

Introduction. The Kurdish language, a collective term for a group of closely related Western Iranian dialects, contains two distinct rhotics: trills and taps. These rhotics are phonemically distinct in all environments except word-initial positions due to phonotactic constraints. The main dialects include Northern Kurdish (NK or Kurmanji), Central Kurdish (CK or Sorani), and Southern Kurdish (SK). While CK prohibits word-initial taps, these are allowed syllable-initially (Mohammadi, 2022). This phenomenon is also observed in NK (Haig and Öpengin, 2018) and SK (Karimi Doostan, 2001). The /ɾ/ in CK is a flap, where the tongue tip moves forward, unlike a backward-moving tap (Hamid, 2016). When pronouncing the voiced alveolar trill /r/, the tongue repeatedly strikes the alveolar ridge, vibrating for a shorter duration in intervocalic positions compared to word-initial or final positions (Hamid, 2016).

Methodology. This study aims to acoustically test the hypothesis regarding the articulatory and durational differences between the trill /r/ and the tap /ɾ/ in CK. A mini-corpus of CK data was compiled, categorizing occurrences of rhotics into word-initial, syllable-initial, word-final, syllable-final, and intervocalic contexts. Using Praat software (Boersma and Weenink, 2024), segment boundaries were manually aligned, and the durations of the rhotics were measured to determine if the tap-trill distinction is solely due to duration or other factors.

Findings. Preliminary results indicate that trills are durationally longer than taps following a medial consonant and intervocalically, while trills are shorter than taps in final positions. Mean intensity measurements support this distinction, except in medial positions where taps exhibit longer mean intensities. The difference in duration is not significantly distinctive, implying a slight difference between the two. Bradley (2001) discusses that in Kurdish, trills are phonologically clusters of taps, using data where a word ending in a tap in the passive voice takes the passive morpheme *-re*, resulting in the sequence *-rre* word-finally. However, this is not accurate as trills are not equivalent to two taps either articulatorily or acoustically. Additionally, the study examines the closely related Hewrami language, where similar phonotactic constraints and phoneme substitutions are observed. This variety is controversial, being considered either a distinct language or a dialect of Kurdish. Hewrami, like Kurdish, prohibits taps word-initially but allows them elsewhere (Naghshbandi, 2010). The cognate words of Kurdish in Hewrami are produced with a tap instead of velarized /l/, similar to NK where velarized /l/ of some CK words are produced with a tap

but not word-initially. Taps share distributional similarities with velarized lateral sounds, both being prohibited in word-initial positions due to constraints like *ɭ (ONS/WD) and *ɭ (ONS/WD) in the realm of Optimality Theory (Flack, 2009). The rhotics in word-final position have the characteristics of a fricative rhotic since the friction noise is evident in the spectrogram. The proximity of laterals and rhotics in the phonological sense needs further acoustic study in future works.

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Title

Rhotics in Kurdish Language: An Acoustic Study