A longitudinal investigation of the acoustic properties of infant-directed speech to Norwegian 6–18-month-old infants

Audun Rosslund[1], Julien Mayor[2], Roger Mundry[3], Arun Prakash Singh[1], Alejandrina Cristia[4] & Natalia Kartushina[1]

[1]Center for Multilingualism in Society Across the Lifespan, University of Oslo; [2]Department of Psychology, University of Oslo; [3]Cognitive Ethology Laboratory, German Primate Center, Leibniz Institute for Primate Research, Göttingen, Georg-August-Universität Göttingen, Johann-Friedrich-Blumenbach Institute, Department for Primate Cognition, Göttingen, Leibniz ScienceCampus Primate Cognition, Göttingen; [4]Department of Cognitive Studies, Paris Sciences et Lettres University

The acoustic expression of caregivers' infant-directed speech (IDS) has been suggested to engage infants' attention and promote language acquisition (Golinkoff et al., 2015). Yet, IDS might differ across cultures, and longitudinal studies are sparse and conflicting with respect to whether IDS changes across development. Here, we addressed these issues by examining the longitudinal trajectory of a range of prosodic-segmental features of IDS, and compared these to adult-directed speech (ADS), in Norwegian parents of 6–18-month-old infants. Sixty-nine families participated in the study. Throughout five sessions across one year, parents were recorded reading a picture-book to their infant (IDS), and to an experimenter (ADS). The book was designed to control for the linguistic content and context of speech. Acoustic analyses of a total of 54,594 vowels and 22,958 phrases compared IDS to ADS. Results showed that, irrespective of infants' age, mothers and fathers used higher pitch, wider pitch range, slower articulation rate, and longer, more variable and less distinct vowels in IDS than ADS. Only fathers' IDS featured overall increased vowel spaces, an effect that might have been circumvented in mothers, who appeared to expand their vowel space in IDS with infants' age. As infants developed over one year, parents' IDS, compared to their ADS, featured a wider pitch range, larger vowel space areas, and shorter vowels, while pitch, articulation rate, and vowel variability and distinctiveness remained relatively stable. This suggests that Norwegian IDS follows similar characteristics as typically reported in the literature (Cox et al., 2020), but also corroborates findings that vowel categories are more variable and less distinct in IDS. Moreover, speech directed to Norwegian infants is expressed with some acoustic features that are dynamic across development, and others that are static. Future studies should examine whether observed trajectories of different acoustic measures impact the functions of IDS.