Teaching Phonological Awareness to Preschoolers with Down Syndrome: Boosting Reading Readiness

Samantha A. Gesel, PhD
University of North Carolina at Charlotte

Lauren M. LeJeune, PhD
University of South Carolina

Christopher J. Lemons, PhD
Vanderbilt University

Elijah is a 4-year-old child with Down syndrome (DS) who attends an inclusive preschool. Elijah has one literacy-related Individualized Education Program (IEP) goal to correctly produce 10 first sounds in a minute on a first sound fluency assessment by the end of his preschool year. During daily classroom instruction, Elijah shows interest in books and demonstrates print awareness by helping turn the page and pointing to words as his teacher reads aloud. Elijah's special education teacher, Ms. Jennifer, is worried about Elijah's transition to kindergarten. Although he has shown foundational print awareness and early language skills, he is not showing progress toward his literacy-related IEP goal. Ms. Jennifer wonders how she can boost Elijah's early reading skills to maximize his chance to benefit from kindergarten reading instruction and put him on a path to becoming an independent reader.

Phonological awareness (PA) is defined as a child's ability to hear and manipulate parts of spoken language (National Early Literacy Panel [NELP], 2009; National Institute of Child Health and Human Development [NICHD], 2000). Because PA relates to *spoken* language, it can be taught without print; however, these activities can be supported by print as children begin to develop letter knowledge. PA comprises many skills, including rhyming, alliteration, and blending, segmenting, and deleting sounds in words (Lerner & Lonigan, 2016). Literacy researchers have developed PA interventions that target all of these skills (see NELP, 2009).

Ensuring that children develop PA increases the likelihood that they are successful with later reading instruction. Two types of PA skills are most important to future reading readiness (NICHD, 2000). These include the ability to *blend* smaller sound units into words (/b/ /a/ /t/ → "bat") and *segment* spoken words into smaller sound units ("milk" → /m/ /ilk/).

Blending and segmenting spoken language can be done across sound units. Utterances can be divided into sentences and individual words, while words can be broken down further into syllables, onset-rime of one-syllable words (e.g., /br//ick/ or /p/ /aint/), or individual sounds in words. Although PA skills across sound units develop simultaneously, children often hear and manipulate larger units of language more readily than smaller units. In this way, the ability to hear and manipulate

DOI: 10.1177/1096250619865953
journals.sagepub.com/home/yec

“There is a significant relation between PA, current reading abilities, and later reading skills for children with DS (Lemons & Fuchs, 2010). This makes early PA interventions especially important.”

phonemes, the smallest meaningful unit of sound in spoken language (e.g., /b/ or /sh/), is considered the most advanced PA skill (Lerner & Lonigan, 2016; NICHD, 2000).

For children with and without disabilities, there is evidence of a strong relation between the ability to blend and segment phonemes and future reading skills (NELP, 2009; NICHD, 2000). When children blend phonemes they hear, they are practicing a skill similar to that required to sound a word out letter by letter and blend those sounds together to read an entire word. In contrast, when children segment phonemes they hear within a whole word, they are mirroring the skills required to spell a word sound by sound. With the ability to hear and manipulate phonemes in words, children have a framework onto which they can map corresponding letter knowledge. In this way, advanced PA skills build a child's understanding of the underlying alphabetic principle, which is a bridge between PA and reading (NICHD, 2000).

Supporting the Development of PA Skills

Children begin to demonstrate basic understandings of PA around 2 years old, and this understanding rapidly expands throughout early childhood (Skibbe, Gerde, Wright, & Samples-Steele, 2016). Children with typical development learn PA skills in high quality, literacy rich environments. However, many children at risk for future reading difficulty should receive more explicit instruction in PA during the preschool and early elementary years to address potential reading risk (NELP, 2009; Philips, Clancy-Menchetti, & Lonigan, 2008). Because PA includes a wide range of skills, it can be challenging to teach. Like Ms. Jennifer in the opening vignette, many early childhood educators feel inadequately prepared to teach PA concepts (Skibbe et al., 2016). Yet, the research literature provides evidence that explicit PA instruction may be one promising way to improve PA skills for children with disabilities (NELP, 2009; NICHD, 2000).

PA and Children with DS

Young children with DS often struggle to develop PA skills, particularly in comparison with peers without disabilities (Lemons & Fuchs, 2010; Martin, Klusek, Estigarribia, & Roberts, 2009; Næss, 2016). Nonetheless, there is a significant relation between PA, current reading abilities, and later reading skills for children with DS (Lemons & Fuchs, 2010). This makes early PA interventions especially important. Furthermore, many children with DS exhibit potentially problematic behaviors, such as work avoidance (Fidler & Nadel, 2007). Therefore, early childhood educators must consider comprehensive PA interventions that address the academic and behavioral needs of their children with DS.

Explicit instruction is especially important for children with DS who often demonstrate deficits in PA-related concepts and are at risk for later reading difficulties (Lemons & Fuchs, 2010; Martin et al., 2009; Næss, 2016). With explicit instruction, children with disabilities broadly (see Gillon, 2000) and DS specifically (see Lemons & Fuchs, 2010; van Bysterveldt, Gillon, &

Foster-Cohen, 2010) show improved PA skills, which support later reading development. In this article, we describe *Boost*, a brief, explicit PA intervention designed for preschoolers with DS. Throughout the article, we return to Elijah's story to highlight how *Boost* may help educators like Ms. Jennifer, who wish to develop their children's PA skills.

Boost: An Explicit PA Intervention

Based on data from ongoing assessments of Elijah's progress toward his early literacy IEP goal, Ms. Jennifer has evidence that Elijah could benefit from targeted, explicit PA instruction aligned with Division for Early Childhood of the Council for Exceptional Children (DEC) Recommended Practices. She decides to use an intervention called Boost, an explicit PA intervention designed to accelerate reading readiness of preschoolers with DS. Ms. Jennifer believes that Boost's focus on blending and segmenting increasingly more challenging phonological units will support Elijah as he works toward his first sound fluency IEP goal. Ms. Jennifer is especially interested in Boost because of its embedded assessment, which will inform her instruction through data-based decision-making. Boost sessions are 15 to 20 min long and include five intervention steps (1-5 min/step). Ms. Jennifer decides to implement Boost 3 days a week when she works with Elijah during his class's center rotations.

Boost is a targeted PA intervention that explicitly teaches children how to blend and segment word parts. The intervention teaches these skills across increasingly challenging phonological units. *Boost* incorporates features of effective instruction known to improve learning outcomes for children with disabilities (see DEC, 2014, 2015; Hughes, Morris, Therrien, & Benson, 2017; Rosenshine, 2012).

First, *Boost* instruction is systematic. Children practice blending prior to segmenting, allowing children to practice the easier PA skill before moving on to the more challenging one. Similarly, *Boost* systematically introduces new phonological units as children master simpler ones. In this way, children practice blending and segmenting word parts of increasing complexity: (a) syllables in compound words, such as "bath"-"tub"; (b) onset-rime in single-syllable words, such as /m/ /ilk/; and (c) individual phonemes in words with a consonant-vowel-consonant (CVC) sound pattern, such as /c/ /a/ /t/.

Boost also uses components of *explicit instruction*. Educators model correct responses for each type of prompt and children receive opportunities for guided practice. If a child makes an error, the educator provides immediate correction by providing the correct answer and repeating the prompt to give the child another practice opportunity. If the child answers incorrectly again, the educator physically prompts (e.g., provides hand-over-hand support to move manipulatives) with the correct answer and repeats the question once more. As needed, the educator may repeat this procedure for another cycle. This process is an evidence-based approach to literacy interventions for children with an intellectual disability (see Browder, Lee, & Mims, 2011). Educators could adapt this process to meet an individual child's behavioral needs (e.g., reducing number of demands

"*Boost* is a targeted PA intervention that explicitly teaches children how to blend and segment word parts."

> “In conjunction with the systematic, explicit instruction and feedback, Boost’s data-based decision-making framework and instructional context align with DEC (2014) Recommended Practices for assessment and instruction.”

after incorrect responses), which would assist in limiting frustrations and minimizing problem behavior even more. For more information on this process, visit https://vkc.mc.vanderbilt.edu/ebip/system-of-least-prompts/. Overall, *Boost’s* systematic and explicit instructional approach aligns with the DEC Recommended Practices of fostering learning and engagement. This approach to instruction supports the acquisition and generalization of new skills (see DEC, 2014, 2015).

Finally, *Boost* uses a data-based decision-making framework that links developmentally-appropriate daily assessment data with instruction and incorporates specific strategies (e.g., clarifying expectations and using a motivational, game-like structure for instruction) designed to prevent challenging behaviors and facilitate engagement (DEC, 2015). In conjunction with the systematic, explicit instruction and feedback, these components align with DEC (2014) Recommended Practices for assessment and instruction (e.g., Recommended Practices A3, A9, A10, INS2, INS3, INS6, and INS7).

Consequently, *Boost* has the potential to support the acquisition and generalization of new PA skills for children with DS, which can enable future reading success for these children. In this section, we describe each *Boost* step and provide suggestions for implementation in early childhood classrooms. For further description of the *Boost* intervention, including empirical evidence supporting its use, see LeJeune, Gesel, and Lemons (2018).

Step 1: Warm Up (1-2 min)

During Boost’s first step, Elijah works on two prerequisite skills. First, Ms. Jennifer provides Elijah with three small counting cubes, models how to touch and count each cube, then provides Elijah with the opportunity to practice his one-to-one correspondence by pointing to the cubes on his own as she counts them. Next, Ms. Jennifer places two picture cards in a line. She points to each card, states which one is first and which one is next, and then prompts Elijah (e.g., “I have a dog and cat. The dog is first. The cat is next. Which one is first? Which one is next?”).

The purpose of the first step in *Boost* is to practice skills that support the later activities. Children count cubes to reinforce their one-to-one correspondence, an important skill for segmenting words into meaningful word chunks. When children have a strong understanding of one-to-one correspondence, they are more likely to distinguish and identify individual phonemes in a word. Second, children must understand the vocabulary words “first” and “next.” Understanding the meaning of these words is important for when a child is asked to identify first or next sounds in a word. In addition, the activities in this first step promote early success because they are quick and relatively easy for children to complete.

> “The game-like format makes blending and segmenting engaging and motivating. This, in turn, reduces the likelihood of challenging behaviors.”

Steps 2 and 3: Blending and Segmenting Games (3-5 min/game)

During the second step of Boost, Elijah plays “Guess My Word” (Fuchs et al., 2001) with Ms. Jennifer. During this game, Ms. Jennifer uses a monkey puppet that always speaks in broken words. Elijah has to blend the monkey’s broken word together to make a real word. For half of the words, Ms. Jennifer gives Elijah an array of pictures cards with three possible answers from which Elijah selects the correct answer. For the other half, Elijah orally provides an answer to the blending prompt without picture supports. For instance, the monkey might say to Elijah, “My word is /p/ /i/ /g/. What’s my word?” To answer correctly, Elijah would have to reply “pig” or select the picture of the pig from three options.

During the third step, Elijah and Ms. Jennifer play “Say-It-Move-It” (Blachman, Ball, Black, & Tangel, 2000). Ms. Jennifer uses plastic blocks to represent larger word parts (syllables or rimes) and smaller chips to represent individual phonemes. For each practice word, Ms. Jennifer provides Elijah a whole word (e.g., “My word is ‘pig’. What word?”) Elijah repeats the whole word back and then Ms. Jennifer prompts him to state the word parts (e.g., “What are the three sounds?”). Elijah moves a plastic chip for each sound he segments. For the example word “pig,” Elijah would move three plastic chips. Alternatively, if segmenting the onset-rime in the word “milk,” Elijah would move a chip for the onset (/m/) and a block for the larger rime unit (/ilk/). During both PA games, Ms. Jennifer provides Elijah models for each target word, immediate error correction as needed, and opportunities to practice his budding PA skills.

The majority of the *Boost* instruction occurs during these two steps, in which children play two different games that target blending and segmenting skills. In Step 2, children blend together word parts educators provide during “Guess My Word.” In Step 3 (“Say-It-Move-It”), educators provide a whole word that children must segment into word chunks (i.e., syllables, onset-rime, or phonemes, depending on the target sound unit). The game-like format makes blending and segmenting engaging and motivating. This, in turn, reduces the likelihood of challenging behaviors. Educators should target a small number of words for each phonological unit (see Figure 1). This allows children to repeatedly practice blending and segmenting the parts of these words and work toward mastery. Figure 4 provides sample script for Steps 2 and 3.

Step 4: Daily Assessment (3-5 min)

After the two PA games, it is time for the fourth step of Boost—the daily assessment (see Figure 2). Ms. Jennifer collects data daily on

Figure 1
Example list of *Boost* target and generalization words

***Boost*: Example Target and Generalization Words**								
Target Words								
Syllables			**Onset-Rime**			**Phonemes**		
Bathtub	Firefly	Airplane	Milk	Cold	Fast	Cat	Mad	Tag
Baseball	Flashlight	Backpack	Mask	Camp	Find	Dot	Mop	Dog
Raincoat	Bookmark	Horseshoe	Belt	Hand	Pond	Sun	Mug	Nut
Doghouse	Footprint	Doormat	Bump	Heart	Paint	Lip	Pig	Pin
Near Generalization Words								
Syllables			**Onset-Rime**			**Phonemes**		
Bathmat	Firework	Airbag	Melt	Cast	Fist	Hat	Dad	Wag
Eyeball	Sunlight	Backbone	Mist	Count	Feast	Pot	Hop	Log
Rainbow	Bookshelf	Snowshoe	Build	Hunt	Point	Bun	Bug	Cut
Birdhouse	Football	Doorbell	Beast	Help	Pant	Zip	Dig	Fin
Far Generalization Words								
Syllables			**Onset-Rime**			**Phonemes**		
Cupcake	Skateboard	Seesaw	Work	Gift	Sink	Tack	Cap	Pal
Lipstick	Sandbox	Popcorn	Wand	Ghost	Soft	Rod	Mom	Job
Sailboat	Starfish	Toothbrush	Desk	Toast	Land	Tub	Cup	Bus
Sunshine	Mailman	Fishbowl	Dump	Tent	Left	Hill	Sit	Kick

“Through this assessment, educators measure children’s PA skills (with and without picture support) for words that are specifically targeted during Steps 2 and 3, as well as generalization words that are not directly taught.”

Elijah’s responses during a brief assessment of the targeted phonological unit. The assessment is closely aligned with the intervention content. The assessment includes prompts related to blending and segmenting target and generalization words, both with and without picture supports. By including different types of prompts, Ms. Jennifer feels confident that the assessment is sensitive enough to capture small changes in Elijah’s PA development. Ms. Jennifer graphs Elijah’s assessment data and visually inspects the graph to determine Elijah’s progress across phonological units (see Figure 3). The results from this assessment help Ms. Jennifer identify when Elijah is ready to move onto a more challenging phonological unit. In addition, Ms. Jennifer assesses previously learned phonological units regularly to ensure that Elijah maintains his improvements even after targeted instruction ends.

Boost includes a short daily assessment of the targeted phonological unit for educators to administer after the two PA games (see Figure 2). This assessment provides information about children’s ongoing mastery of blending and segmenting skills across sound units. Through this assessment, educators measure children’s PA skills (with and without picture support) for words that are specifically targeted during Steps 2 and 3, as well as generalization words that are not directly taught.

Figure 2
***Boost* assessment tool**

Boost Assessment Tool

Student Name: _____ **Date:** _____

Target Sound Unit (*circle*) Syllables Onset-Rime Phonemes

Blending Word Parts **Prompt:** Guess my word: ____ [*pause*] ____. What word?

With Picture Support			**Without Picture Support**		
For each, provide array of 3 target or generalization pictures, with location of correct answer randomly chosen (left, center, or right).			*Simply state prompt (no pictures).*		
Word Assessed (*Gen=Generalization*)	Student Response (*1=Correct; 0=Incorrect*)		Word Assessed (*Gen=Generalization*)	Student Response (*1=Correct; 0=Incorrect*)	
Target Word #1: _____	1	0	Target Word #1: _____	1	0
Target Word #2: _____	1	0	Target Word #2: _____	1	0
Gen. Word #1: _____	1	0	Gen. Word #1: _____	1	0
Gen. Word #2: _____	1	0	Gen. Word #2: _____	1	0

Segmenting Word Parts **Prompt:** My word is ____. What word? [*Child repeats*]. What are the two/three parts?

With Picture Support			**Without Picture Support**		
For each, provide picture card for word student must segment.			*Simply state prompt (no pictures).*		
Word Assessed (*Gen=Generalization*)	Student Response (*1=Correct; 0=Incorrect*)		Word Assessed (*Gen=Generalization*)	Student Response (*1=Correct; 0=Incorrect*)	
Target Word #1: _____	1	0	Target Word #1: _____	1	0
Target Word #2: _____	1	0	Target Word #2: _____	1	0
Gen. Word #1: _____	1	0	Gen. Word #1: _____	1	0
Gen. Word #2: _____	1	0	Gen. Word #2: _____	1	0

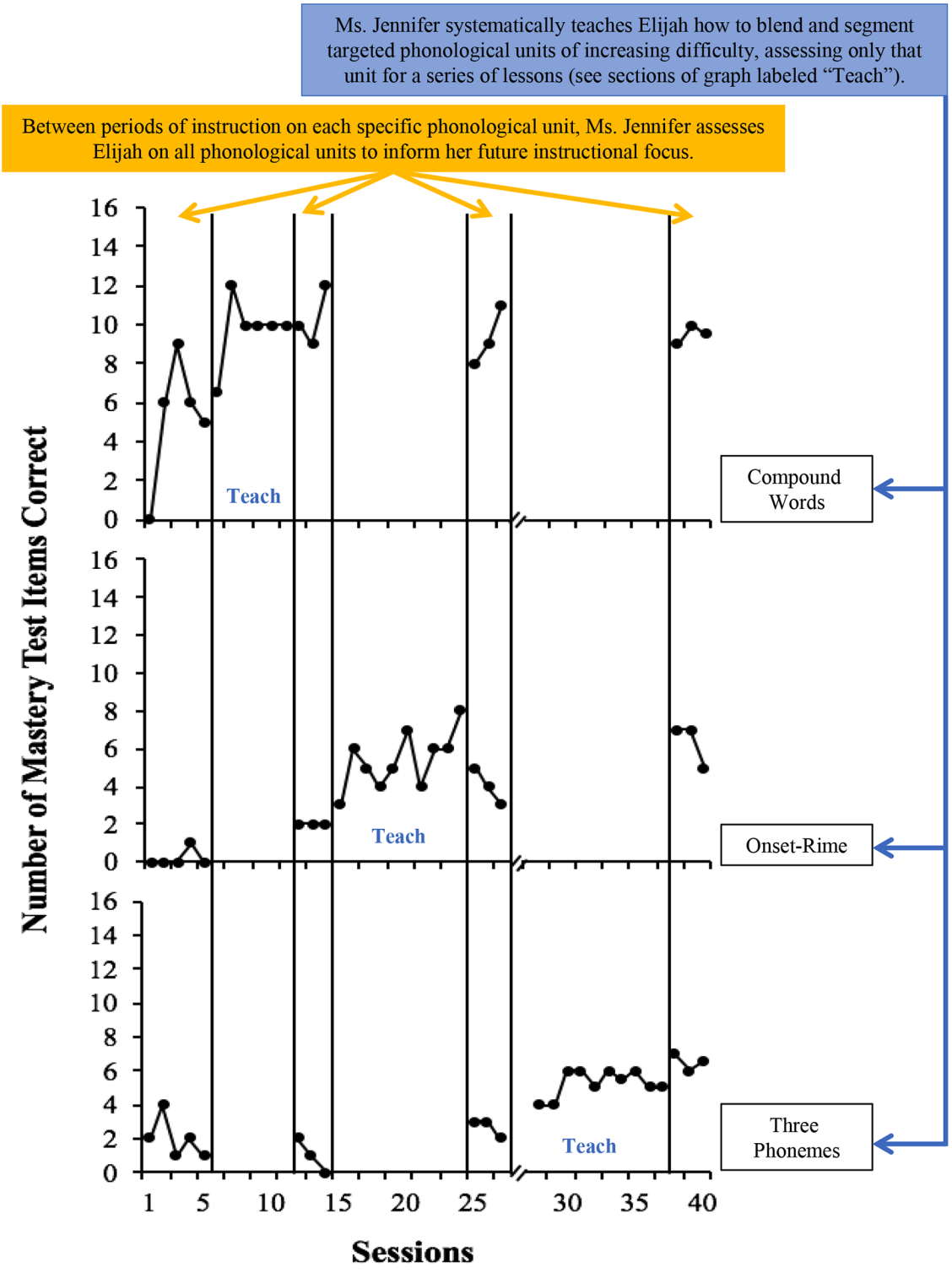
Total Score: _____ / 16

Note. When using this assessment tool, consider the following: (a) The assessment is systematic in that it supports increasingly challenging PA skills. Assess all four items (target, then generalization words) in a section before moving onto the next section. Remember that blending is an easier task than segmenting; similarly, having picture supports is an easier task than not having those supports. (b) This assessment can be used to determine children's current PA repertoire prior to intervention in a given sound unit. Give the assessment prior to intervention to use children's data to plan instructional goals to match child needs. (c) Use the total score on the daily assessments, as well as sub-scores for the different PA skills, word familiarity, and level of picture support to plan instruction. We recommended teachers continue instruction in a given sound unit until the child has scored 10 points total, or shown increased scores for at least 3 to 5 days. If some sub-scores remain low, consider adjusting instruction to target the specific types of skills requiring the most instructional attention.

There are two types of generalization words that may be assessed daily. Near generalization words include a shared, smaller sound unit with the target words. In contrast, far generalization words do not share that smaller sound unit with target words. For example, the words "cat" (target word) and "hat" (near generalization word) both have the rime "-at," while "tack" (far generalization word) does not share the rime of any target word. Figure 1 provides an example list of words that could be used to teach and assess blending and segmenting across each phonological unit addressed in *Boost*. However, educators can choose other words that fit the needs and skills of the children in their class. For *Boost*, words should be imageable (easy to represent with a child-friendly image) and part of the children's receptive vocabulary.

By using the *Boost* assessment to measure child progress across dimensions (blending vs. segmenting, target vs. generalization, picture support vs. no picture support), educators can begin to analyze errors and use these data to inform their instruction. For instance, a child might be able to successfully blend

Figure 3
Elijah's assessment data



Note. These data were originally published in LeJeune et al. (2018). For further description of research design, results, and implications for research and practice, please refer to this citation.

> “The primary goal is to give children an opportunity to practice skills in the applied context of a shared storybook experience. In this way, children may begin to generalize blending and segmenting word parts beyond the *Boost* intervention sessions.”

the syllables of all compound words, regardless of picture support and familiarity with the word, but struggle to segment those same words. This would show a broader mastery of blending syllables as a PA skill, while also indicating a need for additional segmenting practice. Educators can also use the *Boost* assessment data to make informed decisions about intervention content (e.g., identify learning targets and plan lesson activities to individualize instruction), a recommended practice for early childhood educators (DEC, 2014).

Figure 3 shows Elijah's data throughout *Boost*. Ms. Jennifer explicitly and systematically teaches and assesses each sound unit. Periodically, she assesses all sound units. This provides evidence of Elijah's retention of skills related to segmenting and blending previously learned sound units. Based on these data, it is clear that Elijah showed progress across each phonological unit, but has room to improve his PA skills further. Ms. Jennifer should consider Elijah's breakdown of skills across dimensions to determine next instructional steps. By targeting weaker skills, Ms. Jennifer will help Elijah solidify these skills to mastery (e.g., 80% correct in three consecutive sessions).

Step 5: Shared Reading (5 min)

During the fifth step of Boost, Ms. Jennifer selects a text for Elijah to read. Ms. Jennifer loads these texts onto her class iPad® and, during planning, identifies two places to stop while reading—once to blend word parts and once to segment a word—as additional practice of these PA skills in an applied context. Because iPad® time and shared reading are preferred classroom activities for Elijah, he always expresses excitement during this portion of the lesson.

Each *Boost* session ends with a brief, shared storybook experience. This step of the *Boost* lesson is the most flexible. Educators can consider child interests in selecting texts. For example, if a child has a strong interest in dinosaurs, her educator could use a text featuring dinosaurs to capitalize on her motivation to engage in shared storybook reading. By considering both the written text and the pictures in these books, educators can plan ahead to identify two opportunities to practice the targeted skills (e.g., “Look! The dinosaur stepped on a /l/ /eaf/. What word?”). The primary goal is to give children an opportunity to practice skills in the applied context of a shared storybook experience. In this way, children may begin to generalize blending and segmenting word parts beyond the *Boost* intervention sessions. Depending on the text, educators could read a new book during each session, divide a book across multiple days, or repeat a book across sessions for repeated exposure.

Adapting *Boost* for Your Early Childhood Classroom

After about 3 months of intervention, Ms. Jennifer is pleased that the data show Elijah improved in his ability to blend and segment all phonological units (see Figure 3). She is also excited to note that Elijah maintained his increased scores even after her explicit instruction targeting a phonological unit ended. While

Figure 4
***Boost* implementation checklist**

***Boost* Intervention Checklist**	
Step 1: Warm Up	***Overview***: *Practice precursor skills.* (1-2 min.)

- ❑ Practice counting blocks (1-to-1 correspondence).
- ❑ Practice identifying first/next (vocabulary).

Step 2: Blending Game	***Overview***: *Play "Guess My Word" to blend word parts together.* (3-5 min.)

- ❑ Model: Show how to blend two target words with picture choices and two without picture choices.
  - ❑ *Sample script for blending phonemes:*
    - ❑ [*Picture choices available*] "This is "dog", "pig", and "tag" [*point to each picture*]. My word is /p/ /i/ /g/. What's my word?"
    - ❑ [*No pictures*] "My word is /p/ /i/ /g/. What's my word?"
- ❑ Guided Practice: After each model, student practices blending same word (with same level of picture support).
- ❑ Additional Practice: Without model, student blends two target words with picture choices and two without.

Step 3: Segmenting Game	***Overview***: *Play "Say-It-Move-It" to segment word into word parts.* (3-5 min.)

- ❑ Model: Show how to segment two target words with picture support and two without picture support.
  - ❑ *Sample script for segmenting phonemes:*
    - ❑ [*Picture choices available*] "My word is 'pig' [*point to picture*]. What word? What are the three sounds?" [*Move a plastic chip for each sound segmented. Note: for larger phonological units (e.g., the rime /ilk/), move a plastic block].*
    - ❑ [*No pictures*] "My word is 'pig'. What word? What are the 3 sounds?" [*Move a plastic chip for each sound segmented].*
- ❑ Guided Practice: After each model, student practices segmenting same word (with same level of picture support).
- ❑ Additional Practice: Without model, student segments two target words with picture supports and two without.

Step 4: Daily Assessment	***Overview***: *Assess to monitor progress/inform goals.* (3-5 min)

- ❑ Use assessment tool (Table 2) to assess student's blending and segmenting skills within targeted phonological unit. Between time targeting each unit instructionally, assess across all sound units to inform future instruction.
  - ❑ Across target and generalization words.
  - ❑ With and without picture support.

Step 5: Shared Reading	***Overview***: *Blend/segment during shared reading.* (5 min.)

- ❑ Select text and words to practice blending/segmenting within text.
- ❑ Read with child, stopping to apply blending/segmenting skills in context.

Elijah still has room to improve his blending and segmenting of individual phonemes in words, Ms. Jennifer can confidently infer that the targeted instruction in Boost has contributed to improvements in his blending and segmenting skills. Ms. Jennifer shares the positive results with Elijah's classroom teacher. Together, they wonder how they could maximize Boost's effectiveness in the broader inclusive classroom setting.

Collectively, the five steps of *Boost* build children's abilities to blend and segment word parts across increasingly challenging phonological units. For a complete *Boost* intervention checklist, see Figure 4.

By systematically and explicitly teaching PA skills, *Boost* creates a learning environment that sets children up for success and promotes early literacy learning that can be used during other aspects of their inclusive school setting. Even with this strong foundation of evidence-based instructional practices and strategies, however, there are a few additional aspects educators may need to consider to fit the needs of an early childhood classroom more broadly.

First, while the vignette highlights the use of the *Boost* intervention in a one-on-one setting with a special educator, the steps can easily occur in small groups, with each child having

> “By systematically and explicitly teaching PA skills, Boost creates a learning environment that sets children up for success and promotes early literacy learning that can be used during other aspects of their inclusive school setting.”

her or his own set of materials. The same basic principles of systematic, explicit instruction and feedback would still apply. This may increase the feasibility of using a targeted PA intervention in the classroom and broaden the reach of instruction to additional learners. Similarly, if the entire *Boost* intervention package is not feasible, certain features can be implemented in whole group settings (e.g., Guess my Word) using choral responses.

Second, educators can modify session length (typically 15-20 min) while still maintaining the comprehensiveness and effectiveness of the PA instruction. For example, educators can divide the steps across multiple, shorter blocks of instructional time (e.g., three 5-min sessions). In addition to meeting scheduling needs, implementing shorter sessions may also be an effective adaptation for children who engage in challenging behaviors that may relate to longer session lengths. Alternatively, some aspects of the *Boost* intervention could be conducted in small groups and then educators could implement targeted review sessions with children like Elijah who may need additional practice opportunities. Doing this may help educators provide individualized instruction to the children who need it, while still meeting a larger number of children's early literacy needs. Finally, after receiving a brief overview of each step from the classroom teacher, paraprofessionals or instructional helpers can implement *Boost* with children in the classroom. This would support both the classroom teacher and child alike. Educators can consider these valuable resources in planning their instruction to meet the early literacy needs of all their children.

Concluding Thoughts

With the Boost intervention, Ms. Jennifer feels confident in her approach to providing explicit PA instruction to her children. She recognizes the importance of these skills for future reading achievement and strongly believes that all her children can and will benefit from this approach to her instruction. By using an intervention that is aligned with DEC Recommended Practices, Ms. Jennifer knows her instruction has the potential to improve her children's PA skills and boost their readiness to read.

Authors' Note

The research described in this article was supported in part by a Peabody College Small Grant for Research from Vanderbilt University and from Grants H325H140001 and H325D140073, both from the Office of Special Education Programs within the U.S. Department of Education. Nothing in the article necessarily reflects the positions or policies of the funding agencies and no official endorsement by them should be inferred.

You may reach Samantha A. Gesel by e-mail at sgesel1@uncc.edu.

ORCID iD

Samantha A. Gesel https://orcid.org/0000-0002-8045-1607

References

Blachman, B. A., Ball, E. W., Black, R., & Tangel, D. M. (2000). *Road to the code: A phonological awareness program for young children*. Baltimore, MD: Brookes Publishing.

Browder, D. M., Lee, A., & Mims, P. (2011). Using shared stories and individual response modes to promote comprehension and engagement in literacy for students with multiple, severe disabilities. *Education and Training in Autism and Developmental Disabilities*, *46*, 339-351.

Division for Early Childhood of the Council for Exceptional Children. (2014). *DEC recommended practices in early intervention/early childhood special education*. Retrieved from http://www.dec-sped.org/recommendedpractices

Division for Early Childhood of the Council for Exceptional Children. (2015). *DEC recommended practices: Enhancing services for young children with disabilities and their families* (DEC recommended practices monograph series no. 1). Los Angeles, CA: Author.

Fidler, D. J., & Nadel, L. (2007). Education and children with Down syndrome: Neuroscience, development, and intervention. *Mental Retardation and Developmental Disabilities Research Reviews*, *13*, 262-271.

Fuchs, D., Fuchs, L. S., Thompson, A., Al Otaiba, S., Yen, L., McMaster, K. L., . . . Braun, M. (2001). *Peer assisted learning strategies: Kindergarten reading*. Nashville, TN: Vanderbilt University.

Gillon, G. T. (2000). The efficacy of phonological awareness intervention for children with spoken language impairment. *Language, Speech, and Hearing Services in Schools*, *31*, 126-141.

Hughes, C. A., Morris, J. R., Therrien, W. J., & Benson, S. K. (2017). Explicit instruction: Historical and contemporary contexts. *Learning Disabilities Research & Practice*, *32*, 140-148.

LeJeune, L. M., Gesel, S. A., & Lemons, C. J. (2018). Explicit phonological awareness instruction for preschoolers with Down syndrome. *Inclusion*, *6*, 239-257.

Lemons, C. J., & Fuchs, D. (2010). Phonological awareness of children with Down syndrome: Its role in learning to read and the effectiveness of related interventions. *Research in Developmental Disabilities*, *31*, 316-330.

Lerner, M. D., & Lonigan, C. J. (2016). Bidirectional relations between phonological awareness and letter knowledge in preschool revisited: A growth curve analysis of the relation between two code-related skills. *Journal of Experimental Child Psychology*, *144*, 166-183.

Martin, G. E., Klusek, J., Estigarribia, B., & Roberts, J. E. (2009). Language characteristics of individuals with Down syndrome. *Topics in Language Disorders*, *29*, 112-132.

Næss, K.-A. B. (2016). Development of phonological awareness in Down syndrome: A meta-analysis and empirical study. *Developmental Psychology*, *52*, 177-190.

National Early Literacy Panel. (2009). *Developing early literacy: Report of the National Early Literacy Panel*. Washington, DC: National Center for Family Literacy.

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel: Teaching children to read* (00-4769). Washington, DC: U.S. Government Printing Office.

Philips, B. M., Clancy-Menchetti, J., & Lonigan, C. J. (2008). Successful phonological awareness instruction with preschool children: Lessons from the classroom. *Topics in Early Childhood Special Education*, *28*, 3-17.

Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. *American Educator*, *36*, 12-19.

Skibbe, L. E., Gerde, H. K., Wright, T. S., & Samples-Steele, C. R. (2016). A content analysis of phonological awareness and phonics in commonly used Head Start curricula. *Early Childhood Education Journal*, *44*, 225-233.

van Bysterveldt, A. K., Gillon, G. & Foster-Cohen, S. (2010). Integrated speech and phonological awareness intervention for pre- school children with Down syndrome. *International Journal of Language & Communication Disorders*, *45*, 320-335.