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## Assessments of Childhood Apraxia of Speech Disorder

Emily L. Teelucksingh  
*Indiana State University*

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**Research Proposal:**

**Assessments of Childhood Apraxia of Speech Disorder**

Emily L. Teelucksingh

Indiana State University

CD 303 Psycholinguist for Communication Specialists

Margaret Hill, PhD

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### ***Introduction***

Speech communication is important for every human being. Whether the communication is verbal or non-verbal, everyone goes through a specific process to formulate speech. The specific process is known as the speech chain model. As the speaker, the speech communication chain consists of six stages. These are intention, meaning, utterance, articulatory planning, articulatory production, and sound. As the listener, the speech communication chain continues with the auditory response, word sequence, meaning, and then understanding the information that was received. To put this in play, an idea or thought is formed first. The brain then assigns meanings to words and the brain categorizes those words through the mental lexicon. After those words have been assigned, the brain starts planning how to produce thoughts. The brain then sends those plans to the articulatory muscles and produces phonetic sounds to form a meaningful sentence (Denes & Pinson, 1993).

### ***Defining Apraxia of Speech***

Apraxia of speech (AOS) is a speech sound disorder that specifically affects the articulatory production and muscle movement stages of the speech chain model. AOS is separated into two categories. The first category is known as acquired apraxia of speech. This type of apraxia is when someone has developed apraxia over the course of their life due to different damages to the brain. We know that this can be due to experiencing a stroke, traumatic brain injury, or other forms of medical illness. Acquired AOS affects all subdomains of speech in an adult (Ballard et al., 2015).

The second category is known as childhood apraxia of speech (CAS). We don't know the cause of CAS as children who are born with apraxia are diagnosed later when they begin showing signs of CAS during speech development. However, research shows that there is

significant evidence that AOS in children can be from family shared genetics or other genetic causes and medical conditions such as autism spectrum disorder, epilepsy, fragile X syndrome, or other genetic abnormalities (University of Washington et al., 2016).

Specifically focusing on children diagnosed with childhood apraxia of speech (CAS), they are able to form an idea and plan for production, but there is an error in how the brain tells the articulatory muscles to move. According to the American Speech-Language-Hearing Association or ASHA, the prevalence of children diagnosed with CAS is one to two in 1,000 children (American Speech-Language-Hearing Association, n.d). The purpose of this proposal is to explore a proposed study in children with CAS and use the following results to determine an effective course of treatment for children diagnosed with CAS.

### ***Method***

#### ***Participants***

Fifty children of male and female gender between the ages of two and six years will participate in this study. All children must meet the following requirements: native English speaking, normal hearing, and no sign of traumatic brain injury or any other acquired damage to the brain. The fifty children will be diagnosed with childhood apraxia of speech by a speech and language pathologist in a clinic setting.

#### ***Procedures***

There are a total of two methods that are used in this study. The first method is a take-home speech production assessment the parents are provided with and are required to fill out over the course of three days. A recording device will also be provided to the parent to record the speech production assessment. The purpose of this speech production assessment is to identify if the child has any abnormality in imitative response and speech production.

The second method used in this study is the Kaufman Speech Praxis Test (KSPT). The KSPT is an easy to administer and norm-referenced test that identifies and treats childhood apraxia of speech in children ages two to five years and eleven months. A speech-language pathologist will administer this test to the children in a clinic setting. The purpose of this test is to identify, assess, and treat motor speech functions, oral production, connected speech, and characteristics of speech by imitation of the administer. Other information that will be assessed consists of four categories focusing on oral movement and production, isolated vowels/vowel production and consonant production, complex words, and spontaneous speech. Predicted outcomes of this test describe the child's imitative response to the administer, identification of the child's speech system broken down, the ideal course of treatment, and progress in speech and motor development (Gubiani et al., 2015).

### ***Materials***

For the first method, participants will complete a recorded speech production assessment in a natural and comfortable home setting over the course of three consecutive days. It is important that these days are consecutive to give a natural daily routine to evaluate a child's progress and provide adequate results within the given timeline. This will give the speech-language pathologist an idea of where to start treatment based on how the child breaks down the sound of words. Parents of participants will be provided one recording device and a booklet for each day that includes two different categories. The first category is a set of eight words and seven strings of words. The parents are asked to verbally produce the target word or string of words to the child and have them verbally produce it back. This is to evaluate the child's imitative response of the parent and speech production. The second category consists of questions that ask the parent to determine whether their child unsuccessfully or successfully

verbally produced the target word or string of words back to them and is asked to determine the difficulty of production. The target word or string of words can be attempted three times before formulating a result.

The difficulty scale is as follows:

1. Very Successful (first attempt with correct production)
2. Somewhat Successful (first or second attempt with some error in production)
3. Somewhat Unsuccessful (second or third attempt with multiple errors in production)
4. Very Unsuccessful (third attempt with unsuccessful production)
5. Undetermined (Could not formulate a result)

For the second method, a speech-language pathologist will administer the Kaufman Speech Praxis Test on the participants in a clinic setting. The KSPT includes a test booklet that is used for the assessment and then a follow-up assessment. During this assessment, the child will be asked to combine consonants and vowels to form words. There are 225 visual stimulation cards that focus on specific consonants, vowels, and blocks of speech. The child will be assessed on their production of /m, t, b, d, h, n, w, p/ target sounds, vowel-consonant production, consonant-vowel production, consonant-vowel-consonant production, and vowel-consonant-vowel production (Northern Speech Services, n.d.).

### ***Evaluation***

For children with CAS, their speech production is inconsistent. Speech-language pathologists can create target goals for children and treat for articulation structure issues and speech production. This is important because communication is essential for language development. In class, it was important to understand that children with CAS don't have

weakness or have difficulty talking or moving muscles of the mouth. The parts of the brain that plan and program and send messages to those muscles don't work as effectively as they should. It was also learned that childhood apraxia of speech disorder is important for communication sciences and disorders. As a speech-language pathologist, it is essential to diagnose and assess children with CAS to determine the best course of treatment depending on the severity of the client. Many specialized methods such as differential diagnosis, evidence-based treatment, DTTC, AAC, etc. are available to treat motor speech disorders. With the determined results of a child with CAS, the appropriate course of treatment can improve verbal communication in children immensely.

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