

Acoustic features of vowels in mothers' speech to their infants between 4–13-month infants, in relation to phonological abstraction and receptive vocabulary

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The speech directed toward infants is a key contributor to their language development. This study concerns the possible relationship between caregivers' vowel productions in Infant-Directed Speech (IDS) and infants' phonological abstraction and/or vocabulary development. Specifically, we examined whether mothers' productions of the corner vowels, /i, u, a/ in IDS to their infants at 4, 7, 10, and 13 months displayed (i) acoustic hyper-articulation, i.e., greater F1/F2 vowel triangle area circumscribed by the centroids of the three vowels (e.g., Kuhl et al., 1997), in IDS than in their Adult-Directed Speech (ADS) and/or (ii) greater hyper-dispersion, i.e., greater dispersion of tokens within each of the three vowels (e.g., Cristia & Seidl, 2014), in IDS than in ADS. These IDS vs ADS vowel characteristics were then compared with a measure of infants' early phonological abstraction at 4, 7 and 10 months (Altuntas et al., submitted 2023), and of infants' receptive vocabulary (Jones et al, 2022; Kalashnikova, Schwarz & Burnham, 2016) at 13 months. There was greater dispersion in IDS than ADS for all three vowels across all four ages (except /u/ at 7 months) but, despite shifts in the positions of IDS vowels over age, vowel hyper-articulation was only present in IDS to 7-month-olds. Neither hyper-articulation nor hyper-dispersion in IDS predicted infants' receptive vocabulary at 13 months, but there was a significant correlation between infants' phonological abstraction at 4 months and mothers' hyper-articulation at 7 months suggesting that early phonological ability may be associated with their later responsiveness to IDS vowel differentiation around the period (7 to 10 months) when perceptual attunement to native vowels emerges (e.g., Polka & Werker, 1994). These results suggest there may be a hitherto unexamined relationship of early phonological abstraction with later IDS vowel qualities, and even with later perceptual attunement, a possible relationship that begs further investigation.