A major obstacle to addressing the actuation problem (Weinreich, Labov & Herzog 1968) is the lack of data: observing the inception of a sound change is highly unlikely. However, the inception and early stages of dialect contact offer a potentially useful proxy. The reason is that prolonged, large-scale dialect contact (Trudgill 1998, Trudgill et al. 2000) involves the mixing of a wide range of linguistic forms. As a result, the members of the first generation born into the dialect contact setting confront the absence of a single, stable dialect. These speakers, and subsequent generations of speakers, reduce the existing heterogeneity both by not acquiring – or even consciously rejecting – some variants, and by reallocating some to specific phonetic or grammatical environments (Britain & Trudgill 2005, Kerswill & Williams 2000). With respect to the actuation problem, the focus of interest is interspeaker variation: what are the differences in the ways that individuals, as language learners, react to a massively diverse input, and how might these differences shape the trajectory of new dialect formation?

This paper investigates interspeaker variation in the dialect contact setting of Raleigh, North Carolina. 50 years of in-migration of white collar workers from outside the South has resulted in large-scale contact between the local Southern dialect and non-Southern dialects. The Southern Vowel Shift (Labov 1991; Labov, Ash, & Boberg 2006), once prominent in Raleigh, has been gradually disappearing. The Southern Vowel Shift involves the retraction of the front tense nuclei as in *beet* and *bait*, and the simultaneous fronting and raising of the front lax nuclei as in *bit*, *bet*, and *bat*. Previous analysis shows significant loss of Southern shifting over time for all five of these vowels (Dodsworth & Kohn 2012). The present data are conversational interviews with 96 White native Raleigh speakers born between 1920 and 1990, recorded between 2008 and 2011. Those born during the 1950s and early 1960s represent the first generation of speakers to grow up amid intense dialect contact. Acoustic analysis of vowel formants allows a picture of steady change over time beginning with speakers born around 1950 (Figure 1).

![Figure 1. Reversal of the Southern Vowel Shift across apparent time for 96 Raleigh natives.](image)

Each point in Figure 1 shows one speaker’s mean value. As predicted by traditional sociolinguistic theory (e.g., Labov 2001), the majority of speakers adhere to the linguistic norms...
of their age group, and outliers are few. Even the speakers born during the 1950s and 1960s – the first post-contact generation – show remarkable uniformity, despite being surrounded by a wide variety of variants as children and teenagers. Within this first post-contact generation, there are no significant sex or neighborhood effects in linear mixed effects models, and social class effects are very few and weak: occupation shows some unstable white vs. blue collar effects, but parents’ occupation shows no significant effects. Against this backdrop of uniformity during change over time, potential individual differences are addressed in three ways.

1) Speakers born in 1952-1955. Because change has been ongoing for several decades, individual differences in vowel quality are difficult to evaluate; any given speaker is expected to differ from those of different ages. By chance\(^1\), the corpus includes 28 speakers born between 1952 and 1955, and vowel measurements are completed for 17 of them. These speakers offer particularly useful data for assessing individual differences in a dialect contact setting because they started school just as the period of large-scale migration to Raleigh began. Therefore, they were the first native Raleighites to reliably go all the way through school with the children of non-Southerners. Most of these speakers attended the same city high school. Figure 2 shows vowel plots for each of the 17 speakers, where the five front vowels are represented as polygons with concentric levels indicating density. The highest density for each vowel – i.e., the area where the most points would occur on a scatterplot for the vowel – is the area inside the innermost polygon. Peripheral tokens would occur in the outermost level.

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\(^{1}\) The overrepresentation of speakers born in the early and mid-1950s is owed to the fact that many of them were recently retired, and therefore able to volunteer, when a local newspaper article described the Raleigh vowel study in 2010. The full Raleigh corpus has about 250 speakers.
In Figure 2, all of the speakers have higher and/or fronter /i/ (blue) than /ɪ/ (orange), with the possible exception of speaker 78. By contrast, speakers differ in their relationship between /e/ (red) and /ɛ/ (green). In some cases, /e/ and /ɛ/ overlap almost completely, while other speakers show clear Southern reversal of /e/ and /ɛ/, notably speakers 7, 16, 34, and 78. In still other cases, notably speakers 10, 19, and 82, /ɛ/ is the higher or fronter vowel, such that little or no Southern shifting is evident. Finally, the dispersion of /æ/ varies widely across speakers, with 19 and 10 showing the greatest and least dispersion, respectively. Speaker 10, in fact, stands out as particularly un-Southern. In general, Figure 2 shows clear variability across speakers with respect to the SVS, but as noted, there are few significant effects of class, and none for neighborhood or sex, that account for the variability. Rather, at the inception of sudden, large-scale mixing of vowel systems, individual speakers developed somewhat idiosyncratic vowel spaces.

2) Internal factors. In Raleigh, significant but extremely variable effects of surrounding segments on vowel quality are discernible among the oldest, pre-contact speakers. As the SVS reverses, individuals may show differences in their (non-)adoption of these internal factors, especially in light of research on individual differences in perceptual compensation for coarticulatory effects (Yu 2010). The effect of the following segment on the F2 of /æ/ provides a useful case in point. Among the oldest speakers, linear mixed models – which include vowel duration – reveal a significant hierarchy: tokens followed by voiced stops (e.g., bad) show higher F2 than tokens followed by fricatives (e.g., has, past), which show higher F2 than those followed by voiceless stops (e.g., bat). In each of the two younger generations, the hierarchy weakens but remains significant as a group-level effect even as /æ/ steadily retracts (Figure 3).

![Figure 3](image.png)

Figure 3. Effect of following sound on mean F2 for /æ/. Each speaker is represented by three points, showing mean F2 when the following sound is a voiced stop, fricative, and voiceless stop, respectively. The hierarchy is mostly consistent across speakers until about 1980.
To assess individual differences, each speaker’s mean F2 for /æ/ tokens followed by voiceless stops is subtracted from mean F2 for tokens followed by voiced stops. The result is above zero – consistent with the group-level effect – for 86 out of 96 speakers. Among the 10 “deviant” speakers, four are in the second post-contact generation (the youngest group) and are therefore not expected to have acquired the pattern as fully. The remaining six, however, stand out from their peers. They do not differ in degree of Southern shifting, just in their lack of the group-level pattern with respect to the following segment. As shown in Figure 3, /æ/ before voiced stops retracts over time to a much greater extent than /æ/ before voiceless stops, which started out in a more retracted position. Therefore, the relationship between [F2 before voiced stops] and [the difference in F2 before voiced vs. voiceless stops] is roughly linear (Figure 4). The six exceptional speakers have lower-than-expected values, for their age group, on the y-axis. By contrast, an analysis of the residual deviance for the linear model reveals one significant high outlier who has “over-acquired” the pattern: for a male speaker born in 1961 (the middle of the first post-contact generation), the difference between his voiced and voiceless stops is much higher than expected on the basis of his F2 before voiced stops. His mean F2 for /æ/ is high for his age but does not make him a significant outlier; rather, it is his pattern with respect to the following sound that makes him unusual.

![Figure 4](image)

**Figure 4.** The difference between mean F2 of /æ/ before voiced stops and mean F2 of /æ/ before voiceless stops is a linear function of mean F2. The red arrow points to the significant high outlier.

None of these exceptional speakers can be accounted for via social class, neighborhood, or any other known demographic information. Rather, it appears that a small number of individual speakers either under- or over-acquire internal factors conditioning linguistic variation in the community.

3) **Variance.** Because Raleigh speakers have been confronted with a wide variety of vocalic forms via dialect contact, individuals have, in theory, had the opportunity to acquire highly
variable vowel systems. Speakers who, consciously or unconsciously, tolerate a great deal of heterogeneity in their own speech could play an important role in advancing sound change. By the same token, these speakers may help establish a stable dialect in a contact setting, as opposed to linguistic variation factionalized by social groups. Individual differences were assessed by first calculating each speaker’s standard deviation for normalized F2 at the nucleus, for each of the five front vowels. Because the leveling of Southern features has been in progress since the mid-20th century, younger speakers tend to have lower standard deviation than older speakers, who have access to a wider range of forms. For that reason, any given speaker’s standard deviation must be evaluated relative to his/her year of birth. In the Raleigh corpus, standard deviation for each of the five front vowels consistently peaks at about 1940 and declines steadily through the 1980s. Therefore, exceptional speakers were identified by first omitting speakers before 1940 and then modeling standard deviation as a linear function of year of birth (Figure 5). The R-squared values for these linear models ranged from .11 to .29, with a mean of .16. “Exceptional speakers” were those that were labeled as possible outliers in the analysis of residuals vs. fitted values in R.

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Figure 5. Each speaker’s standard deviation for each of the five front vowels, for speakers born on or after 1940. The lines represent the linear models that were used to identify outliers.

Across the five vowels, there emerged a total of 15 instances of unusual standard deviation, of which 14 were instances of exceptionally high standard deviation. Strikingly, one speaker accounted for four of these 15, and another speaker accounted for three; neither speaker is unusual with respect to demographic features. The speaker who accounts for three of the instances of unusually high variance is also, not surprisingly, the male speaker born in 1961, described above, who “over-acquired” the internal constraint on /æ/ F2. The speaker who accounts for four of the 15 instances of unusual variance is a female born in 1949 to a family that had lived in a well-established area of Raleigh for several generations. It is potentially significant
that this speaker was born at a transition point in Raleigh’s linguistic history: 1950 is approximately the point at which the five front vowels began their steady shift away from Southern forms. However, the other speakers born at that time show consistently lower variability than the speaker in question, and the available ethnographic information on this speaker suggests no obvious motivation for her linguistic heterogeneity. These results suggest that a small number of individuals translated a diverse input into a highly diverse repertoire, whereas the majority of speakers showed a degree of leveling similar to others of about the same age.

Overall, the Raleigh data are characterized by striking inter- and intra-speaker uniformity with respect to change over time, internal factors, and variance, even during a period of dramatic contact-induced vowel change. However, as shown in Figure 2, the speakers born at the inception of dialect contact show some clear inter-speaker variability despite growing up under very similar conditions. Further, the distinctiveness of a small number of clearly unusual speakers, with respect to both internal factors and variance, evades standard sociolinguistic explanation. Identifying exceptional speakers, and the ways in which they are exceptional, in community-based corpora offers a promising initial strategy for understanding the role of individual differences in the inception and early propagation of sound change.

References