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2021-10-22

## Vowel Pronunciation as an Ethnic Marker: Pacific Islander Teens in Utah

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### BYU ScholarsArchive Citation

Johnson, Lisa M., "Vowel Pronunciation as an Ethnic Marker: Pacific Islander Teens in Utah" (2021).  
*Faculty Publications*. 5684.

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## INTRODUCTION

### Research Questions

1. Do Utah teens participate in the linguistic practices previously described for Utah and for the West?
2. Do European Americans (EAs) and Native Hawaiian and other Pacific Islanders (NHPIs) pattern together, or is there a distinctive NHPI pattern in Utah?
3. How does the ethnic composition of the socio-cultural context affect ethnic-based vowel patterns?

### Low-Back-Merger Shift

- Documented among English speakers in the Western U.S. and Canada (e.g., Becker, 2019; see also Fridland, et al. 2016; Fridland, et al. 2017; Fridland, et al. 2020; Labov, et al., 2006)
- Key features include:
  - (Near-) merger of low back vowels (BOT and BOUGHT)
  - Lowering and retraction of short front vowels (BAT, BET, BIT)
- Some features found in historical study of English speakers Utah (EAs, mostly male, religious leaders; Bowie, 2017)

### Utah NHPI Community

- 1.4% of population (highest percentage in the contiguous United States)
- Mostly Tongan, Samoan, and Native Hawaiian, with other groups also represented
- Growing since the 1960s; well-established families and communities, plus new arrivals

## DATA AND METHODS

### Teen Language and Identity (TLI) Participants

- 37 NHPI, 40 EA, aged 14 to 18
- 28 female, 49 male
- 28 Valley View HS (suburban, mostly EA); 49 Lakeside HS (urban, ethnically diverse)

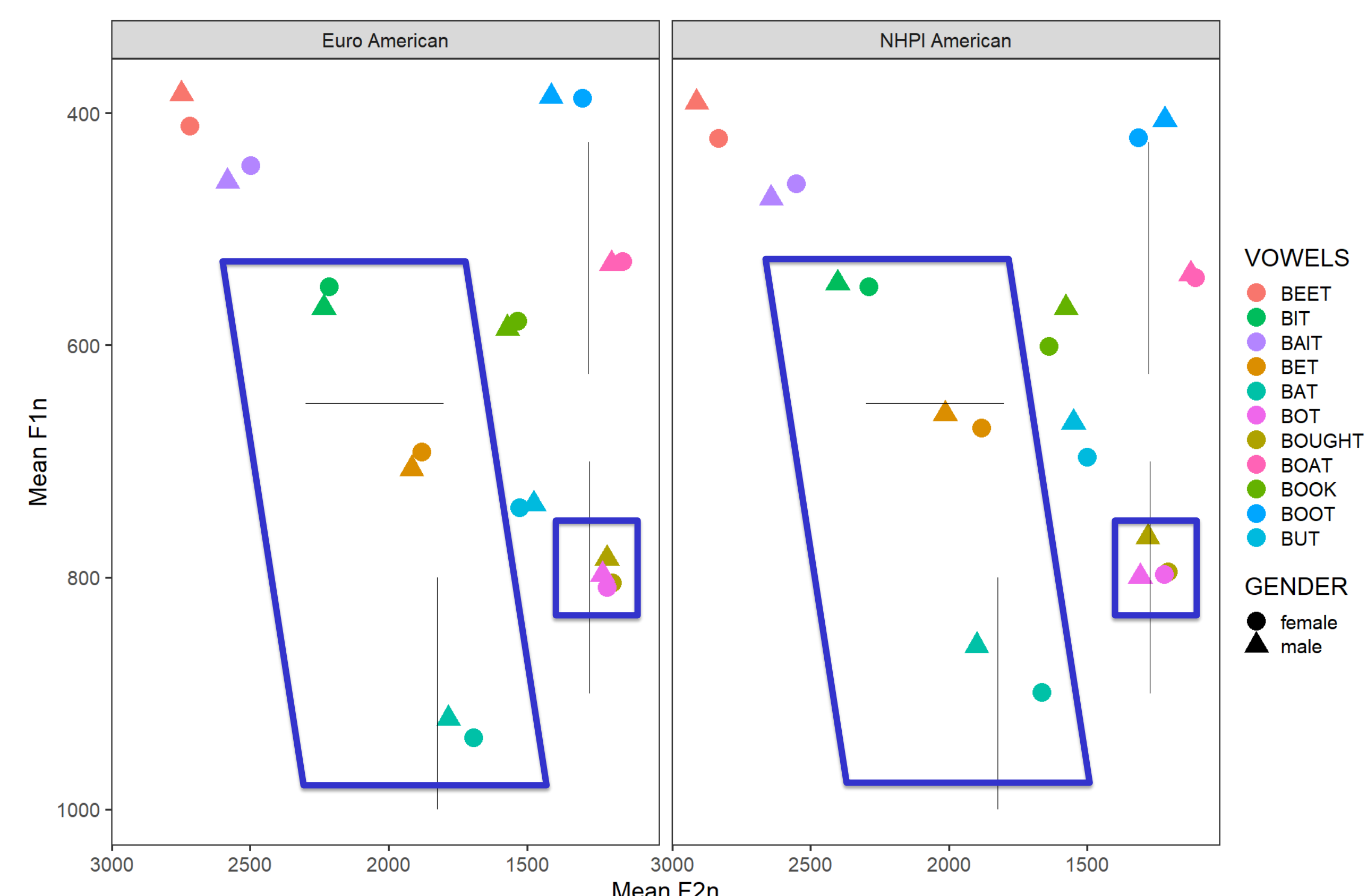
### Data

- Word list tokens of stressed vowels before obstruents
- Transcriptions force-aligned with Montreal Forced Aligner (McAuliffe, et al., 2017)
- Vowel formants auto-extracted at midpoints, corrected, then normalized using Labov method in the Vowels package (Kendall and Thomas, 2010)

### Analysis

- First and second formant estimates compared to ANAE benchmarks (Labov, et al., 2006) and Bowie's (2017) analysis
- Back vowel overlap measured using Bhattacharyya's Affinity (Johnson, 2015)
- Effects of social factors tested using mixed effects linear regressions with the lme4 package in R (Bates, et al., 2015) with random effects for word and speaker
- Best fit model determined using ANOVA to perform likelihood ratio tests (Winter, 2019)

## RESULTS



Group Means by Vowel Category and Speaker Ethnicity with ANAE Benchmarks for BET-lowering, BAT- and BOT-retraction, and BOAT-fronting (Labov, et al., 2006)

LBMS Feature	Bowie's (2017) Historical Findings	TLI Comparison to Bowie (2017)	TLI Differences Based on Social Factors
<b>BOT-BOUGHT Merge/Overlap</b>	Unclear—no statistically significant change over time	More overlap	No significant differences between groups
<b>BOT Retraction</b> (550 tokens)	Unclear—no statistically significant change over time	No direct comparison; retracted for most in the TLI set	Females (CI*[-108, -41]), EAs (CI [-85, -24]), and Lakeside (CI [-84, -16]) leading
<b>BAT Lowering</b> (424 tokens)	Present among earliest speakers, no change over apparent time	Higher rate	Females (CI [5, 66]), EAs (CI [15, 70]), and Lakeside (CI [2, 63]) leading
<b>BAT Retraction</b> (424 tokens)	Not present	Change: retracted in TLI	Females (CI [-262, -136]), EAs (CI [-139, -25]) leading, Lakeside (CI [-115, 12]) trending in that direction
<b>BET Lowering</b> (626 tokens)	Present among earliest speakers, no change over apparent time	Consistent for EAs, lower rate for PIs	EAs (CI [17, 52]) and Lakeside (CI [3, 42]) leading, females (CI [-6, 33]) trending in that direction
<b>BIT Lowering</b> (318 tokens)	Not present	Possible lowering	Females (very slightly) (CI [-1, 32]) and Lakeside (CI [19, 63]) more lowered; greater ethnic differentiation at Lakeside because of interaction (PIs at Lakeside -30)

\*95% CI

## CONCLUSIONS

### Answers to research questions

1. As a whole Utah teens in the TLI study show a high degree of **BOT-BOUGHT overlap, BOT retraction, BAT lowering, and BAT retraction** compared to historical data
2. For **BOT retraction, BAT retraction, BAT lowering, and BET lowering**, EA vowel realization is consistent with a more advanced stage of LBMS than is PI production. PI speakers have lower rates of **BET lowering** than even archival speakers.
3. LBMS features are typically more advanced at the school with more ethnic diversity. For BIT lowering, a significant interaction between school and ethnicity makes Lakeside (the more diverse school) the site of greatest distinction between ethnic groups.

Differences between ethnic groups are supported by ethnographic work and analysis of linguistic identity performance. Analysis of interview speech to follow.

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## ACKNOWLEDGMENTS

Special thanks to participants, faculty, and administrators at Valley View and Lakeside High Schools.

Thanks to Marianna Di Paolo, Adrian Bell, Brian Coddling, Elizabeth Cashdan, Katie Drager and to Marainda Henline.

This material is based upon work supported by the National Science Foundation under Grant Number BCS-1749582. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

