

# Treating apraxia in children with autism: effects of using prompt and pecs



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## **Abstract**

Autism Spectrum Disorder (ASD) and Childhood Apraxia of Speech (CAS) are different diagnoses that present with similar characteristics. While children with ASD and CAS have different interventions, there may be an advantage in treating them together. The purpose of this research paper is to assess whether children with ASD and CAS can benefit from the use of both Picture Exchange Communication System (PECS) and Prompts for Restructuring Oral Muscular Phonetic Target (PROMPT).

## Introduction

Childhood Apraxia of Speech (CAS) and Autism Spectrum Disorder (ASD) are two distinct disorders. CAS is a motor speech planning and/or programming disorder characterized by reduced volitional movements of the articulators in the absence of neuromuscular deficits (Teverovsky, Bickel, & Feldman, 2009). ASD is identified as a neurodevelopmental disability with social communication difficulties and the restricted and/or repetitive behaviors. Children with ASD and CAS seem to present co-occurring verbal and non-verbal behaviors (Chlebowski, Green, Barton, & Fein, 2010). Despite existing research studies, testing for CAS in children with ASD may benefit in creating an effective treatment for facilitating communication. Nonverbal children with autism with/without childhood apraxia of speech may benefit from using both Picture Exchange Communication System (PECS) and Prompts for Restructuring Oral Muscular Phonetic Target (PROMPT) (Shriberg, et al., 2017).

## Childhood Apraxia of Speech

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CAS is a neurological disorder in which speech movements are impaired without any muscular deficits in the articulators. In other words, the brain does not send signals to the articulators when movement is required. According to the American Speech-Language-Hearing Association (ASHA, 2007), children with CAS know what they want to say but cannot communicate that information to muscles in their articulators. This is often misrepresented as reduced intelligibility and comprehension (Teverovsky, Bickel, & Feldman, 2009). CAS is a complex and multifaceted disorder which impairs learning and cognition, behavior, oral motor, and social abilities. The ability to sequence movements required for speech production is compromised. This leads to speech characterized as abnormal prosody, reduced articulatory accuracy as speaking rate increases, poor coarticulation, and increased speech errors (Teverovsky, Bickel, & Feldman, 2009).

Characteristics of CAS vary throughout childhood development. Symptoms can be seen in the beginning of infancy with limited, and in some cases no, canonical babbling and few variegated babbling during the child's first year. During the second year, there is slow and gradual expansion of the lexicon, difficulty combining sounds, delayed first words, and substitution or deletion of phonemes (Terband, Maassen, Guenther, & Brumberg, 2009).

Differential diagnosis for CAS, or a key diagnostic factor for CAS is "inconsistent errors of consonants and vowels in repeated productions of syllables or words and lengthened, disrupted coarticulatory transitions between sounds and syllables, and inappropriate prosody, especially in the realization of lexical or phrasal stress" (ASHA, 2007). Other symptoms of CAS <https://assignbuster.com/treating-apraxia-in-children-with-autism-effects-of-using-prompt-and-pecs/>

include physical groping of the articulators in the effort of producing speech. These characteristics of CAS leaves may result in an increased risk for expressive language difficulty and decreased phonological fundamentals required for literacy. This can lead to a delay in language development and fine motor movement and/or coordination deficits (Terband et al., 2009).

While CAS can be identified in individuals who have inconsistent speech errors and physical groping, providing a diagnosis may be difficult due to the lack of diagnostic testing available. "...There is no accepted, operationally defined, diagnostic testing protocol or clinically available and validated set of behavioral features with greater than 90% sensitivity and specificity, discriminating CAS from other expressive communication disorders" (Murray, McCabe, Heard, & Ballard, 2015). While there is no official testing protocol, ASHA provided a technical report regarding diagnosing CAS by determining specific characteristics that a child presents with. These characteristics are characterized by inconsistent errors in consonants and vowels during repeated productions of syllables or words, complex coarticulatory transitions between sounds and syllables, and inappropriate prosody (ASHA, 2007). Another resource used for diagnosing CAS is *Strand's 10-point checklist*. This checklist helps in assessing various segmental and suprasegmental features in the child (Murray et al., 2015). Genetic disorders or syndromes and brain injury are some possible causes of CAS however there is no widely known cause (Shriberg, et al., 2017).

Treatment of CAS typically focuses on enabling communicative modalities, language skills, and speech production. An effective treatment approach for CAS is Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT). <https://assignbuster.com/treating-apraxia-in-children-with-autism-effects-of-using-prompt-and-pecs/>

PROMPT uses tactile cues to aid in re-establishing the articulatory motor control used for speech production. Hayden & Square (1994) developed a Motor Speech Hierarchy (MSH) to improve speech motor control and development. The MSH is organized based on the development and use of articulators such as larynx, mandible, and lingual system (Tarshis, Rodriguez, & Seijo, 2007). Treating CAS with PROMPT and MSH consists of seven stages which include: general body tone, phonation, vertical plane movements (jaw), horizontal plane movements (lip retraction and rounding), anterior-posterior, superior-inferior trajectories (tongue), temporal coordination of multiple planes, and normalized prosody. Through PROMPT, the clinician provides tactile pressure with kinesthetic and proprioceptive cues (TKP) to guide the child's articulators during speech production. This hands on intervention assists in reshaping the individual and coarticulated parts of speech while limiting unnecessary movements (Hayden, & Square, 1994).

### Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disability where individuals present with deficits in social communication and interaction along with restricted and/or repetitive behaviors. Detecting ASD begins in infancy with characteristics including but not limited to lack of eye gaze, delayed onset of babbling, reduced recognition of mother's voice, and decline or absence of prespeech gestures (i. e. pointing, waving) (Johnson & Myers, 2007). Symptoms of ASD include pragmatic deficits, lack of drive to communicate, inappropriate reciprocal communication, poor prosody, and limited vocabulary. Phonological development consists of motor planning difficulties, oral motor dysfunction, limited speech output, atypical

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vocalizations, and phonological processes. Additionally, shifting from one activity to another may be difficult for individuals with ASD. Individuals with ASD often presents with impaired joint attention, hyper- and/or hyposensitivity to sensory input, and struggles in verbal and nonverbal communication (Chlebowski, Green, Barton, & Fein, 2010).

Children with ASD exhibit deficits in social interactions and connecting with others. They often desire being alone as there is no need for eye contact, gestures, or vocalizations. This isolation leads to difficulty in cooperating with peers in group and single settings. Labeling objects is rarely seen in children with ASD, with the exception of high-functioning individuals. However, while labeling using pointing may be done, it is often without intention or motivation. Children with ASD lack orientation to stimuli or turning to respond to a given stimulus, such as reacting to his/her name. This lack in social development makes it challenging for children with ASD to create and maintain relationships with peers (Johnson & Myers, 2007).

While there is not one test to confirm an ASD diagnosis, the Childhood Autism Rating Scale (CARS) is widely used as a diagnostic tool. CARS assesses behaviors and helps in recognizing individuals who are suspected to have ASD. Supposed causes of ASD are genetic problems or syndromes, brain infections, and/or exposure to toxins during uterine development (Chlebowski, Green, Barton, & Fein, 2010).

Picture Exchange Communication System (PECS) is a well-known treatment for individuals with ASD. PECS was developed by Andrew Bondy and Lori Frost in 1985 as a behaviorally based pictorial communication system used

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to train individuals to request and comment to a communicative partner using pictures (Bondy & Frost, 1993). This technique gradually progresses from using single word utterances to sentence production. In the advanced phases, PECS teaches individuals how to answer questions and ultimately, comment.

PECS consists of six-phases, beginning with verbal prompts and reinforcements.

In phase, children learn to exchange a single picture for a specific desired or targeted item. Phase two consists of children continuing to exchange a single picture throughout a variety of environments amongst different communicative partners. In phase three, the selection increases from one to two or more pictures. These pictures are stored in a communication book where Velcro strips allow for easy removal during communication. Phase four continues with learning to construct simple sentences using the detachable Velcro sentence strip with an " I want" picture followed by a picture of the desired or target item. Children learn to expand sentence structure with verbs, adjectives, and prepositions (Preston & Carter, 2009).

In phase five, the client is encouraged to answer " What do you want?" questions using a selection of picture cards. The PECS intervention concludes with phase six where the client uses picture cards to comment in response to questions such as, " What do you see?", " What do you hear?", and " What is it?". In this last phase, children learn to comment and create sentences using phrases such as " I see", " I feel", " It is a", etc. (Preston & Carter, 2009). PECS is a useful intervention for children with ASD because it does not require any

prelinguistic skills such as eye contact, gestures, and/or verbal imitation.

PECS has also been seen to enhance expressive communication abilities by reinforcement and generalization (Flippin, Reszka, & Watson, 2012).

### Childhood Apraxia of Speech and Autism Spectrum Disorder

There is evidence that CAS may be the cause for the absence of and/or or delayed speech development in some children with ASD. Specifically, three areas of conceptual and empirical perspectives – motor skills, genomics, and phenotypic similarity – support this hypothesis (Shriberg, Paul, Black, & van Santen, 2011). Similarly to children with CAS, individuals with ASD have difficulties with repetitive speech tasks and with a range of motor skill performances. Regarding genetics, FOXP2, a protein that is required for development of speech and language, has been widely studied and associated with ASD. This transcription gene is the only one that is associated with CAS. Phenotypically, individuals with low and high verbal ASD demonstrate similar speech characteristics such as speech, prosody, and voice, to those with CAS (Shriberg, Paul, Black, & van Santen, 2011).

Cheryl Tierney, from the Penn State Milton S. Hershey Medical Center, conducted a three-year study with 30 children between the ages of 15 months and 5 years. Results showed that 63. 3% of children initially diagnosed with ASD also had a diagnosis of CAS and 36. 8% of children initially diagnosed with CAS and ASD (ASHA Leader, 2015). These findings exhibit the need for continued screenings for children with CAS and ASD in order to provide them a better chance of receiving appropriate intervention. While CAS and ASD have different interventions strategies, making a correct



diagnosis is important for preventing long-term problems as there is evidence to suggest that these two disorders frequently coincide (ASHA Leader, 2015).

## Conclusion

PECS and PROMPT have been successfully used in individual treatment for children with either ASD or CAS. However, PROMPT and PECS demonstrate many similarities which provide reason for these interventions to be used in conjunction. While PECS reinforces verbal speech, PROMPT uses TKP methods to aid in the production of sounds and words (Shriberg, Paul, Black, & van Santen, 2011). These interventions both provide treatment using structure and hierarchy which gradually teaches skills in verbal communication. Using PROMPT and PECS may considerably improve communicative functions in and out of therapy, augment and enhance treatment for children with ASD and CAS, and improve quality of life (Shriberg, Paul, Black, & van Santen, 2011).

## References

- American Speech-Language-Hearing Association. (2007). Childhood apraxia of speech [Technical Report]
- Apraxia a common occurrence in autism, study finds. (2015). *The ASHA Leader*, 20 (9), 18-18
- Bondy, A. S., & Frost, L. A. (1994). The picture exchange communication system. *Focus on Autistic Behavior*, 9 (3), 1-19.

- Chlebowski, C., Green, J. A., Barton, M. L., & Fein, D. (2010). Using the childhood autism rating scale to diagnose autism spectrum disorders. *Journal of Autism and Developmental Disorders, 40* (7), 787-99.
- Flippin, M., Reszka, S., & Watson, L. R. (2010). Effectiveness of the picture exchange communication system (PECS) on communication and speech for children with autism spectrum disorders: A meta-analysis. *American Journal of Speech – Language Pathology (Online), 19* (2), 178-195
- Hayden, D. A., MA, & Square, P. A., PhD. (1994). Motor Speech Treatment Hierarchy: A Systems Approach
- Johnson, C. P., & Myers, S. M. (2007). Identification and evaluation of children with autism spectrum disorders. *Official Journal of the American Academy of Pediatrics, 120* (5): 1183-1215.
- Murray, E., McCabe, P., Heard, R., & Ballard, K. J. (2015). Differential diagnosis of children with suspected childhood apraxia of speech. *Journal of Speech, Language and Hearing Research (Online), 58* (1), 43-60.
- Preston, D., & Carter, M. (2009). A review of the efficacy of the picture exchange communication system intervention. *Journal of Autism and Developmental Disorders, 39* (10), 1471-86.
- Shriberg, L. D., Campbell, T. F., Karlsson, H. B., Brown, R. L., McSweeney, J. L., & Nadler, C. J. (2017). A diagnostic marker for childhood apraxia of speech: The lexical stress ratio. *Special Issue: Diagnostic Markers for Child Speech-Sound Disorders, Clinical Linguistics & Phonetics, 17* (7), 549-574.

- Shriberg, L. D., Paul, R., Black, L. M., & van Santen, J. P. (2011). The hypothesis of apraxia of speech in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 41 (4), 405-26
- Tarshis, N., Rodriguez, B. G., & Seijo, R. M. (2007). Therapeutic approaches to speech and language disorders in early childhood. *Pediatric Annals*, 36 (8), 471-7
- Terband, H., Maassen, B., Guenther, F. H., & Brumberg, J. (2009). Computational neural modeling of speech motor control in childhood apraxia of speech (CAS). *Journal of Speech Language and Hearing Research* 52 (6), 1596-1609.
- Teverovsky, E. G., Bickel, J. O., & Feldman, H. M. (2009). Functional characteristics of children diagnosed with Childhood Apraxia of Speech. *Disability & Rehabilitation* , 31 (2), 94-102.