



RESEARCH REPORT

Luke Waites Center for Dyslexia and Learning Disorders

BUILD: A K-1 Early Reading Intervention

A Review of Supporting Evidence

Anna Middleton, PhD, CALT

Sheryl Frierson, MD, MEd

Karen Avrit, MEd, LDT, CALT-QI

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Implementing best practices in teaching children to read has been a perennial problem in many education systems across the United States. Recent data from the National Assessment of Educational Progress indicates over one-third of elementary school students performed below Basic levels in reading skills –a finding similar to previous reports over the past 30 years. During this time, a vast scientific literature has emerged, supporting best practices of reading instruction which are beneficial to most children. A substantial amount of information has also elucidated fundamental aspects of developmental reading and language disabilities, etiological risk factors, and behavioral characteristics.

The rapid growth of the brain and its responsiveness to instruction in the primary years make the time from birth to age eight a critical period for literacy development (Nevills & Wolfe, 2009). The characteristic impairments in reading achievement for children with dyslexia is well established by second grade, and these children often never catch up with their typical reading peers (Ferrer et al., 2015). Thus, early intervention for struggling young readers is paramount and can mitigate the development of more severe reading impairments (Al Otaiba et al., 2009; Castles et al., 2018; Foorman et al., 2016). Appropriate early intervention can also mitigate negative secondary emotional consequences of reading failure such as depression and low self-confidence (Eden, 2016). Word reading interventions are often more effective when implemented in early elementary grades than in later grades (Wanzek & Vaughn, 2016). The “dyslexia paradox” arises from the tendency to diagnose dyslexia after a child has already passed the timeframe in which intervention may be most effective (Ozernov-Palichik & Gaab, 2016). Effective early interventions may result in a reduced incidence of students identified with dyslexia by bolstering weak skills before they fall substantially behind their peers.

In light of this preponderance of scientific evidence, legislation has evolved in many states to ensure the timely identification of students with reading disabilities, as well as those at risk for developing these problems. Toward this end, many states – including Texas – have mandated dyslexia screening for all children in early elementary grades. Students who may be at risk for reading disabilities based on this screening must then be provided remedial instruction. However, few early reading intervention programs exist for students at risk for dyslexia in these early grades.

Foundational and Early Literacy Skills

Written language skills such as reading and spelling are dependent upon oral language skills. Without intact oral language skill, a child will struggle to map the written form of a language onto its spoken counterpart. Many language skills critical for successful reading develop prior to formal reading instruction, often between birth and age 5. These skills are often known as pre-literacy skills, emergent or foundational literacy skills, and are common weaknesses in young children at risk for dyslexia. Foundational pre-literacy skills include aspects of oral language such as vocabulary, phonological awareness, and language comprehension, as well as early concepts related to print conventions such as alphabet knowledge. As each of these types of knowledge and skill develop, the stronger the foundation that has been built for reading instruction. Not only are these skills crucial for successful reading and writing development, but they are also robust predictors of later reading ability and are often the target of early language interventions.

During the early elementary years, children enter into an important transitional stage as they are introduced to formal literacy instruction. However, conventional reading and writing skills are complex and often take years to master. In these first years, a major goal of literacy instruction is to ensure that the foundational literacy skills needed to support

reading development are in place. This is accomplished by introducing early code-focused skills (e.g., letter-sound correspondences and fundamental decoding concepts) and meaning-focused strategies to support comprehension. Additionally, instruction should provide ample opportunity to practice these learned skills to achieve some level of automaticity when reading, which will in turn support reading rate and comprehension.

Early Literacy Instruction

Many of the instructional approaches known to remediate the challenges associated with dyslexia are also beneficial to young readers. For example, instruction in phonological awareness and letter-sound correspondences can improve the primary deficits associated with developmental dyslexia and other word-reading difficulties (e.g., Lovett, et al., 2000; McArthur, 2015; Torgesen, et al., 2001). Similarly, code-based interventions which included both PA training and alphabet knowledge or phonics produced large effects on reading outcomes (NELP, 2008). The scientific literature has long supported systematic phonics instruction as the most effective method for remediating reading difficulties. This type of instruction helps students to better understand the rules and patterns of written language (i.e., orthography) in a clear, explicit, sequential manner (Castles et al., 2018; Ehri et al. 2001). Comprehensive reading instruction, however, involves more than just an emphasis on the structure of English orthography but also includes targeted vocabulary development, comprehension strategy instruction, and extended reading practice for developing fluency (e.g., Fletcher et al., 2018). Furthermore, the same practices which have proven effective in remediating core deficits associated with dyslexia are successful in preventing later reading failure (Hatcher et al., 1994). Early interventions should similarly be comprehensive programs that integrates best practices in a developmentally appropriate sequence for students in early elementary grades.

Although the group deficits of children with dyslexia improve in most treatment studies, individual response to treatment varies and may be particularly evident in young, severely impaired readers (e.g., Middleton et al., 2021). In fact, many pre-intervention student characteristics can predict a student's response to intervention with a fairly high degree of accuracy, though the strength of the association can vary depending on various methodological factors (e.g., Al Otabia et al., 2002; Barth et al., 2008; Lam & McMaster, 2014). Furthermore, student-level factors such as motivation and behavioral problems can also impact academic outcomes (e.g., attention; Shaywitz & Shaywitz, 2008). The precise dissection of causality when reading failure occurs is often complex: It can be due to weaknesses in foundational skills, early literacy skills, or as is often the case, a combination of many factors. Due to the transitional nature of the learning that occurs during the primary years, early intervention programs should be designed to support strong foundational language skills and set the stage for successful reading acquisition by introducing early literacy concepts in an explicit, systematic way, with content designed specifically for students in the early elementary grades.

The BUILD Curriculum

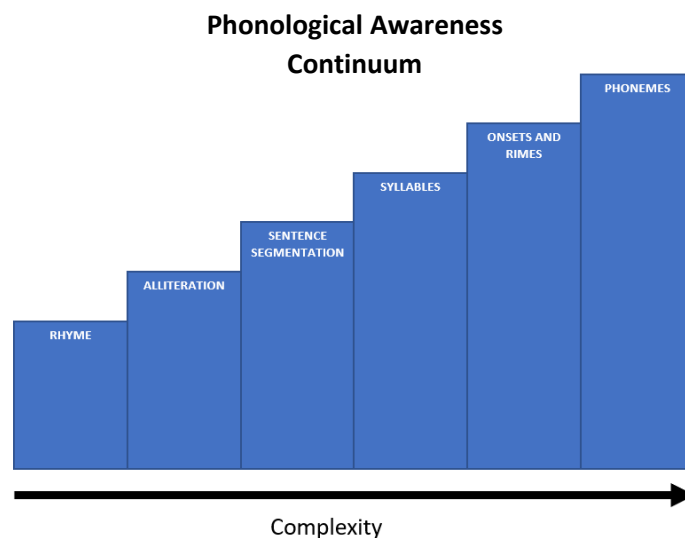
To meet the needs of the K-1 students who have been identified at risk for dyslexia, the staff of the Luke Waites Center for Dyslexia and Learning Disorders at Scottish Rite for Children has developed a 100-lesson reading intervention called *Build: A K-1 Early Reading Intervention*. *Build* is a small group intervention that addresses five specific components of reading intervention based on empirically validated best practices in reading intervention (Castle et al., 2018; Ehri et al., 2001). Each component is taught in a developmentally appropriate way using a direct, systematic, cumulative, multisensory

method of introduction and practice to meet the specific needs of kindergarten and first grade students who are struggling in reading.

The five components of the *Build* intervention are: alphabet skills, letter/sound knowledge, phonological awareness, vocabulary, and comprehension.

Phonological awareness: the explicit introduction of the relationships between speech-sound production, from rhyme to spelling.

Phonological awareness (PA) refers to the understanding of the sound structure underlying an oral language system. PA is not only a robust predictor of later reading skill, evidence supports a causal link between PA abilities and learning to read (Melby-Lervåg et al., 2012). A foundational skill critical to the successful mapping of letters to sounds in alphabetic languages such as English, PA instruction is most effective for young readers (Castles et al., 2018; NELP, 2008). PA skills fall on a continuum of complexity, ranging from simple sound pattern matching (subphonemic skills) to the isolation and manipulation of individual sounds within a word (phonemic skills).



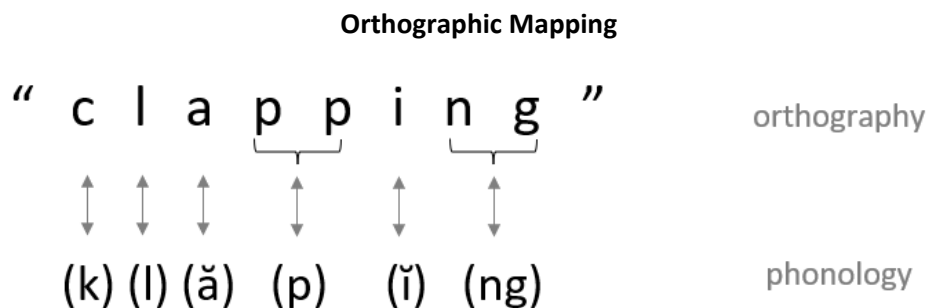
Build incorporates PA instruction into every lesson and follows the developmental sequence of these skills, beginning with rhyme, moving to alliteration, syllable segmentation, phoneme isolation, and phoneme segmenting & blending. Finally, PA and letter sound knowledge are integrated into spelling practice to further facilitate orthographic mapping, or the integration of orthographic (letters) and phonological (sounds) information.

Letter/sound knowledge: the direct instruction of individual letters and sounds, leading to the practice of reading words and sentences.

Letter naming ability is a strong early predictor of later reading skill (Catts et al., 2001). Most schoolchildren in the US education system are first introduced to letters by name rather than by sound. One reason to support the introduction of letter names to prereaders is to reinforce a highly stable characteristic of the letter in comparison to other properties (e.g., letter sounds), allow children to associate both capital and lower-case letter forms, and support early spelling (Treiman et al., 2006). In *Build*, every lesson begins with a brief alphabet activity. These activities serve to strengthen letter naming skill, while also

providing practice applying concepts related to English print conventions (i.e., sequencing, directionality, moving left-to-right across the page).

Direct and systematic instruction in phonics concepts allows students to unlock the patterns of written language, a process known as acquiring the alphabetic principle (Byrne, 2005). Indeed, students who acquire the alphabetic principle are more likely to utilize that knowledge to be able to accurately read other related words and similar letter patterns (i.e., self-teaching; Share & Shalev, 2004). A critical component of reading instruction is the integration of direct, systematic instruction in phonics (Ehri et al., 2001; Torgesen et al., 2001). Throughout the *Build* instructional sequence, letter-sound knowledge is developed through the use of carefully sequenced phonics concepts introduced in a systematic and cumulative manner. The phonics instruction in each *Build* lesson supports the child's knowledge and use of the alphabetic principle. New patterns are introduced in a direct and systematic manner, followed by ample opportunity for practice through repeated exposure to facilitate orthographic mapping (Ehri, 2014).



Fluency: is incorporated within the reading of connected text in phrases and sentences.

Instructional activities known to facilitate reading fluency are incorporated throughout the *Build* program by supporting both automaticity at the lexical and sublexical levels, as well as prosodic reading through connected text practice. Phonics and decoding knowledge are complemented by the introduction of a subset of high frequency words, allowing students to practice decoding at the word, phrase, and sentence level, while controlling for previously learned concepts.

Language Comprehension: the explicit teaching of specific learning strategies used to identify the basic components of a story and enhance oral language ability.

In addition to direct and systematic phonics instruction, building skilled readers necessitates the inclusion of strategies to optimize instruction so that readers can correctly interpret the meaning of the text they are reading. Comprehension is a complex and multi-factorial set of cognitive processes. Evidence supports the effectiveness of several strategies in improving comprehension, including comprehension monitoring, asking and answering questions, teaching story structure, summarizing, and cooperative learning (NICHD, 2000). Strategies that are particularly effective with young readers include comprehension monitoring and story structure instruction (LARRC & Geomans-Maldonado, 2017). Young readers also benefit from shared reading experiences (such as teacher-led book reading), dialogic reading (asking and answering questions), and instruction in sentence structure, which help improve foundational and early literacy skills (NELP, 2008). Because of the complex nature of reading comprehension, instruction in multiple strategies often yields the most favorable outcomes (NICHD, 2000).

Vocabulary is a key indicator of language ability at any age and is predictive of comprehension, particularly in the early school years. As with many other aspects of reading instruction, vocabulary instruction is most effective when direct and explicit (NICHD, 2000). Interventions which target vocabulary and other oral language skills are highly effective in improving oral language skills for children of all ages, and also show moderate benefit in improving basic written language skills such as alphabet knowledge (NELP, 2008).

The comprehension strand of the *Build* program was created to introduce many of these strategies in a developmentally appropriate way. A combination of techniques is used to support comprehension skills, including comprehension monitoring, question generation, story structure, summarizing and inferencing. Students actively participate in these activities through cooperative learning and reciprocal teaching, which are used as part of the comprehension instruction process (Palinscar & Brown, 1984). *Build* addresses early vocabulary instruction by expanding and enriching word relationships by direct instruction in the context of shared reading using the K-W-L model (Ogle, 1986).

Research Conclusions and Next Steps

Although much research to date has investigated response to treatment in both populations of students at risk and students with dyslexia separately, we are unaware of any study which investigated the relative effects of a single treatment across these two populations. Given that the nature of the differences across these groups is quantitative in nature, findings of such a study may provide important information regarding efficacy of a single treatment method in both the prevention of and intervention of reading disabilities. Research regarding the effectiveness of the Build intervention program is underway and findings will be disseminated upon the conclusion of the study.

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