4. Investigating Prosody in Congenital and Acquired Dysarthria Using the Prosodic Marionette Computer Interface
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Purpose: The purpose of this study was to investigate how individuals with acquired dysarthria (AQ) and congenital dysarthria (CG) reproduce prosody (pitch, duration, loudness) using speech and non-speech means.

Methods: There were 11 participants: 5 with CG, 3 with AQ, and 3 healthy controls (HC). Participants completed two tasks: (1) vocal imitation of target prosody and (2) non-vocal reconstruction of prosodic targets using the Prosodic Marionette (PM). The PM interface allows users to manually move icon word blocks on a computer screen to resynthesize utterances to match the target sentence prosody. Audio samples were analyzed for the mean fundamental frequency for each word and for the final phrase boundary contour. The target sentences had four forms: semantic declarative, semantic interrogative, focus word 2, or focus word 4.

Results: The results showed the HC performed as expected for all sentences except the focus word 4. AQ followed the correct prosody pattern for all sentences, but was reduced when compared to HC. CG rarely changed fundamental frequency for focus word 2 and focus word 4 sentences. CG had a rising contour for interrogative sentences, but not to the extent of AQ or HC. CG had a slight rising contour for declarative sentences, unlike AQ and HC who both had the expected falling contour.

Conclusions: The PM was successful towards assessing perception and production of prosody in individuals with and without speech impairments. The PM could potentially be used as a tool for intervention and rehabilitation.