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Development of vowel acoustics and subglottal resonances in American English-speaking children: A longitudinal Study

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Vishwas Shetty

• Elec. Eng., Univ. of California at Los Angeles, 66-147E Engr. IV, 420 Westwood Plaza, Los Angeles, CA 90095,
shettyvishwas@ucla.edu

Steven M. Lulich

View Contributors



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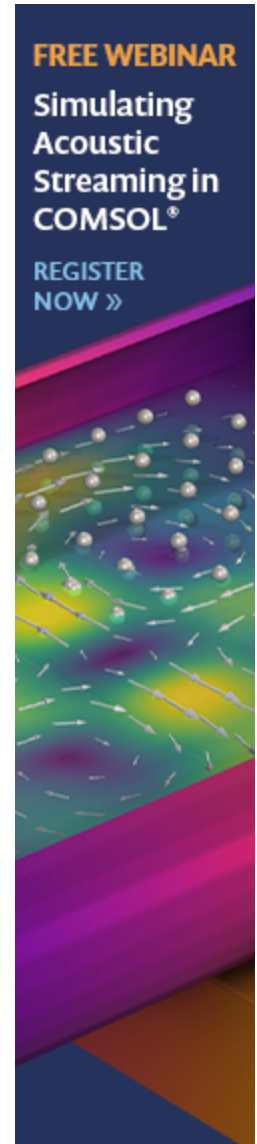
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ABSTRACT

Acoustic analysis of typically developing elementary school-aged (prepubertal) children's speech has been primarily performed on cross-sectional data in the past. Few studies have examined longitudinal data in this age group. For this presentation, we analyze the developmental changes in the acoustic properties of children's speech using data collected longitudinally over four years (from first grade to fourth grade). Four male and four female children participated in this study. Data were collected once every year for each child. Using these data, we measured the four-year development of subglottal acoustics (first two subglottal resonances) and vowel acoustics (first four formants and fundamental frequency). Subglottal acoustic measurements are relatively independent of context, and average values were obtained for each child in each year. Vowel acoustics measurements were made for seven vowels (i, ɪ, ε, æ, ʌ, ɑ, u), each occurring in two different words in the stressed syllable. We



investigated the correlations between the children's subglottal acoustics, vowel acoustics, and growth-related variables such as standing height, sitting height, and chronological age. Gender-, vowel-, and child-specific analyses were carried out in order to shed light on how typically developing speech acoustics depend on such variables. [Work supported, in part, by the NSF.]



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