

/s/ and /ʃ/ Variation Across Gender-Diverse Speakers: Implications for Forensic Casework Involving Minority Speaker Populations

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Phonetic and sociolinguistic research has extensively explored how sex-based factors shape speech production, yet most existing studies and corpora remain centred on cisgender speakers, leaving gender-diverse voices underrepresented (Zimman, 2018, 2021; Merritt, 2023). This gap poses challenges for forensic speaker comparison or identification where transgender or non-binary individuals could become involved, and it affects broader work on voice perception where assumptions about binary gender categories are often taken for granted.

Sibilant consonants such as /s/ and /ʃ/ have long been recognised as salient markers in the negotiation of gender and sexuality. Research has shown that variation in these sounds can index social identity across dimensions including gender, class, region, and ethnicity. However, the origins of these associations remain debated. Phonetically oriented studies often attribute gendered differences in /s/ production to sex-based anatomical variation (Fuchs & Toda, 2010), while sociolinguistic research emphasises learned articulatory habits and the role of social practice (Avery & Liss, 1996; Zimman, 2017). These competing perspectives highlight the complex interplay between biological and social factors in speech production.

Building on prior perceptual findings that listeners can somewhat successfully attribute speakers' gender identities from speech cues, the present study investigates whether acoustic variation in /s/ and /ʃ/ aligns more closely with gender identity or biological sex, contributing to broader discussions of how phonetic detail encodes social meaning.

Twenty-four speakers participated in this study, representing six gender identity groups, outlined in Table 1. Each speaker was recorded reading the Rainbow Passage twice (Fairbanks, 1960). The recordings were processed using Montreal Forced Alignment and manually checked to ensure accurate boundary alignment and reliable IPA transcription. Acoustic measurements of Centre of Gravity (CoG), intensity, skewness, and kurtosis will be extracted using the Vargo (2025) Praat Mass Analyzer script. These variables will be analysed to determine whether variation in /s/ and /ʃ/ productions aligns more closely with previous phonetic or sociolinguistic findings.

<i>Gender Identity</i>	<i>Number of speakers</i>	<i>Sex assigned at birth</i>
Cisgender Male	4	Male
Cisgender Female	4	Female
Non-binary	8 (4+4)	Male and Female
Transgender Male	4	Female
Transgender Female	4	Male
Sum:	24	

Table 1. An outline of the sex assigned at birth and gender identity of the 24 speakers recorded reading the Rainbow Passage for the present study.

As this experiment is ongoing, the acoustic analysis and statistical modelling are still being completed. Findings and emerging patterns and their implications for forensic casework involving speakers from minority populations will be presented at the conference.

References

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