

The Practice Gap

By Sharon Vaughn and Jack Fletcher

KEY TAKEAWAYS

- The practice gap contributes to the challenges experienced by students with reading difficulties and disabilities.
- Students with weak reading skills are less efficient and read more slowly, contributing to reduced practice.
- Expert performance results from *active engagement in deliberate practice* with teachers or coaches monitoring the structured, organized practice.

How is it that a successful golfer's swing can appear so effortless, smooth, and consistent? Is it because the individual is just "gifted" in golf? It is convenient for us to think that whoever performs well, whether it be musically, in sports, or preparing a gourmet meal with ease, are individuals who have a proclivity for success in these areas. However, this way of thinking is mistaken. The best explanation for most success is practice. Deliberate, structured, and sustained practice is the "magic" that provides opportunity for success in almost any field. In this article, we present a rationale with suggestions for the role of deliberate practice in improving reading outcomes for students with significant reading problems. Though not explaining all of the reading difficulties that students experience, adequate deliberate practice reading is a highly influential lever for improving outcomes for students with reading difficulties and disabilities (RDD).

The Practice Gap in Reading

Vaughn and Fletcher (2021) proposed that the practice gap in reading explains many of the reading challenges students with RDD experience. Figuring out how to close the practice gap will provide a valuable pathway to improved outcomes. The number of words a student can read automatically, at a glance, influences significantly the student's efficiency as a reader and thus their reading fluency. Word reading fluency

(i.e., reading words typically in connected text accurately and automatically) is a necessary step to improving overall text understanding. For many students with RDD, automatic word reading is a bottleneck because these students often display slow and labored word reading impairing their understanding of text. There are at least two unfortunate outcomes of this labored word reading: (1) these students use an abundance of cognitive resources to decipher words, leaving minimal cognitive resources to remember, integrate, and comprehend ideas while reading; and (2) the effort necessary to read words reduces interest in reading, and thus students with word reading difficulties spend considerably less time reading. As with all other activities, when we experience consistent challenges with little success we also have reduced motivation and engagement. The hallmark of students with significant word reading difficulties is that they do not read for pleasure—reducing considerably their access to print and thus reducing practice. To illustrate the negative effects of not reading extensively, fifth-graders who are very proficient readers—read more in a few days than poor readers do in a year. This gap in practice is very profound and contributes to many significant problems, including low fluency, inadequate vocabulary development, and the opportunity to build background knowledge—an essential feature of improved comprehension.

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Further, the development of automaticity through practice is tied to the brain reorganization that must occur in order for children to read. Fluent readers seem to recognize whole words instantaneously, which Seidenberg (2017, p. XX) described as "language at the speed of sight." Underlying what seems to be effortless word recognition is a brain system involving the fusiform gyrus which has been described as the brain's letterbox (Dehaene, 2009). This system develops through structured and meaningful exposure to print almost as soon as the beginning reader develops the capacity to link print and sound. This system does not emerge without exposure to print because it is attuned to the statistical probabilities by which letters and morphemes occur in print (Seidenberg, 2017). What seems like

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Abbreviation

RDD: Reading Difficulties and Disabilities

whole word recognition is actually the brain’s growing capacity for processing increasingly large chunks of words so that eventually a reader can go directly from the word to its pronunciation and meaning. If a child is delayed in their access to print and therefore does not have the opportunity to practice reading, the system will be delayed in its reorganization. Thus, the *practice gap* is an extraordinary consideration and is directly tied to the development of the neural systems that permit rapid word reading. Students with weak reading skills are less efficient and read more slowly, contributing to reduced practice. Continued low exposure to word reading over time has a cumulative effect beyond reading successfully. It slows the development of vocabulary and background knowledge, which then reduces comprehension, which then makes reading less enjoyable—and even less likely to be practiced. Is it any wonder that students with significant reading problems display such profound challenges with reading comprehension and content knowledge and that this gap becomes more problematic as they advance through the grades?

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How Practice Works

How is it that practice works? Practice serves to promote chunking which is the cognitive process by which familiar parts are put together in efficient and more easily remembered ways. For example, common letters and their sounds /aigh/ as in *straight* can be chunked so that the unit /aigh/ serves as one chunk to remember rather than all of the individual letters.

dis, in, im	ing, ed	MIX	MIX
Impatient	Worked	Aging	disappear
Incomplete	Watched	Immerge	incapable
Incorrect	Ending	Dislike	developed
Dislike	Swinging	Produced	discontinue
Discontinue	Aging	Distant	intercept
Immortal	Passed	Incomplete	united
Incapable	United	Rising	passed
Immerge	Allowing	Include	incorrect
Dishonest	Produced	Inactive	lying
disorganize	Using	Allowing	using
Incorrect	packed	Locked	incredible
Distant	Locked	Stopped	worked
incredible	Sliding	Swinging	disagree
disappear	stopped	Immortal	sliding
Include	developed	Impossible	hopped
important	anything	Packed	impatient
Inactive	Fixed	Incorrect	fixed
Disagree	hopped	Watched	ending
Intercept	Lying	Important	dishonest
Impossible	Rising	Disorganize	anything

Figure 1. Word Reading Practice. Single and Multisyllable Words with dis, in, im, ing, ed. www.meadowscenter.org

Definition	Characteristics
Student-friendly description of the term (usually provided by your teacher)	Facts or features that help you recognize, identify, or distinguish the term
term	
Examples	Nonexamples
An example must be: <ul style="list-style-type: none"> • A specific, real-world application of the term • Something that fits all of the characteristics of the term 	A nonexample must be: <ul style="list-style-type: none"> • An incorrect, or inappropriate, real-world application of the term • Related to the term but not an example of the term • Something that does not fit all of the characteristics of the term

Definition	Characteristics
Something that can be changed physically without changing chemically	<ul style="list-style-type: none"> • Can be measured • Describes an object • Includes information that can be observed without changing the matter into something else
physical property	
Examples	Nonexamples
<ul style="list-style-type: none"> • Color • Texture • State (solid, liquid, gas) • Boiling point 	<ul style="list-style-type: none"> • The way a material behaves in a chemical reaction • Chemical properties • Something that can be observed only when a substance changes into a different substance

Example of a Completed Frayer Model

Figure 2: Vocabulary Teaching Map

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This type of chunking can occur inferentially with practice paired with explicit instruction. In chess, for example, this type of chunking process permits master chess players to store in long-term memory chess pieces and their position on squares, relieving the cognitive load of thinking about each move independently and allowing chess players to think in more efficient units of decision-making (Walls, 2015). Interestingly, a chess master’s chunking unit is about 50,000 which is similar to the number of vocabulary words needed to learn a new language (Wall, 2015). Practice reading related words can also serve as a way to make associations between common word reading principles so that we learn to generalize these principles to a broader range of words. Figure 1 provides examples of related words and how practice seeing these related words in a range of contexts might support word reading fluency and generalization of the principle to reading related words.

This idea of practice also relates closely to acquiring the meaning of words through explicit instruction and implicit learning, which Share (1995) described as “self-teaching.” We know that vocabulary plays a very powerful role in reading comprehension. Knowing the meaning of words is an essential feature for understanding the larger units of text and thus promoting reading for understanding. However, we simply cannot teach youngsters explicitly the meanings of all the words that they need to know. In order to be extremely knowledgeable about words and their meanings, students must also engage in implicit word learning. Research has examined the number of times students need exposure to a word in text to acquire meaning, and the range is quite large, from six to more than 20 encounters (Rott, 1999; Waring & Takaki, 2003).

Of course, this means that learning the meaning of new words requires engaged practice over time—just like learning to read words. Implicit word learning contrasts with explicit word learning where the meaning of the word is explicitly taught and then practiced in specific ways. See Figure 2 for an example of explicit vocabulary instruction using a word map to introduce a key word, its meaning, and then provide practice using the word orally and in writing. Recognizing that all words cannot be taught explicitly, we have learned that this explicit approach can be exceedingly helpful in establishing knowledge of essential words for content reading, yielding improved vocabulary learning for students with reading difficulties (Vaughn et al., 2014).

Deliberate Practice

Ericsson (2008) described expert performance as resulting from *active engagement* in *deliberate practice* with teachers or coaches monitoring the structured, organized practice. Critical to understanding expert performance in reading requires applying these two constructs. *Active engagement* means that the learner is motivated to succeed in the defined task and is working to achieve well-specified goals. For example, in reading, the student may be eager to master reading word lists of related words and to master reading these words increasingly automatically with an ultimate goal of 20 seconds or faster (Vaughn, et al, 2022). *Deliberate practice* is also a necessary component of expert performance and is different from what we might think of as typical practice. Deliberate practice has specific goals

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Using findings from two syntheses of the research on reading fluency as a guide (Chard, Vaughn, & Tyler 2002; Stevens, Walker, & Vaughn, 2017) the following fluency practices are associated with improved reading performance for students with reading difficulties.

Repeated Word and Phrase Reading	Use deliberate repeated reading of word list reading, and phrase reading to improve students' fluency of reading challenging words independently and in text.
Repeated Reading with a Model	Select a text that is challenging but not too difficult and model reading the text fluently and with expression. Ask student(s) to then read the same passage in the same way with you. Then ask students to read the same passage to a partner providing feedback for missed or challenging words. Finally, ask students to read the passage to themselves identifying any words that are challenging and providing feedback so that they can practice those words.
Set a Performance Criteria for Rate and Accuracy of Reading	With the student, establish a challenging but achievable goal for the rate and accuracy of reading. Practice reading appropriate passages providing feedback and measuring students' performance toward the established goal.

Figure 3. Effective Fluency Practices

Provide feedback that is clear, focused, and directly related to the learning task and that guides the student to continue and/or adjust learning practices.

Scenario 1	After a lesson on essay organization, a teacher meets with a student in an essay conference. The teacher provides feedback on only organization and not the various grammatical errors throughout the essay. The teacher plans to review grammatical errors in another lesson.
Scenario 2	A teacher quickly creates a question and ask students to answer it on sticky notes to turn in before going to the next class. The teacher uses the information about students' needs from the sticky notes to make adjustments to the next day's lesson.
Scenario 3	Instead of saying, "Check comprehension answer 3," a teacher says, "Great work on answering question number 4. Skip to the challenge question on the next page. Remember to check your notes for vocabulary that are used in that comprehension question."
Scenario 4	During a fluency lesson, a teacher says, "I will start by reading this passage aloud. Then, we will read it aloud together. Finally, you will read it aloud on your own with a partner." This sequence is known as "I do," "We do," "You do." Pause after each reading and reread sentences where there was a challenging word.
Scenario 5	After introducing a new skill or concept, effective teachers guide students through participation and practice opportunities. Much of learning occurs through timely and specific feedback that leads to a change in understanding. Effective feedback may be immediate, especially for discrete tasks such as spelling or sounding out a word, to avoid any misunderstanding. Feedback may also occur after a short delay for more complex tasks, such as writing a paragraph, to allow students to think through the process. Timely feedback has three purposes: (1) to prevent inaccurate practice, (2) to increase the rate of student mastery, and (3) to ensure successful, efficient learning.

Figure 4. Provide Meaningful Feedback to Enhance the Effects of Practice

Source: The Meadows Center for Preventing Educational Risk, 10 Key Documents, www.meadowscenter.org

with related tasks and activities and is conducted with teacher or coach feedback and additional practice. This additional practice may be repeated reading for a deliberate purpose, for example, practicing reading challenging words correctly, improving the speed of reading a designated phrase, sentence, or chunk of text. Figure 3 provides examples of how teachers use fluency routines. Another approach involves reading a wide range of text where materials are selected just below the child's reading level with an expectation of independent reading for 20 minutes daily and class follow-up in small groups (Vaughn et al., 2022).

There are four components to deliberate practice: (1) well-defined goals, (2) interest in achieving specified goals, (3) feedback, and (4) opportunities for additional practice. As we think about developing opportunities for deliberate practice for our students, consider the above-mentioned components and how you might ensure that they are represented within your instructional routines. Because interest in achieving specific goals is a necessary component, it may be useful to secure students' interest in achieving specific goals and then to identify the well-defined goals that are expected. This goal setting can lead to goal monitoring (progress monitoring) which serves as a built-in feedback loop to keep students engaged and on track. In addition to the feedback provided through progress monitoring, teachers might consider some of the feedback suggestions offered in Figure 4.

Building the Reading Brain

Teachers of students with RDD need to consider many elements of learning to read with perhaps the most important being opportunities to utilize deliberate practice to build the reading brain. Deliberate practice includes setting goals, monitoring these goals, and providing specific and well-defined reading tasks that are practiced with teacher feedback and support. Deliberate practice targets students developing reading skills and provides opportunities for reading extensively.

References

Chard, D. J., Vaughn, S., & Tyler, B. J. (2002). A synthesis of research on effective interventions for building reading fluency with elementary students with learning disabilities. *Journal of learning disabilities, 35*(5), 386–406.

Dehaene, S. (2009). *Reading in the brain: The new science of how we read*. Penguin.

Ericsson, K. (2008). Deliberate practice and acquisition of expert performance: a general overview. *Academic Emergency Medicine, 15*(11), 988–994.

Rott, S. (1999). The effect of exposure frequency on intermediate language learners' incidental vocabulary acquisition and retention through reading. *Studies in Second Language Acquisition, 21*(4), 589–619.

Seidenberg, M. (2017). *Language at the speed of sight: How we read, why so many can't, and what can be done about it*. Basic Books.

Share, D. L. (1995). Phonological recoding and self-teaching: Sine qua non of reading acquisition. *Cognition, 55*(2), 151–218.

Stevens, E. A., Walker, M. A., & Vaughn, S. (2017). The effects of reading fluency interventions on the reading fluency and reading comprehension performance of elementary students with learning disabilities: A synthesis of the research from 2001 to 2014. *Journal of Learning Disabilities, 50*(5), 576–590.

Vaughn, S., & Fletcher, J. M. (2021). Identifying and teaching students with significant reading problems. *American Educator, 44*(4), 4.

Vaughn, S., Kieffer, M. J., McKeown, M., Reed, D. K., Sanchez, M., St. Martin, K., Wexler, J. (2022). *Providing reading interventions for students in grades 4–9* (WWC 2022007). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from <https://whatworks.ed.gov/>

Vaughn, S., Martinez, L. R., Reutebuch, C. K., Carlson, C. D., Thompson, S. L., & Franci, D. J. (2010). *Enhancing social studies vocabulary and comprehension for 7th grade English language learners: Findings from two experimental studies*. Society for Research on Educational Effectiveness.

Vaughn, S., & Wanzek, J. (2014). Intensive interventions in reading for students with reading disabilities: Meaningful impacts. *Learning Disabilities Research & Practice, 29*(2), 46–53.

Wall, B. (2022). *Chunking Theory in Chess*. Retrieved 15 August 2022, from <http://billwall.phpwebhosting.com/articles/chunking.htm>

Waring, R., & Takaki, M. (2003). At what rate do learners learn and retain new vocabulary from reading a graded reader? *Reading in a Foreign Language, 15*(2), 130–163.

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