# Hypo- or Hyperarticulation? A closer look at infant-directed speech in German

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Infant-directed speech (henceforth: IDS) has been discussed to be clearly distinct from adult-directed speech. However, researchers do not necessarily agree on *how* the two registers differ. Broadly, two lines of arguments can be found. On the one hand, IDS is argued to enhance contrasts. Cross-linguistically, there is evidence for hyperarticulation, particularly for vowel quality (Kuhl et al., 1997; Liu et al., 2003; Weirich & Simpson, 2017) and VOT (Fish et al., 2017). The idea is that more distinct and hyperarticulated exemplars of a category are beneficial for learning contrasts. On the other hand, there is also evidence for hypoarticulation in IDS, both for the articulation of vowels and consonants (Sundberg & Lacerda, 1999; Englund & Behne, 2005; Synnestvedt, 2010; Narayan & Yoon, 2011; Benders, 2013; Benders et al., 2019). Possible explanations for these contradicting findings could be language-specific characteristics, the age of the child or other factors. An additional understudied problem is the fact that most infant-directed speech only addresses speech of *mothers*.

The present study on German IDS tries to shed light on these issues. Using a picture description task, the infant- and adult-directed speech of five mothers and fathers at two points in time were recorded. During the first recording the child was 8 months old while it was 13 months old at the time of the second recording. A fully balanced item set of initial fortis and lenis stops [p, t, k, b, d, g] was investigated followed by three vowel qualities [a, i, ʊ] to study changes of several aspects in German IDS.

The data, which was analyzed by means of linear mixed effects models, replicated well-known findings for increased F0 in IDS (e.g. Fernald & Simon, 1984). Fortis and lenis stops in German are distinguished by VOT and this contrast is hypoarticulated in IDS. Analyses of the temporal organization of the CV-sequence revealed that vowels become relatively longer and consonants become shorter while the overall duration of the sequence remains stable. The data shows that vowels are also qualitatively hyperarticulated (Kuhl et al., 1997; Weirich & Simpson, 2017, McMurray et al., 2013). It appears that for some variables, fathers display the difference in IDS only at a later point in time.

It turned out that there is hyperarticulation with regard to F0 and the vowel quality and duration whereas the consonant quality and duration are hypoarticulated. The present study shows that previous literature on hyper- and hypoarticulation may partially be explained by an age- and sex-specific attention shift towards the unit of interest. Thus, while some former studies have been assumed to contradict each other (Baran et al., 1977; Sundberg & Lacerda, 1999; Sundberg, 2001; Englund, 2005; Burnham et al., 2013), it may have been the case that a general hyper- or hypoarticulation is a somewhat simplified view on IDS. Instead changes in IDS are best explained by attention shift to segments (Benders et al., 2019), which may be of special interest to the learning child at that specific time. It is supposed that language acquisition needs to be seen as a dynamic process and parents may adjust to the age-specific needs of their child accordingly.

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