Nonbinary speaker participation in a sound change in progress

Sociolinguists have observed that linguistic changes pattern in correlation with speaker gender, but previous work has often assumed a binary gender framework (Labov, 1990). Sociolinguistic research has started considering how nonbinary individuals problematize binary models of gender (Becker et al., 2022), but quantitative research with nonbinary speakers has focused on stable variants (e.g., Rechsteiner & Sneller, 2023; Schmid & Bradley, 2019). Less attention has been paid to nonbinary speakers' participation in a sound change in progress.

Northern Cities Shift (NCS) reversal is an in-progress sound change that has been observed in areas including Michigan (e.g., Wagner et al., 2016). One feature of NCS reversal is the reorganization of TRAP into an allophonic system that is split between pre-oral TRAP and pre-nasal TRAP. In Michigan, the shift to a nasal system is incomplete (Nesbitt, 2023), with women leading the change among young speakers (Gehringer, 2022).

The present study investigates the position of nonbinary Michiganders in the shift toward a nasal TRAP system. Data comes from sociolinguistic interviews with eight nonbinary speakers (born 1993 to 1998) who varied by assigned gender at birth and personal pronouns. 24,290 total vowel measurements for the participants were obtained using Fast Track (Barreda, 2021) before outliers were removed (Stanley, 2022) and measurements were Lobanov normalized with tidynorm (Fruehwald, 2025). The resulting data contained 886 pre-oral TRAP tokens and 474 pre-nasal TRAP tokens, which are plotted as by-participant formant trajectories in Figure 1. Pillai scores were then calculated for each participant to assess the degree of non-overlap for the two phonetic environments (Stanley & Sneller, 2023).

All eight participants have Pillai scores above 0.8, as shown in Figure 2, indicating a large distinction between pre-oral and pre-nasal TRAP. Pillai scores from previous research (Nesbitt, 2023; Wagner et al., 2016) were all below 0.8, indicating that the nonbinary participants have more progressive nasal TRAP systems than binary-gender speakers from similar birth years. Figure 2 shows participant Pillai scores by pronoun sets and the four speakers who used *they*/*them* pronouns have, on average, more split nasal systems than the other four speakers. By contrast, assigned gender at birth does not show as clean of a distinction for the Pillai scores in this dataset. This points toward the possibility that nonbinary Michiganders who disalign more strongly with the gender binary through their pronoun usage are more likely to have advanced nasal TRAP systems. Even with the variation in Pillai scores and pronouns seen here, all speakers in this dataset have non-normative genders that are subject to marginalization by dominant social systems of power (Cordoba, 2023). In a position that is lacking power, these speakers can be interpreted as participating in language change to accumulate symbolic capital (Eckert, 1989) in a way that aligns with observations that groups with less societal power tend to be at the forefront of language change (Tagliamonte & D'Arcy, 2009). This research highlights that social marginalization may be a more compelling explanation for language variation and change than explanations based in a binary gender framework.
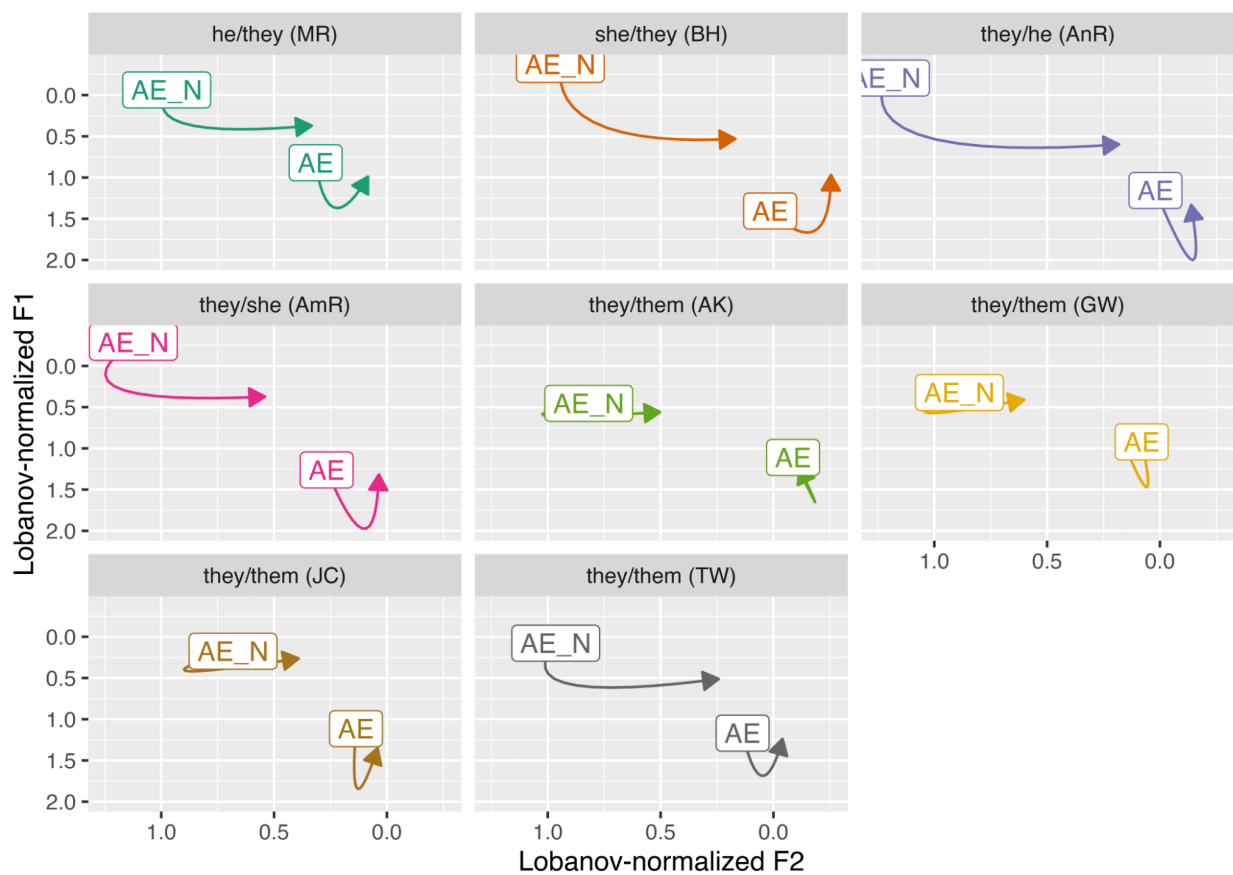
Figure 1: Mean Lobanov-normalized formant trajectories for pre-oral and pre-nasal TRAP for each participant (labelled with pronoun set followed by participant code).
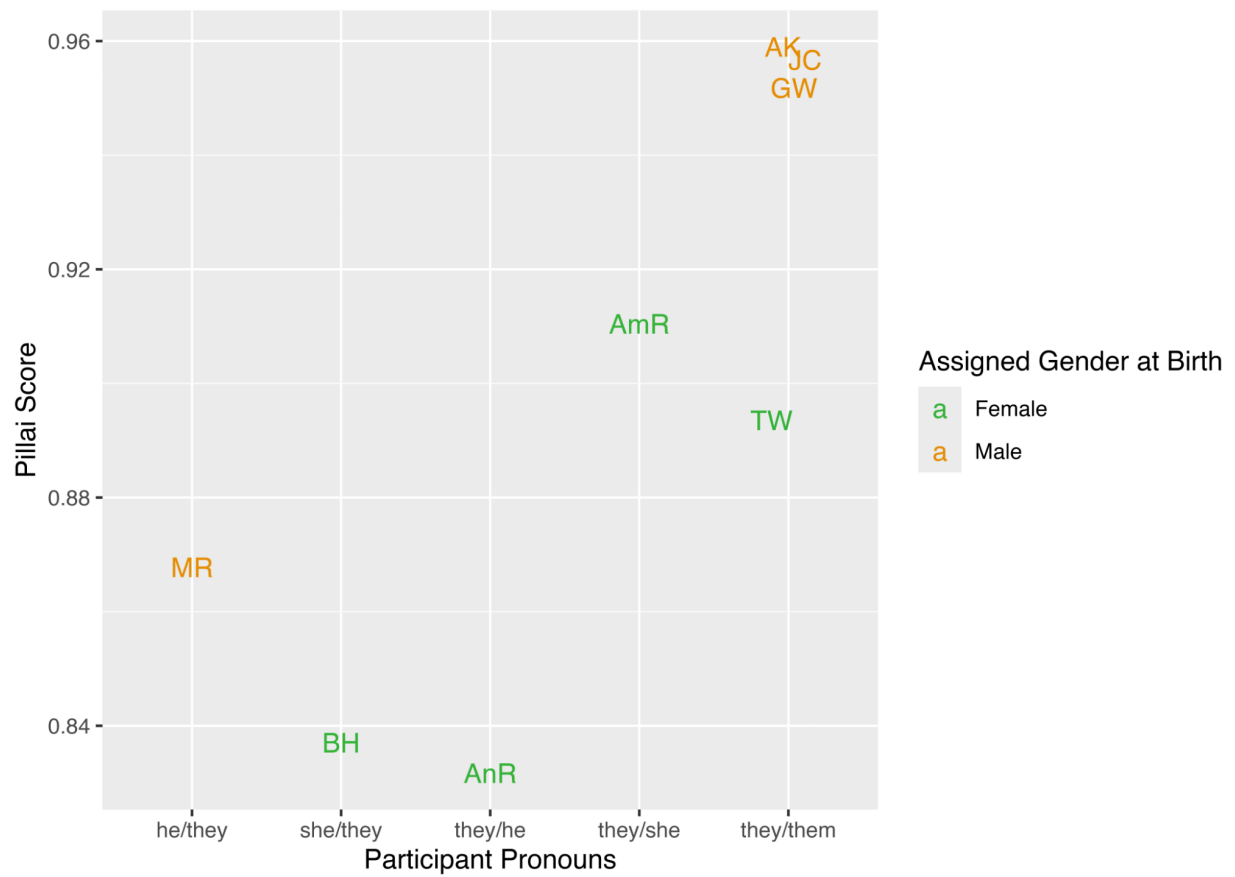
Figure 2: Participants' Pillai scores for TRAP allophones by pronouns with labels colored according to assigned gender at birth.

References

Barreda, S. (2021). Fast Track: Fast (nearly) automatic formant-tracking using Praat. *Linguistics Vanguard, 7*(1), 20200051. https://doi.org/10.1515/lingvan-2020-0051

Becker, K., Khan, S. U. D., & Zimman, L. (2022). Beyond binary gender: Creaky voice, gender, and the variationist enterprise. *Language Variation and Change, 34*(2), 215–238. https://doi.org/10.1017/S0954394522000138

Cordoba, S. (2023). *Non-binary gender identities: The language of becoming*. Routledge.

Eckert, P. (1989). The whole woman: Sex and gender differences in variation. *Language Variation and Change, 1*(3), 245–267. https://doi.org/10.1017/S095439450000017X

Fruehwald, J. (2025). *Tidynorm R Package* [Computer software]. https://github.com/JoFrhwld/tidynorm

Gehringer, P. (2022). Arguing against Northern Cities Shift reversal: Counter-shifting in Michigan. *Proceedings of the Linguistic Society of America, 7*(1), 5246. https://doi.org/10.3765/plsa.v7i1.5246

Labov, W. (1990). The intersection of sex and social class in the course of linguistic change. *Language Variation and Change, 2*(2), 205–254. https://doi.org/10.1017/S0954394500000338

Nesbitt, M. (2023). Phonological emergence and social reorganization: Developing a nasal /æ/ system in Lansing, Michigan. *Language Variation and Change, 35*(3), 273–297. https://doi.org/10.1017/S0954394523000182

Rechsteiner, J., & Sneller, B. (2023). The Effects of Topic and Part of Speech on Nonbinary Speakers' Use of (ING). *University of Pennsylvania Working Papers in Linguistics, 29*(1), 159–166.

Schmid, M., & Bradley, E. (2019). Vocal pitch and intonation characteristics of those who are gender non-binary. *Proceedings of the 19th International Congress of Phonetic Sciences*, 2685–2689. https://www.assta.org/proceedings/ICPhS2019/papers/ICPhS_2734.pdf

Stanley, J. A. (2022). Interpreting the order of operations in a sociophonetic analysis. *Linguistics Vanguard, 8*(1), 279–289. https://doi.org/10.1515/lingvan-2022-0065

Stanley, J. A., & Sneller, B. (2023). Sample size matters in calculating Pillai scores. *The Journal of the Acoustical Society of America, 153*(1), 54–67. https://doi.org/10.1121/10.0016757

Tagliamonte, S. A., & D'Arcy, A. (2009). Peaks Beyond Phonology: Adolescence, Incrementation, and Language Change. *Language, 85*(1), 58–108. https://doi.org/10.1353/lan.0.0084

Wagner, S. E., Mason, A., Nesbitt, M., Pevan, E., & Savage, M. (2016). Reversal and Re-Organization of the Northern Cities Shift in Michigan. *University of Pennsylvania Working Papers in Linguistics, 22*(2), 171–179.