

A cross-linguistic investigation of information structure in infant-directed speech

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Abstract

- Cross-linguistically, **infant-directed speech (IDS)** (e.g. Blount & Padgug 1977, Fernald & Simon 1984, Grieser & Kuhl 1988, Fernald et al. 1989, Kitamura et al. 2002, Liu et al. 2007) shows **prosodic phonetic modifications such as an expanded pitch range**

- **Hypothesis: prosodic modifications in IDS consistent not only with engaging the infant's attention, but also with signaling information structure relevant for IDS**

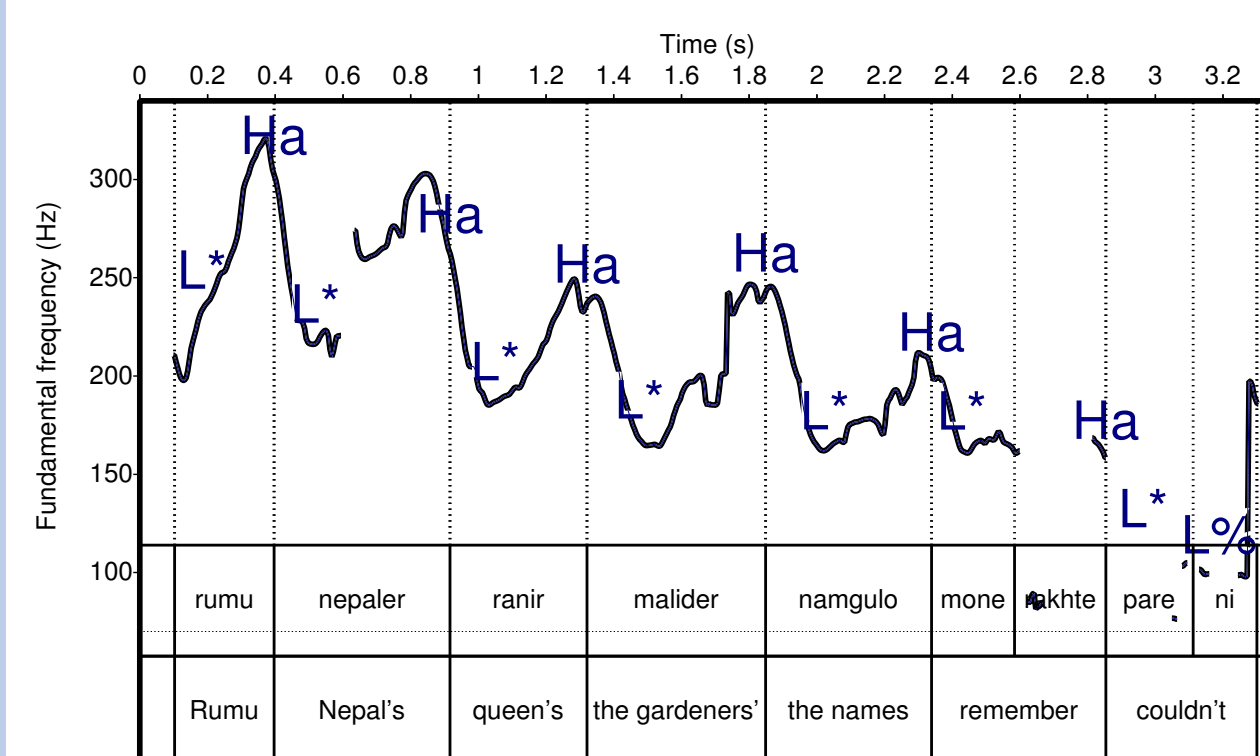
- Cross-linguistic analysis in **Bengali** and **English** to tease apart **language-specific prosodic correlates of information structure** from global prosodic modifications
- Focus on **phonological** intonational analysis to index information structure

Information structure via intonational phonology

- Reliance on **previous work** on Bengali (Khan 2008; to appear) and English (e.g. Beckman and Ayers Elam 1993, Pierrehumbert and Hirschberg 1990) ToBI in non-IDS speech **linking language-specific ToBI intonational categories and information structure**

Bengali

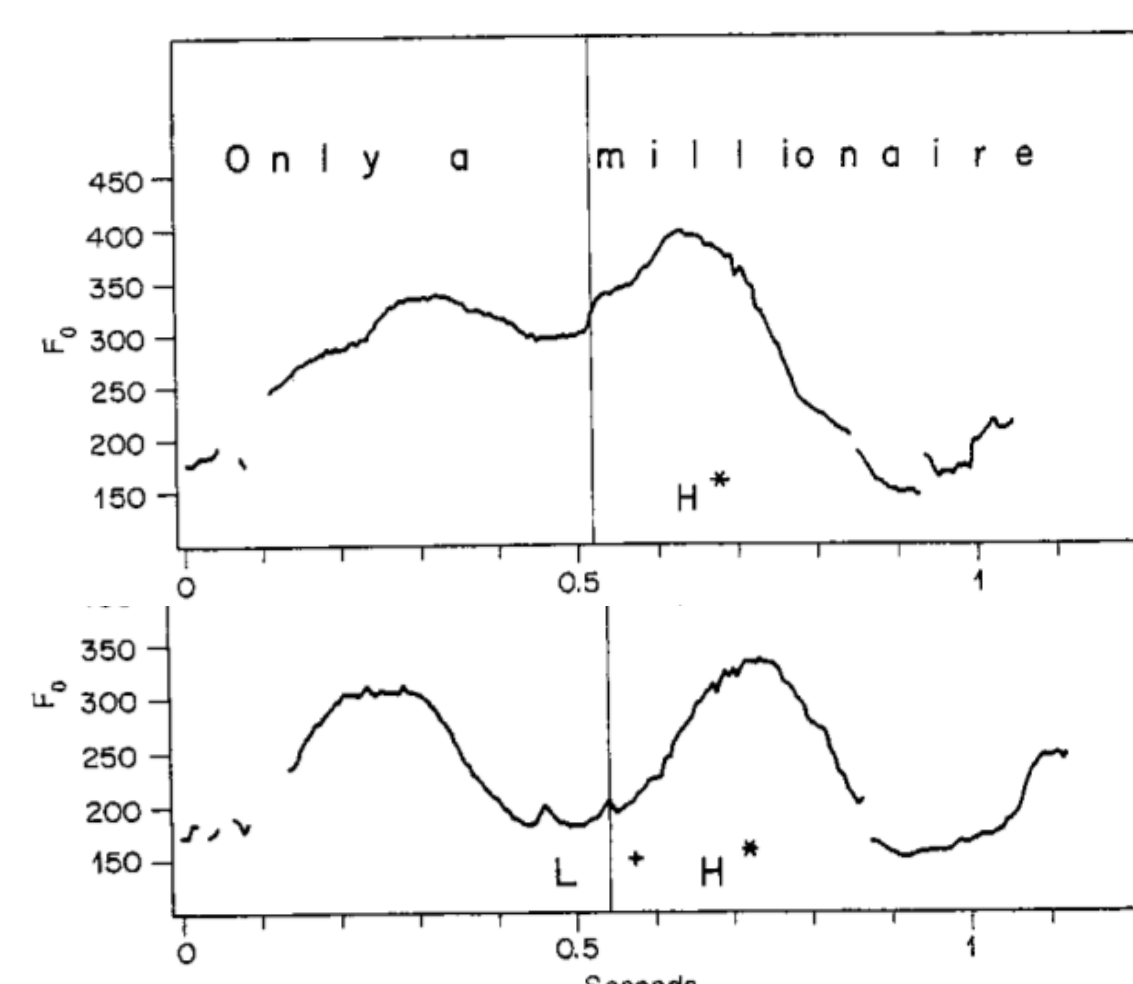
- **L*...Ha**: default pattern of successive rises (see fig. below)
- **L*+fH** and **fH*** mark focus/surprise
- Boundary tones include default **L%**, **topicalized HL%**, etc.



- Successive **L*...Ha** rises in Bengali lab speech (Khan 2008)

English

- **H***: default marker of salience in discourse
- **L+H*** and **L*+H** markers of focus/surprise
- Boundary tone inventory less rich than in **Bengali**



- **English** pitch accent (PA) types: **H*** (above), **L+H*** (below) (Pierrehumbert & Steele 1990)

Materials and Methods

Speakers and speech materials

- 10 speakers for each language (5M/5F)
- Parents of young infants/children
- Speech materials: **North Wind passage**—Aesop's fable
 - Standard language sample with **controlled pragmatic context across languages**
 - Suitable for laboratory speech and IDS elicitation

Recording procedure

- Three repetitions for each speech style (lab speech, IDS)
- **Lab (read) speech as control**: "Read at a comfortable pace"
- **Simulated IDS**: "Read as if speaking to an infant ($\approx 4-5$ months)"
- Subjects given stuffed toys; infants not in room to minimize audio interruptions

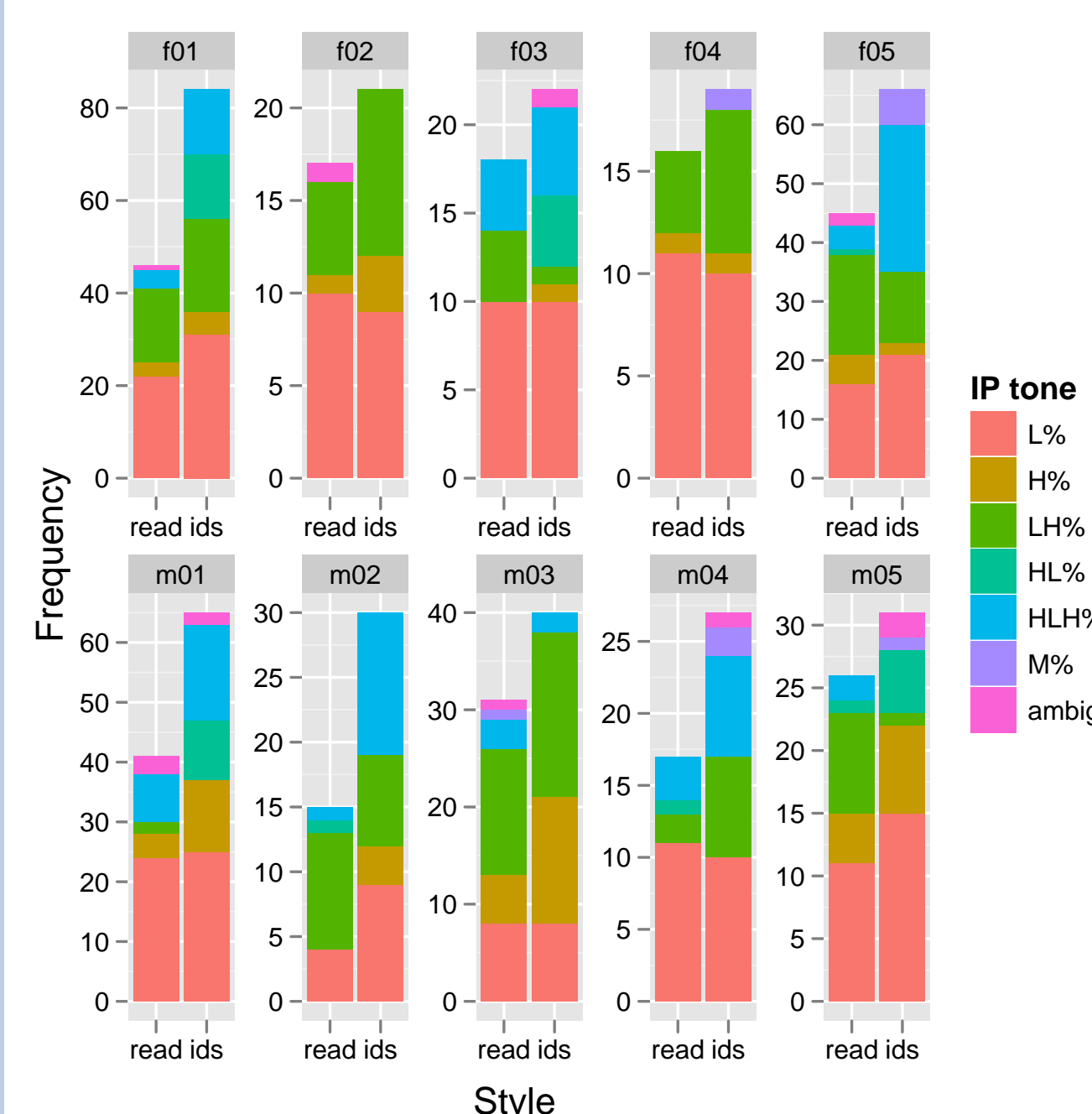
Intonational analysis

- Annotation in Praat with phonemic transcription, syllable boundaries
- **ToBI** annotation as a tool for analyzing intonational phonology

Results: prosodic modifications for engaging listener's attention

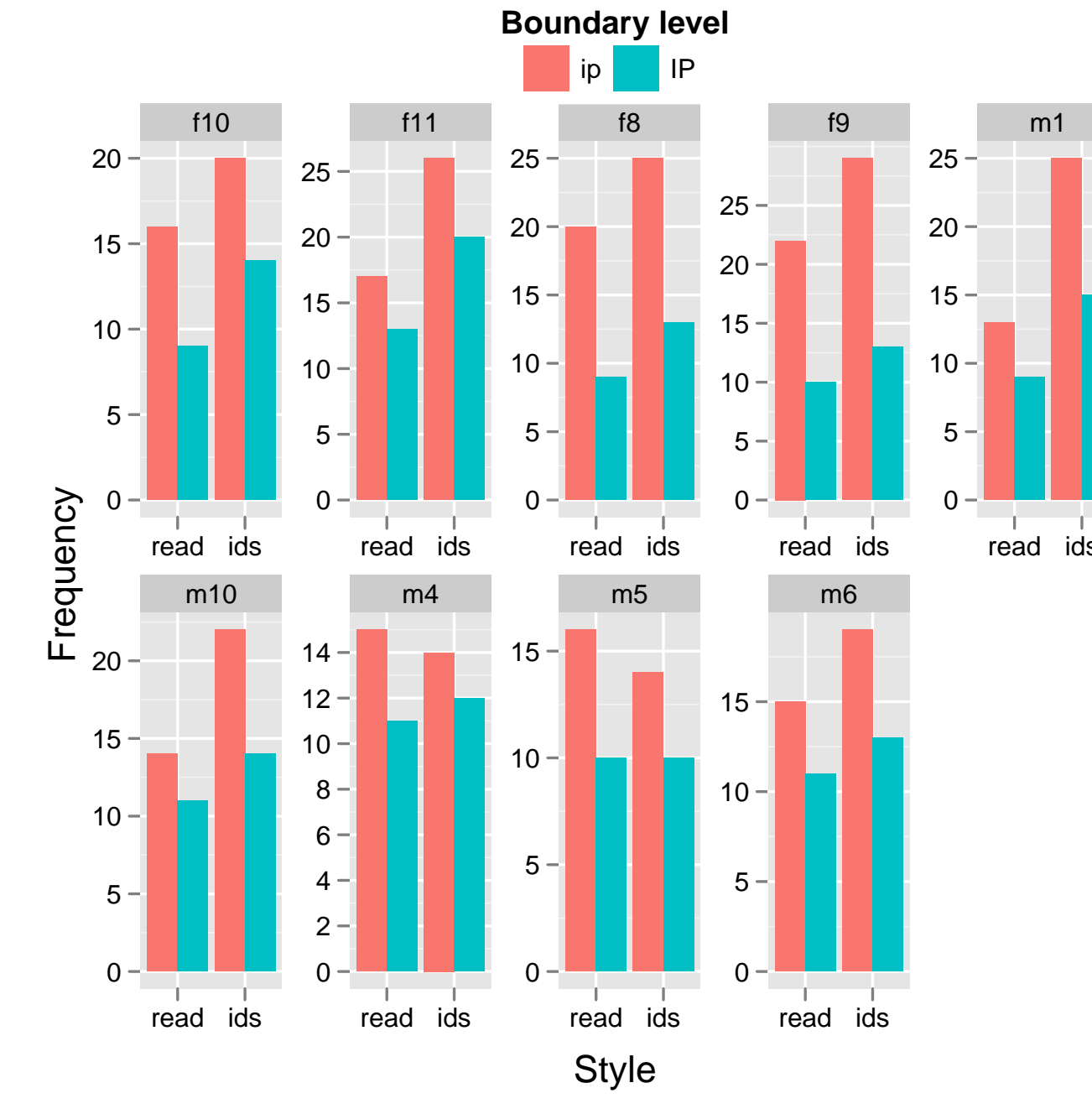
- **In both languages, parents reduced regularity of patterns of pitch variation in IDS**

Bengali



- 1.5 ± 0.3 times **more higher level boundary tones** and **increased variety of boundary types** disrupt regularity of rises in IDS.

English

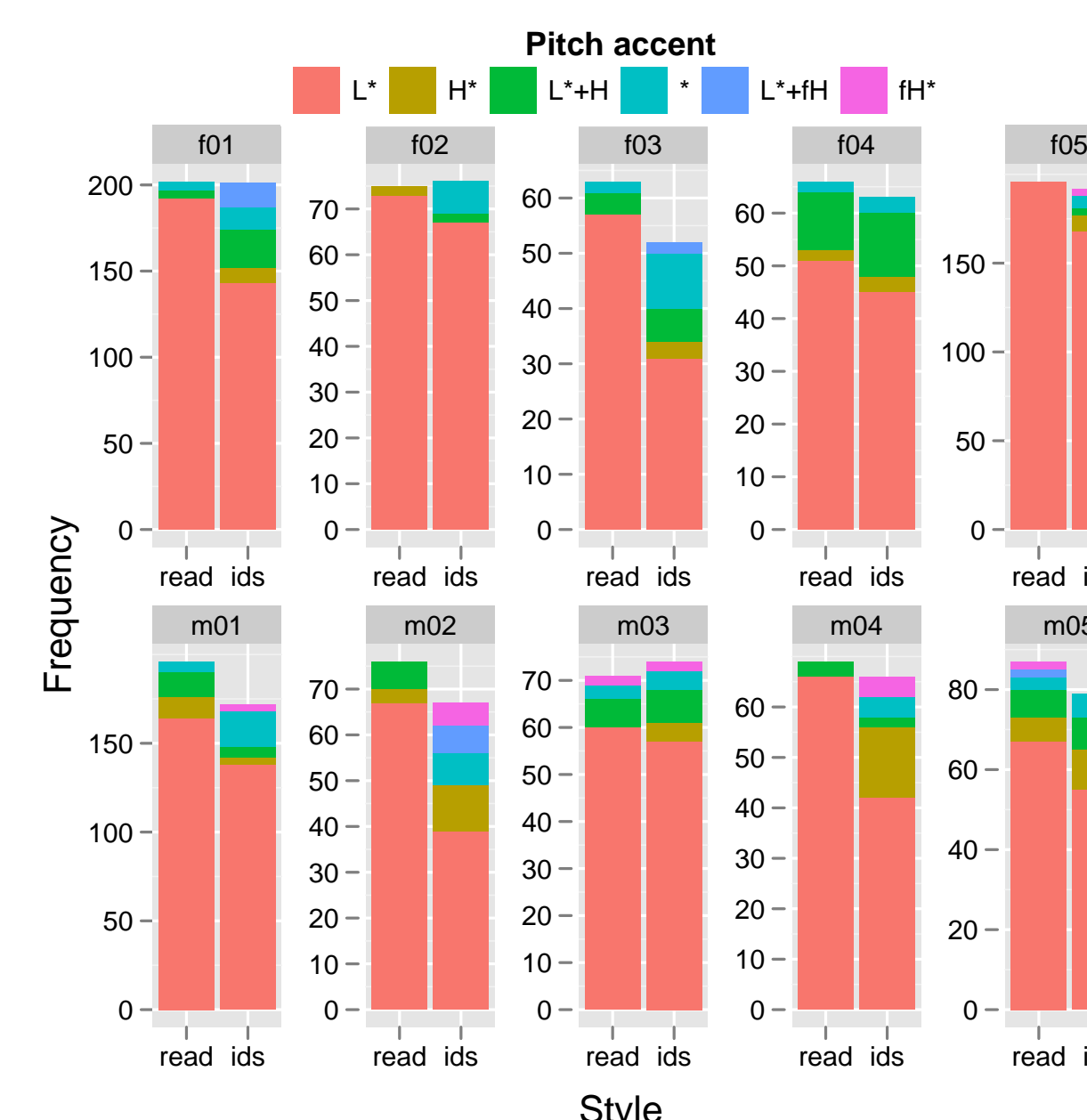


- 1.3 ± 0.3 times **more boundary tones** in IDS—more intermediate (ip) and high level (IP) breaks.

Results: changes in information structure in IDS

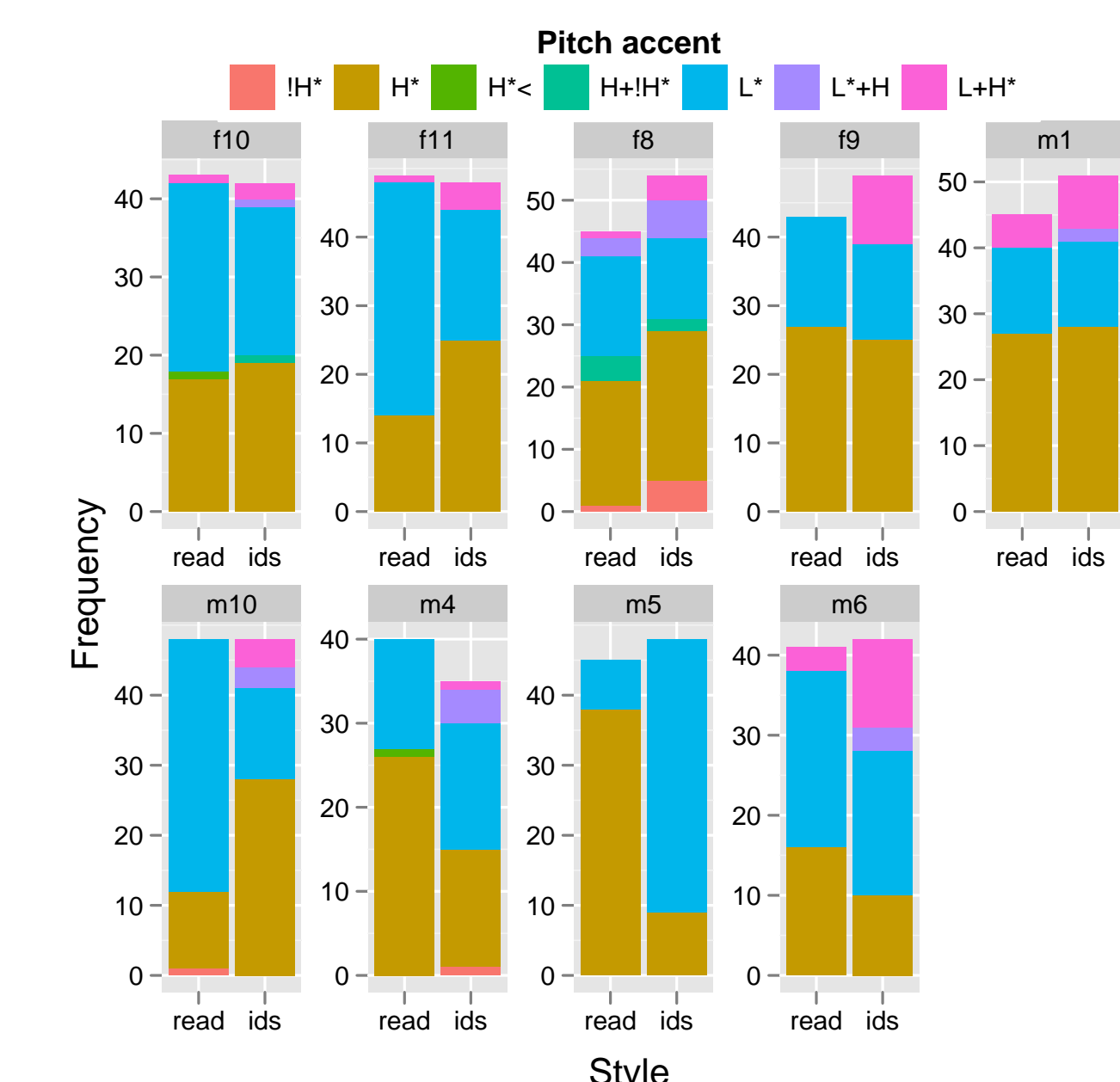
- **Parents also made language-specific prosodic modifications consistent with increase in topicalization, focus in IDS**

Bengali



- More **focus PAs**: **fH*** (**surprise**), **L*+fH** (**wh/corrective**)
- More HL%: boundary tones marking **topicalization**

English



- For most speakers, **more pitch accents**—more words marked as **salient in discourse**
- More **L+H*** and **L*+H**: pitch accents marking **focus/surprise**

Conclusions

- **IDS prosody showed language-specific modifications that both engage the listener and reflect the information structure relevant to IDS**

- Reduction in regularity of language-specific pitch variation in IDS **consistent with communicative goal of engaging infant's attention**
- Increase in language-specific intonational phonological units known to mark **focus/surprise** and **topicalization**

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