A Tale of Two Cities: Community Density and African American English Vowels

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1 Introduction

"I can tell . . . You from Durham, right? Yeah, I can tell because of the way you talk, boy. You like, 'you like to **study**." [produces stressed vowel in *study* with raising] (Two speakers who didn't previously know each other)

In contrast to the study of regional European American English varieties, the acoustic analysis of the African American Vowel System (AAVS) is both more recent and less comprehensive. More recent studies show that this system has a wide, but sporadic, distribution throughout the United States (Bailey and Thomas 1998, Thomas 2007, Yaeger-Dror and Thomas 2010), yet the social correlates of the AAVS remain underexplored (Deser 1990, Kendall and Wolfram 2009, Nguyen 2006, Scanlon and Wassink 2010 for exceptions). A lack of participation in regional European American sound changes and the retention of Southern English features in the urban North have been cited as evidence of linguistic divergence (Labov and Harris 1986), though more recent studies show that African Americans in New York City are retaining some local variables even as these variables recede among European Americans (Coggshall and Becker 2010). As communities from a wider range of geographic locations are sampled, evidence suggests that AAE speaker participation in regional sound changes is more common in Southern enclave communities and is often selective, leading to mixed alignment patterns in which Predominant Regional Variety (PRV) variables exist alongside AAVS variables (Wolfram and Thomas 2002, Yaeger-Dror and Thomas 2010). While previous research suggests that spatial segregation is central in maintaining ethnolinguistic boundaries, studies restricted to hypersegregated communities or intra-community comparisons provide only suggestive evidence for the role of socio-geographic community structures in the distribution of the AAVS.

What social factors contribute to the sporadic distribution of the AAVS? And, does maintenance of AAVS features and resistance to local sound changes correlate with factors such as population density and demographic composition? We compare vowel systems from members of two communities that differ in measures of segregation, but are located less than 12 miles apart. While six of the fourteen young adult African American women selected for analysis entered Historically Black Colleges and Universities (HBCUs) directly out of high school, the remaining eight participants either enrolled in community colleges, certificate programs, or directly entered the workforce. We further consider educational profiles as a social factor that may correlate with participation in the AAVS. Our analysis reveals systematic differences in participation in the AAVS across communities for select variables. Even within a single dialect region, population density and demographic composition are significant factors in the distribution and extent of the AAVS. The relationship between educational profiles and participation in the AAVS appears more complex and merits further investigation.

2 The African American Vowel System

The AAVS is typically presented as a supra-regional vowel pattern that bears a resemblance to the Southern Vowel Shift (SVS) as front lax vowels are high and fronted, and front tense vowels are low and back in this system. As observed in the European American SVS, reversal of the mid front vowels is more common than reversal of the high front vowels (Thomas 2001, the collected studies in Yaeger-Dror and Thomas 2010). However, the AAVS is not identical to European

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American varieties of the SVS as front lax vowels are not as diphthongal as European American SVS lax vowels (Koops 2010, Risdal and Kohn 2013); BAIT only variably lowers, back vowels resist fronting, and BUT is high in the vowel space (see, for example, plots in Thomas 2001).

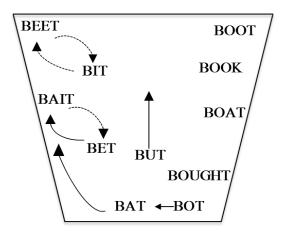


Figure 1: African American Vowel System from Kohn (2013).

2.1 Distribution of the AAVS

Unlike the SVS, the AAVS has been found in many non-southern locations, including Brooklyn, NY, (Thomas 2007), Columbus, OH, (Durian et al. 2010), and Milwaukee, WI, (Purnell 2010). Many urban locations where resistance to the Predominant Regional Variety (PRV) sound changes or participation in AAVS variables have been observed are highly segregated according to indices of population distribution including measures of dissimilarity, isolation, and exposure between ethnic groups within and across census tracts (Massey and Denton 1989). Philadelphia, PA, (Henderson 1996), Brooklyn, NY, (Thomas 2007), Milwaukee, WI, (Purnell 2010), and Houston, TX, (Koops and Niedzielski 2009) all meet the definition of "hypersegregated" communities where African Americans are clustered within census tracts with limited exposure to other ethnic groups (Massey and Denton 1989). These urban studies contrast with studies of enclave communities in the South for which formal measures of segregation are not available, but where partial or total alignment to PRV variables has been observed for AAE (Childs et al. 2010, Wolfram and Thomas 2002). Cross-study differences in the interaction between AAE and PRVs are likely attributed to a number of factors ranging from the local indexicality of a variable to the socio-historical background and demographic profile of the community. As noted by Yaeger-Dror and Thomas (2010:8):

The degree to which a given AAE [speaker] accommodates to the local PVE [Predominant Variety English] norms is theoretically also influenced by the degree of actual face-to-face contact that occurs between members of each group in any given locale. Presumably, the greater the degree of segregation that exists in a given locale, the smaller the opportunity for assimilation or accommodation in either direction.

Several intra-community studies provide some evidence that variables of the AAVS are more common in the speech of African Americans in primarily African American schools (Deser 1990), neighborhoods (Purnell 2010), or with primarily African American social networks (Fridland 2003).¹ As school demographics, neighborhood composition, and social networks are constrained by broader community structures, these findings suggest that community demographic profiles are

¹Fridland found that BAIT and BET reversal were more common among African Americans with strong intraethnic ties.

likely to correlate with the distribution of the AAVS. We build on this line of research through a comparison of adjacent communities that differ on formal measures of segregation and community density.

Limited work exists on social correlates of AAE in general, and the AAVS in specific. Highly stereotyped features such as /ai/ glide weakening show class stratification (Nguyen 2006) and are sensitive to style-shifting and interlocutor identity (Scanlon and Wassink 2010). It is unclear whether similar patterns emerge for other AAVS variables (Kendall and Wolfram 2009).² We consider the relationship between the educational paths pursued by participants in this study as a possible social correlate of participation in the AAVS (See Prichard and Tamminga 2012 and Wagner 2008 for comparable studies of regional European American varieties). Specifically, we examine the extent to which participants who attend HBCUs show AAVS variables compared to participants who do not pursue a university education.

3 Community and methods

The two communities under analysis, Durham, NC, and Chapel Hill, NC, are located in the Piedmont region of North Carolina. Chapel Hill is a town of 58,011 people, 9.7% of whom are African American, 69.5% are European American, and 6.5% are Hispanic. Durham is a mid-sized city of 233,252 people, 41% of whom are African American, 37.9% are European American, and 14.2% are Hispanic (US Census 2011). These communities also differ in geographic measures of segregation. The dissimilarity index measures the percentage of individuals who would need to move to evenly distribute ethnic groups across census tracts. Measures over 60% indicate high levels of segregation, measures between 40 and 60% indicate moderate levels of segregation, and measures below 40% indicate low levels of segregation. Durham is considered a moderately segregated city with an index of 47.9%. Chapel Hill has a dissimilarity index of 19.9% indicating that ethnic groups are more evenly distributed across census tracts for this community. Additional measures of clustering, including the isolation and exposure indices also indicate that African American population in Durham is more clustered and less evenly distributed across the city than Chapel Hill's African American population (US Census 2010).

We analyze sociolinguistic interviews collected in 2011 from fourteen female participants of the Frank Porter Graham (FPG) longitudinal study of AAE, born between 1990 and 1992 (Van Hofwegen and Wolfram 2010). All participants grew up in the Piedmont region of North Carolina. Half of the participants grew up in Chapel Hill while the other half grew up in Durham (See Table 1). Educational profile refers to the activity of the participant post-high school. Six participants, three from each field site, enrolled and began attending classes at HBCUs after graduation from high school. Eight of the participants were enrolled in community colleges, had completed certificate programs and/or were in the workforce, or were seeking work at the time of the sociolinguistic interview (See Table 1).

Chapel Hill	Educational Profile	Durham	Educational Profile
274	HBCU	1090	HBCU
1062	HBCU	1058	HBCU
1054	HBCU	1078	HBCU
268	Community College	1070	Cosmetology
1036	Child care certificate	1072	Home health care
1001	Service Worker	1035	Service worker
1065	Job core	1010	Unemployed

Table 1: List of speakers by field site and educational profile.

²Kendall and Wolfram's (2009) study of the Princeville, NC, mayor indicates that her participation in the AAVS system is not subject to style shifting. However, this pattern may be related to the endocentric nature of the Princeville community, a rural African American township.

While evidence suggests that the AAVS has been present in the region for almost a century (Kohn 2013), immigration from outside the state has led to the recession of the SVS among European Americans in the Piedmont's urban hub, Raleigh, NC (Dodsworth and Kohn 2012). This PRV sound change contrasts with the AAVS system, as front lax vowels are low for the PRV but high for the AAVS. BUT additionally is raised in the AAVS, and is subject to metalinguistic commentary that suggests it is indexed as a local Durham variant, although previous studies of the AAVS show that it has a wide geographic distribution (Durian et al. 2010, Koops and Niedzielski 2009). We compare production of BAT, BET, BIT, and BUT by field site and education level to identify a) whether participants who grow up in more dense and clustered African American communities are more likely to participate in the AAVS; and b) whether individuals who pursue higher education at HBCUs are more or less likely to participate in the AAVS.

Between 15 to 25 tokens of BAT, BET, BIT, and BUT were measured in Praat for each speaker, and formant values were normalized using Lobanov. To compare the relationship of educational profile and community demographics with front lax vowel raising we constructed mixed model regressions using F1 midpoint measures as the dependent variable for the analysis and with speaker as a random factor. A separate regression was performed for each vowel. Each model included duration as a continuous factor to control for correlates of undershoot, and preceding place of articulation as a categorical factor including labial, coronal, velar, and glottal, to statistically control for the influence of place of articulation on F1 values. Education was included as a categorical variable with two levels: university and other. Community was also included as a categorical variable with two levels: Durham and Chapel Hill. Models with an interaction between community and education level were compared to models without an interaction using ANOVA in the lme package of R as visual analysis indicated that the relationship between lax vowel raising and education for some variables differed across communities.

4 Analysis

Figures 2 through 6 display box plots for normalized F1 values for each speaker arranged by community and education level. More negative values correspond to vowels that are higher in the vowel space, so the y-axis has been flipped to aid in interpretation. Raised variables are consistent with the AAVS, while lowered variables are consistent with PRV sound changes. If lax vowels are lower among Chapel Hill speakers, this finding would suggest that higher levels of integration lead to greater participation in PRV sound changes.

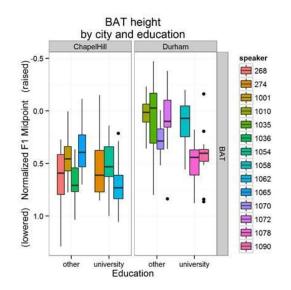


Figure 2: BAT F1 normalized midpoints by city and education.

Differences in vowel height across education levels may indicate that raised front lax vowels are subject to social constraints, possibly as a marker of ethnic identity or as a correlate of upward mobility.

Figure 2 displays the distribution of normalized F1 values for BAT. Regardless of education level, Chapel Hill participants have phonetically lower mean values and ranges than Durham participants for this vowel class. Two of the three HBCU participants from Durham have means that are similar to Chapel Hill students, but inclusion of an interaction between community and education does not improve the goodness of fit for the model. Differences in vowel height between communities are significant (Coeff: -.33, t = -4.58***), but differences for education level are not (Coeff: .14, t = 1.91). This finding is consistent with the interpretation that Durham speakers participate to a greater extent in the AAVS, while Chapel Hill speakers show evidence of participating in PRV sound changes. Community effects are larger than educational effects, although two HBCU students from Durham show lower BAT classes than the rest of their cohort.

Figure 3 displays the distribution for normalized values of BET F1. While the majority of Chapel Hill speakers have mean BET values that are lower in the vowel space than Durham speakers, speaker 274 appears as an outlier in her community. Speaker 274 is a Chapel Hill speaker who attends an HBCU. Her mean BET values are similar to those of Durham speakers who do not attend a four-year university. The same two HBCU speakers in Durham who have lowered BAT classes also have lower BET classes than the rest of their cohort. A model that includes interaction between speaker and community improves upon a model without the interaction.

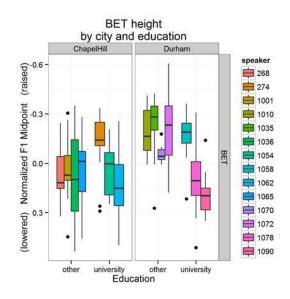


Figure 3: BET F1 normalized midpoints by city and education.

A significant interaction between community and education shows that the relationship between education and front lax vowel raising varies by community (Coeff: -.28, t = 2.69*) (the main effect for community is significant (Coeff: -.24, t = -3.60**), while the main effect for education is not (Coeff: -.07, t = -.97)). These results are likely attributed to the variable nature of raising among the HBCU students across communities. While community differences are visually apparent for participants who do not attend four-year universities, participation in BET raising appears idiosyncratic among the HBCU students.

Figures 4 and 5 display the distribution of BIT and BUT normalized F1 midpoints. Mean values for BIT are phonetically higher among Durham participants, although community differences do not reach statistical significance for either BIT or BUT (BIT: Coeff: -.07, t = -1.86, p = .09; BUT: Coeff: -.10, t = -1.22, p = .25). Differences across educational profiles also do not reach

statistical significance (BIT: Coeff: -.01, t = -.15, p = .88; BUT: Coeff: .02, t = .19, p = .85).³ A lack of significant effects for social factors may reflect the observation that raised BIT classes are a less common component of the AAVS and SVS than raised BET or BAT classes. Among European Americans BIT was never rigorously shifted in this region (Dodsworth and Kohn 2012). Visual inspection shows that means for BUT are higher in the vowel space among speakers who do not attend HBCUs in Durham than their counterparts in Chapel Hill, while HBCU students show a wide distribution of ranges and means across communities similar to the distribution observed for BET.

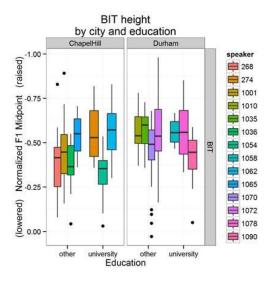


Figure 4: BIT F1 normalized midpoints by city and education.

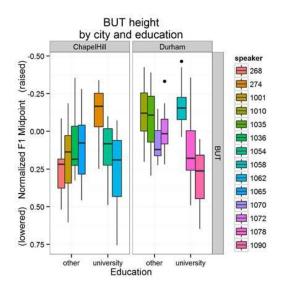


Figure 5: BUT F1 normalized midpoints by city and education.

A lack of significant effects for community in BUT height is surprising given metalinguistic commentary on the variable (see introductory quote). However, as a variable that may be a sociolinguistic indicator, BUT height may be subject to style-shifting so that Durham participants only

³The interaction model did not improve upon the main effects model for the BIT or BUT classes.

variably participate in raising. 1078, a speaker with a notably wide range for BUT F1, explicitly performs BUT raising as inappropriate in formal contexts:

E: And what do you think might be the worst situation to use a non-standard dialect?
1078: Ooh. In court...Just getting' up there and just: "Well, judge, she uh" [produces stressed vowel in *judge* with raising]
E: Mhmh, no.
1078: So, court. Anything where you have to present yourself...

In an interview environment in which participants are aware that they are being recorded, Durham participants may be less likely to use raised BUT variables, masking community differences that might emerge in less formal contexts.

Figure 6 presents a visual summary for the analysis of lax vowel raising across communities and educational profiles. Individuals who do not attend HBCUs show differences across communities for BAT and BET. In contrast, the individuals who attend HBCUs do not consistently pattern with their community cohorts. Speaker 274 from Chapel Hill shows raising for BET, BIT, and BUT, as does speaker 1058 from Durham. The remaining four HBCU students do not show lax vowel raising.

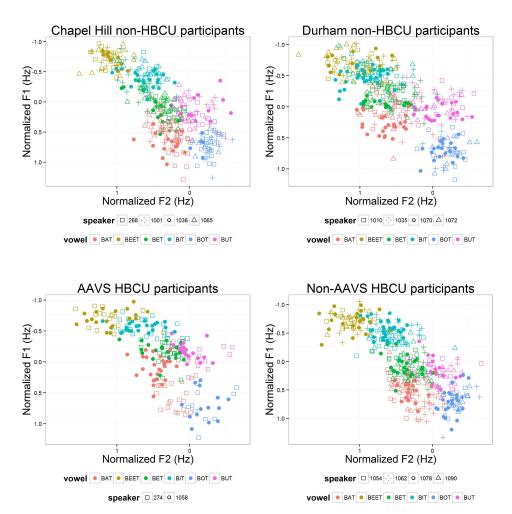


Figure 6. Front vowels by community and educational profile.

The significant difference in BAT height across communities is consistent with the hypothesis that differences in community density and demographics influence levels of participation in the AAVS. Chapel Hill participants trend towards lower lax vowel productions than Durham participants, and this difference is significant for the BAT class. As lax vowel lowering is a PRV sound change within the Piedmont area, lower mean values for BAT in Chapel Hill suggest participation in or accommodation to PRV norms. Chapel Hill participants have increased opportunity for exposure to PRV norms due to the socio-demographic structure of the community. A comparison of demographic profiles for schools attended by the participants highlights how these community structures constrain contact with PRV norms. All Chapel Hill participants attended high schools in which between 14% and 16% of the students were African American. Six of the Durham participants attended high schools in which 76% to 90% of the students were African American. Speaker 1010 from Durham attended a high school where 41% of the students were African American. Formation of social networks, face-to-face contact, and linguistic exchanges are all constrained by these community structures. Because Durham participants grow up in a community setting where African Americans are a majority, exposure to European American sound changes may either be insufficient or participation in PRV sound changes may be socially undesirable.

Differences in accommodation to PRV variables found in previous studies of the AAVS are likely a reflection of such factors. For example, studies of the AAVS in communities with moderate levels of segregation have found evidence of participation in PRV sound changes. Speakers from moderately segregated cities such as Columbus, OH, and Pittsburgh, PA, show participation in PRV sound change, such as back vowel fronting in Columbus, OH (Thomas 1989[1993], Durian et al. 2010), and the low back merger in Pittsburgh, PA (Eberhardt 2009). In contrast, PRV variables were not as common among African American participants in majority African American communities in Milwaukee, WI, a highly segregated city according to these same indices (Purnell 2010). Differences in adjacent communities that differ in formal measures of segregation show that community structures play a role in the distribution of the AAVS for at least some variables. Community size is also likely to play a role as more extensive similarities across ethnolects have been identified in smaller enclave communities (Childs et al. 2010, Wolfram and Thomas 2002). Levels of contact, strength of network ties, and stability of social networks are all likely to vary with broader socio-demographic community structures.

While community density plays a role in how speakers realize the AAVS, educational profile does not have a significant main effect for any of the vowels analyzed. Instead, we observed that individuals who attend HBCUs do not consistently pattern with their community cohorts. Speaker 274 from Chapel Hill shows raising for BET, BIT, and BUT, as does speaker 1058 from Durham (who additionally has a raised BAT class), all of which are consistent with the AAVS. The remaining four HBCU students do not show lax vowel raising. These findings contrast with results presented in Prichard and Tamminga (2012) in which individuals who attended nationally oriented universities did not participate in socially salient local variables. The students who attended HBCUs are similar to the students who attended nationally oriented universities in Prichard and Tamminga (2012), as they are upwardly mobile. However, the HBCU students are in a unique cultural position as they made the decision to attend an educational institution with a specific cultural mission. If HBCU participants consistently showed less raising than their community cohorts, then we might hypothesize that the AAVS is socially-salient and subject to age-grading for upwardly-mobile individuals, whereas consistent participation in the AAVS for these individuals might indicate that the AAVS is socially-salient as a marker of ethnic identity, but not subject to social stigma. Mixed results among these individuals further highlight the idiosyncratic distribution of the AAVS among AAE speakers. These findings illustrate the need for continued investigation into the social correlates of the AAVS. Similar to AAE morphosyntactic features, participation in the AAVS by upwardly mobile or middle class individuals may illustrate that class stratification of AAE variables is mitigated by numerous factors such as personal presentation, audience design, and style shifting (Weldon 2004).

5 Conclusion

Considering the proximity and intertwined nature of the communities under analysis, significant differences for variables like BAT height is suggestive of the influence of spatial segregation on language patterns. Socio-geographic community structures create environments in which speakers of different varieties experience different levels of contact. Analysis of the correlation between these cultural structures and linguistic variation informs our understanding of one way in which intercommunity differences emerge for the AAVS and under what circumstances participation in PRV variation is more common. While early investigation of AAE focused on highly segregated populations in large urban areas, segregation is not uniform across neighborhoods, communities, cities, or geographic regions of the US. In addition to the examination of regional variation in AAE, it is essential to investigate a range of community structures in order to more fully understand the mechanisms and flexibility of ethnolinguistic boundaries.

While community differences are apparent, the presence of outliers within communities indicates that additional factors contribute to the distribution of the AAVS. Educational profile has been identified as a predictor of participation in stereotyped PRV variables (Prichard and Tamminga 2012), but the relationship between AAVS participation and educational profile is not straightforward. These findings show the need for further research into social correlates of the AAVS, as well as perceptions of AAVS variables.

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