Developmental Trajectory for Production of Prosody: Lexical Stress Contrastivity in Children 3 to 7 Years and Adults

K. Ballard, D. Djaja, J. Arciuli, D. James, J. van Doorn

Accurate production of lexical stress within English polysyllabic words is critical for intelligibility. While stress production is affected in most speech-language disorders and in foreign language learners, cognitive and computational models of speech production remain underspecified with regard to lexical stress. This study reports a large-scale acoustic investigation of lexical stress production in healthy English-speaking children from 3 to 7 years (n=73) compared to adults (n=24). Participants named pictures of prototypic strong-weak and weak-strong polysyllabic words. Of 388 productions, 325 met criteria for acoustic measurement. Vowel duration, peak intensity and peak fundamental frequency (f_0) for the first two syllables were used to compute pairwise variability indices of stress contrastivity. Stress was marked consistently by duration and intensity, but not f_0. Production of stress on strong-weak words was mastered by 3 years but, for weak-strong words, continued past 7 years. The different developmental trajectories for SW and WS lexical stress production may be due to physiological constraints on producing short articulatory durations and rising intensity contours rather than lack of familiarity with the less common weak-strong stress pattern in English. These findings will assist interpretation of performance in children with dysprosody.