

RESEARCH-TO-PRACTICE SUMMARY

Helping Preschoolers Develop Phonemic Awareness Skills Using Sound Boxes

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The purpose of this study was to examine the effects of sound boxes as a supplemental instructional technique on improving phoneme segmentation performance for a sample of preschoolers enrolled in a Head Start program. Sound boxes activity coupled with modeling, guided practice, and corrective feedback was implemented and gradually faded as students mastered phoneme segmentation skills. A multiple probe across participants design was used to compare children's phoneme segmentation performance during baseline and sound boxes intervention conditions. All children's performance on phoneme segmentation tasks during sound boxes intervention was above their baseline performance levels. Children were able to maintain their high phoneme segmentation performance levels after modeling, guided practice, and eventually the sound boxes were gradually removed. In addition, children were able to generalize segmenting some of the phonemes when they were presented within words that were not directly taught during sound boxes activity. Implications for using sound boxes in the classroom and at home are provided.

Keywords: phoneme awareness; early literacy intervention

Young children who have not acquired fundamental early literacy skills such as phonological awareness may experience challenges acquiring reading skills when they enter the primary grades. It is critical that early child educators explicitly teach phoneme awareness to increase the likelihood that children will acquire reading skills with ease (e.g., Bentin & Leshman, 1993; Byrne & Fielding-Barnsley, 1991; Hatcher, Hulme, & Ellis, 1994; Smith, Scott, Roberts, & Locke, 2008). The phonological awareness skill that is most predictive of early reading and spelling skills is phoneme segmentation. (Nation & Hulme, 1997; Al Otaiba, et al., 2010).

Phoneme segmentation involves attending to and articulating each individual sound in a spoken word. For example, the teacher may say the word /sit/ and ask the children to *break* the word apart and say each individual sound such as saying /s/ /i/, and /t/. It is no surprise that phoneme segmentation is considered the most challenging skill in the hierarchy of phonological awareness skills (Chappell, Stephens, Kinnison, & Pettigrew, 2009).

Elkonin (1973) created an activity called sound boxes that assists young children in acquiring phoneme segmentation skills with ease. This has also been referred to “ as “say it

move it” activities. Sound boxes have been effective for improving primary grade students’ with and without disabilities performance on phoneme segmentation, word recognition, and spelling (e.g., Joseph, 2002; Keesey et al., 2015). There have been minimal studies, if any, that examined the effects of this technique for preschool children especially those who are at risk such as those enrolled in a Head Start program.

The purpose of this study was to evaluate the effects of sound boxes on Head Start children’s performance on phoneme segmentation performance. We addressed the following research questions: “Do sound boxes improve phoneme segmentation performance for children who are enrolled in a Head Start program?” and “Will the children maintain and generalize their phoneme segmentation performance after supportive prompts are systematically removed?”

SUMMARY OF RESEARCH METHODS

Participants

Participants were three preschool children, Winston (male; age 4-10), Mia, (female; age 5-2) and Nolan (male; age 4-7). All of the children were African-American and attended a Head Start program in a large metropolitan city in the Midwest. These children were chosen to participate in the study as they performed below benchmark levels on Individual Growth and Development Indicators (IGDIs) measures (i.e., *Rhyming*, *Alliteration*, and *Picture Naming*). In addition to IGID measures, a pre-assessment revealed that the children were not able to segment consonant-vowel-consonant (CVC) sounds in words at the start of the study. These words from the pre-assessment were used to teach phoneme segmentation skills in the study.

Sound Boxes Activity

Sound boxes consist of a drawn rectangle divided into three sections according to the number of sounds in words. In this study, CVC words were used so the rectangle was divided into three sections according to the number of sounds in each word that were taught to the children. For example, the rectangle would be divided into three sections for the word “cat.” Tokens were placed below the divided sections of the rectangle. At the start of the sound box lesson, the teacher modeled the procedure by slowly articulating each sound in a word and sliding the tokens in the respective divided sections of the rectangle as each sound was articulated. Next, the instructor guided the children in completing this activity by having them place the tokens in respective sections as they and the instructor articulated the sounds of a CVC word. Afterwards, the children completed the task independently with instructor corrective feedback, which consisted of providing the correct response if the children made an error. Verbal praise such as saying, “correct” was given for correct responses.

In this particular study, children were asked to segment each individual sound in a total of five words. They were also asked to segment sounds in nonsense words that were not directly taught to determine if they were able to transfer segmenting sounds from one word to another. When children demonstrated mastery of segmenting sounds in words, the modeling and guided practice components of the intervention were removed to determine if the children were able to maintain their level of performance without these supports. Eventually, the sound box structure

was removed, and the children only received corrective feedback after segmenting sounds in the words.

Research Design

We used a multiple baseline across participants design to examine the effects of the sound boxes against a baseline condition when no sound boxes were implemented. During baseline and intervention conditions, children were administered an assessment probe that required them to segment each sound in a word that was orally presented to them. Each probe contained five CVC words totaling 15 sounds to segment. We compared children's performance on the probes between baseline and intervention conditions.

SUMMARY OF RESULTS

All children improved over their baseline levels of performance on phoneme segmentation tasks when the sound boxes with modeling, guided practice, and corrective feedback were implemented. It took some children fewer trials than others to attain mastery level of performance. All children were able to maintain their high levels of performance after the modeling and guided practice instructional components were gradually removed. With regards to transferring their segmentation of phonemes to unknown words, all children were able to complete the task at about 50% accuracy by the end of the study. The magnitude of the effects of the sound boxes intervention was strong for all students. The intervention effects remained strong even after some of the instructional components were removed.

DISCUSSION AND IMPLICATIONS FOR PRACTICE

Explicitly teaching young children phonemic awareness skills is crucial for helping them develop basic reading skills with ease when they enter the primary grades. This is especially the case for young children who are at risk of not developing reading skills. A phonemic awareness skill that is strongly related to achieving basic reading decoding and spelling skills is phoneme segmentation (Nation & Hulme, 1997; Al Otaiba, et al., 2010). Results of this study showed that sound boxes coupled with modeling and guided practice opportunities were effective for teaching a sample of preschoolers how to segment sounds. Although more research is needed involving preschoolers with and without disabilities, the results of this study were consistent with prior studies demonstrating that sound boxes was effective for helping children acquire phonological skills (e.g., Keeseey et al., 2015; Maslanka & Joseph, 2002). Implications for using sound boxes in the classroom and at home with preschoolers at risk of not acquiring proficient literacy skills or who have identified disabilities in early language and literacy skills are as follows:

- a. Sound boxes consist of manipulative materials that are appealing to young children and designed to promote active student engagement in learning phonemic awareness skills. These materials can come in the form of a divided rectangle on a dry erase

- board accompanied with tokens or they can come in the form of tiles shaped like boxes for children to slide and put together as they articulate each sound in a word.
- b. Sound boxes can be embedded within a comprehensive early literacy program to teach children beginning, middle, and ending sounds in words. They can also be used as an intensive intervention procedure that supplements the general early literacy curriculum for students with disabilities and who are at risk of not acquiring phonemic awareness skills.
 - c. In addition to helping children segment individual sounds in words, sound boxes can serve as a supportive structure for helping children string together sounds and blend them to form a word. For instance, have children slide their finger across the divided boxes as they say the sounds together.
 - d. Sound boxes activity can be used when young children transition from an early childhood program such as Head Start to kindergarten and from kindergarten to first grade. Beginning with the kindergarten teacher, children can be taught to transition from attending to individual sounds in spoken words to linking those sounds to letters. This will facilitate children's understanding of the alphabetic principle. For example, tokens or tile boxes can be replaced with plastic letters or letter tiles. Children are instructed to slide the letters into the boxes or move the letter tiles and place them next to each other as they sequentially articulate each sound in a word. By at least the middle of first grade, children can write the letters in the boxes as they sound out the word.
 - e. The supportive visual, auditory, and physical prompts that are inherent in the sound boxes activity can be gradually faded as children master phonological skills. Tracking children's progress while using the sound boxes can help teachers determine when to fade the supports (i.e., de-intensify the intervention).

REFERENCES

- Al Otaiba, S., Paranik, C. S., Rouby, D. A., Greulich, L., Sidler, J. F., & Lee, J. (2010). Predicting kindergartner's end of year spelling ability based on their reading, alphabetic, vocabulary, and phonological awareness skills as well as prior literacy experiences. *Learning Disability Quarterly*, *33*, 171–183.
- Bentin S., & Leshem, H. (1993). On the interaction between phonological awareness and reading acquisition: It's a two-way street. *Annals of Dyslexia*, *43*, 125–148.
- Byrne, B., & Fielding-Barnsley, R. (1991). Evaluation of a program to teach phonemic awareness to young children. *Journal of Educational Psychology*, *83*, 451- 455.
- Chappell, J. C., Stephens, T. L., Kinnison, L., & Pettigrew, J. D. (2009). Educational diagnostician's understanding of phonological awareness, phonemic awareness, and reading fluency. *Assessment for Effective Intervention*, *35*, 24–33.
- Elkonin, D. B. (1973). U.S.S.R. in J. Downing (Ed.), *Comparative reading* (pp. 551-579). New York: Macmillan.
- Hatcher, P., Hulme, C., & Ellis, A. W. (1994). Ameliorating reading failure by integrating the teaching of reading and phonological skills: The phonological linkage hypothesis. *Child Development*, *65*, 41-57.
- Joseph, L. M. (2002). Facilitating word recognition and spelling using word boxes and word sort phonic procedures. *School Psychology Review*, *31*, 122–129.
- Keesey, S. Konrad, M. & Joseph, L. M. (2015) Word boxes improve phonemic awareness, letter-sound correspondences, and spelling skills of at risk kindergartners *Remedial and Special Education*, *36*, 167-180.
- Maslanka, P. & Joseph, L. M. (2002). A comparison of two phonological awareness techniques between samples of preschool children. *Reading Psychology*, *23*, 271-288.
- Nation, K., & Hulme, C. (1997). Phonemic segmentation, not onset-rime segmentation, predicts early reading and spelling skills. *Reading Research Quarterly*, *32*, 154–167.

Smith, S. L. Scott, K. A., Roberts, J., & Locke, J. (2008). Disabled readers' performance on tasks of phonological processing, rapid naming, and letter knowledge before and after kindergarten. *Learning Disabilities Research & Practice, 23*, 113-124