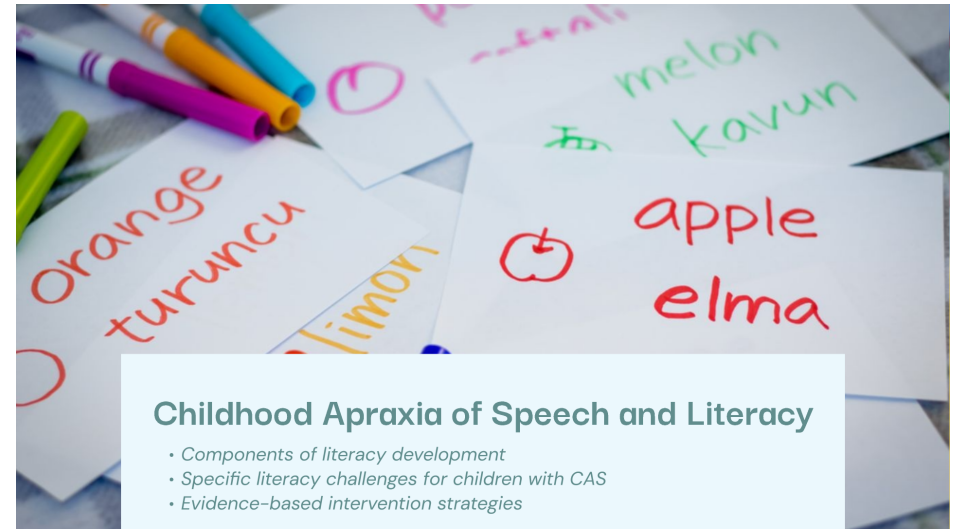


## Childhood Apraxia of Speech

Understanding Its Impact on  
Literacy Development

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### Childhood Apraxia of Speech and Literacy

- Components of literacy development
- Specific literacy challenges for children with CAS
- Evidence-based intervention strategies

## Definition and Overview

Childhood Apraxia of Speech is a motor speech disorder where children have difficulties in **planning and coordinating** the movements necessary for speech. Unlike other speech disorders, CAS specifically affects the brain's ability to send signals to the muscles involved in speaking.

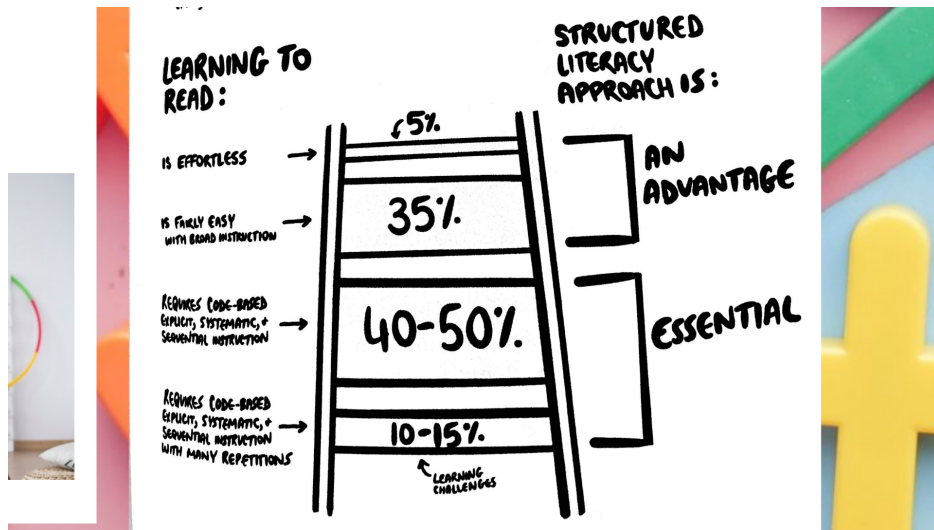
### Key Characteristics of CAS

- **inconsistent speech sound production**
- **difficulty connecting speech to language.**
- **difficulty sequencing sounds**
- **poor ability to imitate new words**

## Prevalence and Importance

CAS affects approximately 1-2 children per 1,000, making it a relatively rare condition. However, **early identification** is essential, as timely intervention can significantly improve a child's communication abilities and overall literacy development.





## Literacy Development

- First, our eyes scan the page to pull out **letter chunks**, syllables, prefixes, suffixes, and word roots

- Then, our brain INSTANTLY connects those clusters to the **sounds they make**

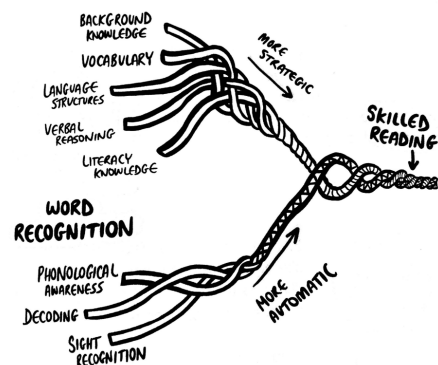
- Next, Our brain **pronounces** those sounds in your head

- Finally, we connect the sounds to their meaning

### HOW OUR BRAINS READ

1	2	3	4
SEE THE CLUSTER OF LETTERS	CONNECT THE CLUSTERS TO THE SOUNDS THEY MAKE	PRONOUNCE THE CLUSTERS IN YOUR HEAD	CONNECT IT TO THE MEANING
SHIP	SH = /sh/ I = /i/ P = /p/	/sh/ /ip/	

### LANGUAGE COMPREHENSION



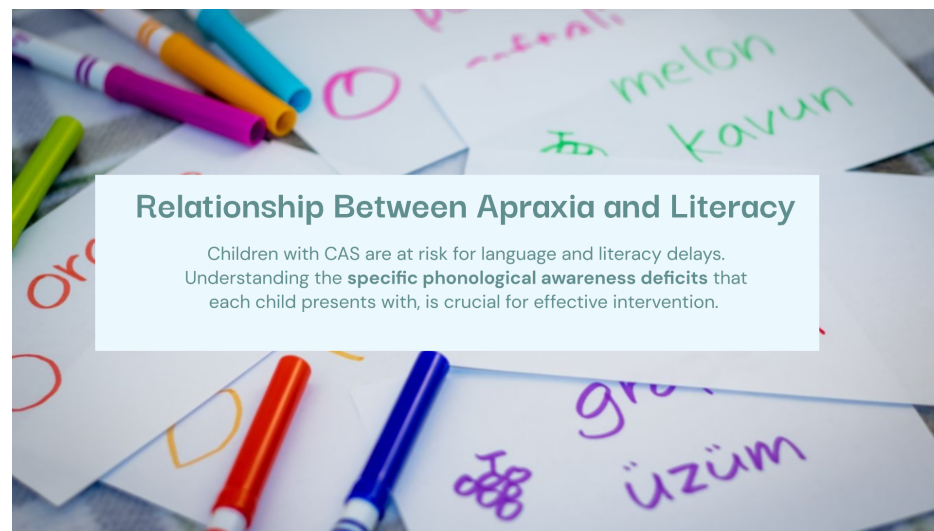
Children's language-comprehension and word-recognition skills work collaboratively to build reading comprehension and fluency.

As students develop their abilities through EXPLICIT teaching and practice, those skills become more automatic and begin working together to increase efficiency.

As a result of strategic teamwork and automaticity of the skills, students' fluency and comprehension strengthen, and children become progressively proficient at reading.

### Relationship Between Apraxia and Literacy

Children with CAS are at risk for language and literacy delays. Understanding the specific phonological awareness deficits that each child presents with, is crucial for effective intervention.



## Connection Between Speech and Reading

Children with CAS often struggle with decoding words, as they cannot accurately produce or combine sounds. In order to learn to read, children must be aware and able to sound out each of the phonemes in the English language.



## What is Phonological Awareness?

The ability to identify and manipulate sounds in words.

- Identifying rhymes – “Tell me all of the words you know that rhyme with the word “bat.”
- Listening for sounds – “Close your eyes as I read some words to you. When you hear the “f” sound, raise your hand.”
- Segmenting sounds – “Say the word tap. What is the first sound you hear? What is the next sound you hear? What is the last sound you hear?”
- Manipulating sounds in words by adding, deleting, or substituting – “In the word hat, change the h to b.” (bat)

## Phonemic Awareness

In order to learn to read, children must be aware and able to sound out each of the phonemes in the English language. A phoneme is the smallest functional unit of sound. For example, the word ‘bench’ contains four different phonemes. They are ‘b’ ‘e’ ‘n’ and ‘ch.’

• Research clearly shows that phonemic awareness performance is a strong predictor of long-term reading and spelling success for children with speech and language disabilities

• According to the International Reading Association, phonemic awareness abilities in kindergarten appear to be the best single predictor of successful reading acquisition.

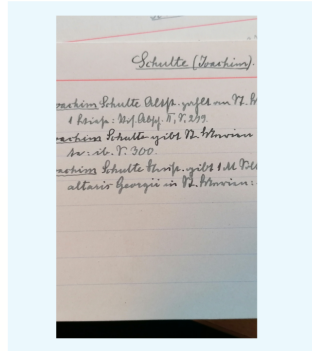
## PHONOLOGICAL AWARENESS

WORD AWARENESS	SYLLABLE AWARENESS
<p>DIFFERENTIATE SYLLABLES IN A SENTENCE</p> <p>Ex: “COUNT THE WORDS YOU HEAR. THE CAT IS BLUE.” (ANSWER: 4)</p>	<p>SEGMENT WORDS INTO SYLLABLES</p> <p>Ex: “BREAK ‘ELEPHANT’ INTO PARTS.” (ANSWER: EL-e-phant)</p>
RHYMING AWARENESS	FIRST SOUND AWARENESS
<p>IDENTIFY AND PRODUCE WORDS THAT END WITH THE SAME SOUNDING FINAL SYLLABLE</p> <p>Ex: “DO ‘CAT’ AND ‘HAT’ RHYME?” (ANSWER: NO)</p>	<p>IDENTIFY AND PRODUCE WORDS THAT START WITH THE SAME SOUND</p> <p>Ex: “GATHER UP WORDS THAT START WITH THE SAME SOUND AS ‘TIGER.’” (ANSWER: CAT, COW, CUP, CALM...)</p>
PHONEMIC AWARENESS	
HEARING AND MANIPULATING THE INDIVIDUAL SOUNDS IN WORDS	
PHONEME ISOLATION	PHONEME BLENDING
<p>IDENTIFY/PRODUCE A SPECIFIC SOUND IN A WORD</p> <p>Ex: “WHAT’S THE FIRST SOUND IN ‘HAT’?” (ANSWER: /h/)</p>	<p>STRUNG TOGETHER INDIVIDUAL SOUNDS TO MAKE A WORD</p> <p>Ex: “GLUE THESE SOUNDS /m/ /t/ /a/ TOGETHER. WHAT’S THE WORD?” (ANSWER: MAT)</p>
PHONEME SEGMENTATION	PHONEME ADDITION
<p>REARRE THE INDIVIDUAL SOUNDS IN WORDS</p> <p>Ex: “WHAT DO YOU HEAR IN ‘HAT’?” (ANSWER: /t/ /a/ /h/)</p>	<p>ADD/TAKE AWAY SOUNDS TO WORDS</p> <p>Ex: “ADD /d/ TO THE BEGINNING OF ‘HAT’.” (ANSWER: CAT)</p>
PHONEME DELETION	PHONEME SUBSTITUTION
<p>TAKE AWAY SOUNDS FROM WORDS</p> <p>Ex: “REMOVE /p/ IN ‘HAPPY.’ WHAT’S THE NEW WORD?” (ANSWER: CLAY)</p>	<p>SWAP/CHANGE ONE SOUND IN A WORD FOR ANOTHER</p> <p>Ex: “CHANGE /p/ IN ‘HAPPY’ TO /t/. WHAT’S THE NEW WORD?” (ANSWER: HART)</p>

## Challenges in Phonemic Awareness

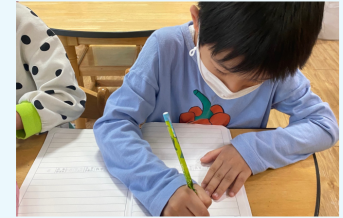
Apraxia affects **phonemic awareness**, which is critical for reading and writing. Children may find it challenging to manipulate sounds, leading to difficulties in rhyming, segmenting, or blending sounds, which are foundational literacy skills.

Children who cannot hear and work with the phonemes (sounds) of spoken words will have a difficult time **learning** how to relate these phonemes to the graphemes (letters) when they see them in written words.



## Influence on Writing Skills

Writing skills can be adversely affected by childhood apraxia. Difficulties in producing speech impacts the ability to spell, structure sentences, and express ideas through writing, complicating the overall literacy achievement.



## Intervention Strategies

Effective intervention strategies for Childhood Apraxia of Speech focus on individualized, explicit, structured literacy instruction.

- **Intensive instruction in phonemic awareness**
- **Multi-sensory instruction**
- **Repetitive books**
- **Fluency**
- **Story Grammar**

## Phonemic instruction

- Blending phonemes
- Isolating phonemes
- Segmenting phonemes
- Adding phonemes
- Deleting phonemes
- Substituting phonemes



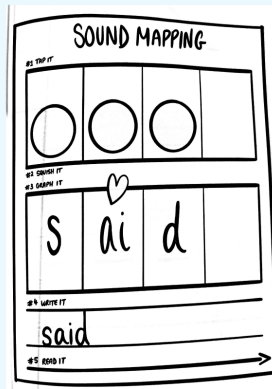
Video: <https://teachergoals.com/books/classroom-instruction/science-of-reading/science-of-reading-bonuses/?v=5435c69ed3bc>



## Role of Multi-Sensory Learning

Multi-sensory learning integrates **visual, auditory, and kinesthetic** elements to strengthen language acquisition. The combination of listening, looking, and moving around creates a lasting impression for the child as things will connect to each other and become memorable.

- **Orton–Gillingham approach** uses sight, sound, movement, and touch.
- **Wilson Reading System:** uses is a “sound-tapping” system.
- **The Barton Reading Program** materials include color-coded letter tiles that help students connect sounds to letters.



## Additional Multisensory approaches

**Phonic faces:** Its purpose is to provide children with a means to visualize sounds.

**The Seeing Stars® program** by Nancy Bell: develops symbol imagery; the ability to visualize sounds and letters in words—as a basis for orthographic awareness, phonemic awareness, word attack, word recognition, spelling, and contextual reading fluency.

**Snap Words:** offer multisensory cues for each sight word. Each word is embedded in a picture, has a related body movement, and has an associated cloze statement.



## What Are Phonic Faces?

The Phonic Faces alphabet is a completely unique type of alphabet. It presents the alphabet and its meaning using a concrete, multisensory approach. The Phonic Faces alphabet is made up of drawings of children, each of whom “says” a different letter sound of the alphabet.

Each alphabet face shows learners what their mouth should be doing when they make the sound that the letter represents. For example, the letter “t” is drawn inside the mouth of “Brian” and shows the letter “t” as his tongue touching the roof of his mouth just behind his teeth. When children look at Brian, they learn that if they put their tongue in the position that he shows, they will be making the sound associated with the letter “t.” Thus, while seeing the letter, they can locate the correct sensorimotor position for their own tongue, and listen as they say the corresponding sound.

This multisensory integration helps the child connect the visual features of the letter with the acoustic features of the sound, as well as the kinesthetic and visual features of the tongue position. These features must neurologically interconnect so that seeing the letter elicits the sound, and hearing the sound retrieves the letter. Linking the motor system is critical to this association. Young children cannot read silently without moving their lips. The mouth must do what the letters show in order to connect to the associated sounds and words. Phonic Faces support this learning by placing the letters inside the mouth, showing the child how to place the tongue, teeth, and lips in the position needed to make the sound.



## Importance of Repetitive Books

*Takes the pressure off while allowing for a lot of practice in a fun way.*

- Frequent practice of sounds and words helps to improve speech. For children with CAS, even the smallest unit of speech is often difficult.
- Books with repetitive text offer numerous opportunities to motor plan and practice phonemes in a fun, natural way.
- The more a child practices the motor plan necessary for production the more automatic it becomes.
- With increased practice, a child will improve production of a sound or word. In repetitive books, familiar phrases are anticipated allowing the child to feel less stress and frustration. Children will participate more and feel success.

# REPETITIVE BOOKS!

## THE BEST LIST OF BOOKS FOR APRAXIA THERAPY

WWW.SWEETSOUTHERNSPEECH.COM

- But Not The Hippopotamus by Sandra Boynton "But not the hippopotamus"
- Goodnight Moon by Margaret Wise Brown "goodnight..."
- Dear Zoo by Rod Campbell "so they sent me a ..." and "I sent him back!"
- Five Little Monkeys Jumping On The Bed by Eileen Christelow "one fell off and bumped his head" and "mama called the doctor and the doctor said, no more monkeys jumping on the bed"
- Llama, Llama Red Pajama by Anna Dewdney "Llama llama red pajama"
- Are You My Mother? by PD Eastman "Are you my mother?"
- Is Your Mama A Llama? by Deborah Guarino "Is your mama a llama?"
- I Love My White Shoes by Eric Litwin "I love my \_\_\_ shoes" (fill in color name)
- Brown Bear, Brown Bear by Bill Martin "\_\_\_\_\_ what do you see?" and "I see a \_\_ looking at me"
- Green Eggs and Ham by Dr. Seuss "I do not like green eggs and ham, I do not like them Sam I am"
- Caps For Sale by Esphyr "Caps, caps for sale 50 cents a cap" and a few more.

### Additio

**Phonic fa**  
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develops :  
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# Family Involvement and Support

Family engagement is crucial as it reinforces therapy at home. Educating families on strategies and providing them with resources enables them to practice skills in daily life, reinforcing progress made during therapy sessions and enhancing the child's confidence.

# Conclusion and Future Directions

The understanding of Childhood Apraxia of Speech highlights its significant impact on literacy development. Addressing these challenges through informed strategies can enhance outcomes.

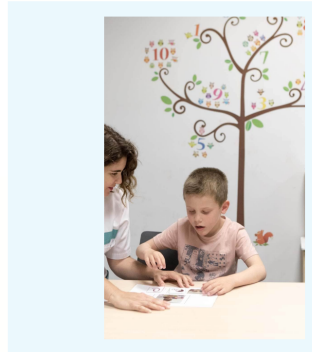
Apraxia **does not cause** these literacy problems. We can say that because children without apraxia also have reading and writing problems, but there *is* an interaction of factors.

# Summary of Key Points

Childhood Apraxia of Speech affects speech articulation and can impede literacy skills. Early intervention is crucial to address these challenges and support overall communication development.

# Importance of Early Diagnosis

Early diagnosis of Childhood Apraxia is vital for timely intervention. Recognizing the signs at a young age enables practitioners to create personalized strategies that significantly improve speech and associated literacy skills.



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