

The domain of pre-boundary lengthening in German

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Background: One of the major correlates of prosodic phrasing is the lengthening of material immediately preceding the phrase boundary. This effect, referred to as pre-boundary lengthening (PBL), has been attested for German as a stable correlate of boundary production (e.g., Petrone *et al.* 2017). However, it is hardly understood what stretch of speech, or domain, preceding the boundary undergoes lengthening. The present study investigates the PBL domain in German, testing two hypotheses: the Word Rime hypothesis, which posits that PBL is initiated on the nuclear vowel of the last main stress syllable and thus defines the domain based on phonological structure (e.g., Kohler 1983), and the Overlap hypothesis, which posits that a lengthening gesture of fixed duration overlaps with the final word and thus refers to phonetic content (e.g., Byrd *et al.* 2006). The latter hypothesis entails that the onset of PBL varies depending on the amount of given segments.

Experiment: The hypotheses are tested in the framework of a production study that controls for the position of main word stress (penultimate vs. antepenultimate), the number of segments, and the presence of a following prosodic boundary. The target words are names with different stress patterns (e.g., *KArolin* vs. *RaMOna*) and name pairs differing only with regard to the presence/absence of a final coda consonant (e.g., *Ramona* vs. *Ramonas*). The realization of a prosodic boundary after the target word is elicited by means of structurally ambiguous lists of the type [A or B and C], which can be interpreted as comprising a left-branching structure [[A or B] and [C]] or a right-branching structure [[A] or [B and C]]. This ambiguity is resolved by means of a prosodic boundary after B in the left-branching case and after A in the right-branching case. The target words are in position B. Twelve items of this sort were recorded with seven subjects so far (we intend to record 24 in total). The duration of each segment in the target words was measured and normalized by z-score transformation.

Results and discussion: Table 1 presents the results for the duration differences of each onset and rime across subjects. In all significant cases, the onset or rime is longer in phrase-final position than in phrase-medial position. All conditions showed a significant effect for the rime of the penultimate syllable (R2) and the following components (O3 and R3). Furthermore, the target words with penultimate stress show a significant effect for the onset of the penultimate syllable (O2) when a final coda is absent (e.g., *Ramona*) but not when a final coda is present (e.g., *Ramonas*). This finding supports the Overlap Hypothesis, as PBL is initiated later if a word has an additional segment. The target words with antepenultimate stress (e.g., *KArolin*) show an effect also for the rime of the antepenultimate syllable (R1) and the onset of the penultimate syllable (O2). This supports the Word Rime hypothesis, as PBL is initiated on the rime of the main stress syllable. These results suggest that the extent of the PBL domain depends on both phonetic content and phonological structure. It seems plausible that the rime of the main stress syllable serves as an anchor for PBL initiation, but the domain expands to the left if the amount of following material is limited.

Table 1. Paired t-test significant results (n=72); *** p < 0.001, ** p < 0.01, * p < 0.05

Condition	O1	R1	O2	R2	O3	R3	Example
Penultimate without coda			***	***	***	***	RaMOna
Penultimate with coda				***	***	***	RaMONas
Antepenultimate		**	*	***	***	***	KArolin

References: ◆Byrd, D., J. Krivokapic & S. Lee. 2006. How far, how long: On the temporal scope of prosodic boundary effects. *J. Acoust. Soc. Am.* 120, 1589–1599. ◆Kohler, K. 1983. Prosodic boundary signals in German. *Phonetica* 40, 89–134. ◆Petrone, C., H. Truckenbrodt, C. Wellmann, J. Holzgrefe–Lang, I. Wartenburger & B. Höhle. 2017. Prosodic boundary cues in German: Evidence from the production and perception of bracketed lists. *J.Phon.* 61,71-92.