

Speech Motor Skill in Indigenous Language Acquisition

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1. Background

- This study investigates whether speech motor skill plays a role in second language (L2) pronunciation in adult learners of Hul'q'umi'num'.
- Hul'q'umi'num' is a Central Salish Canadian Indigenous language spoken in British Columbia in the Pacific Northwest. The language is spoken by less than 40 native speakers, most of which are over 75 years old, so revitalization efforts are urgent [1].
- The research presented here was part of a larger project focused on supporting the revitalization efforts of the Hul'q'umi'num' community, with a focus on the pronunciation.
- L1 English speakers learning Hul'q'umi'num' participated. We tested their speech motor skill levels and their Hul'q'umi'num' pronunciation in order to determine whether individual skill differences can predict variation in pronunciation.

2. Methods

- Eighteen participants completed an articulatory precision task to measure their speech motor skill in English (based on [2]).
- Participants would repeat "I say ___ to my friends" with 40 different target words; first at a normal pace, and then as quickly as possible
- Stimuli consisted of three contexts (Table 1).
- Participants also completed a pronunciation task of Hul'q'umi'num' words that included difficult contrasts (see Table 2).
- We analyzed the sound files in Praat [3], a software built for acoustic analysis.
- We measured the size of the contrast made in the articulatory precision task (Figures 1 & 2); we used the results as a measure of articulatory precision (Figure 3).
- Correlation analyses were used to determine the effect of speech motor skill on the pronunciation accuracy of Hul'q'umi'num' (Figure 4).

3. Methods (cont'd)

Context	Target	Example
coda voicing	/t-d/ contrast	Coat-Code
Alveolar-post alveolar fricatives	/s-sh/ contrast	Seat-Sheet
lenition of intervocalic voiced stops	/b, g/ lenition	Robot, Lego

Table 1. Contexts from the articulatory precision task.

Orthographic Contrast	Option 1	Option 2	Option 3	Option 4
kw'/qw'/kq/q w	mukw'ut	muqw'ut	mukwut	muqwut
lh/th	lhqet	thqet		
s/lh	shes	shelh		
ts/tth/s	tsun	tthun'	kwusun	
s/th	pasut	paathut		
th/s	'athut	'asum		
lh/th	syalh	yath		

Table 2. Stimuli from the Hul'q'umi'num' pronunciation task.

4. Results

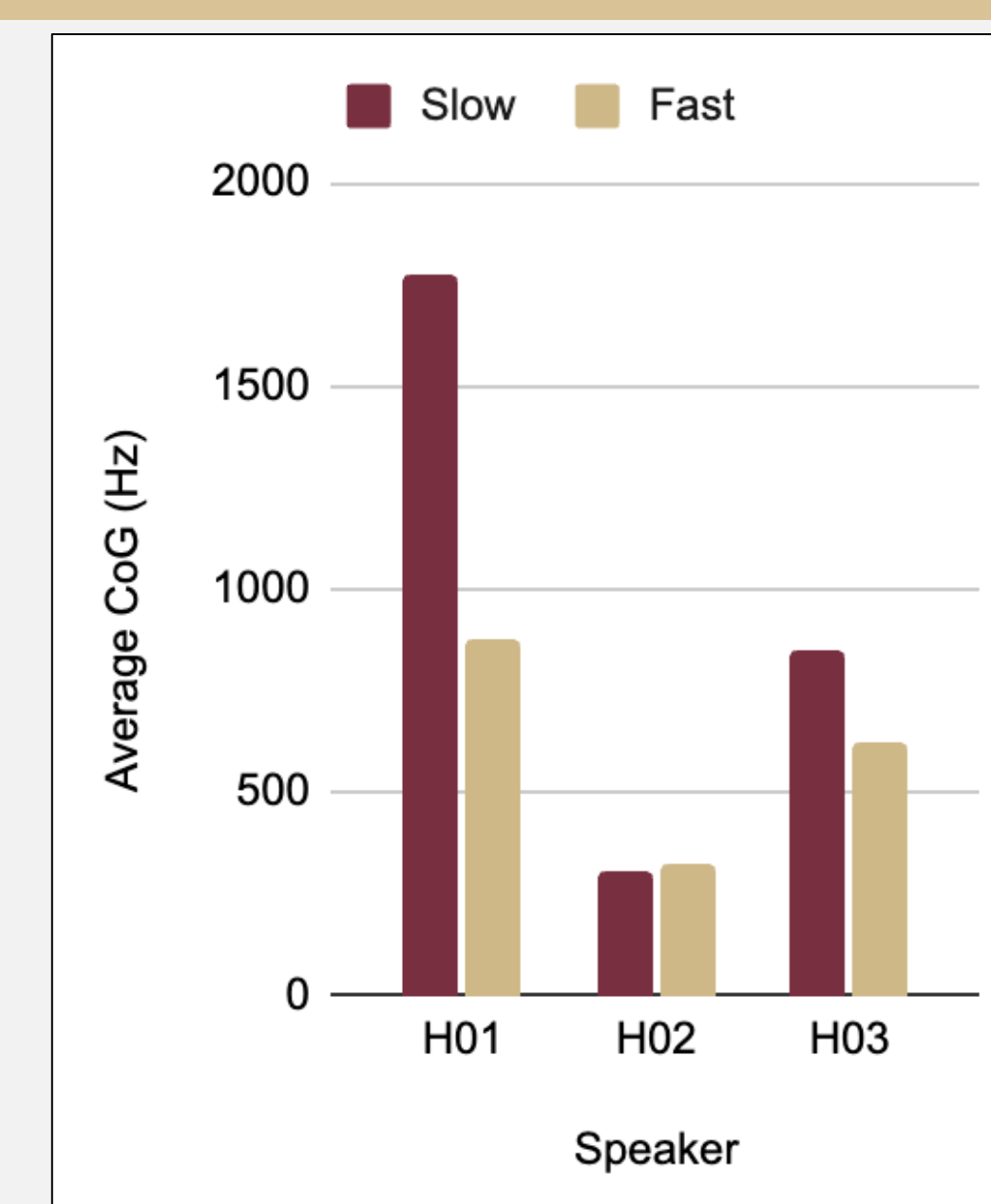


Figure 1. /S-sh/ contrast results.

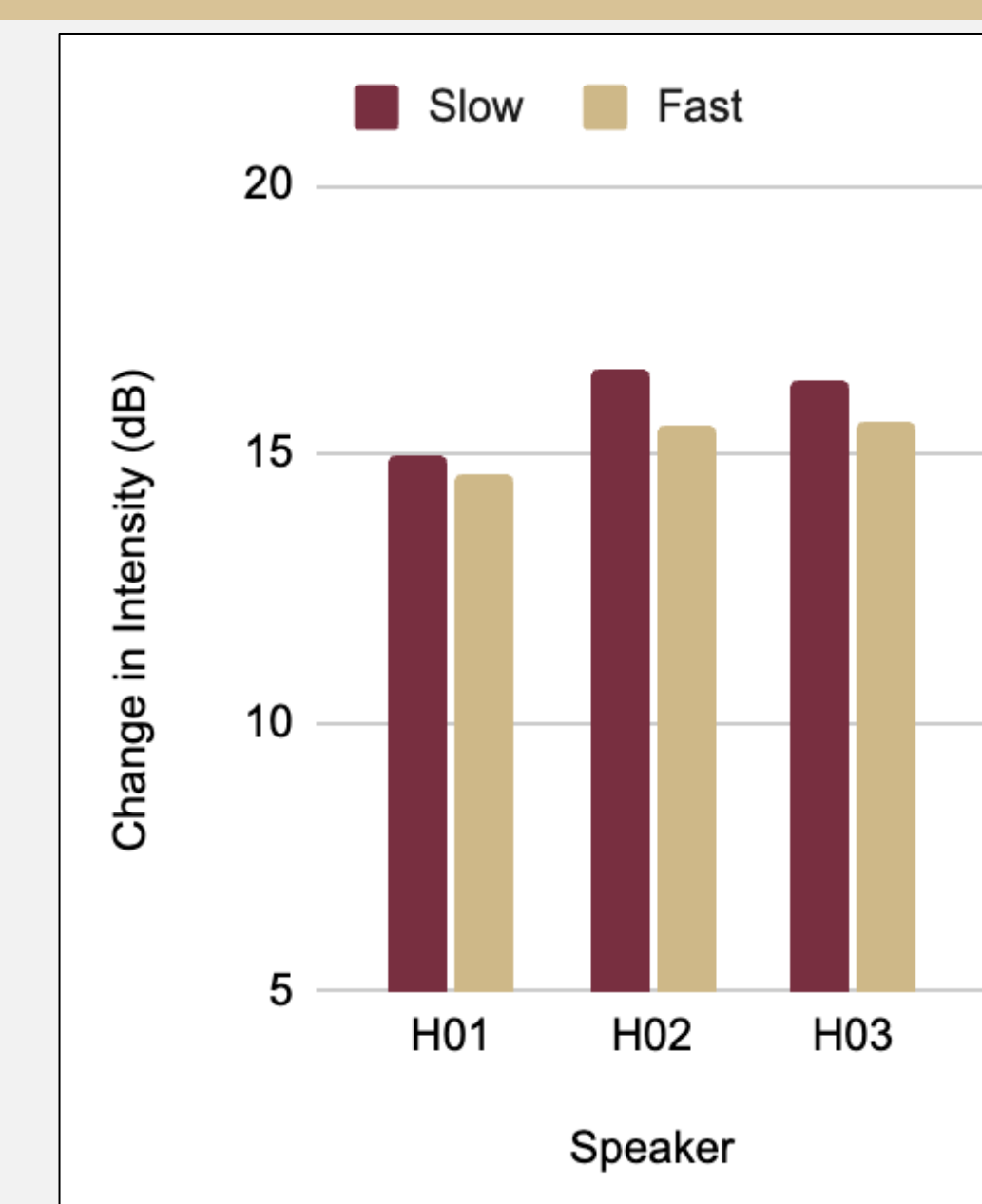


Figure 2. Lenition context results.

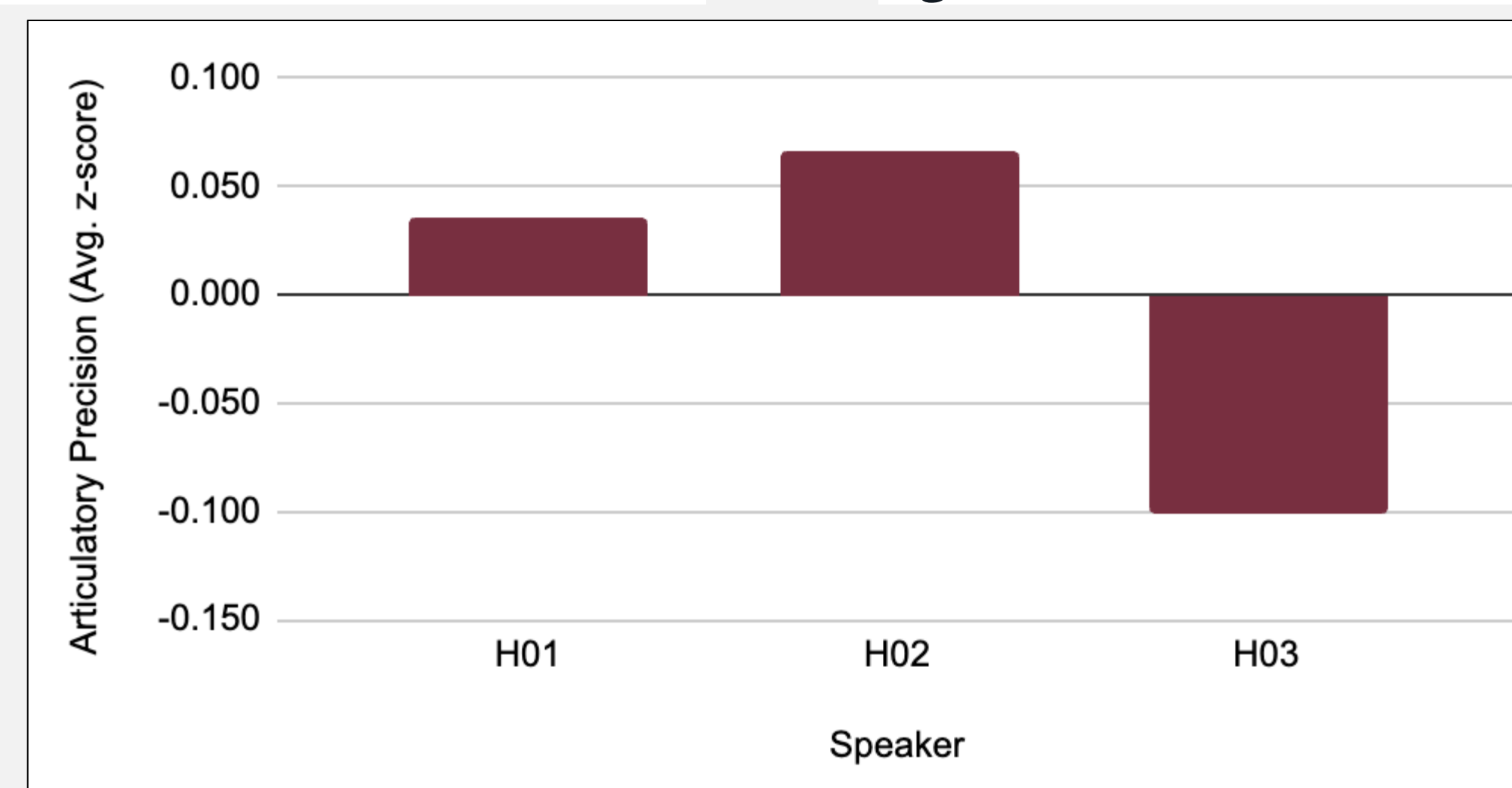


Figure 3. Articulatory precision scores by speaker.

4. Results (cont'd)

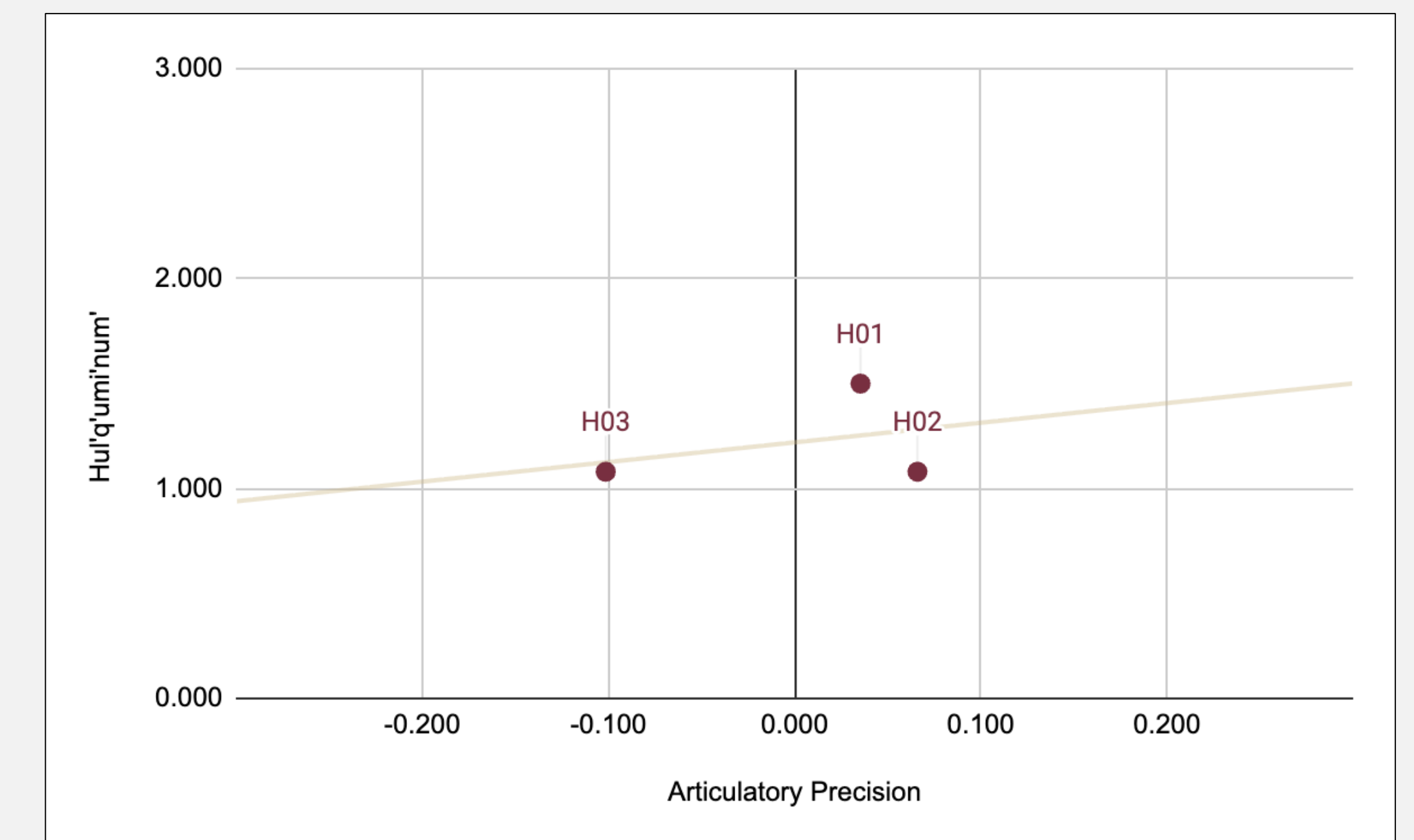


Figure 4. Correlation of articulatory precision score with Hul'q'umi'num' pronunciation.

5. Discussion

- Preliminary results of the articulatory precision task demonstrate individual differences across the three contexts.
- We also observed differences in the pronunciation of Hul'q'umi'num'.
- The correlation does not suggest a clear role for articulatory precision but the full data set is needed to make any conclusions.

6. References

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- Perkell, J. S., Matthies, M. L., Tiede, M., Lane, H., Zandipour, M., Marrone, N., Broderick, M., & Guenther, F. H. (2004). The distinctness of speakers' /s-/ʃ/ contrast is related to their auditory discrimination and use of an articulatory saturation effect. *Journal of Speech, Language, and Hearing Research*, 47(6), 1259–1269. [https://doi.org/10.1044/1092-4388\(2004/095\)](https://doi.org/10.1044/1092-4388(2004/095))
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