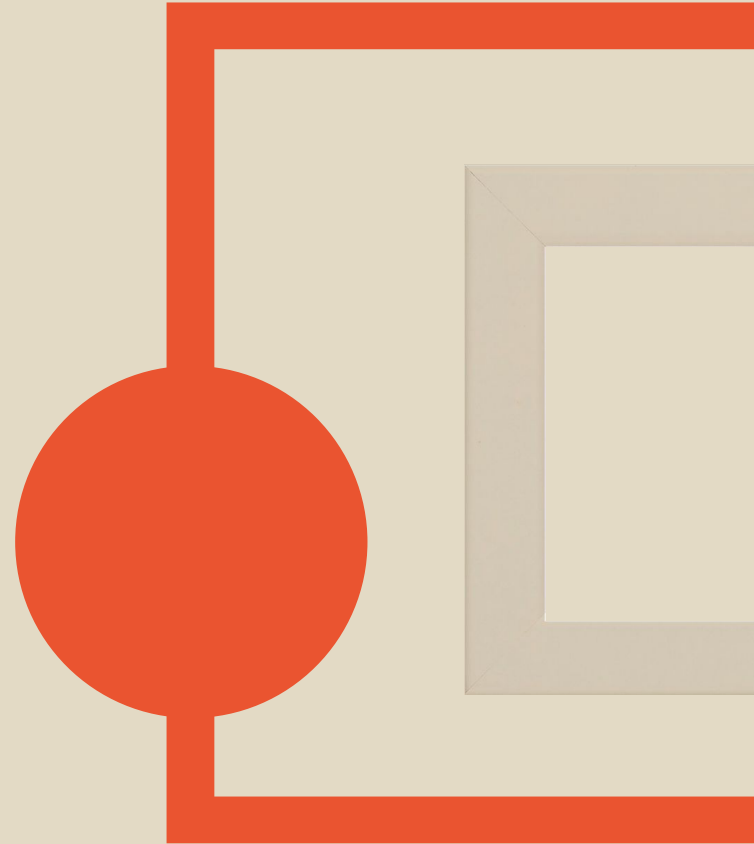


# The impact of social information on VOT shadowing by nonbinary speakers

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# Background

- Social information can impact the degree to which one speaker phonetically converges with another speaker (Babel 2012)
  - Speakers exhibit phonetic convergence:
    - in minimally social laboratory settings (Goldinger 1998, Shockley et al. 2004)
    - in cooperative and conversational situations (Pardo 2006, Pardo et al. 2018)
- Nonbinary speakers alter their speech in queer vs. non-queer settings, especially when there is a threat of being misgendered (Gratton 2016)






# The Current Study

## Shadowing task with nonbinary participants

- To what degree does social context affect the phonetic imitation exhibited by nonbinary speakers?
- Are “queer community settings” salient even when they are only signalled through language?
  - Do nonbinary speakers' show different patterns of convergence toward extended voice onset time (VOT) in word-initial English /p, t, k/ when they believe they are listening to another nonbinary speaker compared to when they believe they are listening to a cis speaker?
- Hypothesis: nonbinary speakers will converge most strongly towards a nonbinary model talker.

# Methods

Queer vs. non-queer contexts were constructed with 3 model speaker conditions:

- **Nonbinary Condition** (model speaker is explicitly said to be nonbinary) 
- **Neutral Condition** (model speaker does not provide gender identity) 
- **Cis Condition** (model speaker is explicitly said to be a man) 

45 participants were recruited = 15 participants for each condition

VOT was chosen because:

- VOT has been well documented as producing convergence (Shockley et al., 2004; Schertz et al. 2021)
- VOT is not known to be stereotyped to gender (Nielsen 2011)



# Stimuli

- 54 stimuli words:
  - All stimuli were:
    - bisyllabic
    - stress-initial
    - similar in frequency based on the SUBTLEXUS database (Brysbaert & New 2009)
  - 40 target words:
    - 16 word-initial /p/
    - 16 word-initial /k/
    - 8 word-initial /t/
  - 14 filler words



# Model Speaker

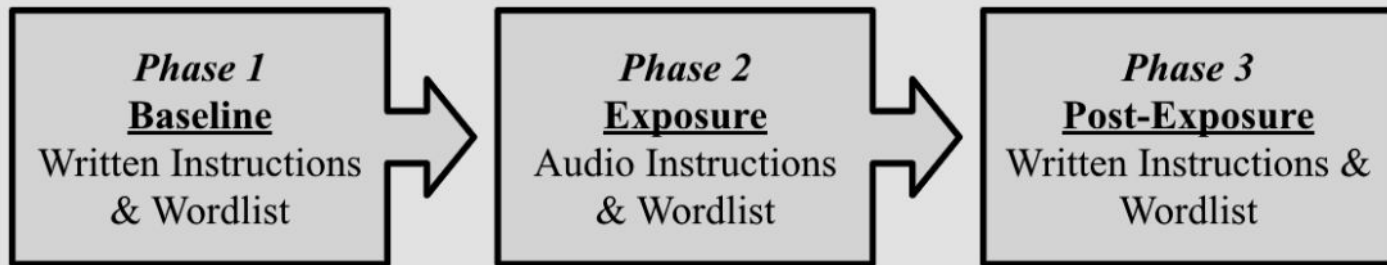
Model speaker was a white Standard American English speaker determined to sound appropriately ambiguous to listeners via a pre-experiment norming study.

- Provided recordings of stimuli words & audio instructions for the experiment
  - Recordings were modified to ensure that extended VOT is prevalent enough to be a target for convergence
    - On average, modified VOT was 102% longer than the original VOT

# Shadowing Task Procedure

Shadowing input-driven elicitation task.

- Words were presented to participants who recorded themselves speaking the word aloud with the carrier phrase, “The word is \_\_\_\_.”
- Experiment was composed of 3 phases:

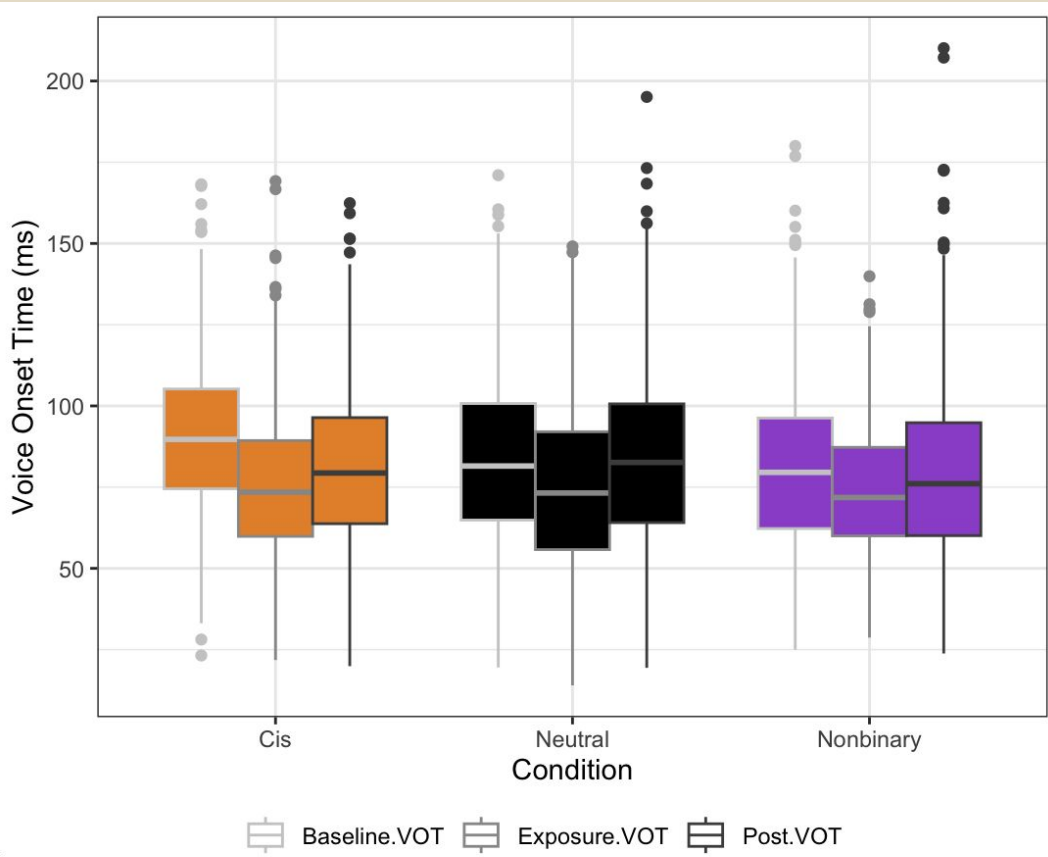


# Getting Into the Results

**Hypothesis:** Nonbinary speakers will converge more towards a nonbinary model talker than a cis model talker

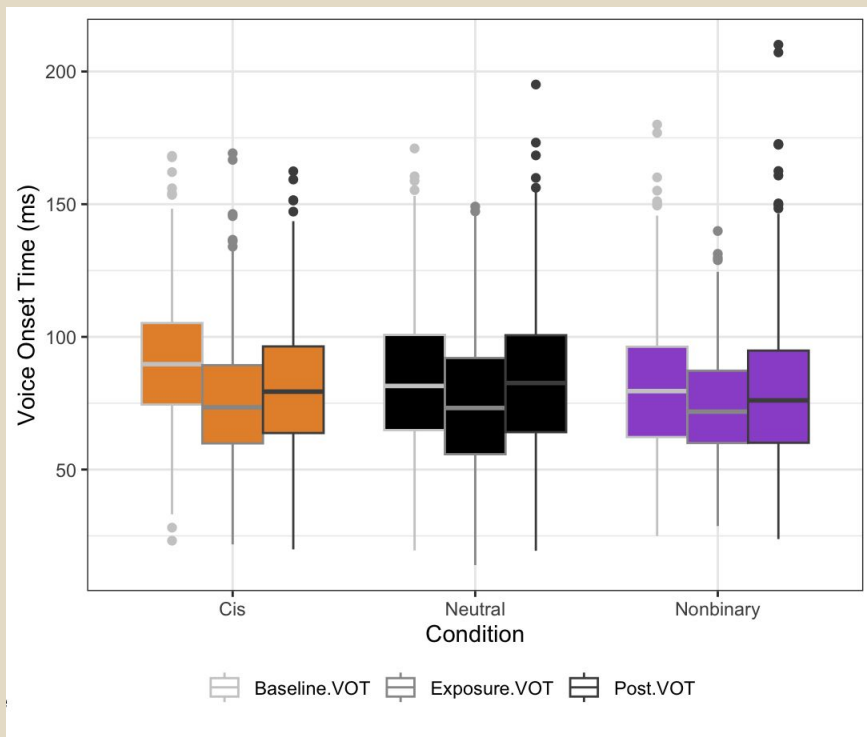
**Results:** Unexpectedly, participants **diverged in all conditions** instead of converging toward the model speaker. However...





In line with the hypothesis, nonbinary speakers **diverge least from a nonbinary model talker** and **diverge most from a cis model talker**.

# Additionally, only the Cis Condition showed significant divergence extending into the Post-Exposure phase.



Fixed effect	Estimate	P value
<b>Neutral Baseline VOT</b>	<b>84.37</b>	<b>&lt;0.001***</b>
<b>(Neutral) Exposure</b>	<b>-9.55</b>	<b>&lt;0.001***</b>
(Neutral) Post	-0.35	0.71
Cis (Baseline)	5.75	0.26
<b>Cis : Exposure</b>	<b>-5.68</b>	<b>&lt;0.001***</b>
<b>Cis : Post</b>	<b>-9.23</b>	<b>&lt;0.001***</b>
Nonbinary (Baseline)	-4.20	0.41
<b>Nonbinary : Exposure</b>	<b>3.03</b>	<b>0.025*</b>
Nonbinary : Post	-1.25	0.36

`lmer (VOT~Phase*Condition+(1|Speaker)+(1|Word))`

# Interpreting the Results

Babel (2012) found that male participants who rated a model talker as attractive were more likely to **diverge** from that talker's production. Babel argues that these participants "were, perhaps, **socially threatened** and distanced themselves in response to the threat".

I posit that even in this minimally interactive experiment, **nonbinary participants linguistically distanced themselves from a model talker due to an interpreted social threat, such as the *threat of being misgendered*.**

# Key Takeaways

These results suggest that **being in an explicitly queer context enables nonbinary speakers to pattern more like another nonbinary speaker** than like a cis-identified speaker

Different situational contexts impact phonetic imitation (Pardo 2006)

This aligns with previous work which argues that (in conversational speech in queer contexts) nonbinary speakers' pattern more like each other regardless of sex assigned at birth, **effectively creating distinct nonbinary speech communities** (Gratton 2016, Rechsteiner & Sneller 2023)

# Wrapping Up

Theorizing that “gender = binary” is **under-representative of real social identities** and the complex nature of language variation that comes along with the construction of identity (Eckert 2014; Conrod 2021; Becker et al. 2022)

Nonbinary participants can provide new insight into the ways **speakers participate in gender stances and form communities of practice.**

# Works Cited

- Babel, M. (2012). Evidence for phonetic and social selectivity in spontaneous phonetic imitation. *Journal of Phonetics*, 40(1), 177–189.
- Becker, K. (2009). /r/ and the construction of place identity on New York City's Lower East Side. *Journal of Sociolinguistics*, 13(5), 634–658.
- Becker, K., Khan, S., & Zimman, L. (2022). Beyond binary gender: Creaky voice, gender, and the variationist enterprise. *Language Variation and Change*, 34(2), 215-238.
- Brybaert, M. & New, B. (2009). Moving beyond Kucera and Francis: A critical evaluation of current word frequency norms and the introduction of a new and improved word frequency measure for American English. *Behavior Research Methods* 41(4). 977–990.
- Conrod, K. (2021). *How to ask gender in a linguistics study*. Medium.  
<https://kconrod.medium.com/how-to-ask-gender-in-a-linguistics-study-da060291d3c8>
- Eckert, P. (2014). The problem with binaries: Coding for gender and sexuality. *Language and Linguistics Compass*, 8(11), 529-535.
- Goldinger, S. D. (1998). Echoes of echoes? An episodic theory of lexical access. *Psychological Review*, 105, 251–279.
- Gratton, C. (2016). "Resisting the Gender Binary: The Use of (ING) in the Construction of Non-binary Transgender Identities," *University of Pennsylvania Working Papers in Linguistics*, 22(2).
- Nielsen, K. (2011). Specificity and abstractness of VOT Imitation. *Journal of Phonetics*, 39(2), 132–142.
- Pardo, J. S. (2006). On phonetic convergence during conversational interaction. *Journal of the Acoustical Society of America*, 119, 2382–2393.
- Pardo, J. S., Urmanche, A., Wilman, S., Wiener, J., Mason, N., Francis, K., & Ward, M. (2018). A comparison of phonetic convergence in conversational interaction and speech shadowing. *Journal of Phonetics*, 69, 1–11.
- Rechsteiner, J. & Sneller, B. (2023). "The Effects of Topic and Part of Speech on Nonbinary Speakers' Use of (ING)," *U. Penn Working Papers in Linguistics*, 29(1).
- Schertz, J., Johnson, E. K., & Paquette-Smith, M. (2021). The independent contribution of voice onset time to perceptual metrics of convergence. *JASA Express Letters*, 1(4), 045205.
- Shockley, K., Sabadini, L., & Fowler, C. A. (2004). Imitation in shadowing words. *Perception & Psychophysics*, 66(3), 422–429.



# Thank you

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