**Semantics-context effects on lexical stress and syllable prominence**

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**Introduction**

- Successful speech communication even when the phonetic signal in the segmental or suprasegmental domain is ambiguous.
- Hearer makes use of all cross-modally available, contextual information (e.g., prosodic and lexical context) to decode current phonetic input.
- Prominence defined as the extent to which a syllable is perceived as standing out against the surrounding ones.
- Prominence perception depends on signal internal (e.g., F0, intensity) and signal-external factors (e.g., meta-knowledge of grammatical categories).
- But does prominence perception also depend on the semantic context?

**Research Questions**

1. Does semantic context affect the perception of lexical stress? More specifically, does a name/month context support lexical stress and higher prominence on the first/second syllable on August, resp.
2. Is the semantic context effect stronger if the phonetic cues to prominence and lexical stress in the target syllable are ambiguous?

**Method**

- **7-step duration continuum from August (name) to August (month)**
- Resynthesized stimuli differing only in the duration ratio of the first vowel /a/ to the second vowel /u/ (cf. Figure 1 and Table 1, F0 was kept constant with a slight decline for phrasal and rhythmic reasons).
- Stims presented to one ‘month’ and one ‘name’ list consisting of various orders of the different words: 1st (May) and 2nd (Friedrich)
- Two criteria for establishing a context that triggers one of the two meanings: (1) One context word overrules the other and (2) the context word is not adjacent to the stimulus (e.g., month lists: Friedrich ju/ju or name lists: Ju/ju Friedrich).
- Lists contained either 3 or 5 context words to make the position of the target word unpredictable.

**Results**

- **Figure 1: Oscillograms and spectrograms showing the contrast in vowel duration between the extreme stimuli of the created continuum from August (top) to August (middle). The bottom panel shows the constant F0 decline of all stimuli.**
- **Figure 2: Percentage of ‘month’-responses as a function of decreasing V1/V2 ratio (stimulus number) to the month list (red) and the name list (blue).**
- **Figure 3: Regression curves derived from the identification functions of ‘month’-responses to the month list (red) and the name list (blue). The vertical lines indicate mean category boundaries in the August-August continuum following the month list (red) and the name list (blue).**

**Discussion**

- **Research question 1: Responses to stimuli are affected by semantic context.**
- **Research question 2: Semantic context affects all stimuli irrespective of whether the V1/V2 duration ratio is ambiguous or clear.**
- V1/V2 duration ratio is a strong acoustic cue to lexical stress in German.
- Fundamental meaning relationships are also used as cues to lexical stress and hence prominence perception.
- Prominence as a perceptual phenomenon with a considerable top-down momentum.
- Robustness against local phonetic cues as a characteristic of meaning-based context effects.
- Meaning based effects may affect directly language processing (like the lexical stress position).
- Pattern based effects (e.g., rhythmic context, Niebuhr, 2009) may affect the interpretation of the phonetic cues, which then provide the basis for language processing.