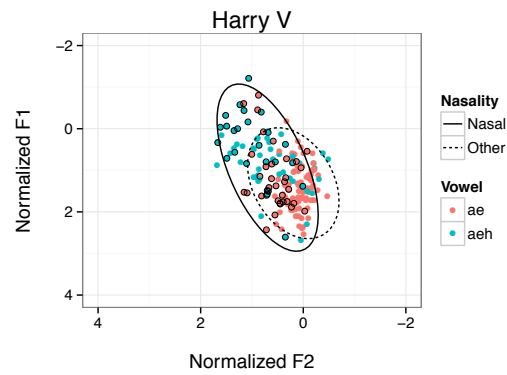


Figure 11: Nasal Pillai = 0.20.

In the Vos family, we see the next stage of the transition from the Philadelphia split short-*a* system to the nasal system. Harry, the father, produces short-*a* tokens which are very similar in quality to Christine’s (Figures 10 and 11). Notably, he spent time as an undergraduate at Harvard University, another nationally-oriented school, where he would have had contact with peers from dialect areas other than Philadelphia. Like Christine, his distribution of short-*a* tokens conforms slightly more to the Philadelphia system than to the nasal system, but not entirely to either. We therefore classify his production as an intermediate or weak Philadelphia system.

From this weak Philadelphia system input, the Vos children produce a dramatic change. Figures 12 and 13 show short-*a* production from Percia, the daughter at the University of Pennsylvania, and her younger brother Nate (age 10). Both children exhibit a strong split between tense and lax short-*a* tokens according to the nasal system. This step away from their father’s weak Philadelphia system to the supra-regional nasal system matches their educational profiles as well. Percia attends the University of Pennsylvania, a nationally-oriented university, and her brother Nate attends a highly ranked special admissions middle school.

The Vos family provides strong evidence for a second stage in the shift from the Philadelphia system to the nasal system. Where the Lyons family shows that a child with strong Philadelphia system input may become an intermediate system speaker when socially motivated to do so, the Vos family demonstrates that the children of an intermediate system parent may become nasal system speakers. We argue that it is *both* the ambiguous input of their father as well as the reinforcement from their nationally-oriented peers that allow the Vos children to completely shift their productions to the nasal system.



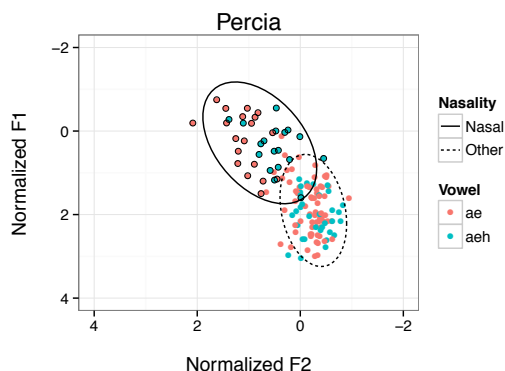


Figure 12: Phila Pillai = 0.02, Nasal = 0.68.

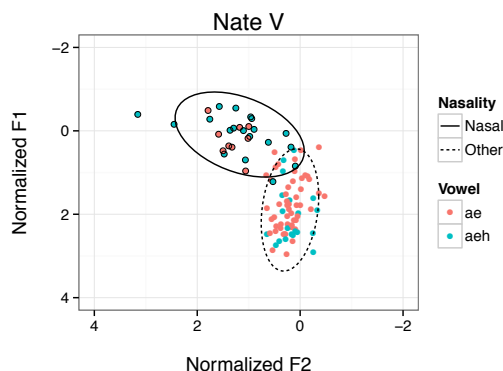


Figure 13: Phila Pillai = 0.06, Nasal = 0.73.

### 4.3 The Chase Family

Finally, we turn to the Chase family. All members of the Chase family identify as African American. Athena, age 18, was our Penn undergraduate interviewer. She interviewed her mother Farrah, age 41, and two sisters Fabiola, 15, and Danielle, 14, both in high school. Unfortunately, data from Farrah could not be analyzed due to the poor sound quality of the interview; however, a substantial portion of the interview was hand coded by the authors, and confirmed that she does possess a neutral short-*a* system.

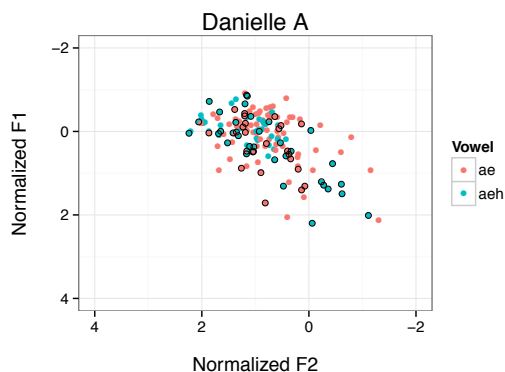


Figure 14: Phila Pillai = 0.03, Nasal = 0.06.

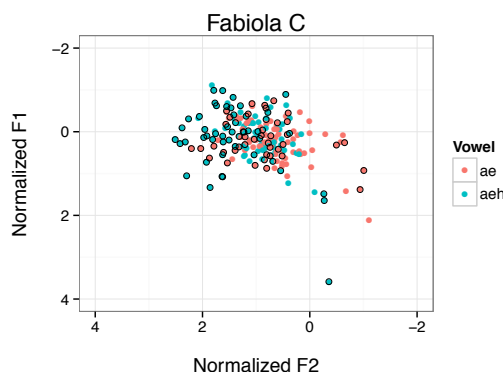


Figure 15: Phila Pillai = 0.11, Nasal = 0.12.

Two of Farrah’s daughters, Danielle and Fabiola, exhibit the same neutral system heard in Farrah’s interview (Figures 14 and 15). Both of these daughters attend an open admissions public high school in Philadelphia.

Athena, the daughter who attends the University of Pennsylvania, demonstrates a dramatic change from the neutral system of her mother’s input. Like the Vos children, she has taken her parental input and shifted away from a neutral short-*a* system to produce a nasal split. This shift to the nasal system is also consistent with Prichard and Tamminga (2012)—unlike her sisters who attend open admissions public high schools, Athena attended a high ranking, nationally-oriented boarding school for high school, and she now attends the University of Pennsylvania.

In essence, the Chase family and the Vos family represent different facets of the same process. The children are given a weakened split or neutral short-*a* system as input, and they either maintain that neutral system or shift to the nasal system. Like the Lyons family, the Chase daughter who exhibits the largest step away from her parents’ short-*a* system is the one whose education has been at nationally-oriented schools.

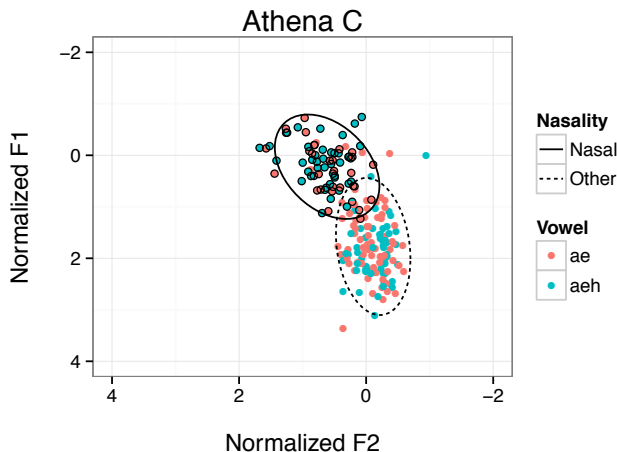


Figure 16: Phila Pillai = 0.01, Nasal Pillai = 0.68.

#### 4.4 Summary

In all three families, we see the combined effects of parental input and type or orientation of educational institution on children’s vowel systems. Children whose parental input includes the traditional Philadelphia short-*a* system maintain this system when attending locally-oriented schools, but shift away from it when attending nationally-oriented universities, reorganizing the conditioning on their short-*a* systems toward the supra-regional nasal split (as shown by the Lyons family). However, the degree to which children are able to fully acquire the nasal system is directly affected by the parental input they receive. Percia Vos and Athena Chase are able to fully acquire the nasal system because their parental input is either a weakened Philadelphia system or a neutral AAVE system, neither of which show a split between tense and lax short-*a* tokens. From this weakened split or neutral system, Percia and Athena are able to produce the nasal system. While Christine has taken a step toward relaxing the robust Philadelphia short-*a* split present in her parental input, she has not fully acquired the conditioning of the nasal system.

## 5 Conclusion

Our data traces the transition from the local Philadelphia short-*a* system to the supra-regional nasal short-*a* system, which progresses in three stages based on both parental and peer input. In the case of the Lyons family, when a Philadelphia split short-*a* system is given as input, the children develop a system that is weakly constrained by Philadelphia conditioning. If that child attends a university that is not regionally-oriented, and is therefore exposed to peers with the nasal short-*a* system, their system is simultaneously constrained by nasal conditioning. These two constraints produce what looks like an intermediate system, as we find in Christine Lyons. As the Vos family shows, when children receive this intermediate system as input and are exposed to peers with the nasal system, they are able to advance to full acquisition of the nasal system. The Chase family illustrates that speakers who receive a short-*a* system without the tense-lax distinction as input are also able to fully transition to the nasal system. The three stages of this transition are exemplified in (1) below.

- (1) Strong Philadelphia system → Intermediate or neutral system → Nasal system.

We posit that these three stages are necessary to the phonological restructuring of a system as complex as Philadelphia short-*a*. Specifically, we argue that children can only diverge so far from

their parental input. If parents provide a robust split in short-*a*, this means that children can at most produce an intermediate system or neutral system, but not an equally robust split with different grammatical conditioning. If parents provide an intermediate or neutral system, their children may then develop the full nasal system. However, both of these steps away from parental input are dependent on peer influence: children do not shift their productions unless they are socially motivated to do so. Thus, we find that complete phonological restructuring requires the convergence of both parental and peer influence over several generations.

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