Prosodic Variation and Rootedness in Appalachian English

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1 Introduction

Place and language are intricately intertwined. In fact, from the Israelites and Gileadites differing pronunciation of *shibboleth* in the biblical book of Judges, to Wenker (1877) and his study of German isoglosses, to the foundational linguistic atlas work of Guilléron and Edmont (1902-10) in France, we have known that people in different places use different linguistic forms. However, much of this work has assumed that the impact of place is static. That is, any and every person from a certain place will be affected by place in a comparable fashion and will sound similar as a baseline, and what affects production within a place are other social factors such as social class or education..

However, with the publication of Labov (1963), the seminal study of Martha's Vineyard, the influence of place became much more nuanced. In this paper, Labov demonstrated that a particular person's orientation to tourism and the island of Martha's Vineyard itself was the determining factor with respect to vowel centralization. Other studies have followed in this vein, and also expanded and elaborated upon it.

Researchers of place recognized that speakers know and understand that certain features index place. And speakers can, and often do, choose to use features associated with place. For example, Lane (1998), studied the emergence of regionally associated features in Thyborøn, Denmark. She found that speakers who used the most regionally-marked features had more interaction with people not from the local area. She suggests that pride in the local variety encouraged the use of regional indexical features, especially when talking to non-locals. Additionally, speakers know that using certain features associated with place can index the social meanings of that particular place. In a series of papers, Johnstone and colleagues found that certain variants indexed a Pittsburgher, and in particular, a particular type of local Pittsburgh persona. This connection to place and locally relevant social persona was stronger in those who did not use the relevant place-based linguistic features (Johnstone et al. 2002, 2006, Johnstone and Kiesling 2008).

Additionally and in stark contrast, some speakers may also avoid using some lingusitic features associated with a particular place. In Valladolid, Yucatán, Solomon (1999) demonstrated that a speaker's orientation toward the urban area correlated with the usage of variants of (y). Those speakers who oriented toward urban areas used the variant [ʒ], which is associated with urbanity. These speakers rejected other variants, particularly those linked to rurality.

1.1 Place in Appalachia

Certain regions are present in many circulating discourses. In fact, Johnstone (2004:69) writes 'regions have come to be seen as meaningful places, which individuals construct, as well as select, as reference points'. Much of my work has focused on a particular region, Appalachia, that exists in the minds of those from the region, and also those not from the region. There are, in reality, two Appalachias. There is the Appalachia as defined by the Appalachian Regional Commission (ARC), comprising 410 counties across 13 states, from Mississippi to New York. The second, and probably more accurate, is the Appalachia that exists in the minds of both natives and non-natives. Figure 1 shows the difference between the two Appalachias. The outer border is the ARC definition, while the inner circle is the area from Ulack and Raitz (1981), a study of the cognitive defintion of Appalachia from Appalachian natives and non-natives. The area indicated is the 'core', that is present in the majority of both insiders and outsiders. I focus on Appalachia because of this clear sense of place, this cognitive reality of the importance of place, and because it is meaningful to me as a native to the region. In a 1975 essay about the values of Appalachian people, Jones writes 'we

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Figure 1: Appalachia as defined by the ARC (outer border) and the 'core' as defined by Ulack and Raitz (1981). Figure is adapted from Ulack and Raitz (1981) and also used in Reed (2018a).

are oriented around places. We never forget our native places, and we go back as often as possible. Our place is always close on our minds. It is one of the unifying values of mountain people, the attachment to one's place'. In fact, many Appalachian people have a clear idea of a particular place, the 'homeplace' described in Cox (2006). This is the reference point for many Appalachians, and the homeplace is usually the local community or a particular place in the local community.

In my work on place in Appalachia, I have tried to quantify this sense of place-based attachment. I term this attachment *rootedness*. In my work, when comparing to speakers with weaker rootedness, speakers with a stronger rootedness use more monophthongal variants of /aɪ/ (Reed 2016, 2018a), have different rates of spectral change of monophthongal /aɪ/ (Reed 2017) use relatively more rising pitch accents and have a different phonetic realization of rising pitch accents (Reed 2016, 2018a), and also have more features of the Southern Vowel Shift (Reed 2018c). Additionally, as a speaker's rootedness changes over a lifetime, their productions of monophthongal /aɪ/ can shift dramatically (Reed 2018b). Thus, rootedness has a profound impact on the vocalic and intonational variation of Appalachian speakers. What about other language aspects?

1.2 Prosody and Variation

Historically, the prosody of languages was categorized in a binary fashion. Languages were either stress-timed or syllable-timed (Pike 1945, Abercrombie 1967). Syllable-timed languages, such as Spanish, were thought to have syllables of roughly equal duration, regardless of stress. In contrast, stress-timed languages, such as English or German, were thought to have large differences in syllable duration, with stressed syllables being much longer in duration than unstressed syllables. Stress-timed languages seemed to have prosodic feet of rather similar duration, rather than equally timed syllables. Thus, languages were categorized as either stress-timed or syllable-timed, with no category in between.

However, when investigators attempted to quantify the distinctions between syllable- and stress-timing, results in support were lacking. For example, Roach (1982) attempted to demonstrate the categorical difference between syllable- and stress-timing, but failed. The durations of the prosodic feet in stress-timed languages was not the same. However, the results seemed to indicate that prosodic timing lie more along a continuum. Grabe and Low (2002), using a Pairwise Variability Index (PVI), were able to place languages on a continuum of pairwise variability that reflected the older

binary categorization. The PVI is a measure of the variability of the durations of adjacent syllabes. Languages with greater differences in adjacent syllables (i.e., greater pairwise variability) were historically categorized as stress-timed. Those languages with lesser differences in adjacent syllables (i.e., lesser pairwise variability) were those that were historically considered syllable-timed. Crucially, languages tend to fall on a continuum of more stress-timed to less stress-timed (or more syllable-timed).

Using the PVI or derivations of it, several studies found distinctions in between different varieties, especially contact varieties. Low et al. (2000) and Deterding (2001) both found prosodic and rhythmic differences between Singaporean English and British English. They attribute this to the influence of the more syllable-timed substrate in Singapore. Carter (2005) found differences between the European American English, Spanish, and Hispanic English in North Carolina, where Spanish and European English fell at different ends of the continuum, with Hispanic English at an intermediate PVI. When investigating variation within varieties of English, related conclusions are also found. Spencelayh (2001) found that PVI varied across four varieties of British English (Newcastle, Buckie, York, and Derby). Thomas and Carter (2006) found that 19th century African American English was more syllable-timed than either 21st century European American English or African American English. Thus, the 19th century AAE was more similar prosodically to Jamaican English. Coggshall (2008) compared Cherokee, Lumbee English, and European American English in North Carolina. She found that Cherokee was the most syllable-timed, followed by Cherokee English, then by younger Lumbee English speakers, and older Lumbee English speakers had the most stress-timed speech. She notes that younger Lumbee speakers appear to be moving to a more syllable-timed speech, presumably due to cultural identity and affiliation. A similar finding occurred in on Abaco Island in the Bahamas, where Myrick (2012) found a change toward more syllable-timing. In London, Torgersen and Szakay (2012) found that speakers in the more ethnically heterogenous urban center of London were more syllable-timed than suburban speakers, who lived in more ethnically homogenous enclaves. Two more recent studies found differences within regional varieties in the United States. Chung et al. (2014) found that Wisconsin English was more syllable-timed than North Carolina English, while Clopper and Smiljanic (2015) found differences between Southern, Northern, and Western speakers in the Nationwide Speech Corpus. Southern speakers were the most stress-timed (and also seemed to have the slowest speech rate).

As one can see, there is a great body of evidence about prosodic rhythm. However, when one turns to Appalachian English, there is practically nothing. However, there is one tantalizing mention in Joseph Hall's classic study in the Great Smoky Mountains. There he writes, 'the great force with with stressed syllables are uttered results in an abnormal weakening of the unstressed syllables' (Hall 1942:44). This excerpt appears to be referencing some prosodic phenomena. It is this excerpt that serves as the impetus for the present study. Given that my work has found differences between Appalachian English varieties and other Southern English varieties, is there a prosodic difference? Clopper and Smiljanic (2015) found that Southern English was the most stress-timed. Is there a difference in timing between Appalachian English and Southern English? Further, my work has shown that within Appalachia, the influence of rootedness has profound impact on many phonetic features of speech. Is there a difference within Appalachian English prosodic rhythm with respect to the rootedness of speakers? The present paper seeks to answer these questions.

2 Methods

2.1 Participants

The participants for this study are 12 male and 12 female Appalachian residents, balanced for age and education. All participants were from Sneedville, TN; a small town located in Hancock County, a rural county in north East Tennessee. The participants ranged in age from 27-94, and represented a reasonable cross-section of the population of the county.

The data from the Hancock county cohort was compared to the Southern data from the Nationwide Speech Corpus (Clopper and Pisoni 2006). This corpus data was collected from undergraduate students at a midwestern university. The students come from a variety of areas around the South-

eastern United States. Crucially, none of the speakers used were from an Appalachian area.

2.2 Data Collection

For the Hancock County cohort, I conducted sociolinguistic interviews — semi-structured interviews designed to cover a variety of topics, while permitting researchers to potentially access a range of conversational styles, with each participant. Twenty of the participants were recorded in one-on-one interviews, while there were two sessions with pairs of interviewees.

Because I am a member of this community and maintain long-standing personal relationships with many of the participants, I tailored the first interview questions after those used in *Roswell Voices*, a project focused on life, culture, and personal histories of long-time residents and their descendants in Roswell, GA (Kretzschmar et al. 2004, 2006). The interviews were more akin to oral history projects than traditional sociolinguistic interviews, but retained elements of Labovian style interviews such as reading tasks and word lists. The present study focuses on the reading data, as it is more comparable to the Nationwide Speech Corpus data.

Each interview took place in a quiet room in the participant's home or workplace. Interviews lasted roughly 45-90 minutes each, depending on how long the participant wanted to talk. Each was recorded on a Tascam DR-40 digital recorder with either an Audio-Technica BP896 omnidirectional condenser lavalier microphone or a Shure MX183 omnidirectional condenser lavalier microphone.[1] The interviews were saved as .WAV files sampled at 44kHz for later acoustic analysis. The interviews were then orthographically transcribed and force-aligned (with hand correction) using the FAVE suite Rosenfelder et al. (2014).

For an overview of the methods for the Nationwide Speech Corpus, please refer to Clopper and Pisoni (2006).

2.3 Rootedness

To quantify the degree of local identity, i.e. rootedness, I used a two-part technique. Since I am an insider (and local community member), during the interview portion of the session(s) I asked questions whose goals were to determine how each participant felt about the local county, patterned after the methodology in Haddican et al. (2013) in Northern England. These questions targeted a speaker's personal identity toward the local area, what part (if any) of the local area he/she considered most dear, and what made that place (if any) more special than others. For these questions, a positive response was scored +1, a neutral (or ambiguous) response was scored 0, and an overtly negative response was -1. Thus, from the identity module of the interview, scores could range from +3 to -3. These scores were combined with the results of the Rootedness Metric (RM), described below.

I designed a Rootedness Metric survey (see Reed 2016 for a full description) to quantify the degree of local place-based attachment, reflecting the participants' affinity toward the local community and also of the the strength of local connections. The Rootedness metric allowed for a measurable view of how localized the attachment was (i.e. local community, county, East Tennessee, Appalachia as a whole) and, most importantly, differentiated speakers from one another, even in a small rural area like Hancock County.

The RM asks questions from seven broad categories: willingness to relocate, travel habits, where a participant claims to be from (both locally and when traveling), family history, areal identification (from their local community to broader regional categories), how much they participate in local events, and self-reported strength of local identity. The RM could total 35.

The results from the interview questions were combined with the results for the RM to provide an overall Rootedness score. This score could vary from -3 to 38.

[1] An equipment malfunction during one trip necessitated using a backup.

2.4 Acoustic Methods

As mentioned above, I focus on the reading passages in the present paper. From the transcribed and force-aligned passages, I computed the normalized Pairwise Variability Index (nPVI) for each passage. Following the methods employed by Thomas and Carter (2006), Chung et al. (2014), and also Clopper and Smiljanic (2015), the nPVI consists of a measure of the duration of adjacent vowel intervals, divided by their mean duration. To avoid the confound of phrase final duration, the final foot of an utterance was not included in the measures.

To calculate the nPVI, the durations of adjacent syllabes were measured, and then the difference of the adjacent syllabes was divided by the average of the two syllables, the formula is shown below.

$$nPVI = 100 \times \left[\sum_{k=1}^{m-1} \left| \frac{d_k - d_{k+1}}{(d_k + d_{k+1})/2} \right| / (m-1) \right] \tag{1}$$

In the formula, m is the number of segments and d is the duration of the kth segment.

2.5 Statistical Analyses

To compare the differences between the two broad dialect regions, I compared the nPVI values of the Hancock County speakers (i.e., Appalachian speakers) with those of the Southern speakers from the National Speech Corpus. I compared this using Welch's t-test. To compare differences within the Hancock County Appalachian cohort, I used simple correlation between the nPVI values and the rootedness scores.

3 Results

3.1 Comparision between Appalachian and Southern Cohorts

The nPVI for the Appalachian speakers was 63.65, while the nPVI for the Southern speakers was 60.85. This difference is displayed graphically in Figure 2. The results of the Welch's t-test were

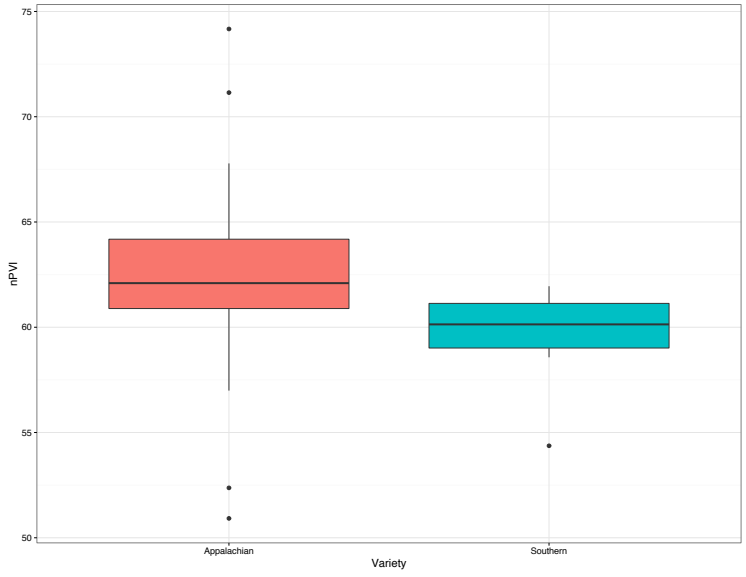

Figure 2: Boxplot showing the difference between the Appalachian speakers on the left and the Southern speakers on the right. The y axis shows the nPVI.

t = -2.1778, df = 31.776, p-value = 0.037. Thus, the two cohorts are significantly different from

one another. This result means that there is slightly greater variability between adjacent vocalic segments in the speech of the Hancock County speakers than that of the Southern speakers from the Nationwide Corpus. Phrased slightly differently, one could say that the speech of the Hancock county cohort is slightly more stress-timed than the Southern speech of the Nationwide Corpus.

3.2 Comparison within the Appalachian Cohort: Rootedness

There was a significant positive correlation between rootedness and nPVI within the Hancock County Appalachian cohort. The correlation was modest, $r = .40$. But, it was significantly different from zero, $p < .05$. Thus, those speakers with a higher rootedness score tended to have a higher nPVI, and thus more variability in adjacent vocalic segments. Put another way, more rooted Appalachian speakers have slightly more stress-timed production that less rooted Appalachian speakers, within this Hancock County cohort.

4 Discussion and Conclusions

From the results discussed above in Section 3, there are two related conclusions to be drawn. First, as noticed by Hall (1942), there does appear to be a prosodic difference between Appalachian speech (at least the Appalachian speech in Hancock County) and Southern speech, as discussed in Section 3.1. While these two varieties are often seen as the same, with Appalachian speech being subsumed as a sub-variety of Southern U.S. English, these results demonstrate that the two varieties do not fully share all features. There are prosodic differences between the two broad varieties. Such results fall within previous findings from my work, Reed (2016, 2018a). For both the monophthongization of /aɪ/ and rising pitch accents, there are clear differences between Appalachian varieties and other Southern U.S. varieties. The present results show further differences between the two varieties. Thus, while the varieties are related and somewhat similar, to say that one is a sub-variety of the other does a disservice to the variation present within both.

Additionally, and perhaps even more interestingly, there are differences within the Appalachian cohort, as discussed in Section 3.2. In Hancock County speech, speakers with a stronger connection to place, i.e., a higher rootedness score, appear to have slightly more stress-timed speech, as measured by nPVI, than speakers with a weaker connection to place. Thus, how a speaker relates to place has a profound impact on how he/she produces speech, even to the level of prosodic rhythm. During the sociolinguistic interviews, several speakers mentioned aspects of speech that signified a local, and the 'melody', 'rhythm', and other descriptors were used. Thus, while vague, these descriptions appear to touch on prosodic phenomena. Combined with the findings of Hall (1942), it appears that the prosody is something that locals produce, and potentially perceive. Such results also mirror previous findings, where more rooted speakers are distinct from less rooted speakers in Hancock County. More rooted speakers utilize different rates and phonetic realizations of the monophthongization of /aɪ/ (Reed 2016, 2017), the frequency and phonetic realization of rising pitch accents (Reed 2016, 2018a), and also aspects of the Southern Vowel Shift (Reed 2018c).

Rootedness, a speaker's connection to place, appears to influence and to impact various aspects of a speaker's linguistic production. All too often, region is considered to be a categorical factor in sociolinguistic investigations. All speakers from a particular locale are lumped together, e.g., Southerners, Californians, etc. However, such practices will miss the crucial and far-reaching impact of how a speaker relates to place. It is not merely where a speaker is from, rather how a speaker relates to place. We must make sure we include this in any investigation of variation.

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