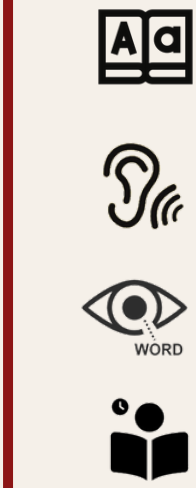
Rapid
Online
Assessment of
Reading



NEXT STEPS

Brain Development and Education Lab

Stanford University

School of Medicine

Graduate School of Education

LEARNING TO READ AT ANY AGE

How children learn to read and write is fundamentally different from how children learn to talk and understand speech. While children naturally pick up spoken language from exposure in their environment, they must be taught reading and writing skills. When foundational reading skills are missing, it can impact a child's reading for their entire lives. Fortunately, screening for foundational reading skills can quickly reveal those gaps in the foundation, and reading interventions can close those gaps for readers of any age!

Several decades of reading **research** have shown that phonemic awareness, word decoding, and fluency are three of the most important foundational reading skills all readers need to master. Effective reading interventions for each skill can be implemented in the **elementary**, **middle**, or **high school** classroom.

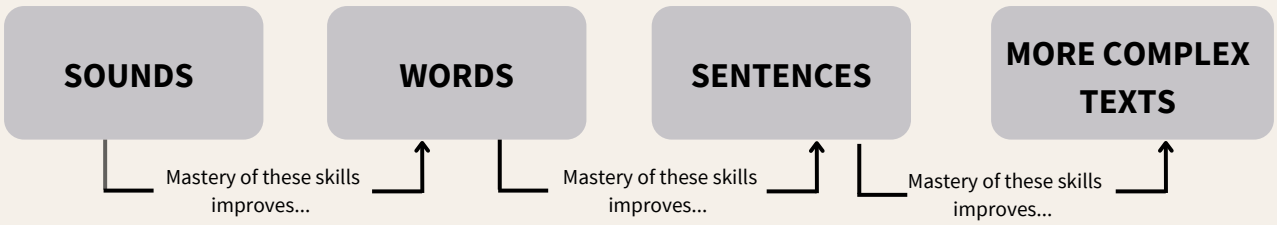
In your classroom, you may be working with individuals, small groups, or large classrooms of readers who need support with foundational reading skills. If you are overseeing instruction for many readers, ROAR data can help you identify who needs more support and inform how you **group readers by skills for intervention.**

Effective instruction in foundational reading skills meets students where they are in terms of skill formation with systematic instruction delivered frequently and regularly. Direct instruction accompanied by frequent opportunities for multi-sensory practice and authentic application reinforces these skills. Explaining to readers the science and purpose behind the instructional activities can support readers' motivation!

Figure 1.9 Reading Rope (Scarborough, 2001)

As an introduction to foundational reading skills, Scarborough's reading rope, shown above, is an excellent depiction of how phonological awareness, word-level decoding, and sentence reading efficiency are woven together to support skilled reading.

WHAT ARE FOUNDATIONAL READING SKILLS?



SOUNDS

Phonological Processing. Recognizing and manipulating phonemes, or the sounds of spoken language, is fundamental to developing reading skills.

This is assessed by **ROAR - Phoneme.**

WORDS

Decoding. Mapping sounds to letters and words, or decoding, is the first reading skill and is the foundation of rapid and automatic word recognition.

Letter sound knowledge is assessed by **ROAR - Letter.**

Word recognition and decoding is assessed by **ROAR - Word.**

SENTENCES

Reading Efficiency. Fluently reading connected text at an efficient rate is important for comprehending increasingly complex text.

This is assessed by **ROAR - Sentence.**

The International Dyslexia Association offers a number of resources to support children with dyslexia of all ages: https://dyslexiaida.org/

ROAR-LETTER

LETTER-SOUND CORRESPONDENCE

WHAT IS IT?

Letter-Sound Correspondence is the ability to map sounds to letters, and letters to sounds.

WHY IS IT IMPORTANT?

Mapping letters to sounds is the foundation of decoding skills. Children need systematic, direct instruction and practice to master letter-sound correspondences and apply these rules to decoding, beginning with short simple words and progressing towards more complex spelling patterns. Some children pick up letter sound knowledge quickly. Many others require extensive practice to achieve mastery. It is best to teach letter-sound correspondence from the beginning when teaching children about the letters.

WHAT ARE THE COMMON CHALLENGES WITH THIS SKILL?

- Readers may learn the names of letters without learning the sounds the letters represent.
- Readers may learn one sound a letter can make but miss other sounds, such as knowing *hard c* (the first sound in “cat”) but needing to learn *soft c* (the first sound in “city”). English is an opaque orthography, meaning that the correspondence between letters and sounds is more complex than transparent orthographies like Italian and Spanish. This complexity makes English more difficult to learn, particularly at the beginning, but research shows that mastering this complexity is important for long-term success.
- Readers often have an easier time with long vowels than short vowels. Certain letters are easily confused by young readers (e.g., b, d), as are certain phonemes. Noting these errors and providing continual practice and scaffolding until the reader has internalized them is important for the development of later, more complex skills.

HOW DO READERS DEVELOP THIS SKILL?

Children need systematic, direct instruction and practice to master letter-sound correspondences and apply these rules to decoding, beginning with short simple words and progressing towards more complex spelling patterns. Some children pick up letter sound knowledge quickly. Many others require extensive practice to achieve mastery. It is best to teach letter-sound correspondence from the beginning when teaching children about the letters.

NEXT STEPS

A phonics program should be structured and systematic, following a scope and sequence. For more information and specific phonics activities, check out the following resources:

For Grades K-5: Florida Center for Reading Research
For grades 3+: check out Open Source Phonics
For in-depth information including tips for all readers: Review of Scientific Reading Research for Teachers

ROAR-PHONEME

PHONOLOGICAL AWARENESS

WHAT IS IT?

Phonological awareness is the ability to recognize and manipulate *phonemes*, or the individual *sounds* of spoken language. While it does not involve written language, the development of phonological awareness is a critical foundation of literacy. Phonological awareness skills include tasks like segmenting words into sounds, blending sounds to form words, and manipulating sounds within words.

WHY IS IT IMPORTANT?

Phonemes are the building blocks of spoken language just as letters are the building blocks of written language - a young reader's challenge is building the connections between the two. Recognizing and manipulating the sounds in words is the foundation of the ability to connect sounds to letters and syllables, which is critical for learning to decode increasingly complex words. Down the road, it is important in helping children learn new words they encounter in print.

> *"To an individual with well-developed phonological awareness, our alphabetic system—which conveys language at the phonological level—is a reasonable approach to visually representing our spoken language. Conversely, an individual lacking such awareness will find the correspondence between symbol and sound capricious at best"*
>
> *Wagner, R. K., & Torgesen, J. K. (1987).*

HOW DO READERS DEVELOP THIS SKILL?

Many children pick up on the distinct sounds that make up words by being immersed in a speech-rich environment. The process of being taught to read with an emphasis on phonics also stimulates the development of phonological awareness for **some children**. However **many others** need more support. Games and other activities that draw attention to the individual sounds and syllables in words give your reader more targeted practice in this skill. Practicing recognition and manipulation of sounds in words can be done with readers of all ages both in the classroom and at home. Because Phonological awareness instruction complements phonics instruction, many programs work on both skills in the same lesson.

NEXT STEPS

A phonological awareness training program should be structured and systematic, ideally following a scope and sequence. For more information and specific activities, check out the following resources:

For Grades K-5: Florida Center for Reading Research
For in-depth information including tips for all readers: Review of Scientific Reading Research for Teachers

ROAR-WORD

SINGLE WORD RECOGNITION

WHAT IS IT?

Two skills are essential for success in reading individual words: Decoding and Automaticity. People with dyslexia struggle with both.

Decoding is the ability to translate a word from print to speech using the knowledge of how letters represent sounds. Basically, it is the ability to sound out a word accurately.

Automaticity is the fast, effortless word recognition of words "by sight."

These skills go hand in hand: decoding knowledge supports the development of automaticity in word reading.

WHY IS IT IMPORTANT?

Decoding words accurately and quickly is the foundation of reading fluency and comprehension. Learning to decode more complex words unlocks more complex texts. Supporting a reader with decoding skills is the key to supporting most chronically struggling readers, and it is possible at any age. Ideally decoding skills are established early in elementary school but interventions are still highly effective at any age.

HOW DO READERS DEVELOP THIS SKILL?

Readers practice decoding letters, syllables, and words into sounds through direct instruction and regular practice. Decoding skills do not develop naturally through immersion, the way spoken language is developed. Direct, explicit, systematic phonics instruction that follows a defined scope and sequence of letter-sound relationships has been shown to be more successful in developing word reading compared to teaching letter-sound relationships as they are encountered in books in a random, unplanned order. It is also important to keep in mind that people vary **dramatically** in the ease with which they can apply letter-sound knowledge to decoding. Some students require light scaffolding while many others require continued, structured, intensive instruction and practice. This variability is why word reading assessments are so critical!

NEXT STEPS

Provide opportunities for readers to practice reading short words: Begin with simple consonant-vowel-consonant (CVC), and systematically building up to complex, multisyllabic words. Remember English is a very opaque orthography with many exceptions to every rule - this presents a serious challenge for most students. A reading program should be structured and systematic, following a scope and sequence and students will vary in the amount of time they need to master each step in the sequence.

For more information and curricular support, check out the following resources:
For Grades K-5: Florida Center for Reading Research Activities
For Grades 4-9: What Works Clearinghouse guide to reading interventions
For grades 3+: Open Source Phonics provides free phonics lessons accompanied by decodable texts
For all grades: UFLI Toolbox is an inexpensive phonics program from University of Florida Literacy Institute.

ROAR-SENTENCE

SENTENCE READING EFFICIENCY

WHAT IS IT?

Reading fluency and efficiency refers to the speed at which students can accurately read and understand connected text. Beyond accurately decoding individual words, students vary substantially in the rate at which they can read words and sentences. This is a common limiting factor as students progress from learning to read to reading to learn.

WHY IS IT IMPORTANT?

The goal of literacy is to unlock a new form of communication through written language. But if reading is slow and effortful then it presents a barrier to comprehension particularly as the text a student is expected to read grows longer and more complex. Developing reading fluency and efficiency makes accessing information through written language as natural as spoken language. Readers who are reading slowly or inaccurately at the sentence-level miss out on key connections across the text. Reading remains difficult and unenjoyable, and comprehension is a challenge, particularly with time constraints.

WHAT ARE THE COMMON CHALLENGES WITH THIS SKILL?

- Particularly for children with dyslexia, reading fluency and efficiency can remain a challenge even as they develop decoding skills.
- Mastering decoding skills is important for building fluency and efficiency. Students who miss this foundation struggle to ever establish fluency.

HOW DO READERS DEVELOP THIS SKILL?

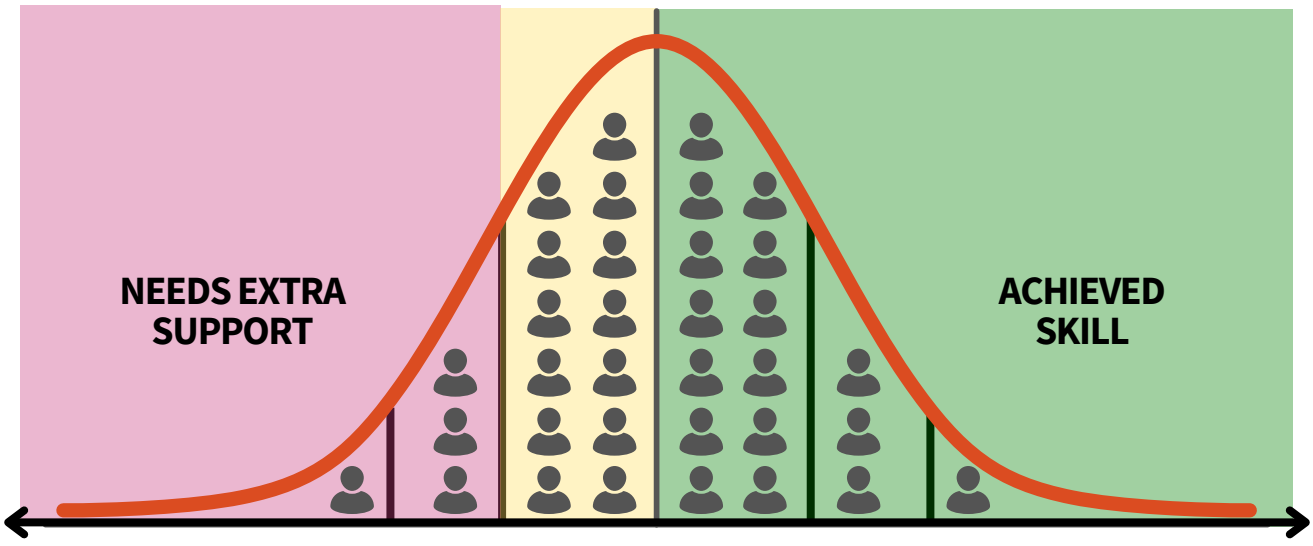
- Efficiently reading sentences depends on decoding skills and, particularly, on developing automaticity in decoding.
- For many students, reading efficiency comes with practice after they've established a strong foundation in decoding. For students with dyslexia, reading efficiency can remain a barrier and requires intensive and targeted intervention.
- Repeated Reading has been identified by research as a key strategy for developing fluency. It has two essential elements: 1) reading and re-reading the same text, 2) oral reading with corrective feedback.
- Fluency intervention for paragraphs and passages should include modeling, repeated reading, and feedback. Choral reading and systematic progress monitoring for fluency also have research support.
- Direct instruction and practice in reading with prosody, or with expression, is a fun and evidence-based way to improve reading efficiency. However students with dyslexia will need more intensive support.

NEXT STEPS

A reading program should be structured and systematic, following a scope and sequence that builds efficiency, fluency and comprehension on a strong foundation of decoding skills. For more information and specific sentence reading activities, check out the following resources:

For Grades K-5: Florida Center for Reading Research Activities
For Grades 4-9: What Works Clearinghouse guide to reading interventions

UNDERSTANDING THE SCORES



Students below the 25th percentile need extra support with this skill. Compared to students who have taken the ROAR, their scores are much lower than most students in their grade.	Students between the 25th and 50th percentile are still developing this skill. Compared to students who have taken the ROAR, their scores are lower than the average student in their grade.	Students above the 50th percentile have achieved this skill. Compared to students who have taken the ROAR, their scores are at or above the average score for students in their grade.

The ROAR assessments return 3 kinds of scores:

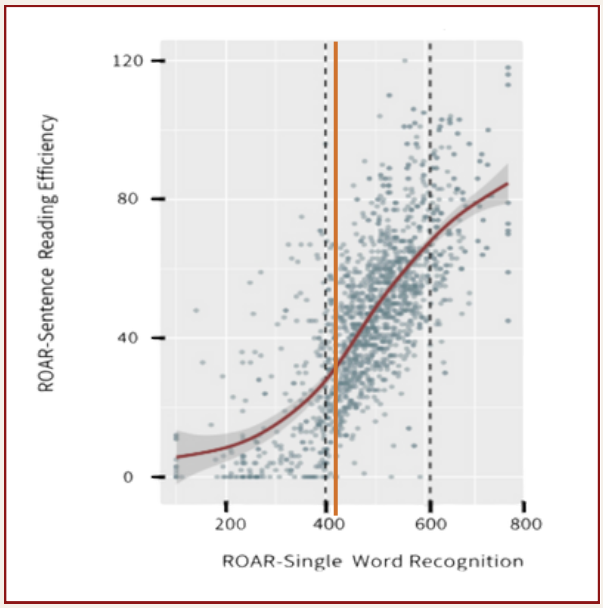
- **Raw score:** This score captures your student's general performance on the assessment, such as total items correct. This score is difficult to interpret on its own which is why it is used to generate standard scores and percentile.
- **Standard score:** This score compares your student's score to the performance of other students in their age or grade group. This score gives you a glimpse of your student's understanding of the tested skill compared to their peers.
- **Percentile:** This score also compares your student's score to all the students in the same grade who have taken ROAR. If students were ranked from the lowest to highest score, this score would be your student's ranking. For example, if your student is in the 74th percentile, then they scored better than 74 out of 100 students.

MORE RESOURCES

For more resources on standard scores and percentiles, see here:

- Southeast Psych standard scores video explanation

DECODING THRESHOLD



Sentence reading depends on single-word reading. This graph illustrates the tight link between single-word reading and sentence reading. The red line demonstrates that as readers improve in single-word reading, they also improve in sentence reading. Readers with low sentence reading efficiency typically need support in single-word reading, or decoding skills.

Importantly, development of sentence reading accelerates above a **decoding threshold.** In other words, elevating students' decoding skills to surpass the decoding threshold should unlock faster development of higher-level reading skills.

END NOTES

Our assessments of these skills have been validated against gold standard assessments in phonemic awareness (CTOPP), word recognition (Woodcock-Johnson), and sentence reading efficiency (TOSREC). We are currently running studies to validate the assessment as a dyslexia screener specifically. The linked research shows that our assessment provides similar information to other gold-standard foundational reading skill assessments.

Further, we have validated the Computer Adaptive Testing algorithm we use in ROAR-Word, and our methods for generating and testing new items for sentence-reading efficiency. To see an overview of research and development, please refer to our ROAR Technical Manual.