

Cues for intonation phrase boundaries in German

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Peters et al. 2005 showed in an investigation of the Kiel Corpus that intonation phrase boundaries in German are correlated with final lengthening, F0, and pauses. Féry & Kentner 2010 also documented the relevance of duration and F0 in lists of names with different groupings. Gollrad 2009 tested the relevance of duration and pitch in accentual phrase boundaries in perception. Her results are discussed at the end of this abstract.

In this talk, we present results of a production and a perception experiment that further establishes the relevance of final lengthening, F0, and pauses as cues of German intonation phrase boundaries. New in our talk is the emphasis on perception in a study of intonation phrase boundaries.

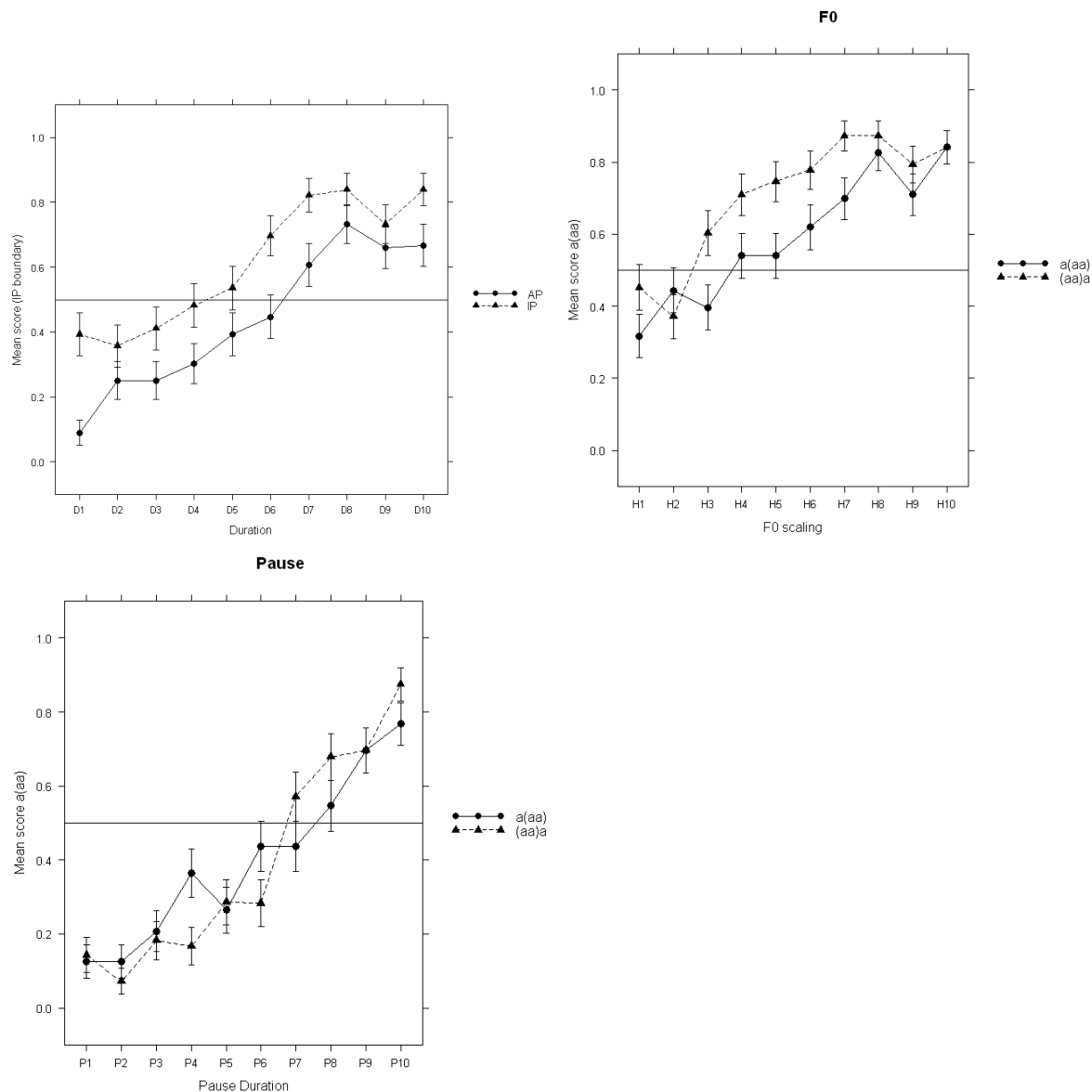
We used lists of names with different groupings as in (1). On standard assumptions about accentual phrasing *ap* (or phonological phrasing) in German (Gussenhoven 1992, Truckenbrodt 2006), each name forms a separate accentual phrase. We expect that the indication of groupings like in (1) then employ the next higher level of the prosodic hierarchy, the intonation phrase *I*.

- (1) a. (Lena oder Lola) und Manu
- b. Lena (oder Lola und Manu)

12 speakers from the Brandenburg area read 864 sentences of the kind shown in (1), balanced for segmental effects by proper permutation of names. By the experimental set-up and a following filter with naive trained annotators, 99% of these have prosodic groupings of the intended kind that were recognized by 2/3 listeners. The analysis concentrates on these 99%. It shows significant effects of all three cues: A vowel at the end of a name is 80.5% longer before an I-boundary than before an ap-boundary. F0 peaks were higher and pauses more frequent before an I-boundary than before an ap-boundary.

In three perception experiments, we tested the relevance of each of the cues separately. We started with final lengthening, for which we employed a recording each of (1a) and (1b) as bases. The bases were neutralized for F0 and pause, and from each base a continuum was synthesized (no lengthening to strong lengthening in *Lena*, at the same time strong lengthening to no lengthening in *Lola*). A significant correlation with the perceived grouping was found. The category boundary of the first experiment served as a guide to minimizing the effect of lengthening in the bases for testing F0. Again two bases were employed, corresponding to (1a) and (1b). Continua were formed in relative peak height on *Lena* and on *Lola*. At one end of the continuum, corresponding to (1a), *Lena* had a low peak and *Lola*, preceding the I-boundary, had a high peak. At the other end of the continuum, *Lena*, preceding the I-boundary, had a high peak and *Lola* had a low peak. Again a significant correlation with the perception of grouping was found. Based on these results, two bases that were relatively neutral as far as duration and F0 could be used for pause manipulations. The continua went from no pause after *Lena* and long pause after *Lola* (cf. (1a)) to long pause after *Lena* and no pause after *Lena* (cf. (1b)). Here, too, a significant correlation with the perception of the grouping was found. Additional measurements of the reaction time of the subjects suggest that pause is the most problematic cue. It shows the longest reaction times.

Thus, each cue shows a significant effect when tested individually. Our results differ from the perceptual results of Gollrad 2009. Gollrad found that duration is a significant cue, while F0 is not a significant cue when duration is neutralized. Her results pertain to the accentual phrase boundary, in a different experimental set-up.



Perceptual results for duration, F0 and pause. The two lines in each plot show the results for the two continua from the two bases. (The difference between the bases, signif. for duration and for F0, is due to remaining cues we did not set out to neutralize. It is not unexpected.)

References

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