Phonological Change in Philadelphia English

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Abstract

Two theoretical frameworks have been particularly influential in the study of phonological change in language: the Neogrammarian Hypothesis and lexical diffusion. The phonological development of the Philadelphia English dialect, particularly the unusual short-a split, serves as a compelling case study for examining these competing models. This quantitative study examines the phenomenon of "short-a tensing". Analyzing the vowel formant frequencies in voice samples of older and younger Philadelphians can show variation within the speech community with respect to an ongoing phonological change. There are 6 participants in this study, in two different age groups: 19-28, and 61-87. All participants are native to the Philadelphia metropolitan area. Words with short-a were selected from Labov (1989) and Henderson (1996) as a sample of short-a words in specific phonetic environments. Recordings of participants' voices are analyzed for the formant frequencies of the short-a vowel and compared between phonetic environments and age groups. With the limitation of a low sample size, preliminary results demonstrate support for the lexical diffusion hypothesis, as the vowel varies consistently between different words, which is not expected if all sound change is regular, which the Neogrammarian hypothesis postulates. It also provides evidence for the idea that the Philadelphia English dialect is moving towards a convergence with Mid-Atlantic dialects in surrounding regions. This research provides evidence for approaches to language that validate the natural variation that is observed between social groups.

Introduction

Language changes. All humans on Earth speak a different language than their ancestors any number of generations ago, with different grammar, lexicon, and sound. On a grand scale, the gradual process of language change is constant and unstoppable. This is a central tenet of the field of linguistics. The study of the sounds of language in particular is called phonology, and phonological change has been of particular interest in historical linguistics and sociolinguistics.

This study is about vowels. All languages have vowels. Vowels are produced by pushing air out of the vocal cords as the vocal tract is left open, and the mouth and tongue are shaped in different ways to produce different vowel sounds. For example, the word “beet” is produced with the tongue raised up and forward in the mouth, the word “boot” is produced with the tongue further back in the mouth, and the word “bot” is pronounced with the tongue down and the mouth more wide open. These different mouth shapes produce slightly different audible frequencies. The human ear and brain are extremely sensitive to these frequencies and a whole spectrum of sounds between them, which allows us to hear many different vowel sounds and subconsciously process language very quickly. Slight changes to these vowel shapes can produce sound patterns that we recognize as belonging to different accents.

The /æ/ vowel is known as the short-a in English. It occurs in words like “tap”, “have”, and “fact”. In some words, this vowel is raised or tensed, meaning the tongue is in a tense position slightly higher up in the mouth, of course producing a different sound, approximately [eə]. Over the last hundred years or so, a phonological change has been happening in several English dialects in the Mid-Atlantic region of the United States, known as /æ/-raising or /æ/-tensing. (The terms “raising” and “tensing” will be used interchangeably here. While they

are different things, they occur together in all American English dialects.) In most North American English dialects, this sound change occurs when the vowel precedes a nasal consonant like /m/ or /n/, for example in the words “slam” and “hand”. This can be explained as a simple phonological rule:

/æ/ → [eə] / _C[+nasal]

“The short-a phoneme /æ/ is raised to [eə] when it precedes a nasal consonant.”

However, in some Mid-Atlantic dialects, this raising occurs in other contexts, like before the /s/ sound in “gas”. In the New York dialect for example, the change affects words like “bath”, “bag”, and “flash”. Sociolinguistic studies have found the short-a vowel in most dialects to be phonologically conditioned; that is, whether or not it is raised depends on the following consonant (Kurath & McDavid 1961, Boberg 2001, Labov, Ash, & Boberg 2005). However, Philadelphia English seems to be an unusual case. Words like "mad" and "bad" show tensing, while similar words like "sad" and "glad" do not. This irregularity has presented a puzzle in the field of linguistics.

Literature Review: Phonological Change, Lexical Diffusion, and the Neogrammarian Hypothesis in the Philadelphia English Dialect

The Neogrammarian Hypothesis

The Neogrammarian Hypothesis, originating from the work of a group of linguists called the Neogrammarians in the late 19th and early 20th centuries, holds that phonological changes are regular and apply uniformly across all words in a lexicon once the change occurs. In other words, once a sound change is initiated in a speech community, it applies to all instances of the

phoneme in question across the linguistic system, regardless of the specific lexical item. The principle that sound laws have no exceptions became a foundational assumption of historical linguistics, framing phonological change as a mechanical and deterministic process (Kurath & McDavid 1961). However, several studies have questioned the strict regularity of sound change, especially in light of observed variation in the spread of sound changes across different lexical items.

Millar and Trask (2007) discuss the relevance of the Neogrammarian hypothesis to the Philadelphia dialect, noting that the tensing of the short-a vowel in some words but not others calls the hypothesis into question. For example, words like "mad" and "bad" show tensing, while similar words like "sad" and "glad" do not. This lexical variability in the implementation of a phonological change points to a kind of diffusion of the change throughout the lexicon. The change seems to be spreading word-by-word throughout the lexicon, pointing to the idea known as lexical diffusion.

Lexical Diffusion

In contrast to the Neogrammarian model, lexical diffusion posits that phonological changes often spread gradually across a lexicon, beginning with a small subset of words and then expanding to others over time. In lexical diffusion, sound changes are thought to begin with a small group of words that undergo the phonetic change first, and this change is then gradually adopted by other words over time. Labov (1989), describing the short-a system in Philadelphia English, demonstrated how phonological changes can start in a specific lexical subset and then expand throughout the lexicon. Over time, a sound change may become widespread within a dialect or speech community, but it may not apply uniformly to all words in the lexicon.

Other detailed studies of Philadelphia speech provide support for the lexical diffusion model. For instance, Boberg (2007) discusses the differential raising of the short-a vowel in different conditioning environments, i.e. as the vowel precedes different types of consonants, ultimately arguing that it represents a case of lexical diffusion. In the Philadelphia dialect, this vowel change affects some words but not others, illustrating how phonological changes can diffuse unevenly through a lexicon. Similarly, Dinkin (2013) provides a detailed analysis of the short-a split in Philadelphia, showing how the raising of /æ/ occurs in some environments but not others. Particularly, it discusses how the short-a raising is less advanced in words like "pal" and "hall," compared to words like "bad" and "mad," showing how the phonological change appears to spread more slowly in certain contexts, particularly before the consonant /l/. These findings highlight the importance of examining the lexical environment, which helps to uncover patterns when studying a sound change.

Additionally, Wang and Cheng (1977) provide a broader theoretical framework for understanding lexical diffusion, contrasting it with the Neogrammarian model. The authors summarize the Neogrammarian hypothesis as change being “phonetically gradual but lexically abrupt”, and describe lexical diffusion as a “lexically gradual but phonetically abrupt” change. A case study from a Chinese dialect is presented as evidence for the existence of lexical diffusion. The authors analyzed a corpus of data from varieties of Chinese, and found that there were splits in tone between Middle Chinese and the modern Teochew dialect of Chinese, with no apparent conditioning phonological factors. They found multiple minimal pairs in modern Chinese dialects that were homophones in Middle Chinese, leading the authors to claim that “words change… severally at a time rather than always in a homogeneous block” (p. 150). This particular study is interesting because it shows how completely unrelated dialects from two

different language families can show the same underlying linguistic principles when studied scientifically in this way. Evidence from Chinese can be directly applicable to a study of English.

Variation, Change, and Sociological Factors

The short-a tensing phenomenon in Philadelphia English in particular is significant to the conversation about phonological change because it is evidence of a phonological change in progress. It can be observed in processes of both transmission (spreading across geographical space) and diffusion (spreading throughout the lexicon). Labov's (2007) study on transmission and diffusion highlights the ways in which sound changes, such as the short-a split in New York City, diffuse across geographical and social boundaries. He explores how changes spread beyond individual speakers and communities, underscoring the importance of social networks in the diffusion of linguistic features. This concept is particularly relevant for understanding how the short-a split, while geographically localized in the mid-Atlantic region, exhibits regional and social variation in Philadelphia. It also helps to understand how phonological change spreads across geographical space. The short-a raising has slowly spread southward, probably originating in Canada (Fruehwald 2007) to New York, to Philadelphia, evolving as it permeates dialect boundaries, known as isoglosses (Evanini 2009).

As Labov (1966) first demonstrated in his study of phonological variation in New York City, understanding linguistic variation is the key to understanding linguistic change. Humans express their social identity and belonging in a particular social group through subtle linguistic markers, and when there is linguistic variation between social groups, any social change will naturally lead to a linguistic change. In this way, the vehicle of linguistic change is variation, and

“most language changes proceed by a shift in the frequencies of competing variant forms”. (Millar & Trask 2007, p. 260)

Henderson (1996) further explores this by focusing on African-American speakers in Philadelphia, providing insight into the sociolinguistic factors that shape how and why particular communities adopt phonological changes. Henderson found that Black speakers tended not to adopt the short-a split that is seen as characteristic of Philadelphia; perhaps it is only really characteristic of white people in Philadelphia. In a similar vein, Wagner (2013) examines the intersection of ethnicity, gender, and local language change in Philadelphia high schools. The study shows how specific groups, particularly African-American speakers, use language change, such as short-a raising, as a way to assert social identity.

Competing systems

The complex short-a split in Philadelphia may also be moving towards the nasal split observed in surrounding dialects. Labov et al. (2016) contrasts the two competing vowel systems for short-a in Philadelphia: the “traditional Philadelphia system” described above, and the simpler “nasal system” where “all /æ/ before front nasal consonants are tense; all others are lax” (Labov et al. 2016). Fruehwald (2017) further complicates the narrative by showing that many local dialect features in Philadelphia are undergoing “reversal”, i.e., converging with other North American dialects. This is part of a broader trend in many North American dialects in the last 30-50 years: many have tended to converge with each other due to factors like increased connection and population movement leading to dialect mixing and more homogeneity (Stanley, Renwick, & Nesbitt 2024). This pattern is mostly only established for white speakers, and not for all races and ethnicities.

Mapping The Timeline of the Change

Understanding the trajectory of any language change requires information from older and newer sources. The rate of language change is not always slow, but it does always occur over multiple generations. Tucker (1944) presents "Notes on the Philadelphia Dialect", a relic from 80 years ago with a wealth of information about the short-a split, especially in different conditioning environments such as before /l/. More extensive systematic research done by Labov (1989) in his "Exact Description of the Speech Community: Short *a* in Philadelphia" presents another piece of the puzzle. Labov, Rosenfelder, & Fruehwald (2013) help put the puzzle together with a large corpus study of older and newer data about sound changes in Philadelphia. This study provides a more zoomed-out view of the language change over the last 100 years. The insights gained from these studies with a more historical perspective can be compared to more current data (i.e., from 2025), enabling researchers to trace the progression of the short-a split and other phonological changes. Observing the differences between older and younger speakers is a crucial part of the study, as it makes use of "apparent time" (Millar & Trask 2007, p. 271). Apparent-time studies make the assumption that most people learn their language in childhood, and after adolescence they do not normally significantly change their speech. Thus, language changes happen with new generations, and older people retain a more conservative dialect. This language change is ongoing, so adding more data to the timeline will provide a more complete picture.

Conclusions from the Literature

The short-a tensing in Philadelphia English provides a compelling case study for understanding the nature of phonological change. The contrasting theoretical frameworks of the Neogrammarian Hypothesis and lexical diffusion provide useful lenses through which to

examine this change, with evidence seeming to support the idea of a gradual, word-specific pattern rather than a uniform, rule-based process. The sociolinguistic background of Philadelphia can also show how social factors such as ethnicity and identity influence the adoption of phonological changes. The ongoing evolution of the short-a split, and how broader linguistic trends of dialect convergence complicate it, demonstrate the complexity of linguistic change. The current research, through the analysis of historical data and the collection of more current data, will offer valuable insights into the progression of this change. By tracking differences between older and younger speakers, we can build a more comprehensive understanding of how language changes over time, enhancing the broader picture of phonological evolution.

Research Questions

This study focuses on two main research questions. Firstly, I am interested in comparing the two main hypotheses for language change, the Neogrammarian hypothesis and lexical diffusion, to decide which one seems to apply to the Philadelphia case. Secondly, I am interested in looking at the effects of age to study change in "apparent time". If there are differences between older and younger speakers, these can be used to ascertain the progression of change.

RQ1: Is short-a tensing in Philadelphia English a regular phonological change, or is it happening by a process of lexical diffusion?

RQ2: What are the effects of speaker age on the short-a split system?

a. Do younger speakers align with the traditional Philadelphia dialect more or less than older speakers do?
b. Is the short-a split system in Philadelphia English converging or diverging with other Mid-Atlantic dialects?

Methodology

Participants and Data Collection

There were 6 participants in this study, of a wide age range. Participants were divided into two general age groups based on a mean split with the average participant age being 47. This created two groups with age ranges 19-28 and 61-87.

. All participants are native to the Philadelphia metropolitan area and speak English as their first language. Five of the participants identified as white, and one identified as Asian.

Participant recruitment methods included flyers posted in Philadelphia churches and cafes, distributed to students at Philadelphia universities, and by social media (Instagram and Reddit). In total, 17 faculty members were contacted from the University of Pennsylvania, Temple University, and the Community College of Philadelphia to ask for their assistance in sharing the recruitment flyer. People were able to scan a QR code or email to complete the study online. Participants read and agreed to the informed consent online via Google Forms. After consenting to the study, participants completed a Demographic Questionnaire, which served as a pre-screening. They were then asked to make an audio recording of the given word list (Appendix A) as well as a passage containing the target words, to get a sense of how they use the words naturally in a sentence. They then submitted audio recordings to a dedicated email address. Participation was voluntary, and two randomly selected participants were compensated with a $50 gift card sent by email.

Words with short-a were selected from Labov (1989) and Henderson (1996) as a sample of short-a words in different conditioning environments. See full word list in Appendix A. To incorporate the target words in a reading passage, the word list was put into ChatGPT with the prompt “Write a short story containing all of these words.”

Because additional words were added to the word list after the pilot, three of the participants read the full word list, and three only read the short one. When comparing all six participants, only the short word list was used.

Materials

There were 8 phonetic environments examined in the short list. The independent variables are the phonetic environment following the vowel in each word[1], and the age of the participants. The dependent variable is the vowel quality. Conditions being tested are whether the vowels are lax (lower and back) or tense (higher and forward). A limitation of this method, as in similar studies of this type, is that it is impossible to study both the right and left phonetic environments as variables. This study relies on the patterns found in the literature which show that /æ/-tensing is generally a process conditioned by the right phonetic environment.

The "vowel prediction" column is based on previous studies of Philadelphia English by Labov (1989) and Henderson (1996). It reflects the typical short-a split in Philadelphia at that time.

Short Word List

Word	Phonetic environment	Vowel Prediction
back	_/k/	lax
bad	_/d/	tense
bag	_/g/	lax
bath	_/θ/	tense
glad	_/d/	tense

[1]Most of the phonetic environments had only one sample word in the short list, except for the _/d/ words, which had four sample words.

glass	_/s/	tense
grab	_/b/	lax
half	_/f/	tense
mad	_/d/	tense
ran	_/n/	tense
sad	_/d/	lax

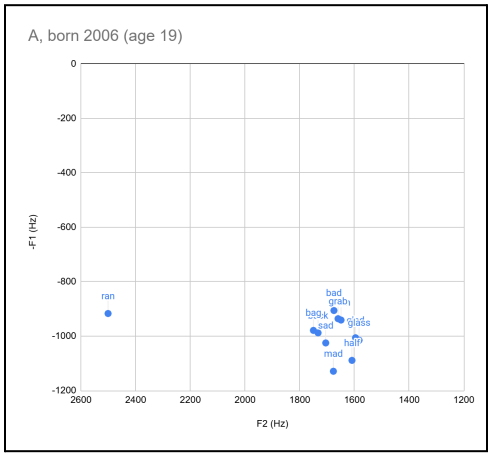
Analysis

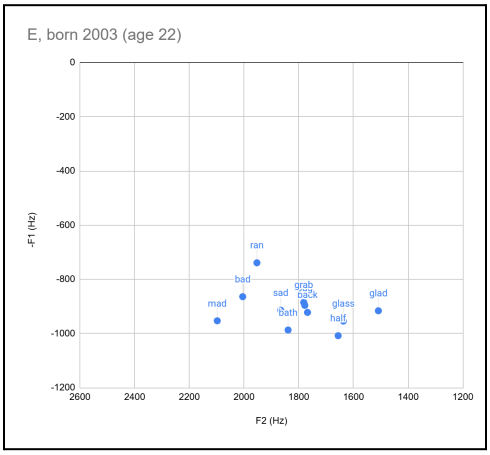
The data were to be originally modeled using logistic regression, predicting vowel quality as a function of age and phonetic environment. However, an alternative analysis was utilized due to a small sample size. Recordings were analyzed using the acoustic-phonetic analysis software, Praat. The formant frequencies F1 and F2 were extracted manually from each vowel. The vowels were also analyzed using impressionistic phonetic judgement into the categories “Lax” (L) and “Tense” (T). Each instance of the word was judged impressionistically as lax (sounds like [æ]) or tense (sounds like [eə]), based on listening to the recordings. The lax category roughly corresponds to a higher F1 and a lower F2, compared to the tense category which is a lower F1 and a higher F2.

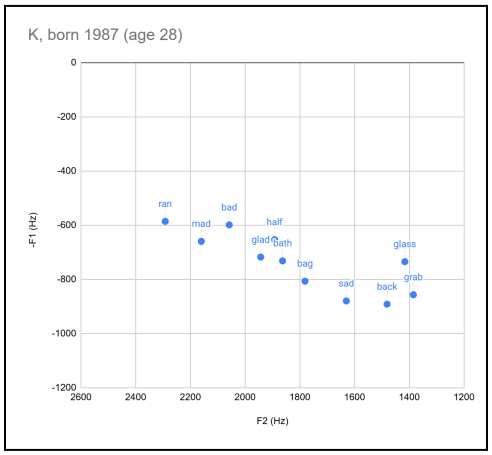
To analyze age differences, participants were divided into two general age groups based on a mean split with the average participant age being 47. This created two groups with age ranges 19-28 and 61-87.

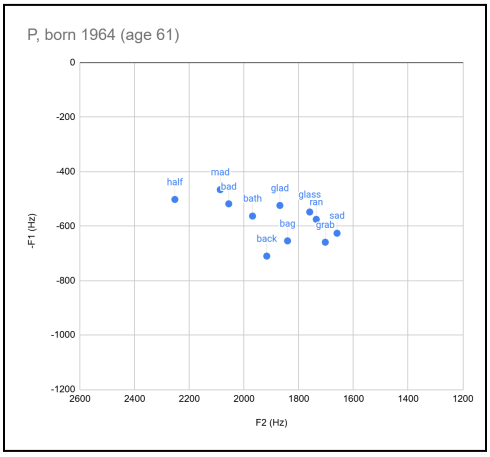
Results and Analysis

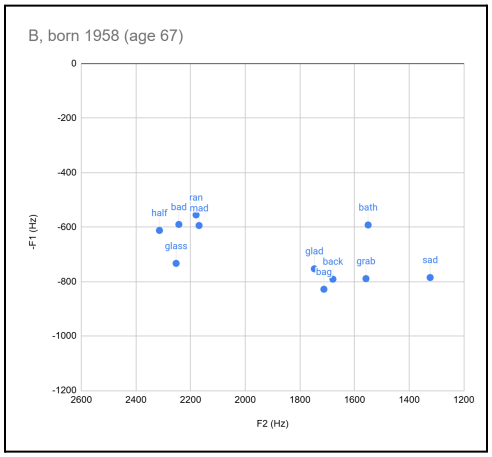
Formant graphs

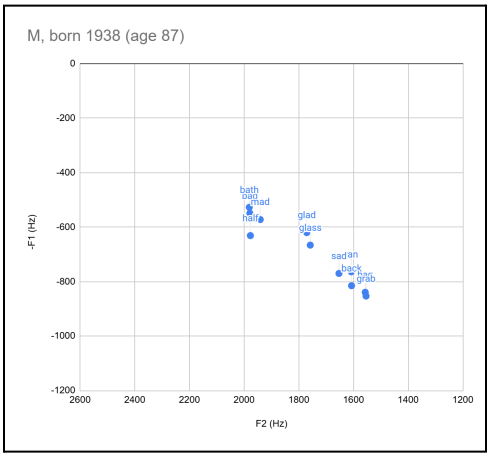












The graphs show widely varying patterns in the distribution of vowels for each participant. For example, we see that Participant K has what appears to be a wide continuous distribution between the different words, while Participant B appears to have two distinct clusters which can be seen as two distinct phones. Participant A appears to have one phone for all words except “ran”, which is distinct. This makes sense, as “ran” was the only word with a nasal consonant after the vowel. In many Mid-Atlantic dialects, nasal consonants following the vowel are the sole predictor of /æ/-tensing. This suggests that A has a more typical Mid-Atlantic nasal split. While the visual analysis of the scatterplots themselves doesn’t seem to show a consistent pattern, nonetheless looking closely at specific words can be more revealing. Note the tendency of the word “mad” to be higher up and to the left than “sad” on most participants’ graphs. Let’s take a closer look at the individual words.

Overall table

The following table is based on impressionistic judgements. Each instance of the word was judged impressionistically by the author as lax (sounds like [æ]) or tense (sounds like [eə]), based on listening to the recordings. There were no instances found of the same participant saying the same exact word two different ways, in the word list or the passage reading.

phonetic environment	Word	# Lax	# Tense
_/k/	back	6 (100%)	0 (0%)
_/g/	bag	5 (83%)	1 (17%)
_/θ/	bath	2 (33%)	4 (67%)
_/s/	glass	2 (33%)	4 (67%)
_/b/	grab	6 (100%)	0 (0%)
_/f/	half	2 (33%)	4 (67%)
_/n/	ran	2 (33%)	4 (67%)

_/d/	bad	2 (33%)	4 (67%)
_/d/	glad	2 (33%)	4 (67%)
_/d/	mad	2 (33%)	4 (67%)
_/d/	sad	6 (100%)	0 (0%)

This table tells one very interesting story about the vowel split. The four words with the same phonetic environment (_/d/) have different tendencies. The word “sad” seems to always be pronounced lax, while “bad”, “glad”, and “mad” are usually tense. This table does not show the vowel split for each person and how these can be compared with each other, but it shows the general patterns for each word, which gets more closely at the question of lexical diffusion.

Discussion

To address the research question of the Neogrammarian hypothesis and the lexical diffusion hypothesis, the first step is to figure out the expected result if each hypothesis were true. The Neogrammarian hypothesis holds that sound changes are regular across the lexicon, and are consistent within groups of words with the same phoneme in the same phonetic environment (Kurath & McDavid 1961). In other words, the sound change can always be expressed in a phonological rule, of the form

/æ/ → [eə] / _X

so that all relevant words undergo the change equally at the same time. The Neogrammarian hypothesis allows for the change to be phonetically gradual over time, i.e. the sound change may move gradually up the vowel space, and it will of course spread gradually across the speech community, but it would apply equally to all words which fit the phonetic description. Thus, this hypothesis would predict that the phoneme varies with phonetic environment, but not by individual word. It treats the /æ/ phoneme as a single phoneme with a complementary

distribution of allophones. If the Neogrammarian hypothesis is true, we would expect to see the same pattern in all words within the _/d/ environment. Perhaps not all people would say it the same way as each other, but each speaker would say all words within the _/d/ environment the same way. Both the graphs and the table show that this is not exactly the case.

The lexical diffusion model predicts that the sound change happens differently to different lexical items. The phonological rule still generally applies, but there may be a gradualness across the lexicon. Wang and Cheng (1977) said it best as "lexically gradual but phonetically abrupt", as opposed to a regular change under the Neogrammarian hypothesis, which may be "phonetically gradual but lexically abrupt". In lexical diffusion, specific words within the same phonetic environment can have different patterns, but this hypothesis would predict a general agreement between speakers about which specific words have the change and which do not. It is almost as if there is not exactly one underlying phoneme in all the words, but each word has a distinct sound within the speaker's mental lexicon, and each lexical unit can undergo changes without immediately affecting all words with that phoneme. The lexical diffusion model might predict that individual words have different patterns within the same phonetic environment, but that there is some agreement between the speakers. Because this model is necessarily less strictly pattern-based, and because it is impossible to have a group of multiple speakers with exactly the same accent, it is harder to see direct evidence for lexical diffusion in the data.

There are a couple of different ways that this limited data can be used to address these two hypotheses, both demonstrating evidence in support of lexical diffusion. First is the table showing a clearly different overall tendency for "sad" (100% lax and 0% tense) and "mad" (33% lax and 67% tense) despite both words having the same phonetic environment. Second is the

absolutely crucial fact that within each submitted recording, there was not a single instance of any participant producing the same word in two different ways, even between the word list and the passage reading. Even the four participants who do not rhyme “sad” and “mad” pronounce each individual word consistently. This disproves the hypothesis of simple free variation between the allophones [æ] and [eə]. The distribution is not random; there is clearly a lexical effect.

The lexical effect is also shown in the formant frequency scatterplots. When the scatterplots are analyzed for individual words, “sad” is typically found closer to the lower right corner, meaning it tends toward the lax vowel, which is slightly more open and back in the mouth, while “mad” is typically found closer to the upper left, tending towards the tense vowel, slightly higher and with the tongue more forward. The two words have a consistently different vowel tendency, unlike allophones in free variation, and also unlike the complementary distribution of allophones predicted by the Neogrammarian hypothesis. Even though speakers have wildly different distributions of frequencies in the scatterplot, patterns can be found when looking for individual words.

So far we have only discussed one particular phonetic environment, the _/d/ environment, because there are four of these words in the short word list, and it shows the most obvious unusual pattern. The other interesting phonetic environment is the _/n/, which represents the vowel followed by a nasal consonant. As seen in Labov et al. (2016), many dialects have a short-a split which is conditioned simply by the nasal. The nasal split might be expected to be observed in a more general Mid-Atlantic dialect south of Philadelphia, where all short-a vowels are lax except for those preceding a nasal consonant, which are tense. This pattern is seen clearly in the scatterplot for Participant A, indicating that this 19-year-old individual has adopted a dialect less characteristically “Philadelphian” and has a nasal split.

The full word list included more of these nasal words, and so there is some data on these words from the three younger participants.

Phonetic environment	Word	# Lax	# Tense
_/n/V	banana	1 (33%)	2 (67%)
_/n/	began	0 (0%)	3 (100%)
_/n/	can	0 (0%)	3 (100%)
_/n/	man	0 (0%)	3 (100%)
_/n/	pan	0 (0%)	3 (100%)
_/n/V	planet	1 (33%)	2 (67%)
_/n/	ran	2 (33%)	4 (67%)
_/n/	tan	0 (0%)	3 (100%)

All of the younger speakers pronounced all of these words with the tense vowel. For “ran”, which was collected from all six speakers, two of them (both older speakers) pronounced it with the lax vowel. When we look more closely at individuals, interesting irregularities emerge. A counterintuitive fact is that producing certain vowels lax is a predictor for saying other vowels tense. More specifically, the 2/6 participants who produced “ran” with the lax vowel also produced “mad” and “glad” with the tense vowel. The 2/6 participants who produced “mad” with the tense vowel also produced “ran” with the lax vowel. The 1 younger participant who produced the _/n/V words with the lax vowel was also the only one of the younger participants to produce a tense vowel in “bath”, “glass”, and “half”. This is why we must be careful not to conclude “The Philadelphia English dialect is characterized by generally more tense short-a vowels,” because the short-a split is actually just a completely different system. The nasal split generally has tense vowels before nasal consonants, and the Philadelphia split generally has tense vowels in different contexts, but also some lax vowels before nasal

consonants. The vowel split is more complicated because it is undergoing a sound change in the process of lexical diffusion, so the vowels are all highly word-specific.

With the small sample size, it is difficult to make generalizations based on the age groups. The age range of the 6 participants is very wide however, and one interesting fact can be observed about this. Based on the scatterplots, the two participants who fall closest to the Mid-Atlantic nasal split, i.e., less "typically Philadelphian", are A and E, who are also the two youngest participants. This is evidence of a change in apparent time. Younger speakers tend to reflect the speech towards which a dialect is actively changing, while older speakers reflect the more conservative or traditional speech of the past (Millar & Trask 2007). It appears that the Philadelphia English dialect is actively moving away from this complex short-a split and towards a nasal split, in addition to the lexical diffusion that has also been happening with short-a tensing. Fruehwald (2017) suggests that Philadelphia is undergoing "reversal" of local features like the short-a split.

Conclusions

Based on the very limited evidence gathered from a study with only 6 participants, some interesting conclusions can be drawn. Limitations include low sample size, and the fact that all participants except one were white, so the results cannot be generalized to other racial groups. Firstly, to address RQ1, /æ/-tensing is happening in Philadelphia English by a process of lexical diffusion, meaning that the change is happening to individual words and diffusing across the lexicon over time. Secondly, to address RQ2, younger Philadelphian speakers are showing a shift towards a nasal split. This seems to be part of a more broad trend, at least among white speakers of North American dialects, where local dialect variation is decreasing as dialects converge with more generic speech in the larger region.

These subtle shifts in sound frequencies are really what make all accents what they are. The human brain is remarkably fine-tuned to these slight differences and can immediately hear them and make judgements about the speaker. Accents can be associated not just with geographical regions but also with different races and social classes. Often our subconscious perceptions and feelings about different groups of people affect how we perceive their accent. This is why it is important to remind ourselves of what these dialect differences really are, differences in sound. They have no inherent value outside of the cultural meaning assigned to them, subconsciously signifying whether a person is in the community or not. The natural variation in language observed between social groups is not something to be corrected, but to be observed and studied as an aspect of human diversity.

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Appendix A

Materials

Full Word List

Word	phonetic environment	Vowel Prediction
African	#_/f/	lax

albums	_/l/C	lax
alley	_/l/V	lax
back	_/k/	lax
bad	_/d/	tense
badge	_/d͡ʒ/	lax
badminton	_/d/	?
bag	_/g/	lax
banana	_/n/V	lax
bath	_/θ/	tense
began	_/n/	tense
can	_/n/	tense
cap	_/p/	lax
carry	_/ɹ/V	lax
cash	_/ʃ/	lax
casual	_/ʒ/	lax
classical	_/s/V	lax
dance	_/n/C [-voice]	tense
glad	_/d/	tense
glass	_/s/	tense
grab	_/b/	lax
grand	C/ɹ/_/n/C	tense
half	_/f/	tense
ham	_/m/	tense
hammer	_/m/V	lax
hand	_/n/C [+voice]	tense
hang	_/ŋ/	lax
have	_/v/	lax
jazz	_/z/	lax
landed	/l/_/n/C [+voice]	tense
laughing	/l/_/f/V	tense

mad	_/d/	tense
man	_/n/	tense
mat	_/t/	lax
matter	flap	lax
pad	_/d/	lax
pal	_/l/#	lax
pan	_/n/	tense
personality	_/l/V	?
planet	_/n/V	lax
plastic	C/l/_/s/	tense
ran	_/n/	tense
rather	_/ð/	lax
sad	_/d/	lax
snatch	_/t͡ʃ/	lax
swam	_/m/	tense
tan	_/n/	tense

Passage

On a warm, casual afternoon, a man in a grand alleyway near the park began to unpack his bag. Inside, he had a mixture of items: a banana, a hammer, a badminton racket, and a few albums filled with classical and jazz music. He ran his hand through his hair, adjusting his cap, and glanced at the pad of cash in his pocket, wondering if he had enough to grab a drink from the nearby stand.

As he swam through thoughts of the day ahead, he couldn't help but feel a little bad. He had been looking forward to a relaxing bath later, but something seemed off. His pal had promised to join him for a game of badminton, but now he wasn't sure if he'd show up. Still, he

could always go alone. After all, he could always hang out and enjoy the sun with a half-eaten banana and the latest jazz album.

Despite the sad thought, he shook his head and tried to stay glad. “Does it really matter?” he muttered to himself. “I can always dance on my own if I want to.” He looked around, admiring the glass buildings around him and the way the light made his tan glow. But just then, a mad shout echoed from the distance, and he quickly grabbed his bag and ran down the alley. Someone had snatched a badge off the ground, and he wasn’t about to let it slip by.

The sound of a hammer hitting the ground echoed as he reached the end of the alley. There, an old man was having a bad day, having dropped his mat and was now looking for his lost cap. The man smiled and offered his help. "I can help you," he said, glad to have found a way to ease the situation, even if just for a moment.