

Vocal Tract Area Functions for Child Talkers

Brad H. Story and Kate Bunton

The purpose of this study was to measure vocal tract area functions for vowels and vowel sequences produced by children. Direct measurement of vocal tract area functions requires 3D volumetric imaging of the head and neck region. These procedures can be demanding and intimidating for children. As an alternative, we are using a technique reported in Story (2006) in which acoustic sensitivity functions are used to incrementally perturb a vocal tract shape until the resonant frequencies match the target formant frequencies. In the present study this technique is used in an attempt to generate area functions with only limited a priori knowledge of the overall vocal tract configuration. The feasibility of this method was reported in Bunton et al. (2013), and the current study expands this work to include multiple children 3 to 6 years of age and ten American English vowels.