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**182nd Meeting of the Acoustical Society of America**

Denver, Colorado

23-27 May 2022

**Speech Communication: Paper 1pSC3**

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**Unity and diversity in Asian American language variation: Data from Chinese, Filipino, Korean, and Vietnamese Americans****Charles B. Chang and Danielle Dionne***Department of Linguistics, Boston University, Boston, MA, 02215; cc@bu.edu; ddionne@bu.edu*

The present study examined sociophonetic variation in a small sample of Asian Americans in Boston, Massachusetts representing four ethnic groups: Chinese, Filipino, Korean, and Vietnamese. Analyzing these speakers' English production in tasks eliciting both casual and careful speech, we focused on four linguistic features comprising features observed in Eastern New England and in certain Asian American groups. Three features (R-DELETION, L-VOCALIZATION, L/R-CONFLATION) were coded auditorily and one (LOW BACK RAISING of /a/ to /ɔ/) acoustically. Overall, results showed low use of Eastern New England features (R-DELETION, LOW BACK RAISING), high use of L-VOCALIZATION, and no use of L/R-CONFLATION, but also significant differences in specific patterns of use according to ethnicity and speech style. Ethnicity was a significant predictor of the occurrence of R-DELETION and L-VOCALIZATION, and also a significant predictor of first formant (F1) values in the low back vowels, although no clear vowel merger was found. Careful speech showed lower rates of R-DELETION and L-VOCALIZATION and less overlap of the low back vowels as compared to casual speech. These findings reveal similarities and differences in speech production among ethnically diverse Asian Americans and highlight the need for further investigation of phonetic variation within this community.

## 1. INTRODUCTION

A central goal of sociolinguistics is to determine whether members of a social group share norms—common beliefs surrounding linguistic behavior (Labov, 1972b)—in their treatment of linguistic features. These socially-based units of linguistic analysis, or “speech communities” (Patrick, 2002), can be defined in terms of various social dimensions. In regard to ethnoracially-defined communities, extensive research on Latinx American (Resnick, 1975; Wolfram, 1974; Wolfram et al., 2004) and African American (King, 2018; Labov, 1972b; Poplack & Tagliamonte, 2001) speech communities has provided great insight into the shared norms for linguistic features in these communities.

One population that has not been investigated systematically in this way is Asian Americans (i.e., US residents of Asian ancestry). This may be due to the fact that there is greater diversity in linguistic background among Americans who are ethnoracially perceived as Asian than within other ethnoracial groups in the US. Asian Americans may have experience with any of several unrelated, and typologically disparate, heritage languages, such as Korean, Mandarin, Tagalog, and Vietnamese. Thus, if there were an ethnolect (i.e., a language variety typically associated with a particular ethnic group; Eckert, 2008) that we could call “Asian American English”,<sup>1</sup> it would presumably be influenced by even larger amounts of social, cultural, ethnic, and linguistic diversity than other ethnolects. This is not to say that African American English or Latinx English stem from monolingual or monocultural origins. Rather, we mean to point out the particular difficulty of accounting for the heterogeneity in what is considered “Asian American”, even under the narrow meaning of the term as referring to US residents of East/Southeast Asian ancestry.

Perhaps for this reason, sociolinguistic research on Asian Americans has generally investigated specific linguistic and cultural backgrounds, including Chinese Americans (e.g., Hall-Lew & Starr, 2010; Wong, 2007; Wong & Hall-Lew, 2014), Japanese Americans (e.g., D’Onofrio & van Hofwegen, 2020), and Korean Americans (e.g., Cheng, 2020), as opposed to Asian Americans *en masse* (see Cheng et al., 2022 for a recent review, which shows an increasing amount of research in this area but only a few studies comparing multiple Asian heritage communities within the same region simultaneously). This research has suggested that, in addition to differences in heritage cultures and languages, Asian American communities show considerable linguistic variation. For example, Wong and Hall-Lew (2014) found that Chinese Americans in San Francisco and in New York City differed in their production of the BOT and BOUGHT vowels, with San Franciscans producing a merger that was not found in the New Yorkers’ production.

As with other ethnoracial groups, people with different Asian ancestries tend to get grouped together under a single, common macro-identity (Lo & Reyes, 2009). This tendency is reflected in the finding that native English listeners can identify voices of ethnically Asian talkers broadly as “Asian”, but not more narrowly as “Chinese” or “Korean”, for example (Newman & Wu, 2011). This tendency also motivates investigating the Asian American community as a whole. Overall, however, there is little research that investigates the perception of Asian American English, and even less that aims to understand its production. Although Newman and Wu (2011) suggest that listeners perceive features that they systematically attribute to Asian American talkers (see also Cheng & Cho, 2021), there is no consensus on what those features might be or whether they exist in the context of a broader Asian American English ethnolect.

In the context of regional dialect variation, an additional consideration for the investigation of Asian American English is the extent to which ethnolectal variation interacts with regional influences. In the case of Boston, MA, it was previously believed that minority groups did not play a role in perpetuating the predominantly white, Boston dialect (see Browne & Stanford, 2018); however, recent studies have suggested that this is not entirely the case (Browne & Stanford, 2018; Stanford, 2019), raising the possibility that Asian Americans in Boston might use features characteristic of the local Boston dialect. Although Asian Americans are estimated to comprise almost 10% of the population in Boston (United States Census Bureau, 2021),<sup>2</sup> to our knowledge there is no research that investigates whether, in terms of local dialect features, the linguistic behavior of Asian Americans in Boston resembles that of white Bostonians.

In the present study, we examined the English production of Asian Americans in Boston with the aim of providing insight into the linguistic behavior of an understudied ethnoracial minority group in Boston and into the status of Asian American English as an ethnolect. The study addressed three research questions. The first two questions were regional and ethnolectal questions. Do Asian Americans in Boston produce features associated with Eastern New England (ENE) English (Q1)? Moreover, do they produce features associated with perceptual accounts of Asian American speech, regardless of their specific linguistic and cultural backgrounds (Q2)? In addition, we considered the

<sup>1</sup>Because one goal of the present study is to determine, in the first place, whether or not speakers from different Asian heritage communities share linguistic norms at a macro-identity level, it is inherently problematic to refer to the target (hypothetical) ethnolect we are interested in as “Asian American English” before it has been carefully studied. We acknowledge this problem, and are using the phrase “Asian American English” in the interim for the sake of terminological simplicity.

<sup>2</sup>This statistic was taken from the 2021 Census of the City of Boston and is therefore not representative of the Greater Boston area, which includes other surrounding cities such as Cambridge and Brookline.

possibility that individuals might vary in their use of regional and/or ethnolectal features depending on speech style, in light of previous research showing that such features may be suppressed in careful speech (Labov, 1972a; Wolfram & Schilling, 2016). Thus, our third research question (Q3) pertained to within-speaker variation: do Asian Americans in Boston differ in their production of regional and/or ethnolectal features according to speech style?

## 2. BACKGROUND: TARGET FEATURES

As discussed in §1, the goals of the present study were twofold: (1) to investigate whether Asian Americans use features that align with traditional descriptions of ENE English, and (2) to take the first steps toward identifying features of a potential Asian American English ethnolect. To these ends, we focused on four phonetic features for this study: two features associated with ENE English (R-DELETION, LOW BACK RAISING) and two features associated with perceptual accounts of Asian American speech (L-VOCALIZATION, L/R-CONFLATION).

Arguably the most distinctive feature of the Boston dialect, R-DELETION (i.e., the deletion of /ɪ/ in syllable coda position) has been at the center of linguistic research on ENE English for decades. This feature is highly salient, to the extent that it is referenced in mainstream media when portraying people from Boston (e.g., “pahk the cah on Hahvahd Yahd”; Randall, 2015). Findings on R-DELETION indicate that white, working/middle-class Bostonians delete /ɪ/ at a relatively high rate (Irwin & Nagy, 2007), but the feature has been receding in younger generations (Nagy & Irwin, 2010; Stanford, 2019). Until recently, minority populations within New England, and more specifically within Greater Boston, had been largely excluded from studies on R-DELETION because they were thought not to share the regional norms of the majority population (i.e., white Bostonians/New Englanders) (Browne & Stanford, 2018; Nagy & Irwin, 2010; Stanford, 2019); however, a recent study examined African Americans and Caribbean Americans directly, finding that they did not pattern like white New Englanders in R-DELETION (Browne & Stanford, 2018). To our knowledge, there is no prior research examining R-DELETION among Asian Americans in Boston.

LOW BACK RAISING—the raising of low back /ɑ/ to something closer to open-mid /ɔ/—is another feature associated with ENE English. In ENE, relatively little change has occurred in this feature over time; moreover, patches of Western New England seem to be adopting the feature now, too (Nagy & Roberts, 2008). While LOW BACK RAISING is slightly less salient than R-DELETION, it is still above the threshold of social awareness. For example, a community news site for Greater Boston informs visitors that the “ah” sound in *tonic* is often produced like “tawnic” in Boston (Gaffin, nd). With a different regional focus, Wong and Hall-Lew (2014) examined variation in the low back vowels among Chinese Americans in New York City and San Francisco, finding that both groups produced a BOUGHT vowel that was lower than standard /ɔ/; however, San Franciscans did not show the BOT-BOUGHT distinction produced by New Yorkers. These results led Wong and Hall-Lew to conclude that how participants produce BOUGHT depends not on ethnicity alone, but rather on ethnicity as it is co-indexed with city of origin. This interplay of ethnic and regional identity motivates the investigation of Asian American speech in other dialect regions such as Boston.

A feature with a vibrant research history in Australia, New Zealand, and the UK (Borowsky & Horvath, 1997; Hardcastle & Barry, 1989; Johnson & Britain, 2007; Stuart-Smith et al., 2006) and a growing research history in the US (Ash, 1982; Durian, 2008; Fix, 2004, 2014; McElhinny, 1999), L-VOCALIZATION is the process by which the lateral /l/ in coda position is realized as a vowel, semi-vowel, or glide (Hardcastle & Barry, 1989). In many cases, L-VOCALIZATION results in full deletion of /l/. This feature has been observed in white Americans in Philadelphia (Ash, 1982) and African Americans in Columbus, OH (Durian, 2008), as well as in Chinese Americans in the San Francisco Bay Area (Hall-Lew & Starr, 2010). Perceptual accounts of Asian Americans’ English speech have also implicated L-VOCALIZATION as a feature associated with Asian American identity (Newman & Wu, 2011). At the same time, it is clear from the research discussed above that L-VOCALIZATION occurs in many different speech communities across the US, including multiple ethnic groups. Previous research on L-VOCALIZATION, however, has not attempted to compare *across* racial/ethnic groups, let alone across different Asian ethnicities. This leads us in the present study to compare four nationally-defined Asian ethnicities, which we describe further in §3.

Our fourth target feature was L/R-CONFLATION, the phenomenon of not producing a distinction between the lateral /l/ and the rhotic /ɹ/. Stereotypically associated with English speakers of Asian ancestry, this feature has been discussed in perception studies pertaining to Asian American speech (Bauman, 2013; Newman & Wu, 2011; Watanabe, 2017). The idea of L/R-CONFLATION among Asian Americans is based on the logic that substrate influence from an Asian heritage language that does not contrast laterals and rhotics (e.g., Japanese) could lead to failure to distinguish these sounds. However, from a societal perspective, L/R-CONFLATION has become a stereotype of Asian Americans of any ancestry (Fong, 2019), which may reflect a social bias—specifically, an (implicit) Asian-foreign association—that could contribute to the perception of foreignness or accented speech (Yi et al., 2014). Crucially, there is little evidence

**Table 1: Talker information including talker code, group (ethnicity), sex, age, age of arrival (AoA) in Boston, length of residence (LoR) in Boston, and rate of English use. Codes indicate group, sex, and relative English use (e.g., ‘CML’ = Chinese male low).**

Talker Code	Group	Sex	Age (yrs)	AoA in Boston (yrs)	LoR in Boston (yrs)	English Use Rate
CML	Chinese	male	21	1	20	60%
CMH	Chinese	male	22	0	22	97%
FFH	Filipino	female	24	0	24	100%
FML	Filipino	male	23	18	5	80%
KFH	Korean	female	20	18	2	95%
KML	Korean	male	26	22	4	45%
VFL	Vietnamese	female	21	18	3	5%
VFH	Vietnamese	female	28	6	22	70%

that Asian Americans actually produce L/R-CONFLATION (cf. Kirkham & Wormald, 2015, on Asian Brits), and to our knowledge there are no production studies of L/R-CONFLATION comparing Asian Americans across ethnicities.

### 3. METHODS

Part of a larger project examining Asian American language variation in Boston, the present study examined a talker sample of eight Asian Americans representing four ancestry-based groups: Chinese, Filipino, Korean, and Vietnamese (see Table 1). The primary basis for selecting the two talkers in each group (out of a larger set of participants) was their self-reported daily rate of English use; we examined this variable in particular because it provided insight into participants’ frequency of engagement in English (as well as, indirectly, the rate at which they may speak other languages). To represent the diversity of Asian American linguistic experience, each group included a “high-use” and a “low-use” talker.<sup>3</sup> In addition, to ensure that all talkers had had ample opportunity to be exposed to ENE English, the sample was limited to talkers who had resided in Boston for at least two years at the time of participation. Previous research has shown that adults who relocate to a new dialect area can produce features of the new dialect as early as one year after relocation (Bigam, 2010; Bowie, 2000; Conn & Horesh, 2002; Munro et al., 1999; Nycz, 2016), meaning that the talkers in the present study can reasonably be compared to ENE talkers in previous studies.

The data for the present study come from a study protocol comprising two parts: a sociolinguistic interview and a set of scripted speech production tasks. The entire protocol, which took 1–1.5 hours total, was administered by an Asian American researcher and audio-recorded at 44.1 kHz and 16 bps using a Zoom H4N recorder and an AKG C520 head-mounted condenser mic for the talker. Following the informed consent procedure, the protocol began with the interview, which was meant to elicit conversational speech (i.e., a casual speech style). The researcher engaged the talker in free conversation for 30–40 minutes before leading them through a detailed background questionnaire. After the questionnaire, the interview concluded with a picture narration task in which the talker was asked to describe two scenes. The second part of the protocol moved the talker to a sound booth, where they completed three tasks (picture naming, sentence reading, passage reading) that were meant to elicit a careful speech style. The materials for all these tasks are viewable on the Open Science Framework (OSF) at <https://osf.io/hpqrk4/>.

Analysis of the recordings for each talker was carried out in Praat (Boersma & Weenink, 2016) and consisted of three main steps: orthographic transcription, text-to-speech alignment (done manually in Praat TextGrids at the utterance level), and auditory/acoustic coding of the four target features along with associated predictor variables (described further below; also done in Praat TextGrids). For each feature, we attempted to collect 100 tokens (i.e., sites for potential occurrence) per talker and style; token collection began five minutes into the interview recording and at the start of the sound booth recording. Because the sound booth recording was short, sometimes it contained fewer than 100 tokens. The dataset thus comprised 1,579, 1,636, 1,241, and 1,575 tokens of, respectively, R-DELETION, LOW BACK RAISING, L-VOCALIZATION, and L/R-CONFLATION. The full dataset is viewable at <https://osf.io/zcjkrl/>.

Coding of R-DELETION was performed auditorily in terms of three categories: “present” (/ɹ/ was produced), “absent” (/ɹ/ was deleted), and in rare cases “ct” (can’t tell; unclear whether /ɹ/ was deleted). Tokens for R-DELETION comprised words containing /ɹ/ in coda position (e.g., *cart* /kɑrt/), excluding cases of adjacency to another rhotic. Linguistic predictors coded for each token were five variables that have been shown to be related to R-DELETION

<sup>3</sup>Note that talker FML represents the “low-use” talker in the Filipino group with 80% English use, which may be problematic considering the “high-use” talker in the Vietnamese group reported a lower rate of English use (70%).

(Irwin & Nagy, 2007; Nagy & Irwin, 2010; Stanford, 2019): following sound, presence of stress on the host syllable, number of syllables in the host word, occurrence in a bound morpheme, and grammatical category of the host word.

Coding of LOW BACK RAISING consisted of acoustic analysis of the first two vowel formants (F1, F2) in low back /a/ and open-mid back /ɔ/. Tokens for LOW BACK RAISING were thus split evenly between words containing /a/ (e.g., *entree* /ɑntreɪ/) and words containing /ɔ/ (e.g., *caught* /kɔt/). For each token, the host word and the target vowel were annotated. A Praat script adapted from DiCano (2013) was used to extract formant measurements at ten equidistant time points (as proposed in Cheng, 2020); by-token means for F1 and F2 were then calculated over these time points. Mean formant measurements were normalized using the Nearey method (Barreda & Nearey, 2018) within the `vowels` package (Kendall & Thomas, 2018) in R (R Development Core Team, 2021). Linguistic predictors coded for each token were two variables shown to affect vowel production (Stanford, 2019): preceding and following sound.

Coding of L-VOCALIZATION was performed auditorily in terms of the four-level schema outlined in Hall-Lew and Fix (2012): “definitely consonantal”, “some vocalization but more consonantal”, “more vocalized than consonantal”, and “definitely vocalized”. Tokens for L-VOCALIZATION comprised words containing /l/ in coda position (e.g., *sell* /sɛl/), excluding cases of adjacency to another lateral. Linguistic predictors coded for each token were two variables that have been shown to affect vocalization rates (Hall-Lew & Fix, 2012): preceding vowel and presence of stress on the host syllable. For the purposes of binary logistic regression modeling, the four levels of coding were later collapsed into a binary opposition: “no vocalization” versus “at least some vocalization”.

Finally, coding of L/R-CONFLATION was also performed auditorily, in terms of three categories: “conflated” (the target sound, either /l/ or /ɹ/, was produced as the other sound), “not conflated” (the target sound was clearly produced), and “ct” (can’t tell). Tokens for L/R-CONFLATION comprised words with /l/ or /ɹ/ in onset position (e.g., *lemon* /lɛmən/), excluding cases of adjacency to another liquid. Following from the findings of Paolillo (1995), which suggest that L/R-CONFLATION is more likely to occur after another consonant or between a vowel and a consonant in word-final position, linguistic predictors coded were preceding and following sound.

To check the reliability of the coding, 5% of all tokens were randomly sampled and recoded again, either by the second author or by another linguistically trained research assistant. Comparison between the first and second rounds of coding showed 90.6% agreement for tokens from interview recordings and 88.0% agreement for tokens from scripted speech recordings, suggesting that the original coding was indeed reliable.

## 4. RESULTS

The data were analyzed with mixed-effects regression in R using the `lmerTest` package (Kuznetsova et al., 2017). All models included the fixed effects Ethnicity (representing the four ancestry-based groups<sup>4</sup>), Style (careful, casual), and Speech Rate (of the host word, measured in syllables/sec; centered), as well as random intercepts by word. For each model, categorical fixed effects were sum-coded, causing the last level for each predictor to be dropped from model outputs. To obtain the estimate for the dropped level, the coefficients for all other levels of the predictor were subtracted from the grand mean (i.e., intercept). Models were built using forward selection, with linguistic predictors (see §3) being kept in the model only if they significantly improved model predictions as indicated by likelihood-ratio tests. Only simple effects were tested, as the size of the dataset did not support testing higher-order interactions.

Starting with the results for R-DELETION, we found that although talkers did delete /ɹ/, overall this was not a site of major sociolinguistic variation for these talkers (see Figure 1). Rates of R-DELETION varied across talkers but were generally low ( $M = 6.0\%$  overall;  $M = 8.5\%$  in casual speech,  $M = 3.3\%$  in careful speech), far lower than those reported in previous studies (cf.  $M = 54.7\%$  in Stanford, 2019;  $M = 37.8\%$  in Irwin & Nagy, 2007). Thus, our Asian American talkers did not appear to use R-DELETION similarly to white, working-class Bostonians (Stanford, 2019).

Following Stanford (2019), whose best-fit model of /ɹ/ production (rhoticity) included following sound, ethnicity, socioeconomic status (SES), and birth year as predictors, our model-building process for the R-DELETION data considered the fixed effect Following Sound (coded in terms of three levels: consonant, vowel, pause), along with the other linguistic predictors mentioned in §3. However, due to the nature of our dataset (in which each birth year corresponded to a single talker and SES was asymmetrically distributed across groups), we could not include SES or birth year. Our best-fit logistic mixed-effects model included the fixed effects Ethnicity, Style, Speech Rate, and Following Sound and is presented in Table 2. Results showed an Ethnicity effect in that Filipino talkers were significantly more likely ( $\beta = 0.482, p = 0.021$ ) but Korean talkers were significantly less likely ( $\beta = -1.404, p < 0.001$ ) to use

<sup>4</sup>The group predictor is labeled “Ethnicity” because the groups are defined in terms of ethnicity/ancestry and not nationality; that is, talkers may identify as American without being a US citizen. Indeed, the larger set of participants included individuals born in the US, those born in an Asian country but raised in the US, and those born in an Asian country and raised there until as late as college-age.

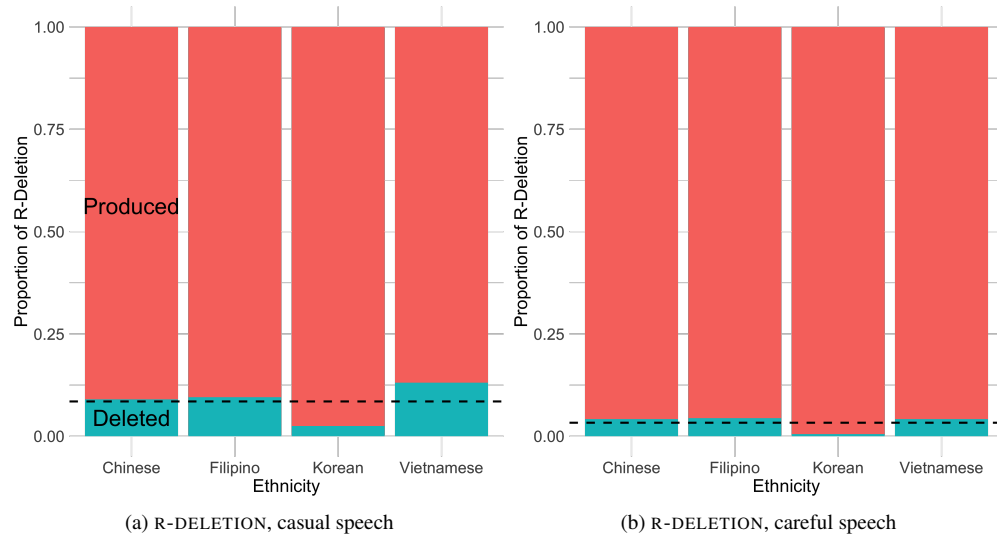


Figure 1: Rates of R-DELETION (blue) in (a) casual and (b) careful speech, by ethnicity. Dashed lines mark overall rates.

Table 2: Fixed effects in the best-fit model of R-DELETION (AIC = 627.7). Model formula:  $R\text{-Deletion} \sim \text{Following Sound} + \text{Speech Rate} + \text{Ethnicity} + \text{Style} + (1 | \text{Word})$ . Significance codes: \*  $p < 0.05$ , \*\*\*  $p < 0.001$ .

	Estimate	Std. Error	z value	Pr(>  z )	
(Intercept)	-4.452	0.426	-10.446	<0.001	***
Following Sound: consonant	1.275	0.378	3.376	<0.001	***
Following Sound: vowel	0.056	0.440	0.129	0.897	
Speech Rate	0.142	0.036	3.944	<0.001	***
Ethnicity: Chinese	0.197	0.213	0.924	0.356	
Ethnicity: Filipino	0.482	0.209	2.301	0.021	*
Ethnicity: Korean	-1.404	0.333	-4.217	<0.001	***
Style: careful	-0.292	0.147	-1.996	0.046	*

R-DELETION compared to the grand mean; the coefficient for the Chinese group was not significant. The estimate for the Vietnamese group is -3.727 (higher than the model intercept), suggesting that Vietnamese speakers were more likely to use R-DELETION. Results also showed a Style effect: R-DELETION was significantly less likely in careful speech ( $\beta = -0.292, p = 0.046$ ), as reflected in Figure 1. There was an effect of Speech Rate, whereby faster speech rates were associated with a higher likelihood of R-DELETION ( $\beta = 0.142, p < 0.001$ ). Finally, there was also an effect of Following Sound: R-DELETION was significantly more likely (compared to the grand mean) before a consonant ( $\beta = 1.275, p < 0.001$ ) but not before a vowel ( $\beta = 0.056, n.s.$ ). The estimate for /ɪ/ before a pause is -5.784 (lower than the model intercept), suggesting that R-DELETION was less likely in this environment.

Moving to the results for LOW BACK RAISING, we found that, overall, talkers produced low back vowels that were not raised/merged, as shown in Figure 2 (which presents the Nearey-normalized F1 and F2 measurements for all tokens from all talkers). Figure 2 shows a large overlap between /a/ and /ɔ/ in the vowel space in casual speech, but also a considerable number of tokens falling outside of the overlapping area. In careful speech, moreover, the spaces for the two vowels are distributed even more distinctly, consistent with a lack of merger.

Because LOW BACK RAISING concerns primarily vowel height, our model-building process for this feature built separate models for (Nearey-normalized) F1 and F2, and for the present purposes we focus on the results for F1, the acoustic correlate of vowel height. Our best-fit linear mixed-effects model for F1 (presented in Table 3) included the fixed effects Vowel (two levels: /a/, /ɔ/), Ethnicity, Style, Speech Rate, Previous Sound (six levels: obstruent, nasal, liquid, glide, vowel, pause), Following Sound (same levels as Previous Sound), and Sex (two levels: female, male). Results showed a clear Vowel effect: /a/ was produced with significantly higher F1 compared to the grand mean ( $\beta = 0.025, p < 0.001$ ). The estimate for /ɔ/ is 0.663 (lower than the intercept), suggesting that /ɔ/ was conversely

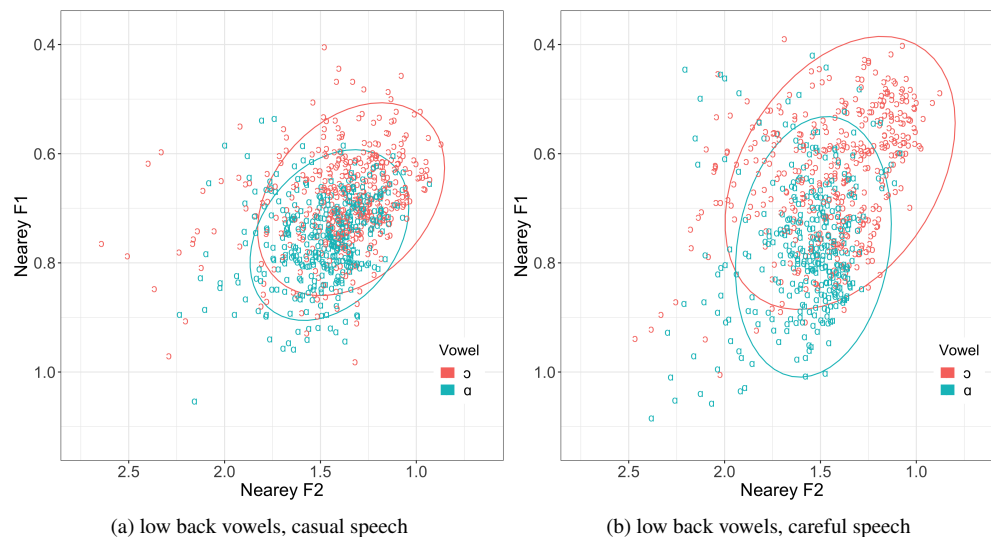


Figure 2:  $F1 \times F2$  plots of /a/ (blue) and /ɔ/ (red), in (a) casual and (b) careful speech. Ellipses account for 95% of tokens.

produced with lower F1 compared to the grand mean. Taken together, these results point to the two vowels not being merged, meaning that /a/ is not raising to /ɔ/. This finding falls in line with the results of Stanford (2019), whose best-fit model of F1, which included ethnicity as the only fixed predictor, reflected a merger of the low back vowels for white/Jewish Bostonians but not African American Bostonians. Overall, our results did not show a merger for Asian Americans in Boston, yet they also showed an Ethnicity effect: Chinese talkers produced significantly higher F1 values compared to the grand mean ( $\beta = 0.019, p < 0.001$ ), whereas the coefficients for Filipino and Korean talkers were not significant. The estimate for Vietnamese talkers is 0.663, suggesting that Vietnamese talkers produced lower F1 values. Results also showed a Style effect: F1 was significantly lower than the grand mean in careful speech ( $\beta = -0.015, p < 0.001$ ). The estimate for casual speech is 0.703, suggesting that F1 values tended to be higher in casual speech. There were also effects of Previous Sound and Following Sound: F1 was significantly lower compared to the grand mean when the preceding sound was an obstruent ( $\beta = -0.017, p = 0.009$ ) but significantly higher when the following sound was an obstruent ( $\beta = 0.044, p = 0.033$ ) or when either the preceding or following sound was a nasal ( $\beta_s > 0.020, ps < 0.05$ ). There was a Sex effect as well: females produced significantly higher F1 compared to the grand mean ( $\beta = 0.030, p < 0.001$ ). Finally, there was also a Speech Rate effect, whereby faster speech rates were associated with significantly lower F1 values ( $\beta = -0.004, p = 0.003$ ).

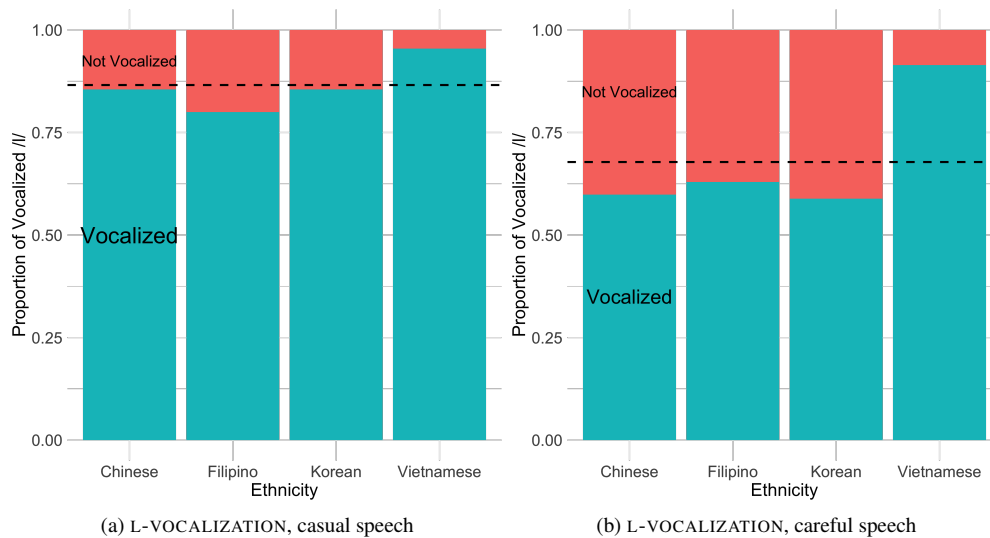
As for L-VOCALIZATION, talkers generally showed high rates of L-VOCALIZATION ( $M = 79.8\%$  overall;  $M = 86.6\%$  in casual speech,  $M = 67.8\%$  in careful speech), as shown in Figure 3. Nevertheless, there was clear variation in use of this feature, both among ethnicities and between styles. For example, Figure 3 shows higher rates of L-VOCALIZATION for the Vietnamese group compared to the other groups, both in casual and in careful speech.

Our best-fit logistic mixed-effects model of L-VOCALIZATION (presented in Table 4) included the fixed effects Ethnicity, Style, Speech Rate, Sex (as above), and Stress (on the host syllable containing /l/; stressed or unstressed). Results showed an Ethnicity effect in that Chinese, Filipino, and Korean talkers were less likely to use L-VOCALIZATION compared to the grand mean ( $\beta_s < -0.474, ps < 0.01$ ). The estimate for the Vietnamese group is 3.159, suggesting that Vietnamese speakers were more likely to use L-VOCALIZATION, as reflected in Figure 3. Results showed a Style effect, in that L-VOCALIZATION was significantly less likely in careful speech ( $\beta = -0.588, p < 0.001$ ). There was also an effect of Speech Rate, whereby faster speech rates were associated with a higher likelihood of L-VOCALIZATION ( $\beta = 0.095, p = 0.032$ ). On the other hand, the coefficient for Sex was not significant, and there was also no clear effect of Stress, in contrast to previous accounts of L-VOCALIZATION in other ethnolects (Ash, 1982).

Results for L/R-CONFLATION were consistent across ethnicities and styles in showing no use of this feature. That is, there were zero cases of L/R-CONFLATION, regardless of speech style. As such, we did not build a model of these data. In the next section (§5), we provide some thoughts on the total absence of L/R-CONFLATION from our talkers' speech. We also discuss a few other interesting patterns that pertain to the production of /l/ and /ɹ/ in onset position.

**Table 3: Fixed effects in the best-fit model of F1 (AIC = -3080.9). Model formula:  $F1 \sim \text{Vowel} + \text{Previous Sound} + \text{Following Sound} + \text{Sex} + \text{Speech Rate} + \text{Ethnicity} + \text{Style} + (1 | \text{Word})$ . Significance codes: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .**

	Estimate	Std. Error	t value	Pr(>  t )	
(Intercept)	0.688	0.021	33.379	<0.001	***
Vowel: /a/	0.025	0.005	5.387	<0.001	***
Previous Sound: obstruent	-0.017	0.007	-2.616	0.009	**
Previous Sound: nasal	0.021	0.010	2.124	0.034	*
Previous Sound: liquid	0.002	0.009	0.240	0.811	
Previous Sound: glide	-0.002	0.015	-0.158	0.874	
Previous Sound: vowel	0.0007	0.011	0.063	0.950	
Following Sound: obstruent	0.044	0.021	2.130	0.033	*
Following Sound: nasal	0.052	0.023	2.323	0.020	*
Following Sound: liquid	-0.011	0.021	-0.522	0.602	
Following Sound: glide	-0.052	0.045	-1.147	0.252	
Following Sound: vowel	-0.045	0.029	-1.538	0.125	
Sex: female	0.030	0.003	9.137	<0.001	***
Speech Rate	-0.004	0.001	-2.961	0.003	**
Ethnicity: Chinese	0.019	0.005	3.614	<0.001	***
Ethnicity: Filipino	0.004	0.004	1.047	0.295	
Ethnicity: Korean	0.0007	0.004	0.185	0.853	
Style: careful	-0.015	0.003	-4.415	<0.001	***



**Figure 3: Rates of L-VOCALIZATION (blue) in (a) casual and (b) careful speech, by ethnicity. Dashed lines mark overall rates.**

**Table 4: Fixed effects in the best-fit model of L-VOCALIZATION (AIC = 1,098.9). Model formula:  $L\text{-Vocalization} \sim \text{Sex} + \text{Stress} + \text{Speech Rate} + \text{Ethnicity} + \text{Style} + (1 | \text{Word})$ . Significance codes: †  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .**

	Estimate	Std. Error	z value	Pr(>  z )	
(Intercept)	1.431	0.131	10.933	<0.001	***
Sex: female	-0.192	0.105	-1.822	0.068	†
Stress: stressed	0.154	0.121	1.273	0.203	
Speech Rate	0.095	0.044	2.140	0.032	*
Ethnicity: Chinese	-0.663	0.181	-3.663	<0.001	***
Ethnicity: Filipino	-0.590	0.140	-4.224	<0.001	***
Ethnicity: Korean	-0.475	0.145	-3.272	0.001	**
Style: careful	-0.588	0.109	-5.404	<0.001	***



## 5. DISCUSSION

Overall, the findings of this study suggest that Asian Americans in Boston produce features associated with ENE English at low rates (see Q1); that they produce only some features associated with perceptual accounts of Asian American speech (see Q2); and that their use of regional features and potential ethnolectal features differs according to speech style (see Q3). Our results for regional (ENE) features (R-DELETION, LOW BACK RAISING) provide evidence of greater conservatism among Asian American talkers as compared to the white talkers examined in previous studies (Irwin & Nagy, 2007; Stanford, 2019); that is, Asian Americans in Boston are less likely to produce non-standard regional features than white Bostonians. Additionally, our results for potential ethnolectal features (L-VOCALIZATION, L/R-CONFLATION) contradict the perception that Asian Americans produce L/R-CONFLATION, as we found zero use of this feature in more than 1,500 tokens. Although these results are limited by the talker sample (which was small and included two Filipino talkers who both had relatively high rates of English use), we observed broad similarity among all eight talkers (i.e., all used some features at lower rates and other features at higher rates); therefore, this broad similarity is unlikely to be due to the high English use rates in the Filipino group specifically.

Taken together, our findings paint a picture of both unity and diversity in the linguistic behavior of Asian Americans in Boston. On the one hand, the results suggest that Asian Americans share (high-level) norms in what they are—and are *not*—producing. Further, there is coherence in these norms: the three features that our talkers did not produce at a high rate (R-DELETION, LOW BACK RAISING, L/R-CONFLATION) are all highly stigmatized, salient features (Fong, 2019; Gaffin, nd; Randall, 2015), whereas the feature that our talkers did produce at a high rate (L-VOCALIZATION) has been observed in several other speech communities, consistent with the view that this feature may not be as stigmatized or as salient. On the other hand, a statistical investigation into the data reveals significant variation among the groups for every feature that was attested (i.e., excluding L/R-CONFLATION). In what follows, we examine the unity and diversity among our talkers in more detail, considering each of the four target features in turn.

Starting with R-DELETION, our results suggest that Asian Americans in Boston do not use this feature in the same manner as the canonical (typically white) ENE talkers documented in previous research. In general, rates of R-DELETION among our talkers were much lower ( $M = 6.0\%$  overall) than those reported in previous research. However, there were still differences among groups in specific rates of R-DELETION: compared to the overall likelihood of R-DELETION, Korean talkers ( $M = 1.5\%$ ) were less likely to delete whereas Filipino ( $M = 6.9\%$ ) and Vietnamese talkers ( $M = 8.7\%$ ) were more likely to delete. This disparity suggests that while Asian Americans may share high-level norms for R-DELETION (i.e., don't use this feature very often), they do not share specific norms for this feature (e.g., precise target rates of use). Note that, while our talkers did not use R-DELETION at high rates, we observed some using other production strategies for cases of coda /ɪ/. To be specific, both Vietnamese talkers produced an epenthetic schwa after some cases of coda /ɪ/. Unlikely to be linked to ENE English, this strategy raises the possibility that Asian Americans may eschew a regional feature due to influence from a heritage language. In the above case, the epenthetic vowel could be coming from the influence of Vietnamese phonotactics (which disallow consonant clusters and allow only nasals or voiceless stops in coda position; Kirby, 2011) combined with metalinguistic awareness of English /ɪ/.

As for LOW BACK RAISING, our results again suggest that Asian Americans in Boston do not use this feature in the same way as previously-described ENE talkers. In particular, our talkers consistently did not raise /a/ to /ɔ/ to merge the two vowels, in contrast to the pattern reported for (white) ENE talkers. At the same time, however, there were significant differences among groups in F1 values, with Chinese talkers producing higher F1 than the other groups. Although these differences should be interpreted with caution as the groups themselves consist of only two talkers each (meaning that there is a reasonable chance the differences reflect individual differences more than group differences), they nevertheless fall in line with the duality of unity and diversity seen in the other features examined.

Our results for L-VOCALIZATION provide further evidence of the unity–diversity duality. Our talkers used L-VOCALIZATION at very high rates overall, but specific rates of L-VOCALIZATION were not uniform across groups (see Table 4). As with R-DELETION, these results suggest that Asian Americans share high-level norms, but not *specific* norms, for L-VOCALIZATION. The high rates of L-VOCALIZATION are interesting because while this feature has been noted in perceptual accounts of Asian American speech, it has not been exclusively associated with Asian American speech. On the contrary, L-VOCALIZATION has been studied extensively in the context of other ethnolects (e.g., African American English) and even in majority communities (Ash, 1982). For example, Fix (2014) found that white women with social ties to local African American communities would often use L-VOCALIZATION in an effort to index as an in-group member. Thus, this feature clearly exists in a variety of speech communities, seemingly without the social stigma associated with other features, which could help explain the high rates found in the present study. For these reasons, we speculate that talkers in the present study may have used L-VOCALIZATION at high rates in part

because it is a more generalized feature that is not uniquely intertwined with stereotypes of Asian American English.

The one feature that does not show the unity–diversity duality seen for other features is L/R-CONFLATION. This is because L/R-CONFLATION was simply not found at all, meaning that the results for this feature showed only unity (in talkers’ non-use of the feature). Crucially, the total absence of L/R-CONFLATION in our dataset points to two possibilities, which are not mutually exclusive: perceptual accounts of Asian American speech implicating L/R-CONFLATION as a constituent feature have been influenced by listeners’ implicit bias and/or the mainstream media’s portrayal of Asian Americans, or Asian Americans are hyper-aware of the stigma associated with L/R-CONFLATION and avoid this feature at all costs. However, note that, similar to the case of R-DELETION, some tokens for L/R-CONFLATION showed types of non-canonical production that were not classifiable as cases of L/R-CONFLATION. In particular, there were sporadic instances of vocalization and of devoicing (e.g., talker VFH gliding /ɪ/ into /w/ at the beginning of *require*, vocalizing /l/ in *like*, and devoicing /s/ in *sacrifice*), which suggest that some talkers might use alternative strategies for producing liquids that still allow them to avoid L/R-CONFLATION.

Finally, our results addressing Q3 evince significant effects of speech style that fall in line with the expectation that non-standard features will be used differently (in particular, less) in careful speech, which may be more subject to self-monitoring. For every feature that was attested, use of the feature—or the expected consequence of its use—was less evident in careful as compared to casual speech. This was true of R-DELETION, where rates of use were lower in careful ( $M = 3.3\%$ ) than in casual speech ( $M = 8.5\%$ ), and of L-VOCALIZATION, where again rates of use were lower in careful ( $M = 67.8\%$ ) than in casual speech ( $M = 86.6\%$ ). In the case of LOW BACK RAISING, F1 values were actually lower overall in careful than in casual speech (i.e., both /ɑ/ and /ɔ/ were more raised when spoken carefully; see Table 3); however, the degree of overlap between the vowels following from raising was lessened in careful as compared to casual speech (see Figure 2). Crucially, all of our models included speech rate as a control predictor, meaning that the observed style effects are distinct from the contribution of rate variation across styles.

## 6. CONCLUSION

The overall aim of the present study was to shed light on the speech of minority populations in Boston and the possibility of an Asian American English. Several previous studies have identified phonetic features associated with specific Asian American communities (e.g., Chinese Americans in San Francisco), but little research has compared Asian Americans at a broader level in an effort to identify shared ethnolectal features. While the scale of research required to characterize an Asian American ethnolect is larger than could be accomplished here, this study took a preliminary step by providing a detailed analysis of the linguistic choices made by individuals belonging to a common ethnoracial background and regional community in different speech styles. Asian Americans in Boston are similar in that they use certain features at lower rates and others at higher rates than other populations, but different Asian ethnic groups vary in terms of their specific use of these features. Thus, while the limited size of our talker sample prevents us from ruling out the possibility of an Asian American ethnolect entirely, the cross-ethnicity variation found in this study does not, in the end, support the view that Asian Americans *en masse* truly talk alike.

That said, this study is just a preliminary step in research on the Asian American community as a whole, and there remains a need for larger, more in-depth studies that compare Asian Americans’ production of English across different ethnicities, styles, and regions, including individuals of South Asian heritage and less urban areas (see also Cheng et al., 2022). Following from the current findings, there are several directions for further research. For one, given the high rates of L-VOCALIZATION observed in this study, it would be insightful to conduct a follow-up study that directly compares the use of L-VOCALIZATION by Asian Americans in Boston and other groups such as white Americans; such a study would help contextualize Asian Americans’ high rates of L-VOCALIZATION. In addition, although we did not observe any instances of L/R-CONFLATION according to how the feature was defined here (i.e., in terms of onset position), we did observe one instance of talker CFL producing a rhotic instead of a lateral in coda position (in the word *small*); thus, a study investigating liquids in multiple positions (as in Kirkham & Wormald, 2015) would shed additional light on the status of L/R-CONFLATION as a feature associated with Asian American speech. Finally, future work could explore many other regional features as potential sites of variation among Asian Americans in Boston. For example, given that African American Bostonians have been found to produce the MARY/MARRY/MERRY distinction, nasal split short-a, and the NORTH/FORCE distinction (Browne & Stanford, 2018), exploring these features in Asian American Bostonians could be fruitful. Our hope is that the present findings provide a foundation of initial data on Asian American sociophonetic variation across ethnicities that will encourage further exploration and understanding of linguistic unity and diversity in Asian America.

## AUTHOR CONTRIBUTIONS

Conceptualization: C.B.C., D.D. Data curation: C.B.C., D.D. Formal analysis: C.B.C., D.D. Funding acquisition: C.B.C. Investigation: C.B.C., D.D. Methodology: C.B.C., D.D. Project administration: D.D. Resources: C.B.C. Software: C.B.C., D.D. Supervision: C.B.C., D.D. Validation: C.B.C. Visualization: D.D. Writing – original draft: C.B.C., D.D. Writing – review & editing: C.B.C., D.D.

## ACKNOWLEDGMENTS

We are grateful to Abigail Ripin, Aspen Bombardo, Celia Anderson, Cristina Reguera Gómez, Elisabeth Kot-salidis, Emily Fisher, Dominique Lopiccolo, Hosang Wayne Yoon, Jo Huang, Juno Dong, Kevin Samejon, Megan Brown, Michael Fang, Qian Yu, Rachel Templeton, Samantha Rigor, Shan Wan, Sharmaine Sun, Tyler Olds, and Xi-aoyi Claire Tang for research assistance, and to Danny Erker, Kate Lindsey, and audiences at BU, NWA 49, and ASA 182 for helpful feedback. This work was funded in part by a Peter Paul Career Development Professorship to C.B.C.

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