Production of prosodic cues in coordinate name sequences addressing varying interlocutors

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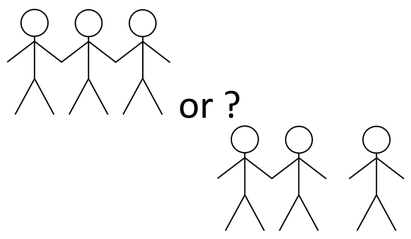
BACKGROUND:

Name1 and Name2 and Name3



in production, prosodic cues can disambiguate (by making the internal grouping explicit)
- final lengthening
- f0-range
- pause duration

1. without internal grouping
no brack(et): N1 and N2 and N3

2. **with internal grouping**
brack(et): (N1 and N2) and N3

- The strength of prosodic cues and of potential cue combinations are influenced by the speakers themselves and by external factors, such as interlocutor and noise (Biersack et al. 2005; Cangemi et al. 2015; DePaulo & Coleman 2010; Garnier et al. 2006; Landgraf et al. 2017; Kempe et al. 2010; Kemper et al. 1995; Petrone et al. 2017; Summers et al. 1988)
- For coordinates with internal grouping, the Proximity principle (Kentner & Féry 2013) predicts a weakening of the prosodic cues group internally (at N1 in the bracket condition), while Anti-Proximity predicts a strengthening of the prosodic cues at the edge of groups (at N2 in the bracket condition).
- Weakening refers to a decrease in final lengthening, f0-range, and pause duration, while strengthening refers to an increase of the prosodic cues.

Q1: PROSODIC DISAMBIGUATION: Can we replicate findings of previous studies regarding differences in the use of f0-range, final lengthening, and pause on Name1 (N1) and Name2 (N2) in coordinates with and without internal grouping?

Q2: GENERAL CONTEXT-DEPENDENT VARIABILITY: To what extent do these prosodic cues vary in different contexts?

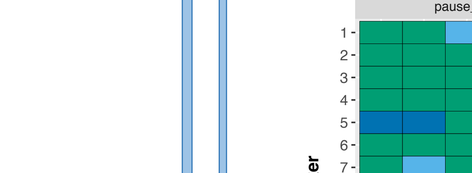
Regarding the **combined use of the three different prosodic cues:**

Q3: INTER-SPEAKER VARIABILITY: Do different speakers show different patterns of cue combinations within a context (C1)?

Q4: INTRA-SPEAKER VARIABILITY: Do speakers show different patterns of cue combinations between contexts?

METHOD:

- 16 monolingual German speakers (13 female, 2 male, 1 other); 19–34 years of age (*M* = 25.8, *SD* = 4.6)
- stimuli (taken from Holzgrefe-Lang et al. 2016): sequences of three disyllabic, trochaic names
- **two conditions**: **no bracket**: *Moni und Lilli und Manu,* **bracket**: *(Moni und Lilli) und Manu*
- referential communication task with **five different contexts** (fig. 1)
- 864 productions entered the analyses (960 recorded productions - 96 excluded items)
- statistical analysis: linear mixed-effects models
- exploratory analysis: classification of patterns in the interplay of combinations of two of the cues on Name2 (N2).



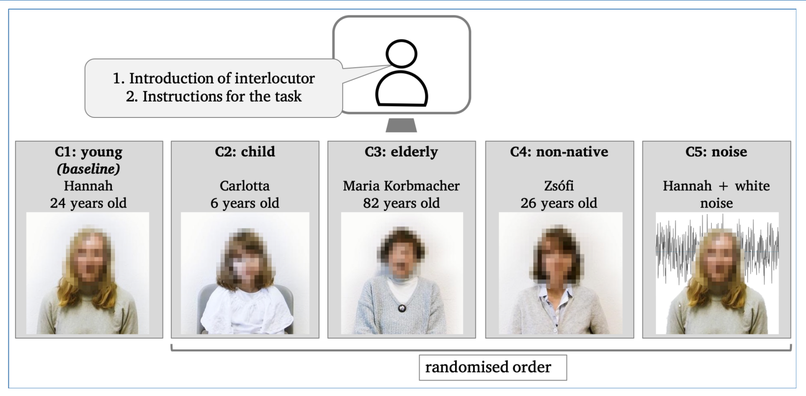


fig 1: Five experimental contexts. Note: Pictures were not pixelated; noise was presented auditorily.

RESULTS: Statistical analyses of PROSODIC DISAMBIGUATION and GENERAL CONTEXT VARIABILITY (Q1, Q2)

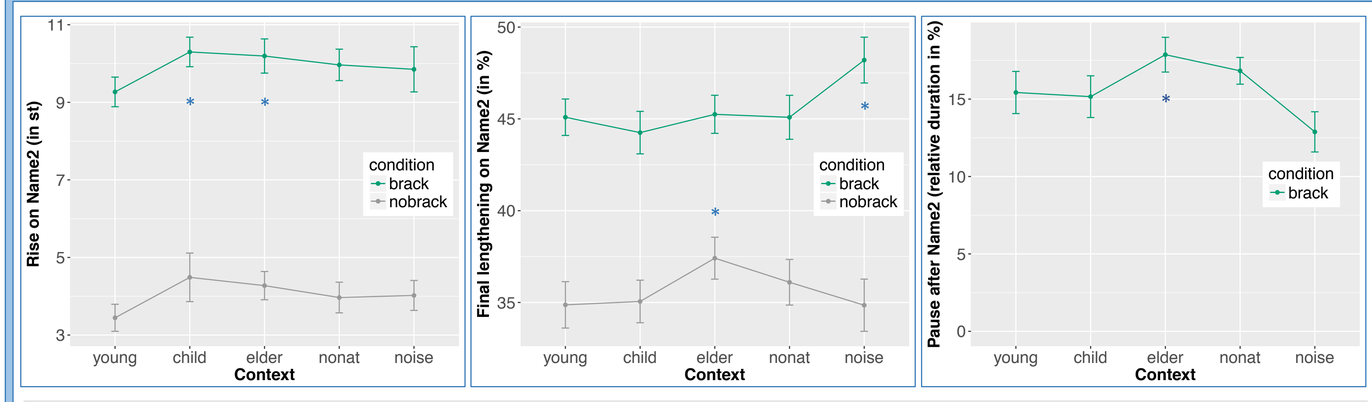


fig 2: Mean values and 95% CI for rise (left panel), final lengthening (mid panel), and pause (right panel) on N2 for each context and condition (green = bracket, grey = no bracket).
* indicates main effects and interactions with a p-value < 0.05.

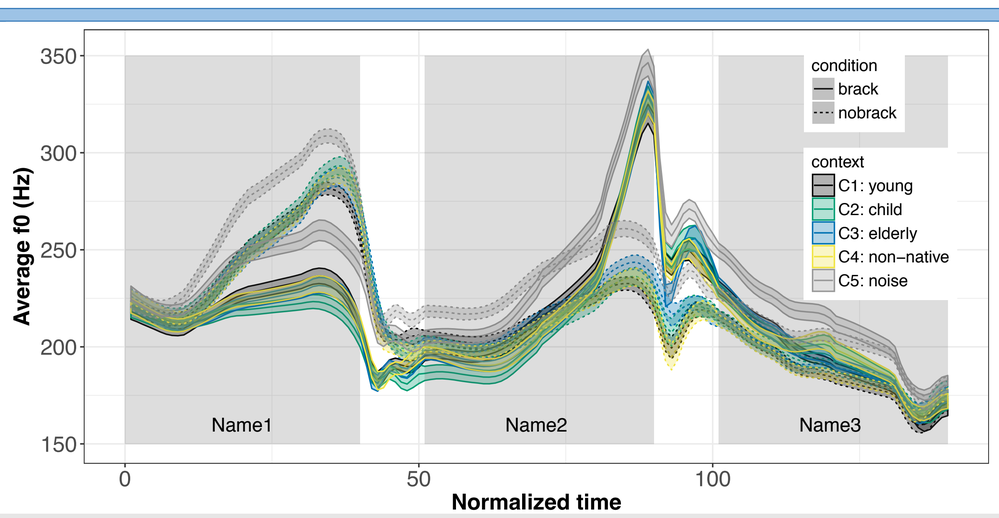


fig 3: Time-normalized f0-contours of coordinates for condition (solid lines = bracket, dashed lines = no bracket) and context (cf. colours) by a subset of 13 female speakers.

Q1: YES. Results in line with Proximity/Similarity model (Kentner & Féry 2013), (cf. fig.3 for f0-contour).
N1 brack:↓final lengthening,↓f0-range; N2 brack:↑final lengthening,↑f0-range + pause

Q2: WE FIND CONTEXT-DEPENDENT VARIABILITY. C2 - C5 compared to C1
C2 N1 brack:↓f0-range (tendency); N2:↑f0-range
C3 N1 brack:↓f0-range (tend.); N2:↑f0-range, brack:↑pause, nobrack:↑final lengthening
C4 N1 brack:↓final lengthening (tendency); N2:↑f0-range (tendency)
C5 N2 brack:↑final lengthening,↓pause,↑f0-range (tendency)

RESULTS: Exploratory analyses of INTER- and INTRA-SPEAKER VARIABILITY (Q3, Q4)

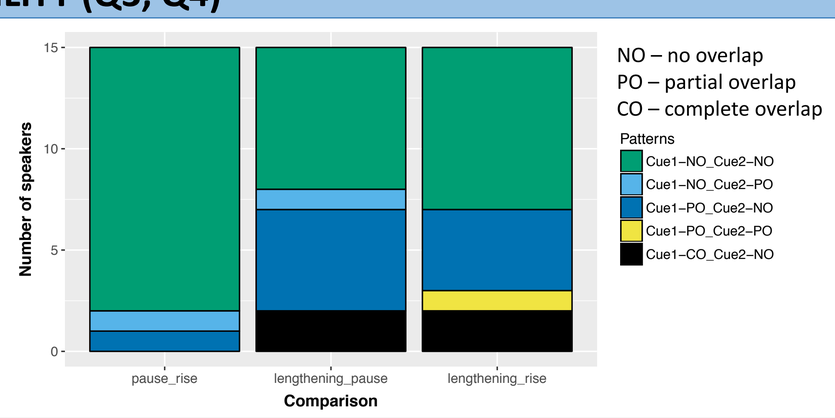


fig 4: Inter-speaker variability of cue combination patterns (colours) in C1 (young adult) for the three comparisons (x-axis). The y-axis shows number of speakers. The names of the patterns refer to the cues given below the bars.

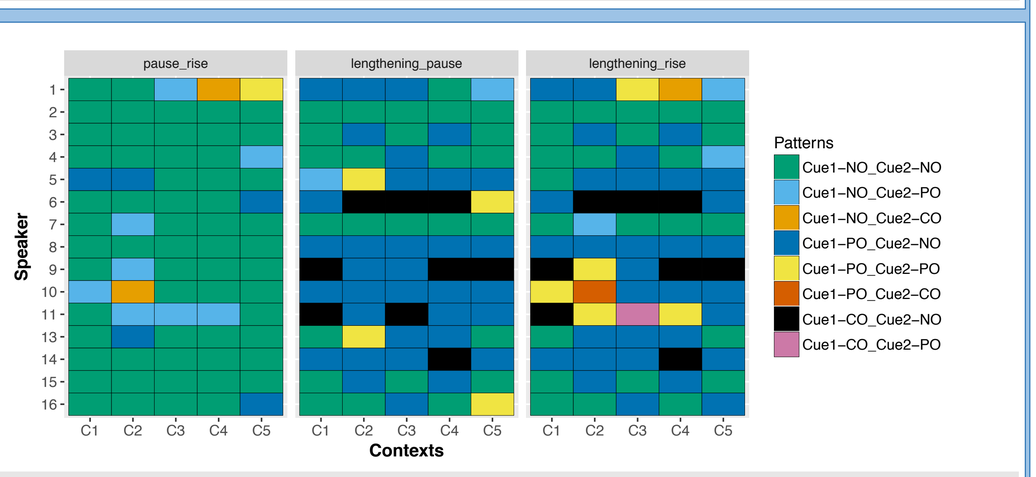


fig 5: Intra-speaker variability of cue combination patterns (colours) across contexts (x-axis) used by individual speakers (y-axis) for the three comparisons (facets). The names of the patterns refer to the cues given above the plots.

Q3: YES, but variability is restricted**.** Overall all three cues are used to mark the difference between conditions, most speakers clearly used pause and rise to distinguish between conditions.

Q4: YES, but limited: more stability than variability**.** Mostly, at least one cue with no overlap, small differences between contexts.

Relatively stable prosodic repertoire between and within speakers → prosody as a "skeletal structure" for the utterance (Frazier et al. 2006).

OUTLOOK:

- Production study with elderly speakers (data collection running: so far 15 participants, age range 61-80 years)
- Gating study with young participants: At what point in the coordinate structure are listeners able to reliably distinguish between the two conditions? (data collection in preparation)
- Production and perception study with people with right hemisphere lesion (data collection running: so far 11 participants)
- Production and perception study with people with aphasia/left hemispheric lesion (in preparation)

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