

MODIFICATIONS OF TONGUE BODY KINEMATICS AS A PROMINENCE MARKING STRATEGY IN GERMAN

INTRODUCTION

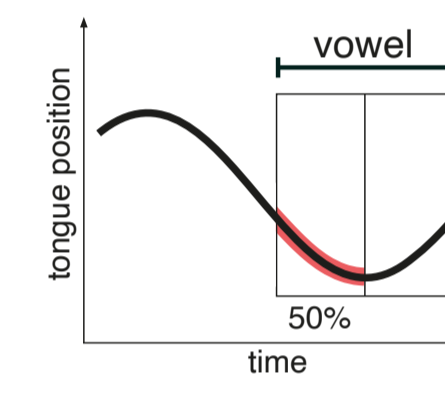
- enhancing **prominence** of parts of an utterance can signal information structure [1]
- achieved by pitch-accent placement (laryngeal system) as well as modifications of articulator movements (supralaryngeal system, → **prosodic strengthening**) [2; 3]
- prosodic strengthening
 - strategy of **sonority expansion**: greater opening of the vocal tract [4]
 - strategy of **localised hyperarticulation**: more distinct vocalic targets [5]
- can be observed as a concomitant of accentuation (here: across-accentuation) but also between accented words (here: within-accentuation) → articulatory cues encode varying **degrees of prominence** [6]
- prosodic strengthening has been shown in English for the tongue only across-accentuation [2; 5; 7] and in German across and within-accentuation only for the lip system [6; 8]

1 How are tongue body kinematics modified when marking prominence in German?

2 Can the modifications be observed across-accentuation or also within-accentuation?

METHODS

- acoustic & **articulatory recordings** (Electromagnetic Articulography) of 27 native speakers of German
- target words with /a/ or /o/ in the stressed syllable (e.g. *Wahwe*, *Bohme*), embedded in carrier sentences
- four focus conditions** as increasing degrees of prominence
- elicitation through an interactive question-answer task (cf. below)
- analysis of tongue body movements during the target vowels /a/ and /o/ on the vertical and horizontal movement dimension:
 - extremum position** (or vocalic target),
 - mean position** within first 50% of the acoustic vowel,
 - peak velocity** of the gesture
- comparison of normalised measures between four focus types



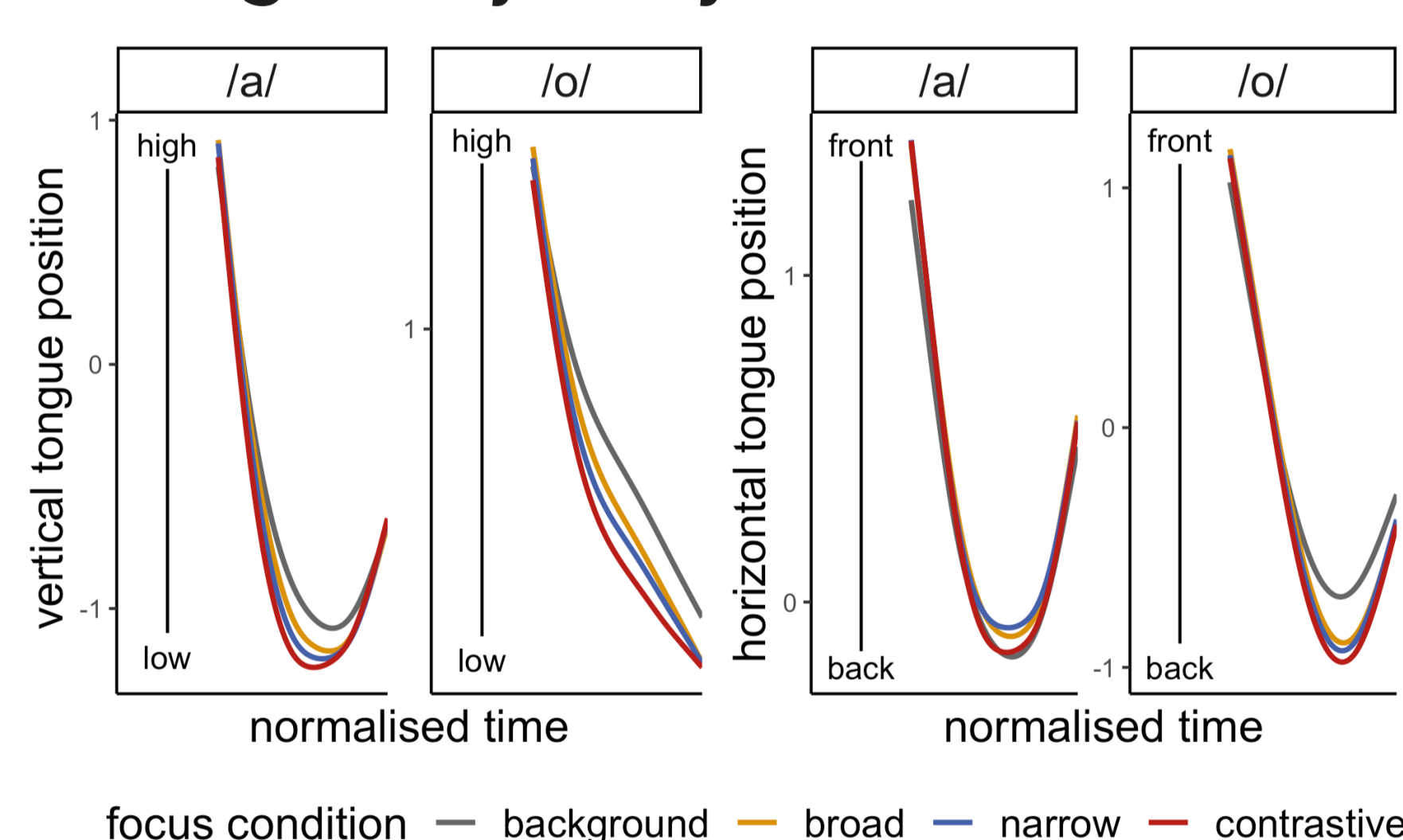
background	broad focus	narrow focus	contrastive focus
Q. Hat er den Bohrer auf die Wahwe gelegt? <i>Did he put the drill on the wahwe?</i> A. Er hat [den Hammer]_F auf die <u>Wahwe</u> gelegt. <i>He put [the hammer]_F on the wahwe.</i>	Q. Was hat er gemacht? <i>What did he do?</i> A. Er hat [den Hammer auf die Wahwe gelegt]_F . <i>He [put the hammer on the wahwe]_F.</i>	Q. Wo hat er den Hammer hingelegt? <i>Where did he put the hammer?</i> A. Er hat den Hammer [auf die Wahwe]_F gelegt. <i>He put the hammer [on the wahwe]_F.</i>	Q. Hat er den Hammer auf die Bohme gelegt? <i>Did he put the hammer on the bohme?</i> A. Er hat den Hammer auf die [Wahwe]_F gelegt. <i>He put the hammer on the [wahwe]_F.</i>
unaccented	accented		

RESULTS

extremum position

- lower targets in low vowel /a/ and close-mid vowel /o/, retracted targets in back vowel /o/ under prominence → associated with **sonority expansion** and **localised hyperarticulation**
- gradient changes between focus types

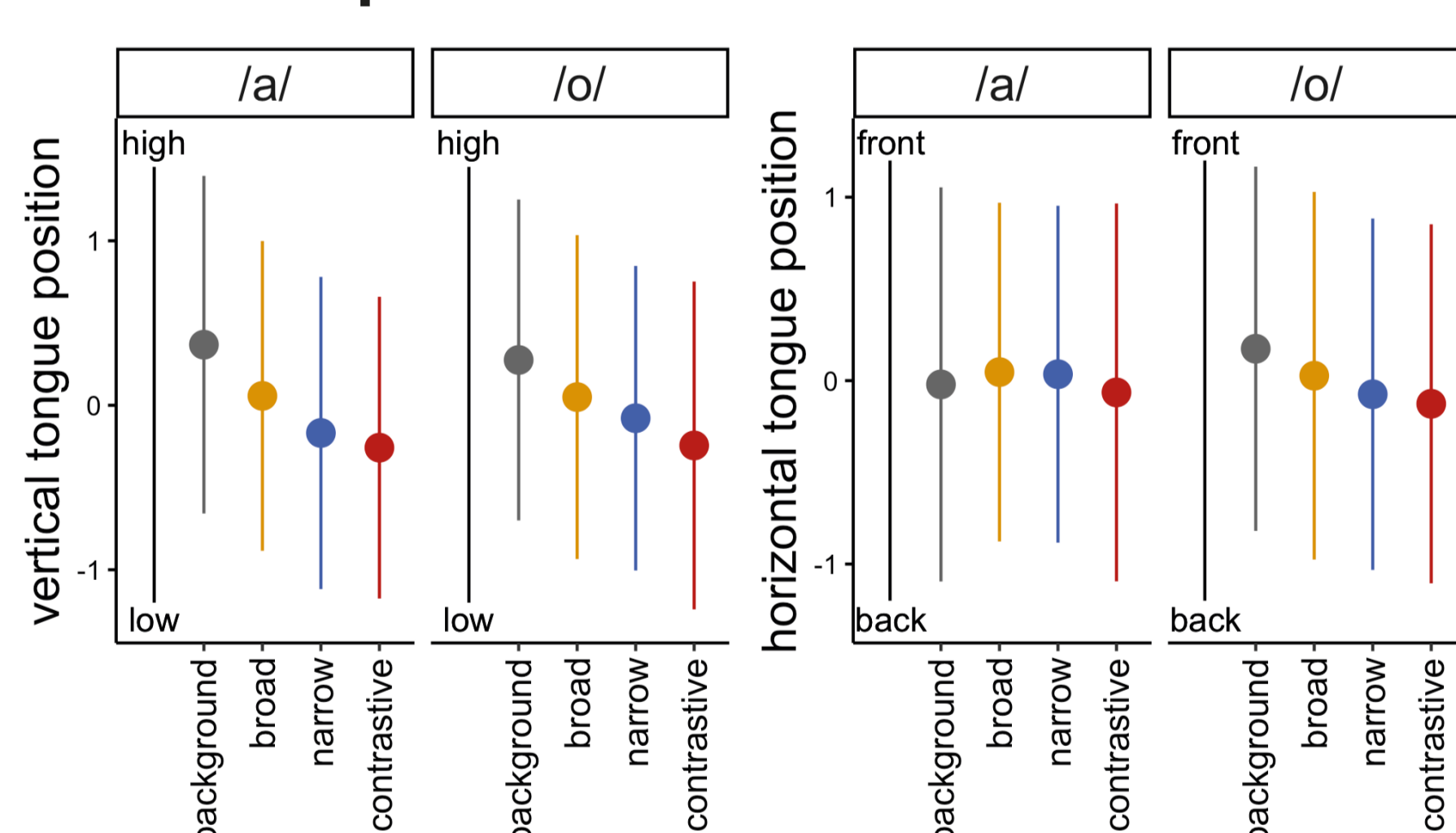
averaged trajectory around extremum



mean position in window

- mean tongue positions in the selected window (first 50% of the acoustic vowel) also show **lower tongue** in /a/ and /o/ and **retracted tongue** in /o/ under prominence
- gradient changes between focus types

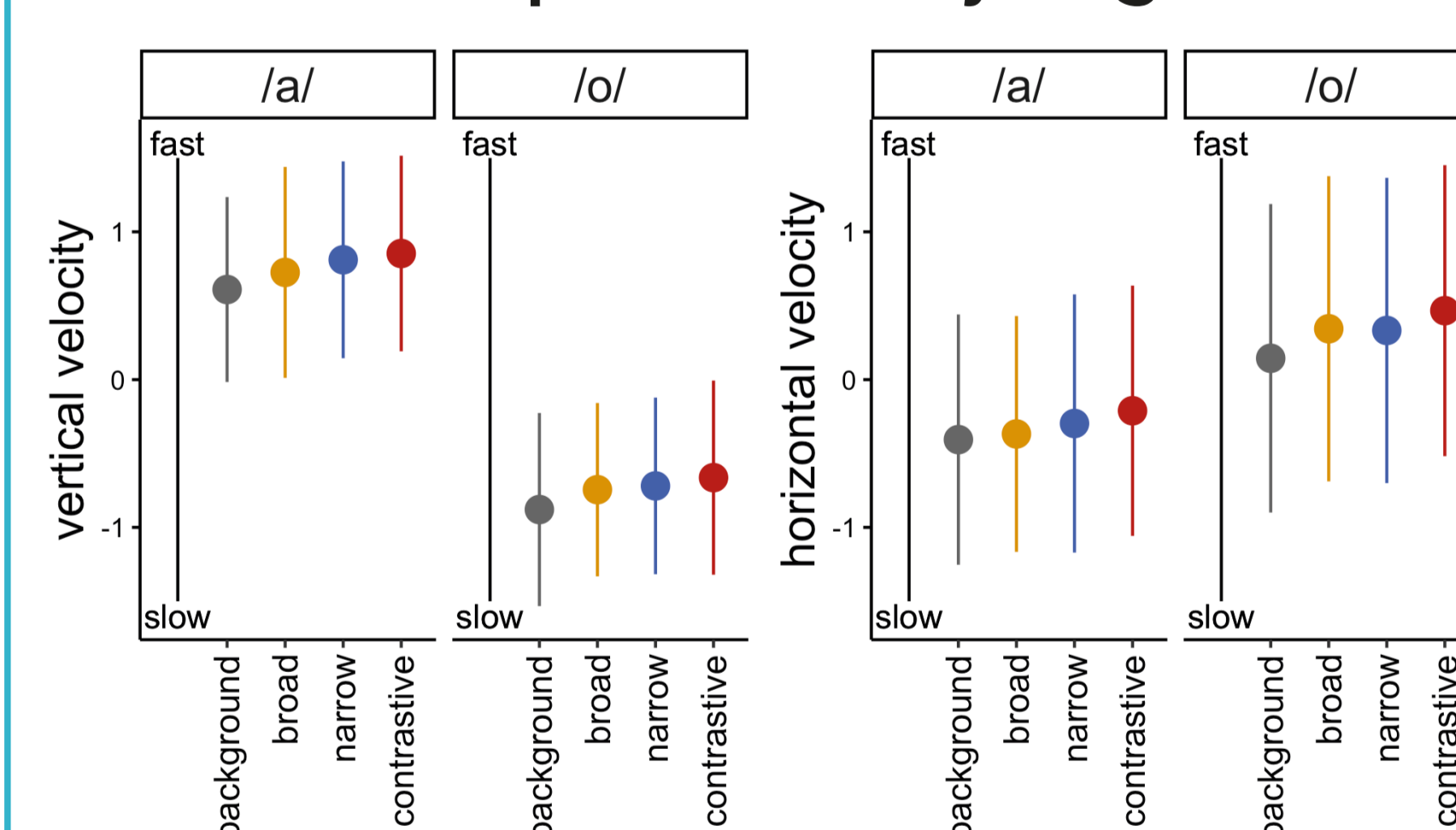
mean position in selected window



peak velocity

- absolute values show **higher peak velocities** (i.e. faster movements) in /a/ and /o/ in the vertical and horizontal dimension under prominence
- trend towards gradient changes between focus types

mean abs. peak velocity of gesture



DISCUSSION & CONCLUSION

1 Modifications include more extreme **tongue positions** in relevant articulatory dimensions and increased **peak velocities**. Speakers simultaneously apply the strategies of sonority expansion and localised hyperarticulation.

2 Gradient modifications occur between all four focus types and therefore across as well as **within-accentuation**. Supralaryngeal changes are not exclusively a means to indicate accent but rather a **direct expression** of focus structure.

→ **prosodic strengthening** by means of the tongue body in German

→ emphasis on **gradient nature** of prominence marking

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