

The influence of intonation on word recognition in German 17–24-month-olds

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Introduction

Word recognition

- German infants can segment trochaic words (e.g., *Blume*, ‘flower’) from speech from around nine months of age [1-4]
- Intonation affects segmentation in German 9-month-olds: only high-pitched stressed syllables are treated as onsets of trochaic units ([2] and [4])
- In German, intonation is not lexically contrastive, but signals, among others, illocution type, e.g.
 - declarative with a high-pitched stressed syllable and a fall ($H^* L\text{-}\%$)
 - polar question with a low-pitched stressed syllable and a final rise ($L^* H\text{-}\wedge H\%$)

(1)  Da ist eine Puppe. ‘There is a doll.’
 Ist das eine Flasche? ‘Is that a bottle?’

- We test whether young children’s word recognition is affected by intonation [5]

Research questions

RQ1:

Does intonation affect German 17–24-month-old children’s referential word recognition?

RQ2:

Does the influence of intonation on word recognition change with age?

Methods

Participants

- 16 German monolingual children from Konstanz (south-west of Germany) between 17 and 24 months old (avg. age 21 months, 10 f, 6 m)

Stimuli

- 8 depictable trochaic words (strong-weak) that are generally known to young children [6+7] e.g., Affe (‘monkey’) – Bagger (‘digger’)

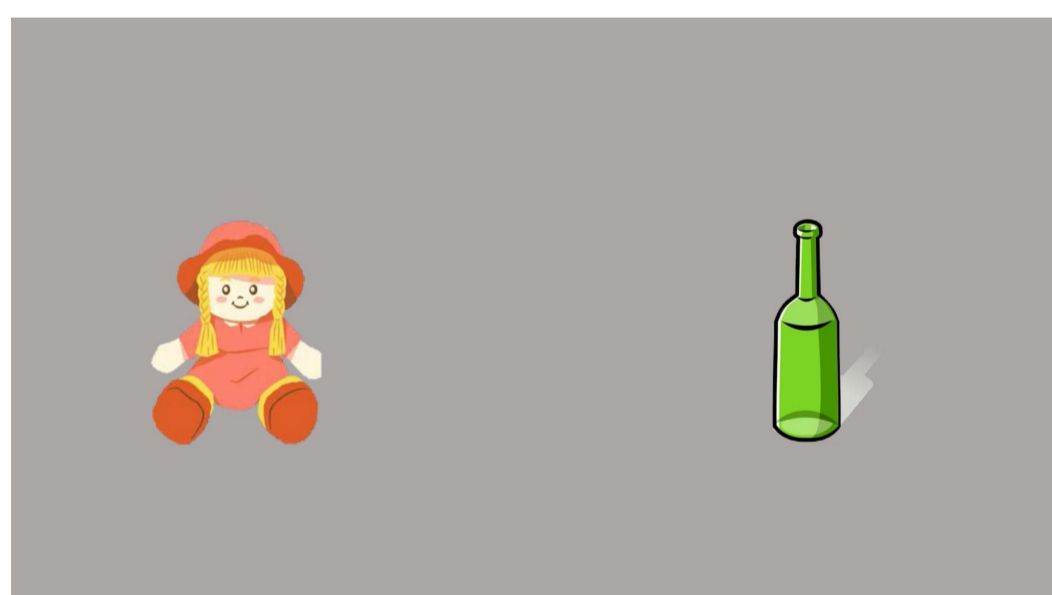


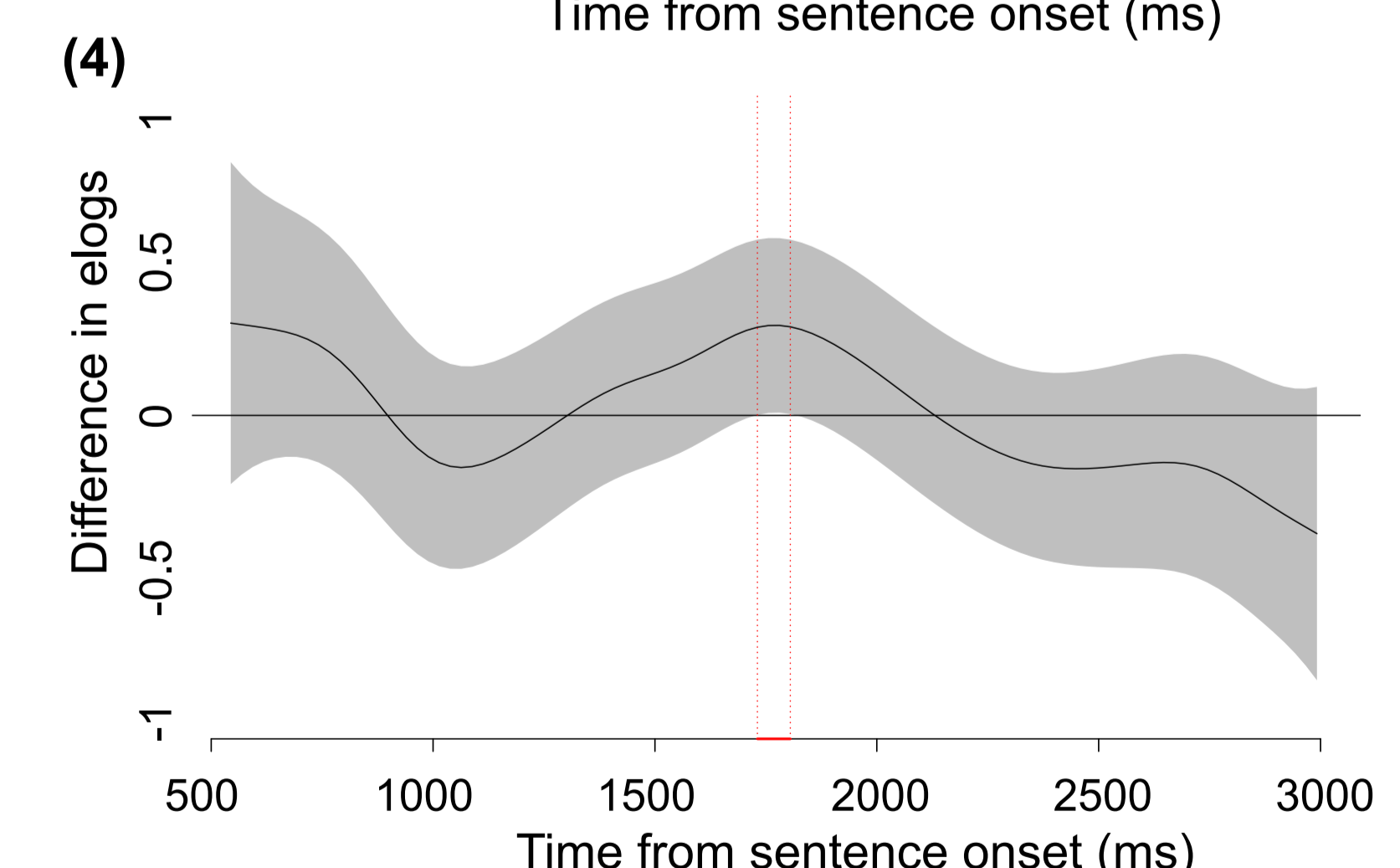
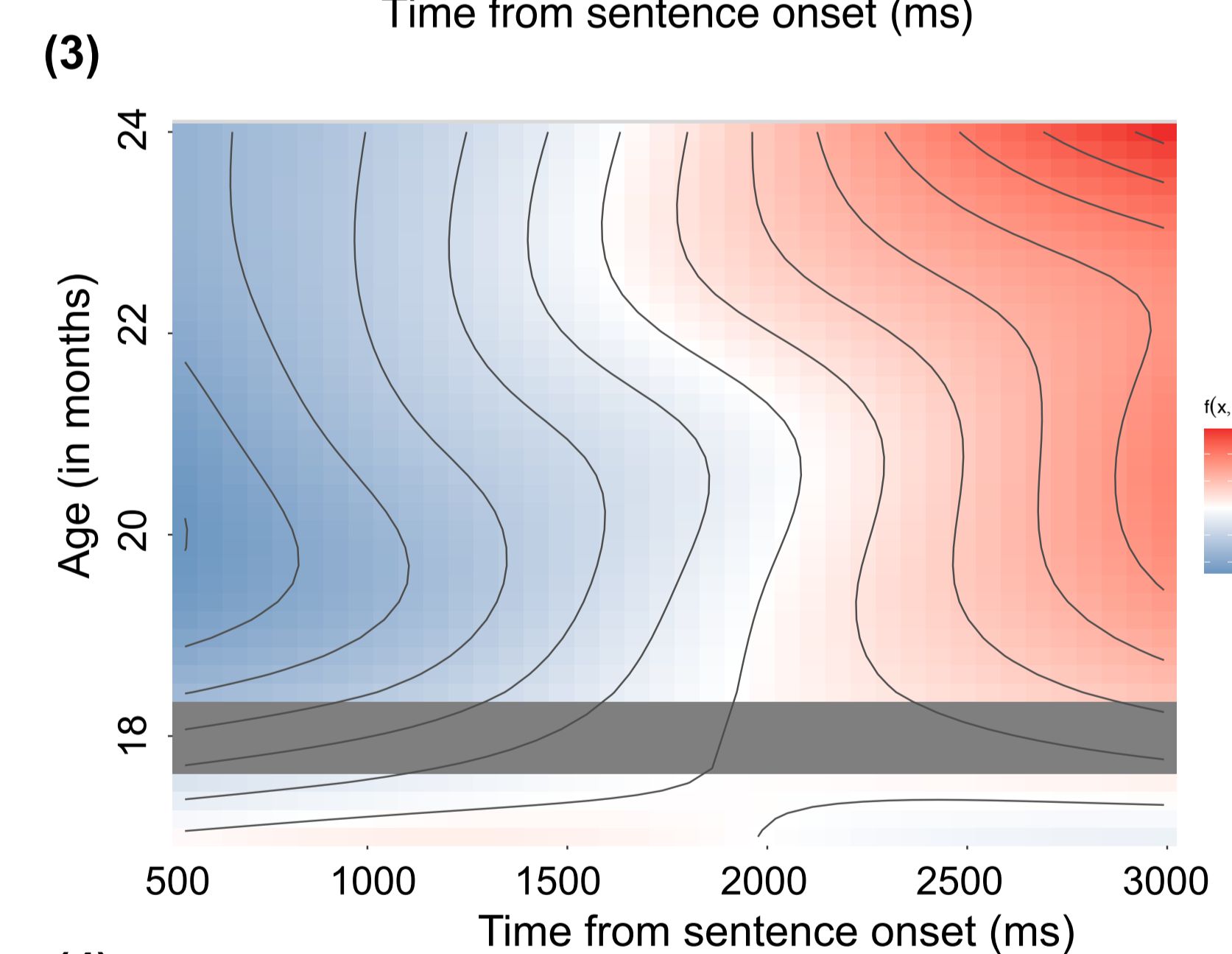
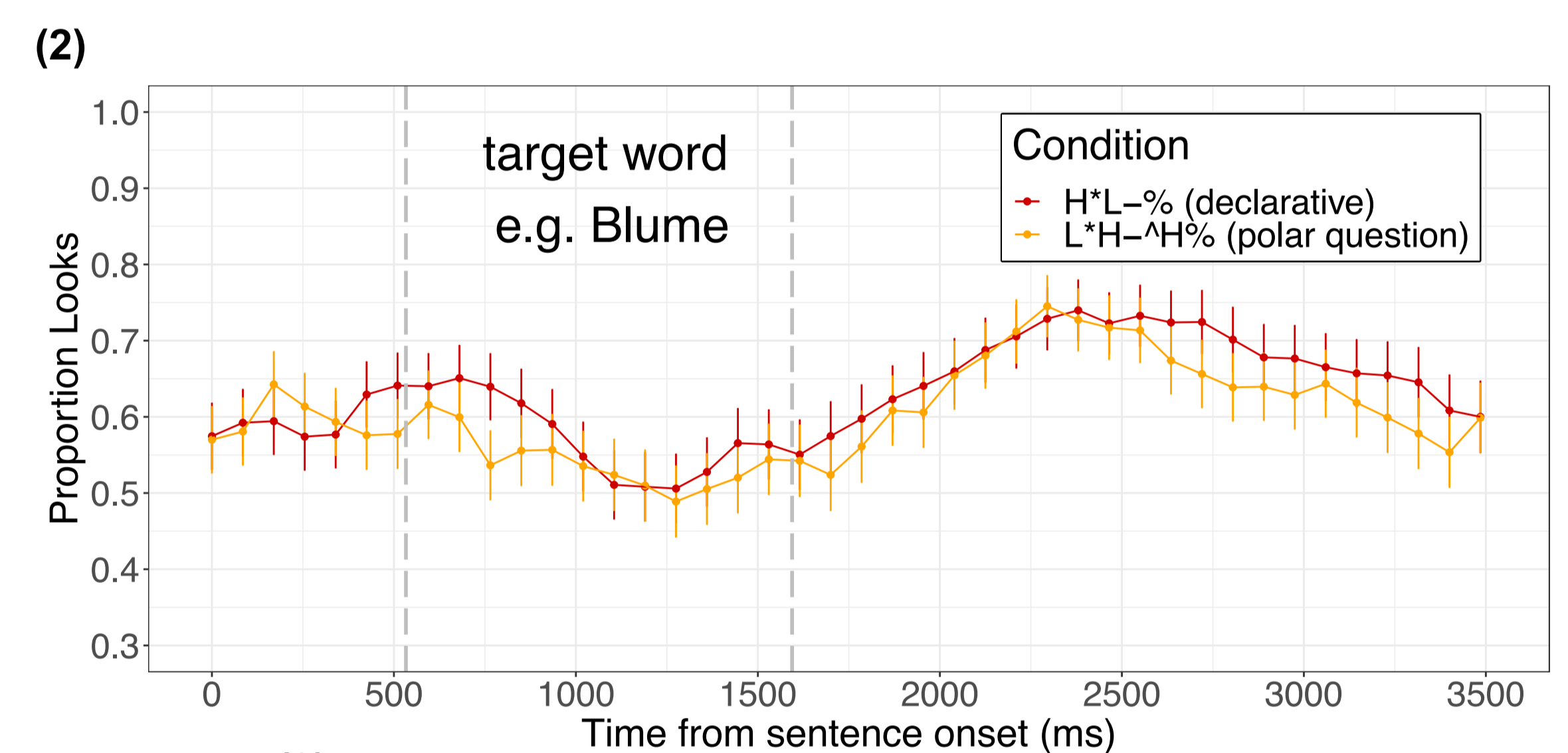
Fig. 1: Example display of a fixed object pair in a trial, while one of two carriers is played: (falling declarative with H^* on stressed syllable or rising polar question with L^* , see (1)). Sentences were recorded by a female native speaker of German.

Procedure

- Looking-while-listening study (Tobii Pro Spectrum) with 16 experimental trials separated by attention-getter [8]
- Order of pictures in pair was fixed per child but counterbalanced across children
- Each object was named in half of the trials and served as distractors in the other half
- Intonation condition was manipulated within-items and within-subjects
- Preview of objects was 1.5s before sentence onset and trials ended 3.5s after target word onset (cf. [9])
- Trials were pseudo-randomized in 8 different lists
- Parental questionnaire of background and whether target words are known to the child

Analysis & Results

- Fixations were extracted at 60Hz and analysed using fasttrack [10] & general additive mixed models (gamms, cf. [11])
- Items were excluded if target was not known to the child (as indicated by parental questionnaire)
- Gamms included
 - parametric effects for age (in days), intonation condition and block (first vs. second half), none of which was significant
 - smooths for event (participant, item) and intonation condition over time
- Children showed increase in target fixations approx. 700ms after target onset, but there was no effect of intonation condition (see (2))
- **When accounting for age effects in target fixation** (tensor between Time*Age, see (3)): significant effect of intonation condition between 1730 ms and 1805 ms after sentence onset (see (4))



Discussion, Conclusion and Outlook

- There was no general effect of intonation condition in the group of 17–24-month-old German children
- When accounting for age effects (older children look earlier and longer to the target after naming), there is a small but significant effect of intonation condition: **children fixate target more when produced with H^* than L^* accents**
- Future work: increase sample size and dissociate sentence type (declarative vs. polar question) and intonation (rise vs. fall)

References

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