ASHA Seminar 2013

- **Topic Area:** Speech Sound Disorders in Children
  Session Number: 1036
  Treating Articulation & Phonology in a Literacy Context

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Scaffolded Writing Using a Cloze Spelling Procedure for Developmentally Disabled Students

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Why DD?

- NCLB (2001) and IDEA (2004) changed the way that students with severe disabilities participate in the curriculum and high-stakes assessments.
- IEP were goals not aligned with curriculum and focused on functional living skills.
- Most instruction focused on sight word learning.
  - No impact on comprehension/functional use
  - Does not lead to reading or writing skills

- National Reading Panel (NRP, 2000) identified the essential components of learning to read for ALL students
  - Vocabulary, fluency, comprehension, phonemic awareness, and phonics
- Still a lack of phonemic awareness and phonics instruction and research for this population.
- Research and instruction on writing and spelling development also lacking for students with significant disabilities.

Connections

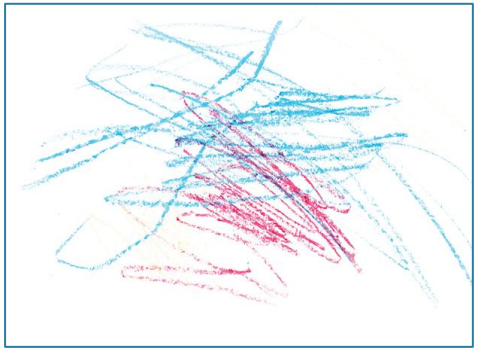
- Oral language, reading, writing, spelling
- Spoken and written language share some features including:
  - Phonology
  - Pragmatics
  - Semantics
  - Syntax
  - Morphology

Speech & Spelling

- Spelling is developmental and follows a predictable sequence.
- Spelling shares the same developmental principles and phonological process errors as speech.
- Confirmed by study conducted by Read in 1975
  - Consistent patterns of invented spellings across children for same words
  - Demonstrated awareness of features of sounds and speech production
  - Not just memorization

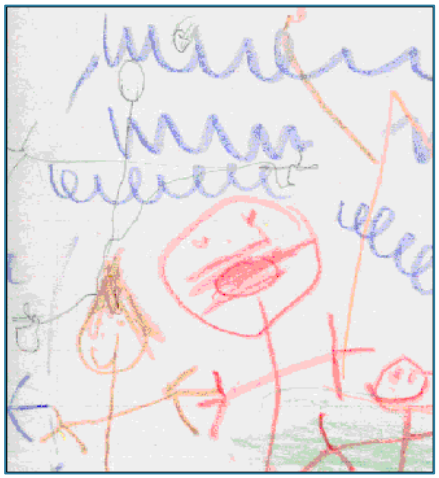
Gentry's Stages of Spelling

- 1. Precommunicative
  - 5 substages



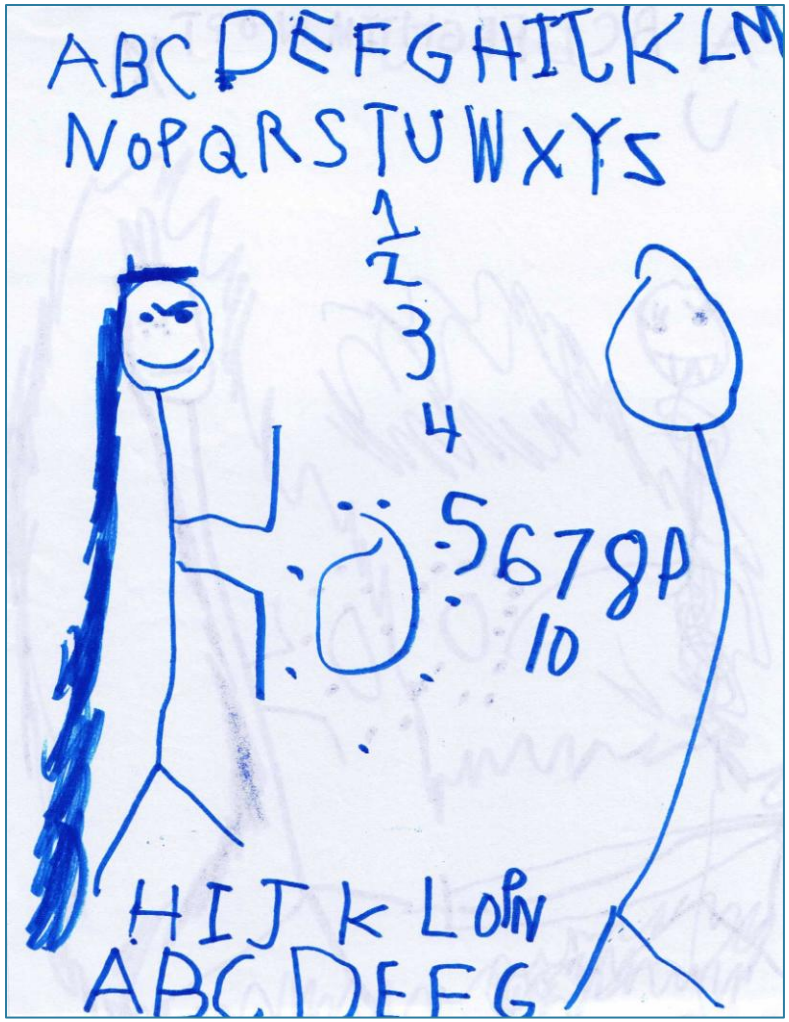
  - 1a. Early scribbling

  - 1b. Prewriting experimentation
    - Attempts at imitating writing
    - Meaning changes, no permanent message
    - Beginnings of content, form, function



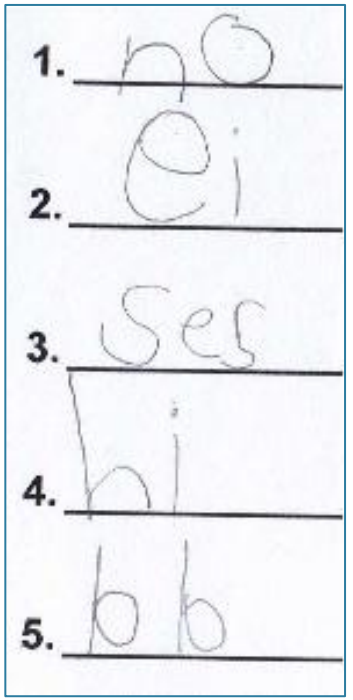
Precommunicative Substages

- 1c. Pre-phonemic
  - Alphabet, numbers, lines,
  - No letter-sound correspondence
  - Upper- and lower-case letters
  - No left to right orientation

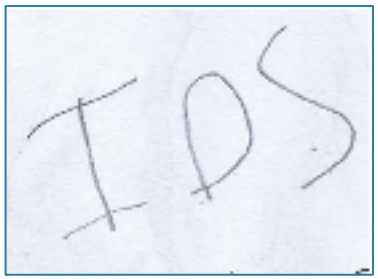


Precommunicative Substages

- 1d. Early phonemic
  - Initial letters follow alphabetic principle
  - Random letters may follow some may follow sounds or shape of word



- 1e. Letter name
  - One letter may represent a syllable



I like dinosaurs.
DS = dinosaurs

Stages of Spelling Cont'd

- 2. Semi-phonetic
  - Incomplete syllabic/phonemic representation
  - Phonological processes seen in speech
    - Final consonant deletion, stopping, devoicing, cluster reduction, etc

- Students in this study are functioning in the substages of the *precommunicative* stage and the semi-phonetic stage.

Later Stages of Spelling

- 3. Phonetic
- 4. Transitional
- 5. Conventional

Encoding vs. Decoding

- Encoding
  - Constructing words
  - Speech to print
  - Activates pronunciation and meaning
  - Segments using motor system
  - Sound to letter associations
  - Meaningful interaction with text
  - Can write any word with alphabetic code knowledge
  - Can decode after word is written
- Decoding
  - Reading words
  - Print to speech
  - Activates visual processing first
  - Letter to sound associations
    - Exceptions are difficult
  - Does not usually occur in a meaningful interaction with text
    - Analyzing unrelated word lists – counting, blending, copying

Setting/School

- Inner city public elementary school
- Low performing based on statewide assessments
  - Ranked at the 19th percentile
- Low socioeconomic status
  - 96% receiving free or reduced lunch
- Predominately African-American population
  - 92.2% of students
  - Remaining students are mostly Caucasian

Participants

- Self-contained special education classroom
- IEPs for speech and language services

Participant	Age	Grade	Gender	Disability
1	8;4	1st	F	Moderate Intellectual
2	8;5	2nd	M	Developmental Delay
3	10;6	3rd	F	Moderate Intellectual

Materials

Session 10
5/17/13

PRE-intervention
Subject: WS841

1. _____
2. _____
3. _____
4. _____
5. _____

Phonic Faces elementOry.com

Session 5 – 4/29/13

It was a hot and sunny day. The baby dinosaurs were drinking water with their moms. " _____ _____ are so thirsty!" the dinosaurs said. One of the babies wanted to sit with his brother on his mom's back. _____ _____ climbed up from the water. _____ _____ _____ said, "I love you, boys." Another dinosaur heard his friends yelling behind him. "Leave _____ _____ alone! Just let us _____ _____!" shouted dinosaur angrily. The dinosaurs wanted to drink their water in peace and quiet.

Goals

- Interactive approach to intervention
  - Oral language
  - Reading
  - Writing
  - Spelling
- Improve ability to connect phonemic awareness skills with writing/spelling
- Increase emergent literacy skills
  - Reading orientation
  - Locating lowercase and capital letters
  - Letter vs. words
  - Meaning of punctuation

Intervention

- 30 minute sessions twice a week for 5 weeks
  - 9 total sessions
- Targeted open and closed syllable patterns
  - CV
  - VC
  - CVC
- Sessions 1-4 words were randomly assigned
  - organized by syllable shape
  - not organized by vowel

- Sessions 5-9 words were grouped by vowel so that students would only have to focus on changing consonants

Session #	Syllable Shape/Vowel	Words
5	Open CV/long e	We, he, she, me, be
6	Open CV/long o	Go, no, so, do, hi
7	Open VC/short i	In, if, it, is, up
8	Open VC/short a	As, at, am, or, on
9	Closed CVC/short o, e, a	Mom, dad, bed, pop, tot

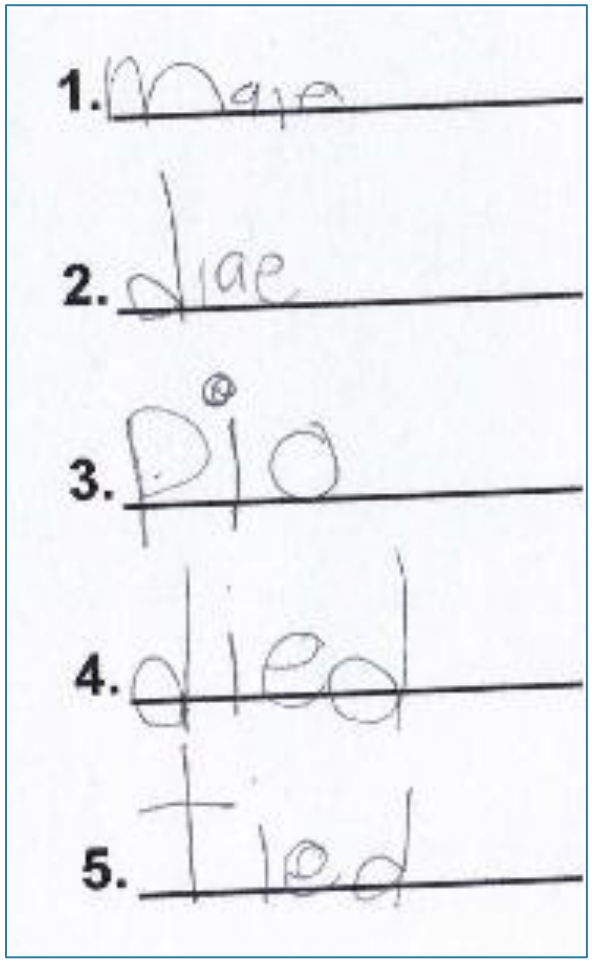
Procedures

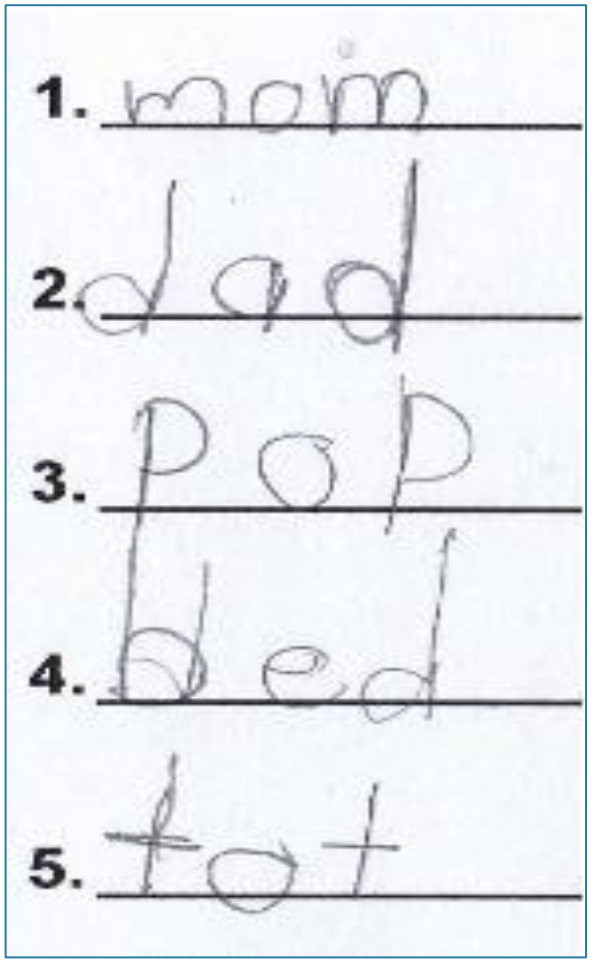
- Pre-intervention probe completed independently
- Introduction to reading passage
- Examiner reads aloud until reaching a cloze structure while students follow silently with finger
- Group discussion and use of Phonic Faces to decide how to spell target word using **encoding**
  - Which letter tells your mouth to say /p/?
  - Phonic Face cards cue for sound errors and orthography errors
  - Highlight individual sounds as well as how to blend the sounds

Procedures…Continued

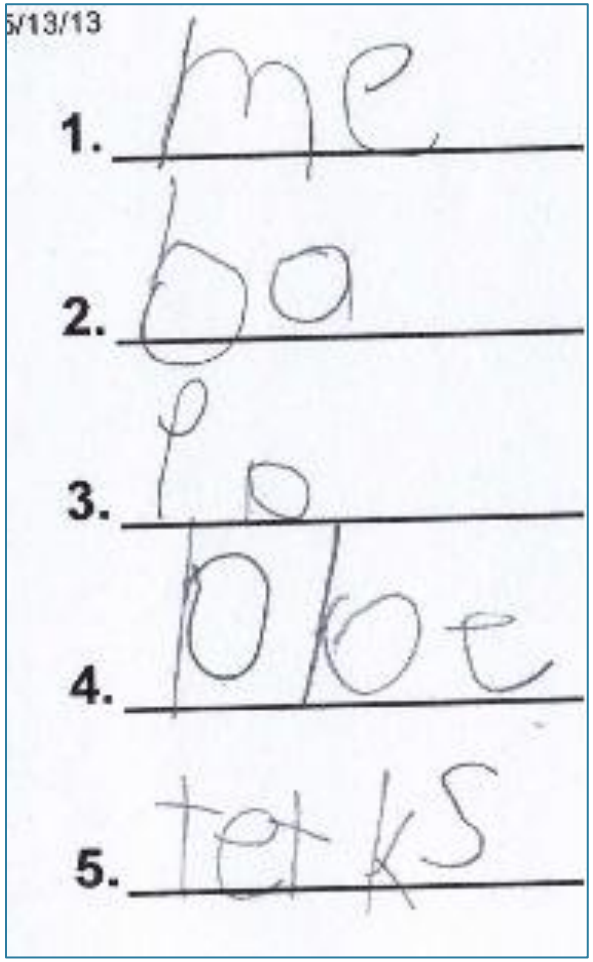
- Examiner reads completed text prompting students to decode the words they just spelled
- Independent writing time using letters and words
  - examiner conference to record what students had written
- Post-intervention probe completed independently

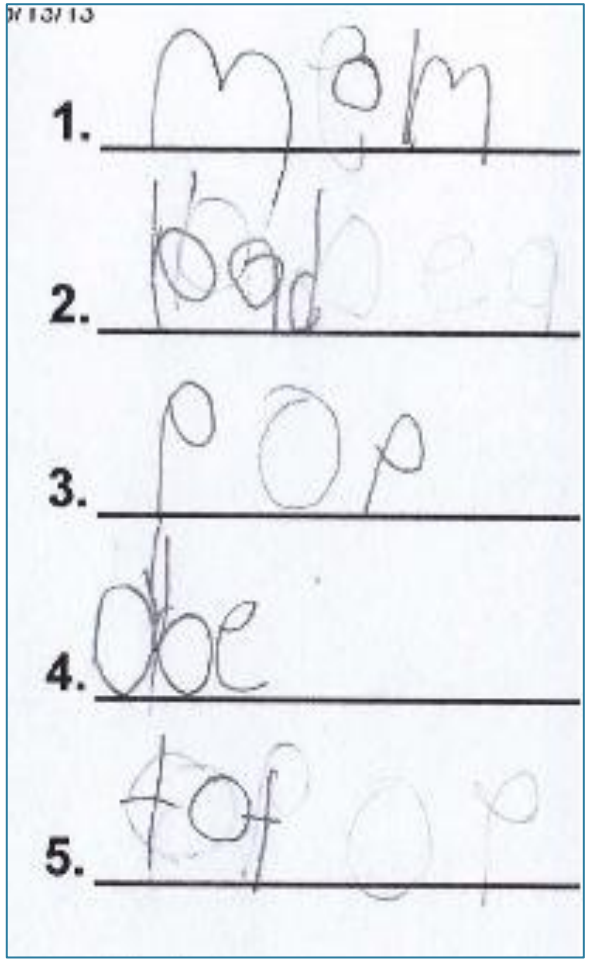
Student 1 – Probe 9



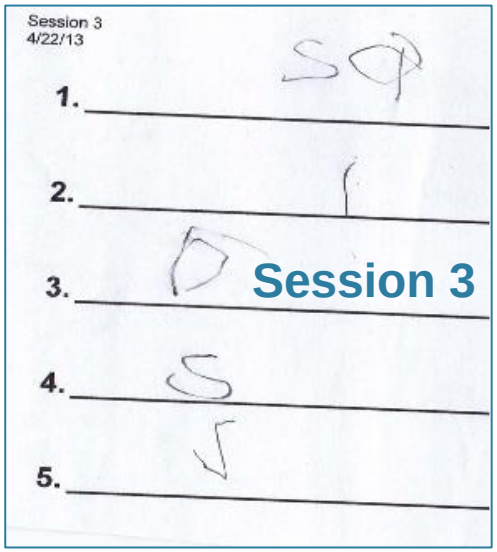


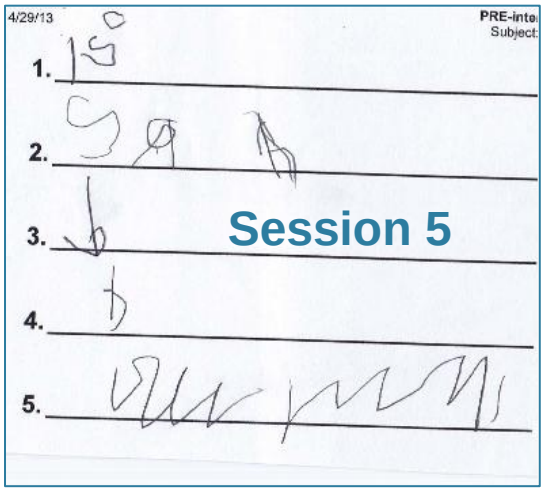
Student 2 – Probe 9

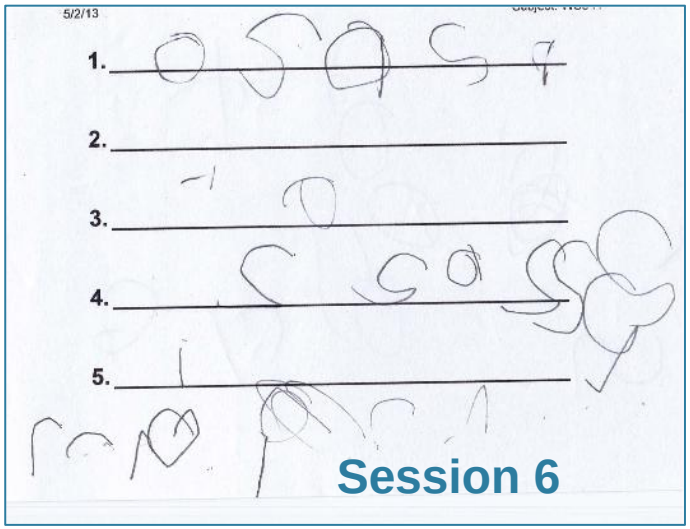


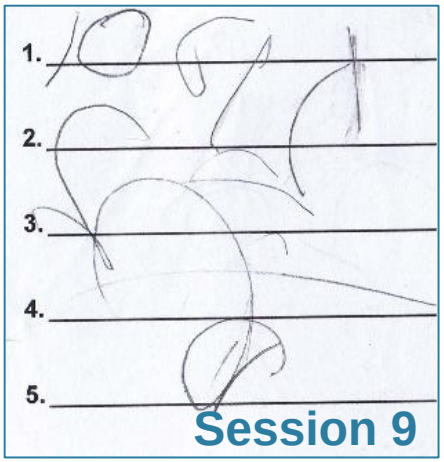


Student 3 – Example Probes

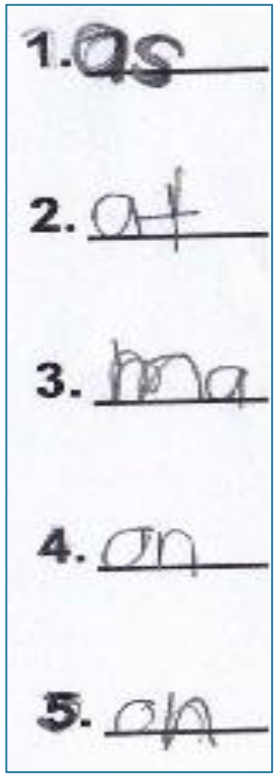




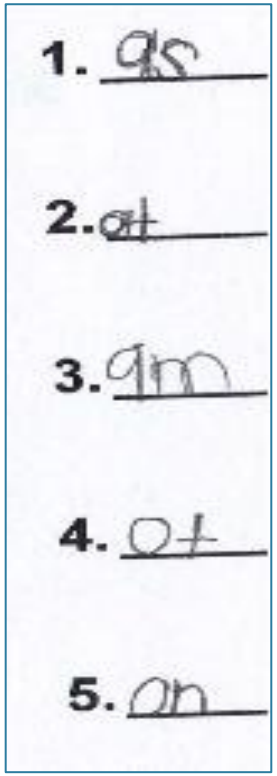




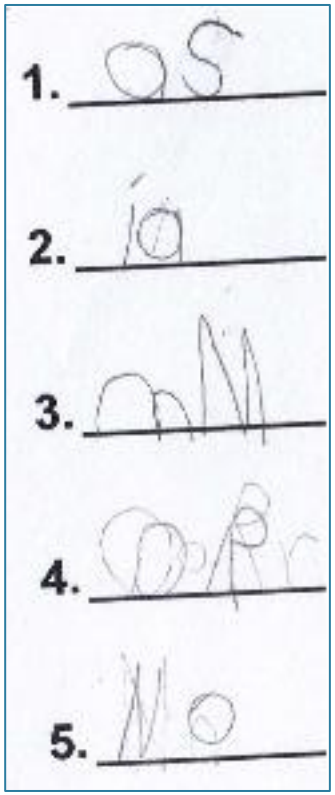
Student 1 – Session 8



Look at that yellow dinosaur! He has big spikes a n his back. He is so big! He is a s tall a s the trees! He has been walking for a long time. "I a m so tired!" he said. He was supposed to meet his friends here a t 2:00pm. "I wonder where my friends are?" asked dinosaur. Do you think his friends will come early o n late?



Student 2 – Session 8



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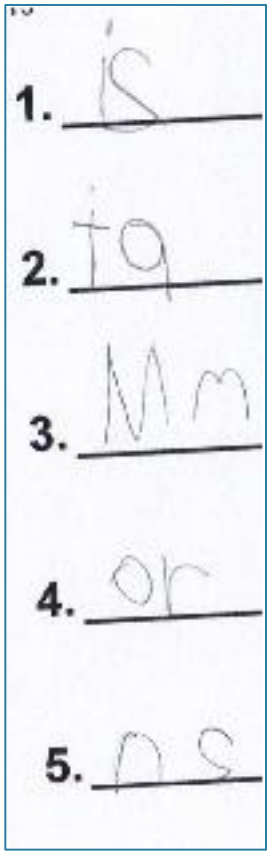
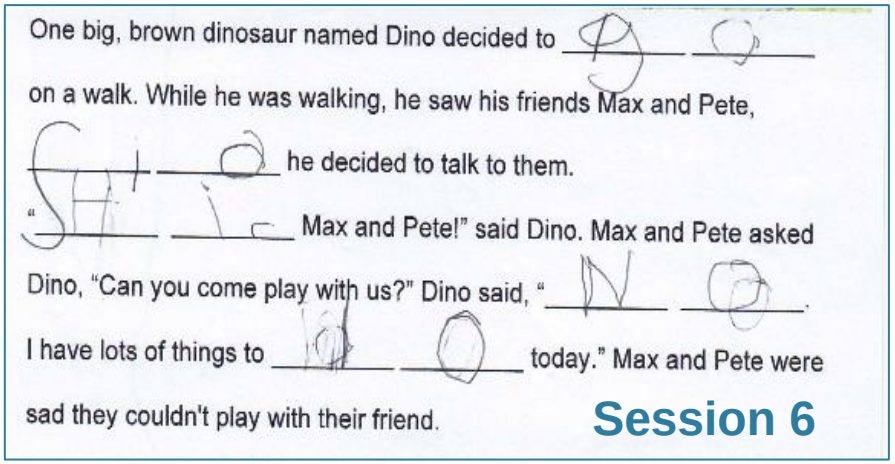
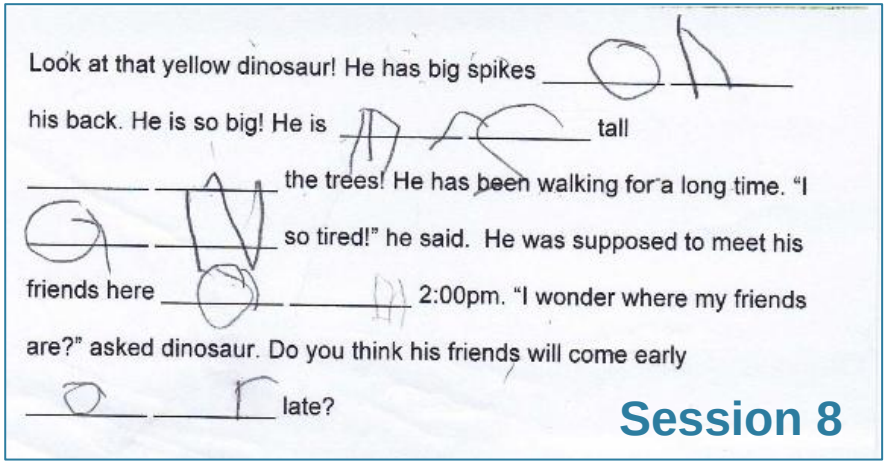


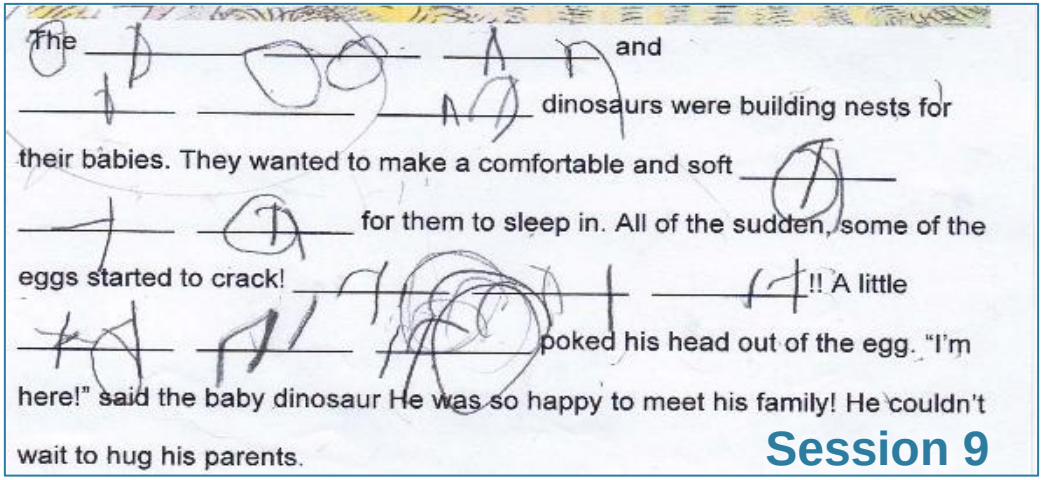
Student 3 – Sample Texts


One big, brown dinosaur named Dino decided to _____ _____ on a walk. While he was walking, he saw his friends Max and Pete, _____ _____ he decided to talk to them. "_____ _____ Max and Pete!" said Dino. Max and Pete asked Dino, "Can you come play with us?" Dino said, "_____ _____. I have lots of things to _____ _____ today." Max and Pete were sad they couldn't play with their friend.

Session 6

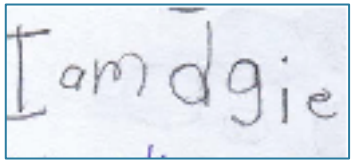

Look at that yellow dinosaur! He has big spikes _____ _____ his back. He is so big! He is _____ _____ tall _____ _____ the trees! He has been walking for a long time. "I _____ _____ so tired!" he said. He was supposed to meet his friends here _____ _____ 2:00pm. "I wonder where my friends are?" asked dinosaur. Do you think his friends will come early _____ _____ late?

Session 8


The _____ _____ and _____ _____ _____ dinosaurs were building nests for their babies. They wanted to make a comfortable and soft _____ _____ _____ for them to sleep in. All of the sudden, some of the eggs started to crack! _____ _____!! A little _____ _____ _____ poked his head out of the egg. "I'm here!" said the baby dinosaur He was so happy to meet his family! He couldn't wait to hug his parents.

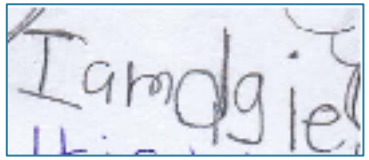
Session 9

Student 1



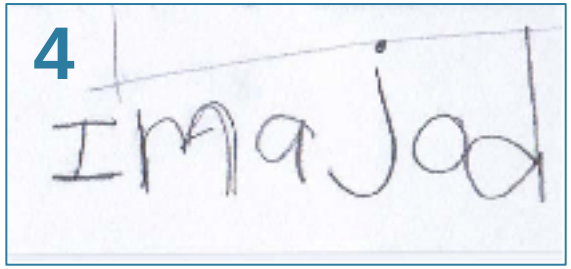
2

This dinosaur is big



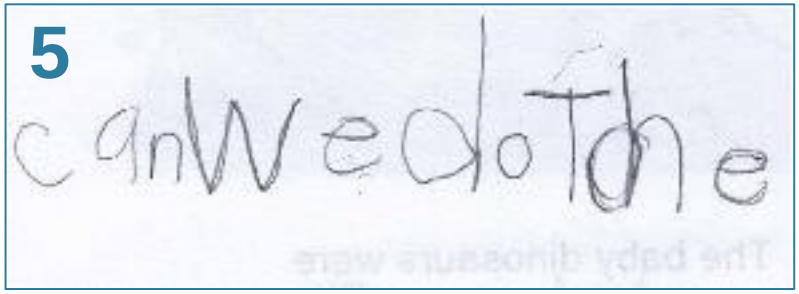
It is big

4

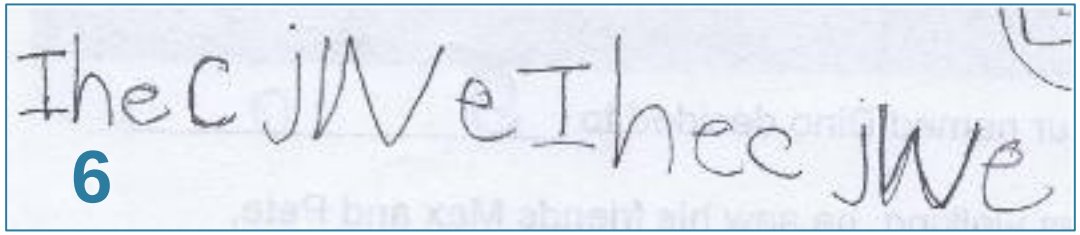


Don’t eat the food

5

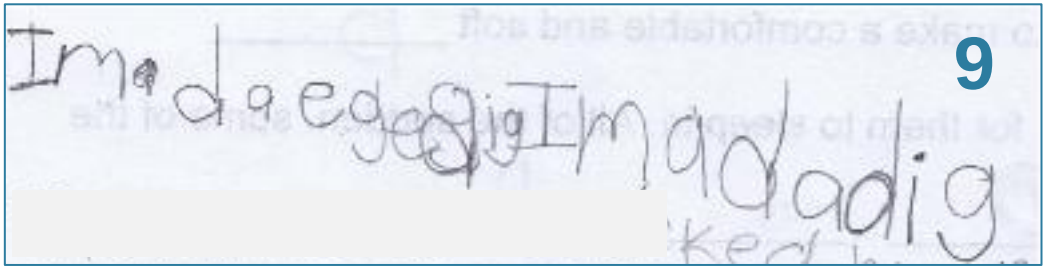


Dinosaur eat cornflake



6

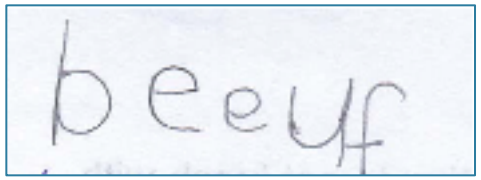
I want water. The dinosaur can’t play with me.



9

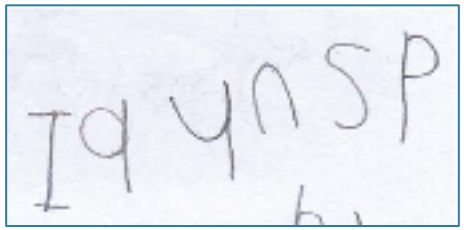
The dinosaur cracked his egg. It is big.

Student 2

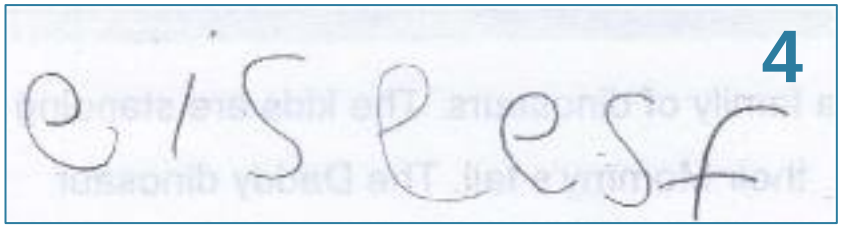


2

He’s eating his food

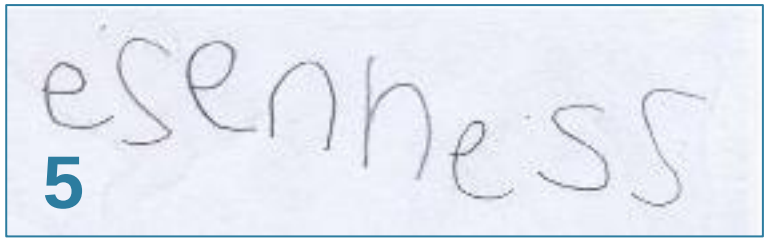


I feel happy



4

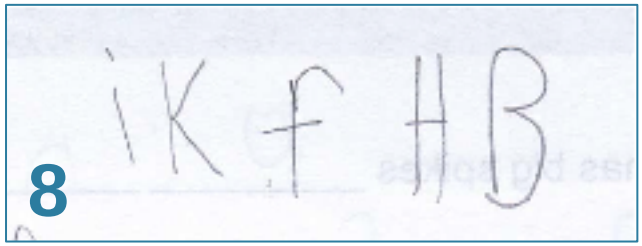
If you can, eat some food



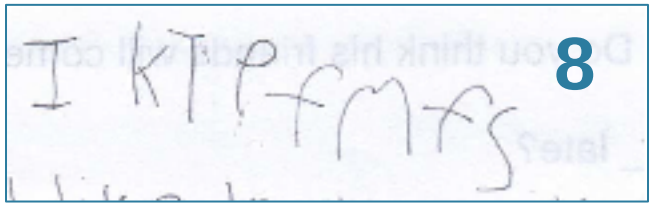
5

Eat some noodles.
Eat some cereals.

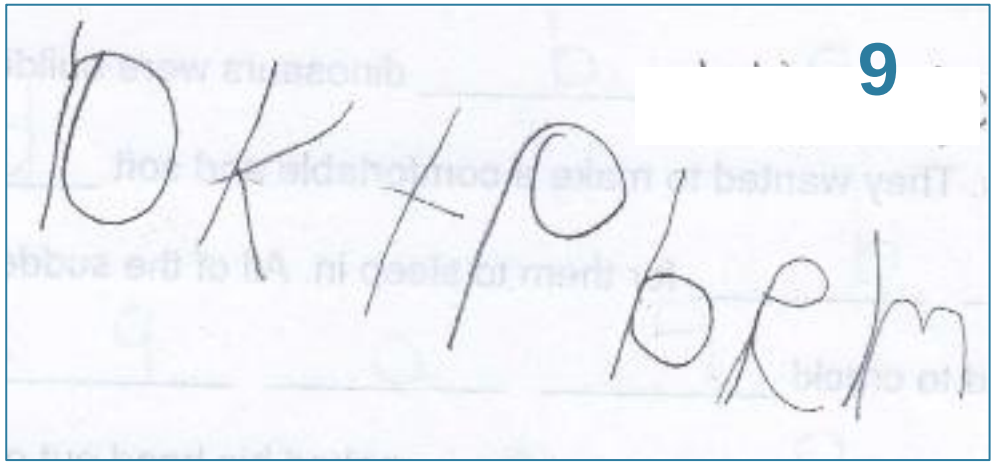
More Student 2



I feel happy

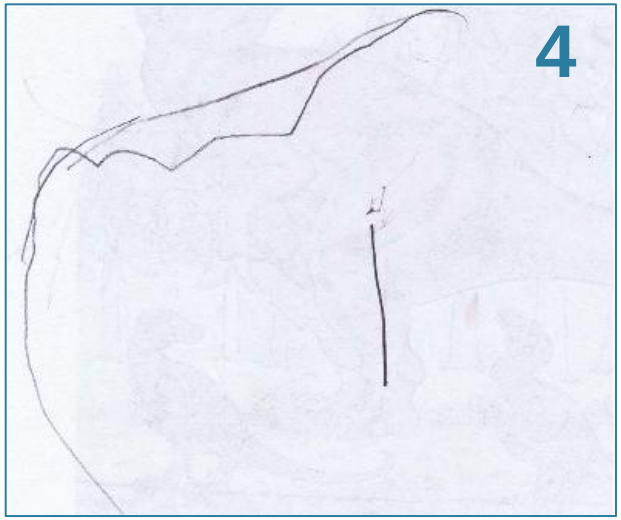


I like to play with my friends

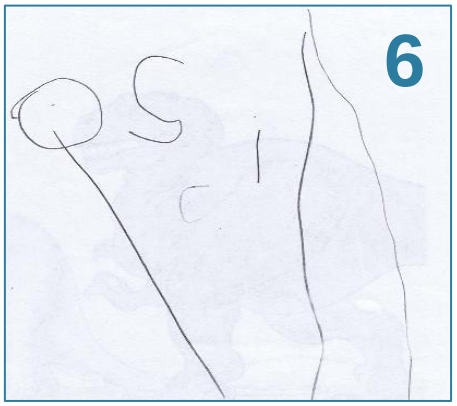


I like to play babies

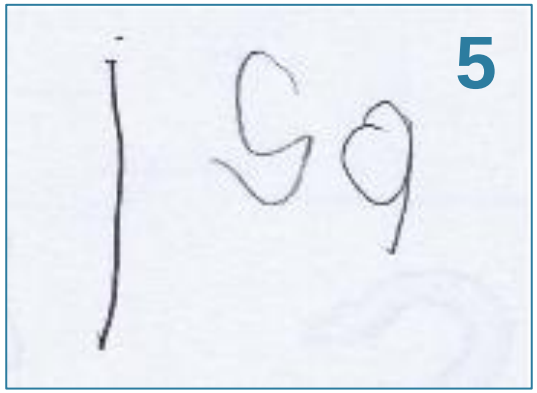
Student 3

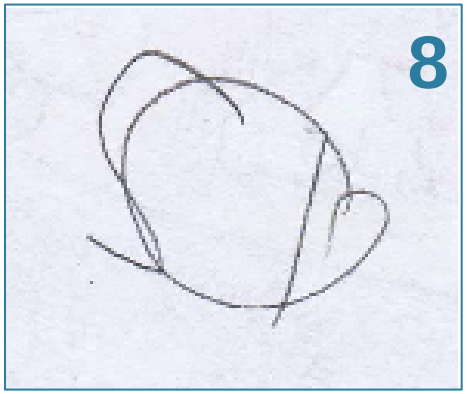


I eat for food.



I love a lot. I can't.





References

Articulation Therapy in Reading Context

Targeting Articulation Errors Within the Curriculum

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Brookhaven School District
Jan Norris, PhD, CCC-SLP
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Many Reasons to Intervene for SSD within Curriculum

- With the implementation of the Common Core State Standards, SLPs are being held accountable for student success within the curriculum.
- reading impairment is predicted by poor performance in phonology at preschool
- Children with SSD also have comorbid reading disabilities
- Speech sound disorders affect the student's reading performance in addition to intelligibility in reading and conversation

(Catts, 2005; Lewis, Freebairn, & Tylor, 2000; Smith, Pennington, Broada, Shriberg, 2005; Rvachew, 2007)

Potential Benefits

- It is the goal of the SLP to ensure the student's success across all settings, especially the curriculum.
- Targeting speech sound errors in a reading context potentially will increase the student's overall performance in reading
- Potential to reduce time required for carryover since sounds are learned within a meaningful linguistic context

Case Study 1

- Method: Use context-based reading to target speech sound errors
- Participants: 2 students with mild-moderate speech sound disorders
  - One student with targeted errors tongue thrust /s/, cluster reduction for /s/ blends, and gliding for (w/l)
  - One student with fronting (t/k) and (d/g)

Intervention

- The SLP selected grade level text for targeted speech production (i.e., decodable readers)
- If text was above student's reading level, the SLP used echo reading (I read it, you read it)
- The written text provided a context in which the linguistic load was lightened but the sound production correction occurred within meaningful connected discourse.
- As the student read, any words containing the target sound were
  - Acknowledged for correct sound production
  - Corrected by the child following feedback from the SLP or self-corrected
  - The SLP guided the child to a more correct production of the word.

Results

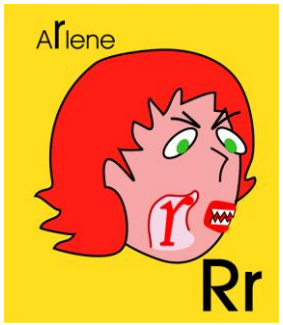
- Carryover production was seen across error positions within one session.
- Example (from the book *Pumpkin, Pumpkin* by Jeanne Titherington)
  - “The pumpkin seed grew a pumpkin sprout.”
  - Student (First Reading): The “pumtin” seed “drew” a “pumtin” sprout.
  - SLP: Good reading, now look at this letter (point to /k/) and be sure to use your good /k/ sound.
  - Student (Second Reading): The pum***k***in seed ***g***rew a pum***k***in sprout.

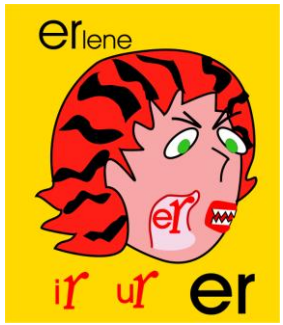
Subject 2

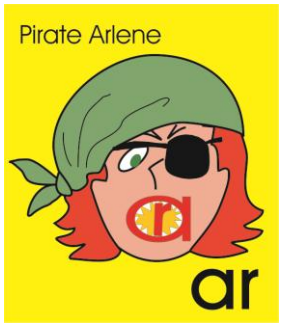
- Second Student Example:
  - “The pumpkin sprout grew a pumpkin flower.”
  - Student (first reading): “The pumpkin sprout grew a pumpkin fwower.”
  - SLP: Look at this word (point to flower); /l/
  - Student: “The pumpkin sprout grew a pumpkin flower.”
- The reading context is targeting the sound at a higher level than isolated word level, and therefore increasing student carryover.

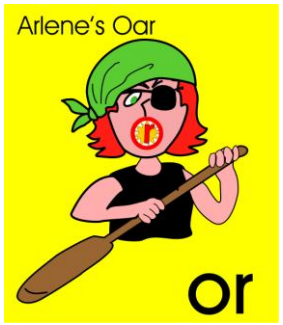
Case Study 2

- Method: Use context-based reading to target /r/
- Participant: 1 students with mild-moderate speech sound disorders
- Used Phonic Faces to differentially cue production of /r/ /ɝ/ /ɑr/ /or/









Case 2 – “r” intervention

- R – intervention: http://www.youtube.com/watch?v=vuRiP90EzfY

- Nonverbal intervention: http://www.youtube.com/watch?v=fmHcdbA0n00

Implications

- SLPs can target speech sound disorders in a reading context to increase overall student linguistic knowledge and reading ability.
- The linguistic and visual cues from the reading context increase the student awareness of the speech sounds, thereby increasing carryover and overall intelligibility.
- We must make our practice relevant to the general education curriculum, or we will become irrelevant.

References

- Catts, H., and Kamhi, A. (2005). Language and reading disabilities*, 54,* 422-428.
- Lewis, Freebairn, & Taylor (2000). Academic outcomes in children with histories of speech sound disorders. Journal of Communication Disorders, Volume 33, Pages 11–30.
- Rvachew, S. (2007). Phonological Processing and Reading in Children With Speech Sound Disorders. *American Journal of Speech-Language Pathology,* Vol.16 260-270.
- Smith, Pennington, Broada, Shriberg (2005). Linkage of speech sound disorder to reading disability loci. Journal of Child Psychology and Psychiatry, Volume 46, Issue 10, pages 1057–1066.

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Literacy-based Articulation Therapy for School-aged Children: Pilot Study

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Persistent Speech Sound Disorder

- A speech sound disorder (SSD) is the significant delay in the acquisition of articulate speech sounds *(Lewis, Shriberg, Freebairn, Hansen, Stein, Taylor, & Iyengar, 2006)*
- Approximately 11-13% of children between the ages of 5-7 years are diagnosed with a speech sound disorder *(Shriberg, Tomblin, & McSweeney, 1999)*
- When a speech sound error persists beyond typical development (i.e., 8-years-old), it is referred to as a persistent sound error (i.e., residual error)

Persistent SSD and Literacy

- More than 90% of SLPs will serve a child with a speech sound disorder at some point *(ASHA, 2006)*
- Research suggests 75% of children with idiopathic speech sound disorders (SSDs) have normalized speech by the time they reach the age of six *(Shriberg, 1994)*
- If a child's SSD persists past the age of literacy acquisition, he or she will be at risk for reading problems *(Bird, Bishop, & Freeman, 1995)*

Shriberg (1993)

Subgroup	Sounds
Early eight	/m, b, j, n, w, d, p, h/
Middle eight	/t, ŋ, k, g, f, v, tʃ, dʒ/
Late eight	/ʃ, s, θ, ð, r, z, l, ʒ/

Traditional Approach to SSD

- Speech language pathologists (SLPs) have typically corrected persistent speech sound errors from either a motor or linguistic approach *(Bernthal & Bankson, 2004)*

- Efficacy research for SSD has primarily focused on the phonology and sound production

SSD and Phonological Awareness Training

- A few interventions have focused on phonological awareness *(Gillon, 2005; Gillon & Moriarty, 2006)*
- Speech intelligibility improvements shown from phonological awareness training *(Dodd & Gillon, 2001; Gillon, 2000; Hesketh et al., 2000)*
- No studies show speech changes from phonological awareness training *(Harbers, Paden, & Halle, 1999)*

Integrated Approa

- Others have focused on broader oral/written language goals (i.e., dynamic language) *(Hoffman & Norris, 2005, 2010)*
- Phonological and orthographic cues working together
- Advantage is the potential for increased efficiency resulting from the integrated approach

Why the SLP?

- SLPs working in a school setting provide services to students from a wide range of disability categories *(ASHA, 2012)*
- Educational reform, legal mandates, and evolving professional practices suggest SLPs must take a more active role in literacy
- CCSS states that all school personnel are accountable
- Rather than putting “more on our plate” we must develop methods for simultaneously working on oral and written language

Question

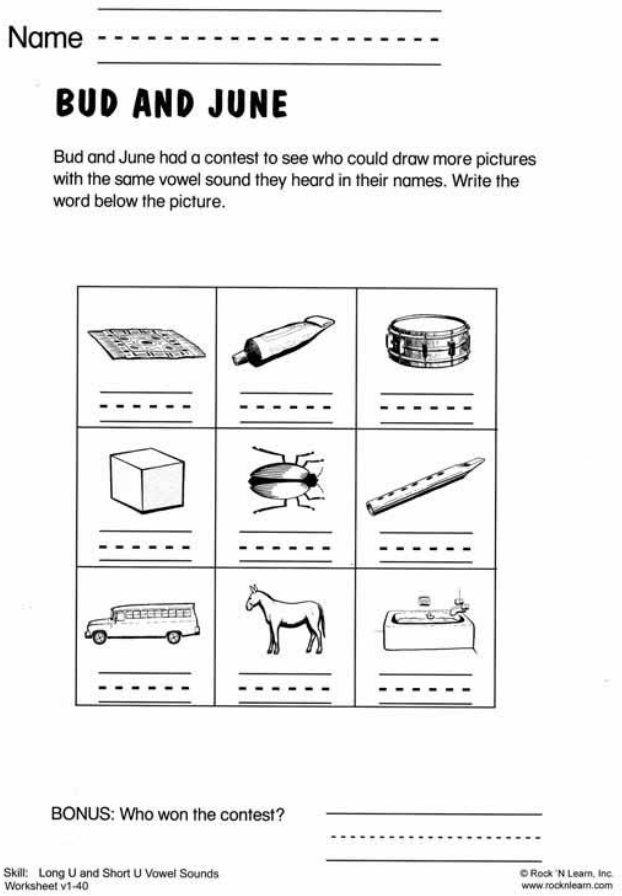
- In a literacy context, how can articulation therapy for a persistent sound error be corrected effectively and efficiently?
  - Self-correcting in less time
  - Carry-over

Pilot Study Methods

- Title 1 public elementary magnet school in southeastern Louisiana
- Two 5th grade children (10;9 and 11;0)
- School-based SLP with CCC's and 6 years experience
- Articulation therapy 2x weekly in group setting for five weeks
- Target sound /s/

Teacher's Typical Phonics Sheet

- A syllable pattern is targeted or contrasted
- Examples of words that fit or don't fit the pattern(s) are displayed
- The consonants used are random
- Response is usually written



Name ----------

BUD AND JUNE

Bud and June had a contest to see who could draw more pictures with the same vowel sound they heard in their names. Write the word below the picture.

BONUS: Who won the contest? _____

Skill: Long U and Short U Vowel Sounds
Worksheet v1-40

Difference in Lesson Plans

Traditional Artic Lesson | **Phonics-Artic**

Lesson

Phoneme S initial – 1 CVVC 1-2 syllable

sail	seas
sailboat	soap
seems	

Today the little girl wants to **sail** her **sailboat**, but it **seems** the **seas** are filled with **soap**.

LOVE PURPLE
LIVE GOLD

Procedure

SLP began the lesson by:

1. Presenting the first written word within the lesson plan and asking the child to read it

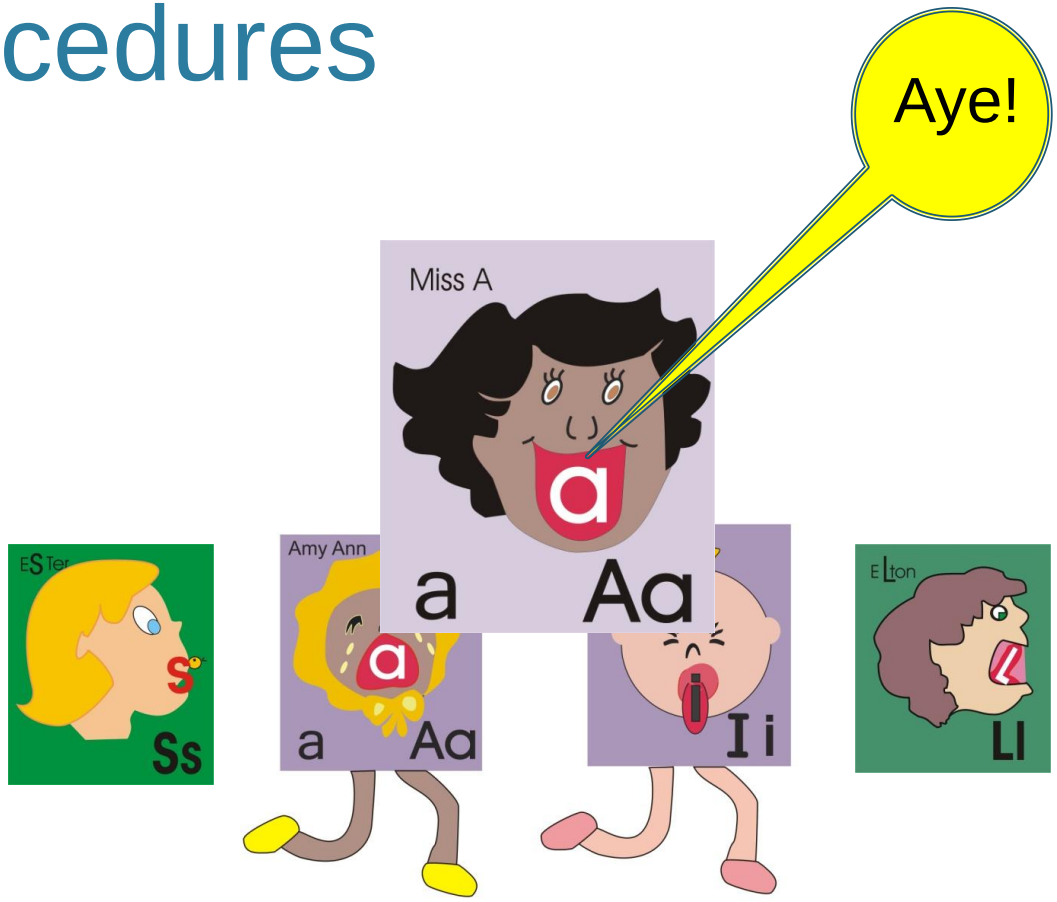
Phoneme S initial – 1 CVVC 1-2 syllable

sail	seas
sailboat	soap
seems	

Today the little girl wants to **sail** her **sailboat**, but it **seems** the **seas** are filled with **soap**.

Procedures

If child was unable to read the word appropriately, SLP modeled correct interpretation using necessary Phonic Faces to spell the word

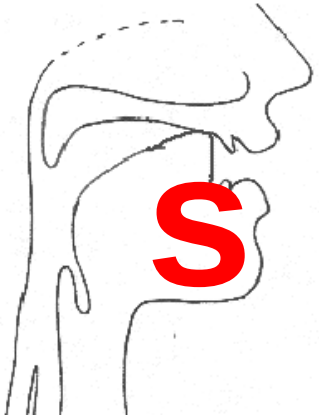


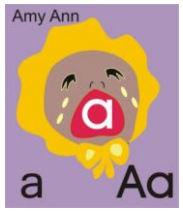
Procedures

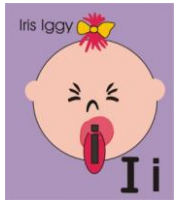
2. The child was asked to read the word using the Phonic Faces cards to cue speech production

- If the child misarticulated the word, corrective feedback was given, associated with cues in the written word

"Read the word to sound just like the Phonic Face."

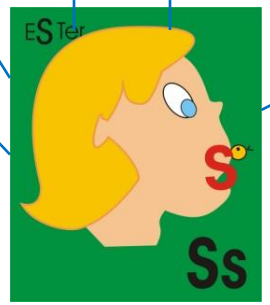






Today the little girl want**s** to **s**ail her **s**ailboat, but it

seem**s** the **s**ea**s** are filled with **s**oap.



3. SLP would help the child attain correct production by reading the same words embedded in written sentences

- Corrective feedback was provided when necessary

Procedures

4. SLP asked child to spontaneously talk about the picture within the lesson plan
   - The SLP employed the Phonic Faces cards to remind the student to be aware of articulation and for overall word recognition

Results

Student 1

Age equivalency: 9.1 (pre); >9.11 (post)

Phonological Awareness Subtests	
Pre-test	Post-test
-3	-1

Improved in the 2 weak areas

(Final sounds in isolation; Syllable deletion)

Graphemes (58 total)	
Pre-test	Post-test
55	57

Student 2

Age equivalency: >9.11 (pre and post)

Phonological Awareness Subtests	
Pre-test	Post-test
-6	-3

Sounds in isolation a weakness

(Improved at post-test)

Graphemes (58 total)	
Pre-test	Post-test
58	58

Results

Student 1

Age equivalency: 9.1 (pre); >9.11 (post)

Decoding (80 total)	
Pre-test	Post-test
70	77

Test of Written Spelling (TWS)	
Pre-test	Post-test
115	123

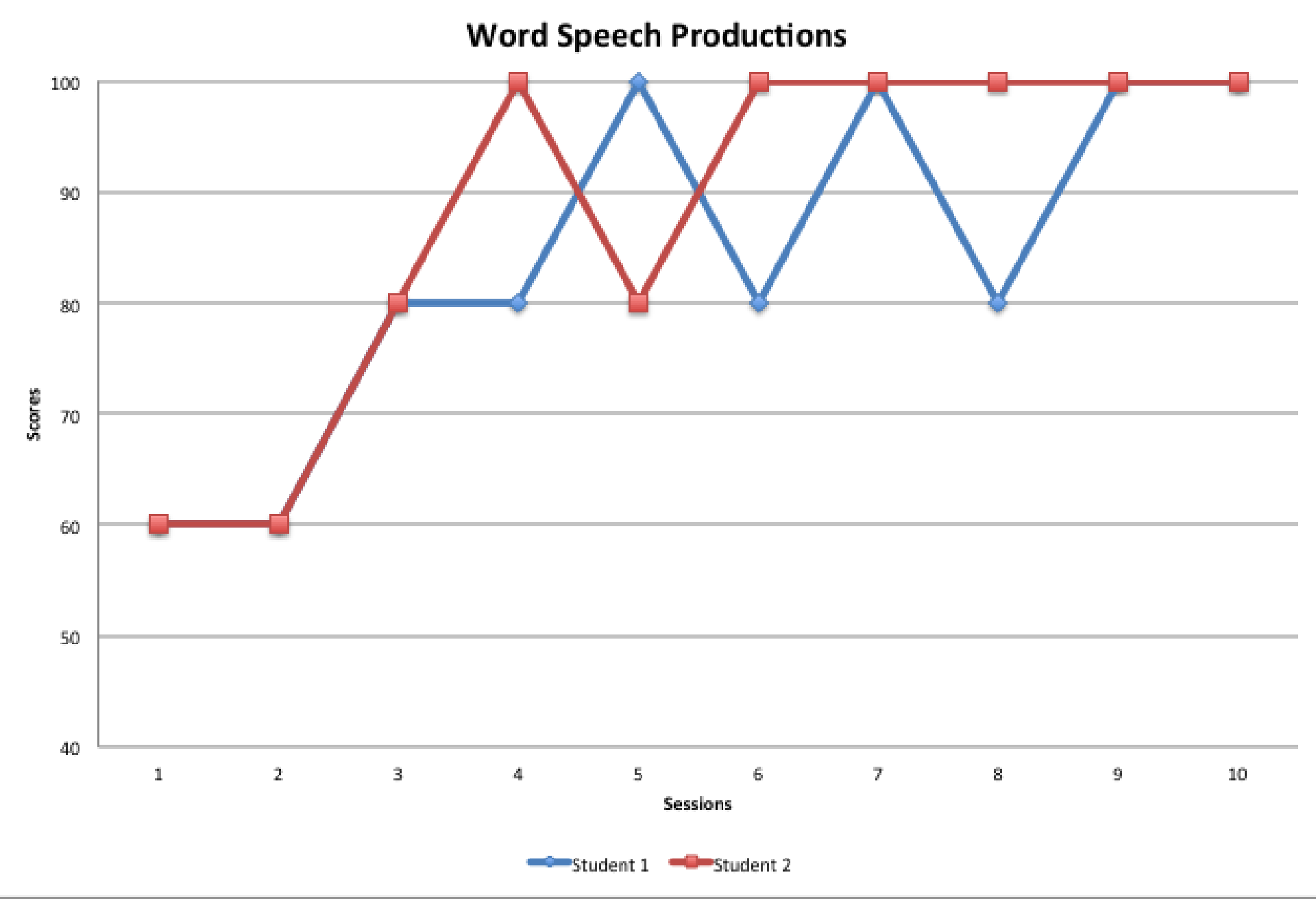
Student 2

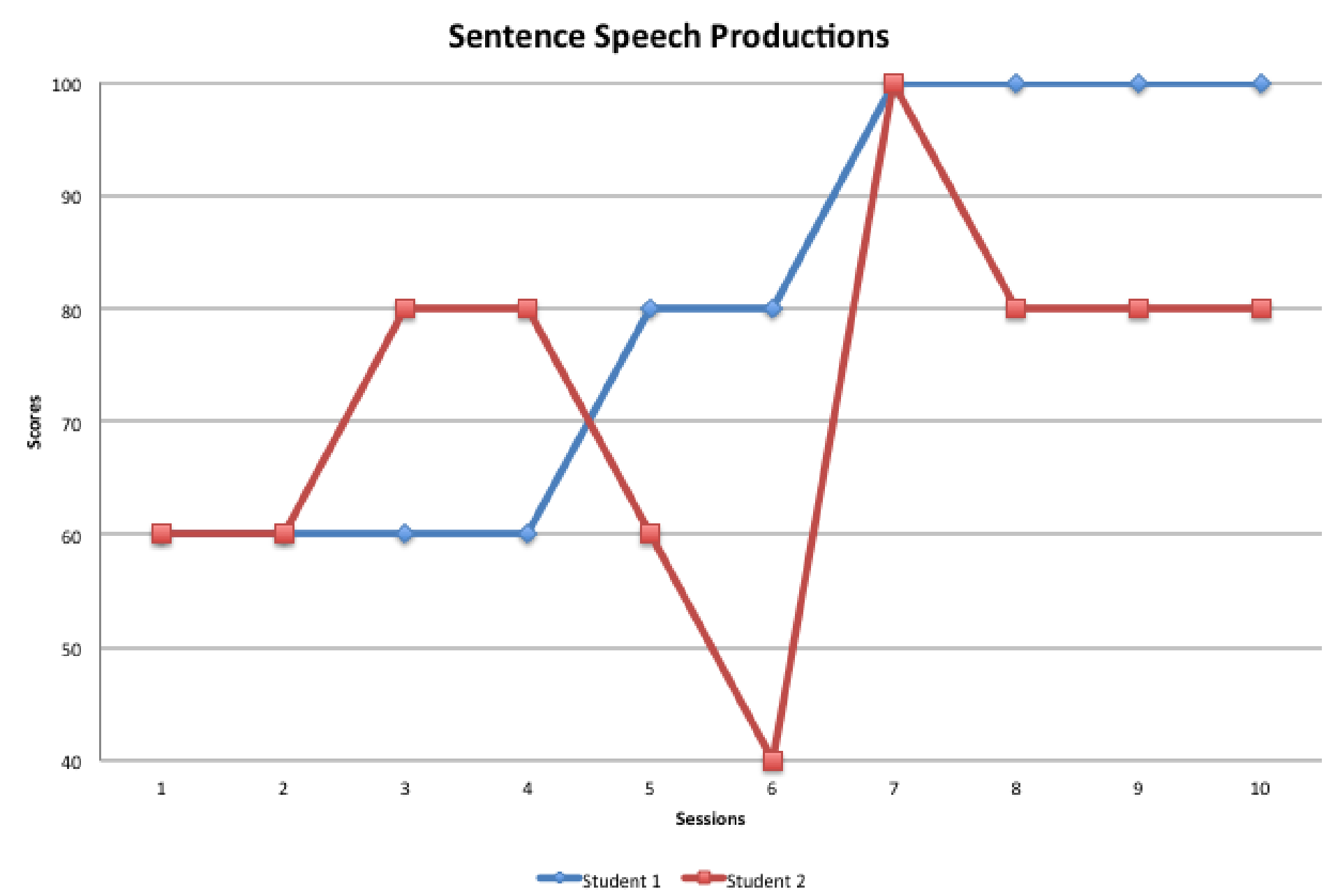
Age equivalency: >9.11 (pre and post)

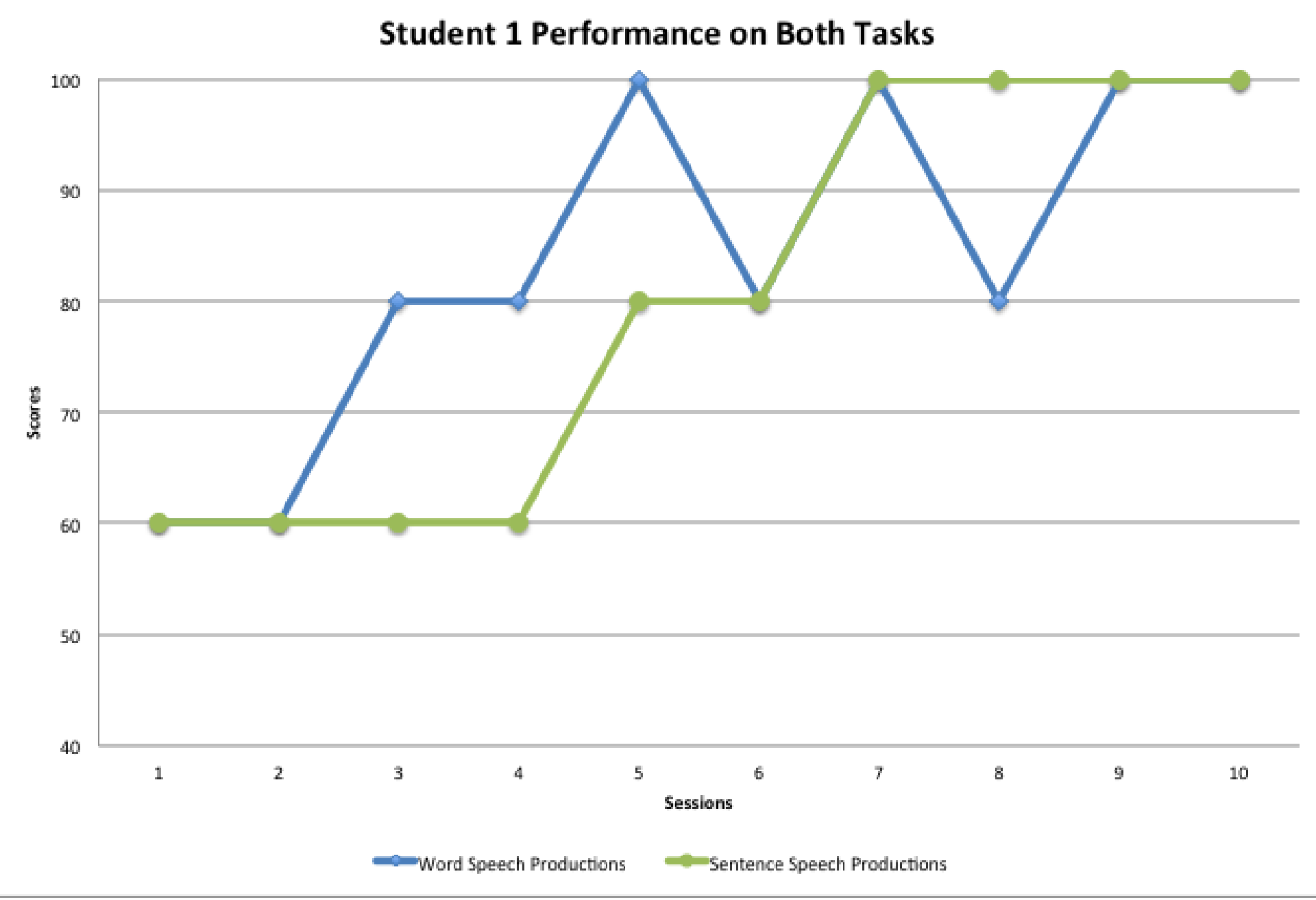
Decoding (80 total)	
Pre-test	Post-test
79	80

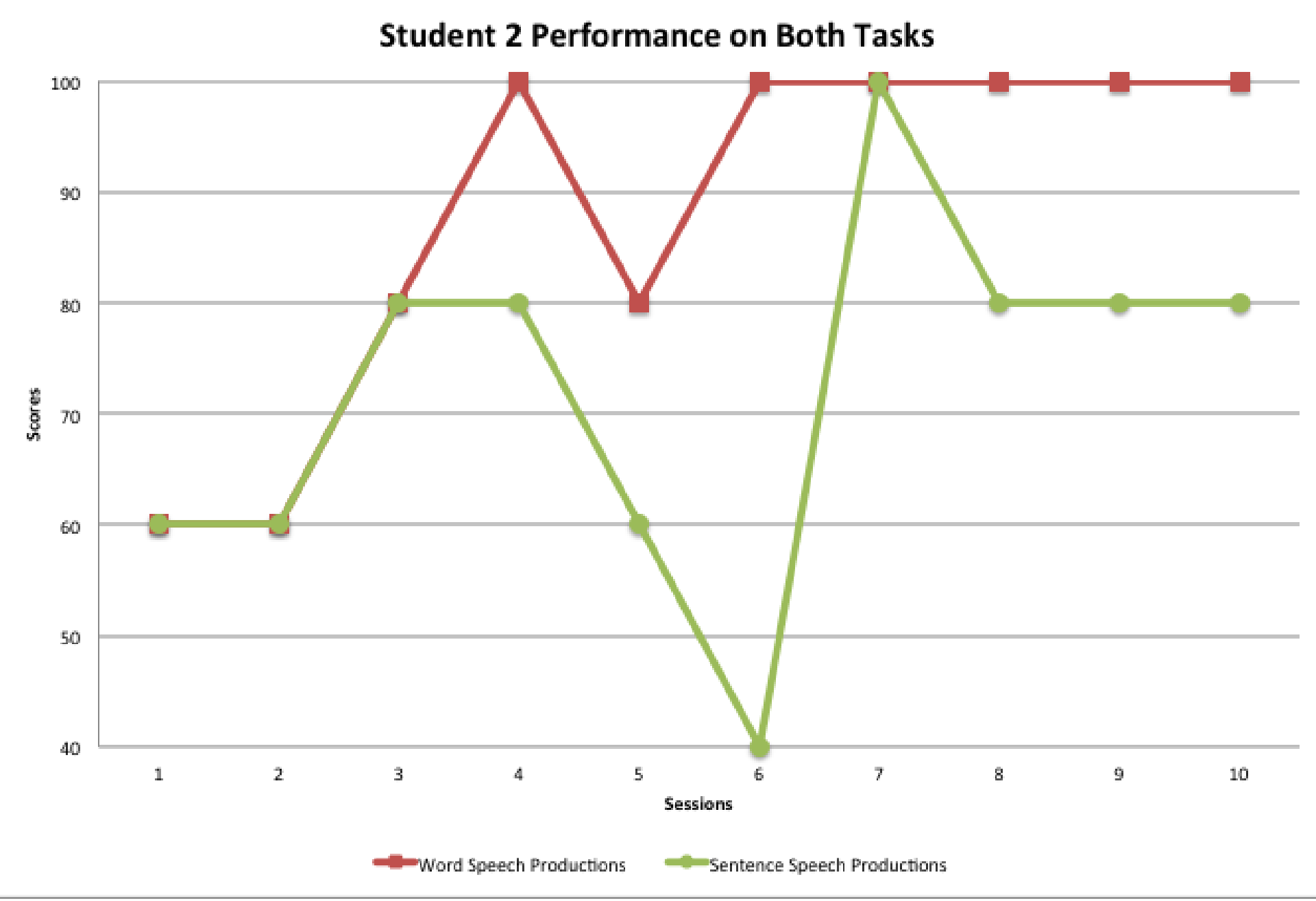
Test of Written Spelling (TWS)	
Pre-test	Post-test
120	120

*Standard score for TWS


Word Speech Productions
100
90
80
70
60
50
40
Scores
1
2
3
4
5
6
7
8
9
10
Sessions
Student 1
Student 2


Sentence Speech Productions
100
90
80
70
60
50
40
Scores
1
2
3
4
5
6
7
8
9
10
Sessions
Student 1
Student 2


Student 1 Performance on Both Tasks
100
90
80
70
60
50
40
Scores
1
2
3
4
5
6
7
8
9
10
Sessions
Word Speech Productions
Sentence Speech Productions


Student 2 Performance on Both Tasks
100
90
80
70
60
50
40
Scores
1
2
3
4
5
6
7
8
9
10
Sessions
Word Speech Productions
Sentence Speech Productions

Conclusion

This study revealed multiple key findings:

- In a matter of five weeks, student scores increased significantly
- By incorporating literacy into therapy, phonological awareness skills increased

Future Research

As a preliminary pilot study, there are several changes to be made for future research, including:

- Assessment measures
- Sample size
- Duration of study
- Baseline data

References

American Speech-Language Hearing Association. (2006). *2006 Schools Survey report: Caseload characteristics*. Rockville, MD: Author.

American Speech-Language-Hearing Association. (2012). *2012 Schools Survey report: SLP caseload characteristics.*

Bernthal, J., & Nicholas, B. (2004). *Articulation and phonological disorders*. (5th ed.). University of Virginia: Pearson.

Dodd, B., & Gillon, G. (2001). Exploring the relationship between phonological awareness, speech impairment, and literacy. *International Journal of Speech-Language Pathology*, *3*(2), 139-147.

Gillon, G. T. (2000). The efficacy of phonological awareness intervention for children with spoken language impairment. *Language, Speech, and Hearing Services in Schools*, *31*(2), 126.

Gillon, G. T. (2005). Facilitating phoneme awareness development in 3-and 4-year-old children with speech impairment. *Language, Speech, and Hearing Services in Schools*, *36*(4), 308.

Harbers, H. M., Paden, E. P., & Halle, J. W. (1999). Phonological awareness and production: Changes during intervention. *Language, Speech, and Hearing Services in Schools*, *30*(1), 50.

Hesketh, Catherine Adams, Catherine Nightingale, Rebecca Hall, A. (2000). Phonological awareness therapy and articulatory training approaches for children with phonological disorders: a comparative outcome study. *International journal of language & communication disorders*, *35*(3), 337-354.

References

Hoffman, P. R., & Norris, J. A. (2005). Intervention: Manipulating complex input to promote self-organization of a neuro-network. *Phonological disorders in children*, 139-156.

Hoffman, P. R., & Norris, J. A. (2010). Dynamic systems and whole language intervention. *Interventions for speech sound disorders in children*, 333-354.

Lewis, B. A., Shriberg, L. D., Freebairn, L. A., Hansen, A. J., Stein, C. M., Taylor, H. G., & Iyengar, S. K. (2006). The genetic bases of speech sound disorders: evidence from spoken and written language. *Journal of Speech, Language and Hearing Research*, *49*(6),1294.

Moriarty, B. C., & Gillon, G. T. (2006). Phonological awareness intervention for children with childhood apraxia of speech. *International Journal of Language & Communication Disorders*, *41*(6), 713-734.

Shriberg, L. D. (1993). Four new speech and prosody-voice measures for genetics research and other studies in developmental phonological disorders. *Journal of Speech, Language and Hearing Research*, *36*(1), 105.

Shriberg, L. D. (1994). Five subtypes of developmental phonological disorders. *Clinics in Communication Disorders, 4*(1), 38–53.

Shriberg, L. D., Tomblin, J. B., & McSweeny, J. L. (1999). Prevalence of speech delay in 6-year-old children and comorbidity with language impairment. *Journal of Speech, Language and Hearing Research*, *42*(6), 1461.