

## **ABSTRACT**

Title: A Pause Marker to Discriminate Childhood Apraxia of Speech from Speech Delay

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Analytic frameworks are needed for pathway modeling of genomic, neuroimaging, and speech motor findings in speech sound disorders, including research in Childhood Apraxia of Speech (CAS). We describe a generic, seven-element speech processing framework to address this need. Literature samples from CAS research support the content validity of the framework.

Single-sign behavioral markers of complex neurodevelopmental disorders have conceptual and psychometric advantages over multi-sign (checklist) and endophenotype inclusionary criteria. In the second section, we describe a single-sign marker of CAS, the Pause Marker (PM). Diagnostic accuracy estimates reported for the PM were obtained from conversational speech samples from 291 speakers: 225 participants, ages 3 to 9 years, with Speech Delay; 40 participants, ages 3 to 50 years, with idiopathic or neurogenetic CAS; and 26 participants, ages 45 to 84 years, with adult-onset Apraxia of Speech or Primary Progressive Apraxia of Speech.

In the third section, we interpret PM findings for participants with CAS as consistent with deficits in planning, programming, and feedforward speech processes. We posit that the PM meets the need for a speech event to study the neural correlates of the 'moment' of apraxia, much as dysfluencies provide event markers for in silico and other methods in stuttering.