The influence of rhotic allophones on prosodic grouping decisions in the perception of German compounds

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Utterance-level prosody is marked suprasegmentally but also phonetically through segmental variation. For example, voiceless stops in English show increased VOT at prosodic boundaries, indicating domain-initial strengthening (Kim, Kim & Cho 2018) and listeners can use segmental variation for word segmentation (Steffman 2021). Rhotic allophones have also been suggested to differ in perceptual salience: alveolar trills ([r]) are perceived as "stronger" or more salient allophones of /r/ compared to uvular fricatives ([ʁ]) in German (Reinisch & Mitterer 2023). We ask whether different rhotic allophones influence the perception of prosodic boundaries such that the supposedly stronger alveolar trill is more likely to trigger the perception of a prosodic boundary compared to the weaker uvular fricative.

Using a word grouping task, Austrian German listeners will be presented with three-word sequences, in which the middle word begins with /r/, e.g., *Sucht-Risiko-Sport* (*addiction-risk-sport*). Importantly, the words can be grouped into one compound and one simplex word by placing the boundary either before or after the middle word, e.g., **Suchtrisiko**-*Sport* (**risk of addiction**-*sport*) or *Sucht*-**Risikosport** (*addiction*-**risky sport**). Participants' task will be to listen to the three words in isolation and pick one of these groupings according to their perceived preference. Critically, the /r/-initial word will be presented with either [r] or [ʁ]. We ask whether the rhotic allophone heard on the middle word will influence the decision of placing this word domain initially (*Risikosport*) such that [r] is associated with a prosodic boundary more frequently than [ʁ].

Fifty participants will complete an online two-alternative forced-choice task, listening to 52 three-word target sequences and 40 filler sequences recorded by an Austrian German female speaker who is able to produce both rhotic allophones naturally. Words were f0-manipulated (flat pitch) and concatenated with a 100ms ISI to minimize suprasegmental influences. Stimuli were counterbalanced across two lists, with each participant hearing all target sequences once, half featuring [r] and half featuring [ʁ] on the critical word. A pretest using orthographic stimuli tested baseline grouping preferences for the target sequences among Austrian German speakers, independent of the pronunciation of the rhotics. Analyses of the critical trials will take into account these a-priori preferences in determining whether the alveolar trill leads to more grouping decisions placing the /r/-initial words domain initially.

The findings will help understand how phonetic variation in rhotic allophones influences the perception of prosodic boundaries and therefore how suprasegmental and segmental information interact at the phonetics-prosody interface during speech perception.

Kim, S., Kim, J., & Cho, T. (2018). Prosodic-structural modulation of stop voicing contrast along the VOT continuum in trochaic and iambic words in American English. *Journal of Phonetics, 71,* 65–80.
Reinisch, E. & Mitterer, H. (2023). Are alveolar trills perceived as "strong" rhotics? Proceedings of the 20th International Congress of Phonetic Sciences, Prague, Czech Republic.
Steffman, J. (2021). Prosodic prominence effects in the processing of spectral cues. Language, Cognition and Neuroscience, 36(5), 586–611.