ABSTRACT

BACKGROUND: Motor speech disorders resulting from progressive brain disease, stroke, or traumatic brain injury are often confounded by a pervasive impairment in somatosensory function which may go largely undetected.

OBJECTIVE: To develop/test an automatic vibrotactile assessment system, based on an adaptive threshold tracking algorithm, suitable for human subjects across the lifespan.

METHODS: A single-interval up/down (SIUD) adaptive procedure (Lecluyse & Meddis 2009) was coded into our VIBROS software to create automatic threshold tracking of vibrotactile stimuli across a range of test frequencies (5, 10, 50, 150, 250, and 300 Hz) on the glabrous surface of the index finger and nonglabrous surface of the oral angle in 42 neurotypical adults.

RESULTS: A two-way ANOVA revealed the factors **skin site** and **test frequency** were both highly significant ($p < .001$) determinants of vibrotactile sensitivity.   Thresholds were higher for the oral angle compared to the finger. The classic 250 Hz 'dip' characteristic of the glabrous hand, was absent in perioral skin consistent with the lack of Pacinian corpuscles.

CONCLUSION: The speed of the SIUD adaptive tracking algorithm (4-minutes/site) opens new possibilities for efficient assessment of the somatosensory system as a function of disease/injury state, pharmacologic or neurosurgical intervention, and adaptive plasticity during behavioral therapy.