Effects of speaking rate on the control of vocal fold vibration: Clinical implications of active and passive aspects of devoicing

Abstract

Stevens (1991) has suggested that, while speakers control glottal apertures in producing consonants, the buildup on intraoral pressure during an oral closure creates decreases in transglottal flow, which can, in itself, reduce or halt vocal fold vibrations. The object of this study was to determine whether speakers can take advantage of such pressure effects in controlling the voicing attributes of intervocalic stops. Intraoral pressure, vocal fold vibration (Lx portions of electroglossograms), and electromyographic (EMG) activity of the orbicularis oris inferior were monitored for 6 subjects while they produced at “slow,” “normal,” and “fast” speaking rates utterances containing intervocalic stops /p/ and /b/. Product-moment correlations between the intervocalic pressure rises and the amplitude contour of Lx showed strong negative relationships at normal-to-fast rates of speech. However, this relationship was not maintained at slower rates, where decreases in the amplitude of Lx sometimes occurred before the onset of EMG activity in the labial adductor. The findings suggest that, at normal to fast rates of speech, speakers can use the passive effects of pressure in controlling vocal fold vibration for stop consonants.