What is Orthographic Mapping and How Does It Link to Comprehension?

By Marisa Ramirez Stukey | Categories: Science of Reading, Reading, Reading Intervention and Acceleration (Grades K–5)

What exactly is orthographic mapping, and how does it relate to comprehension? We explore this hot topic in the seventh installment of our series ***Structured Literacy: Unpacking Nine Key Topics for Transforming Reading Instruction and Outcomes for Readers.***

To catch up on earlier posts in the series, start with the introduction, "From Guided Reading to a Structured-Literacy Approach: My Journey as an Educator."

As early readers embark on their journey toward fluent reading, they have a wide variety of skills to learn and apply. Teachers understand this all too well, as we work hard to teach all the science-based skills necessary for accurate decoding and active comprehension.

Sometimes these skills seem disconnected, but what if there were a special glue that could help readers hold together some of these seemingly separate components of reading?

Good news! There *is* a special glue and it's a process called orthographic mapping.

What Is Orthographic Mapping?

While the concept of orthographic mapping is not new, it may be new to teachers.

Over the last few years as a greater understanding of the science of reading has made its way into more and more classrooms, orthographic mapping has become a frequently heard term.

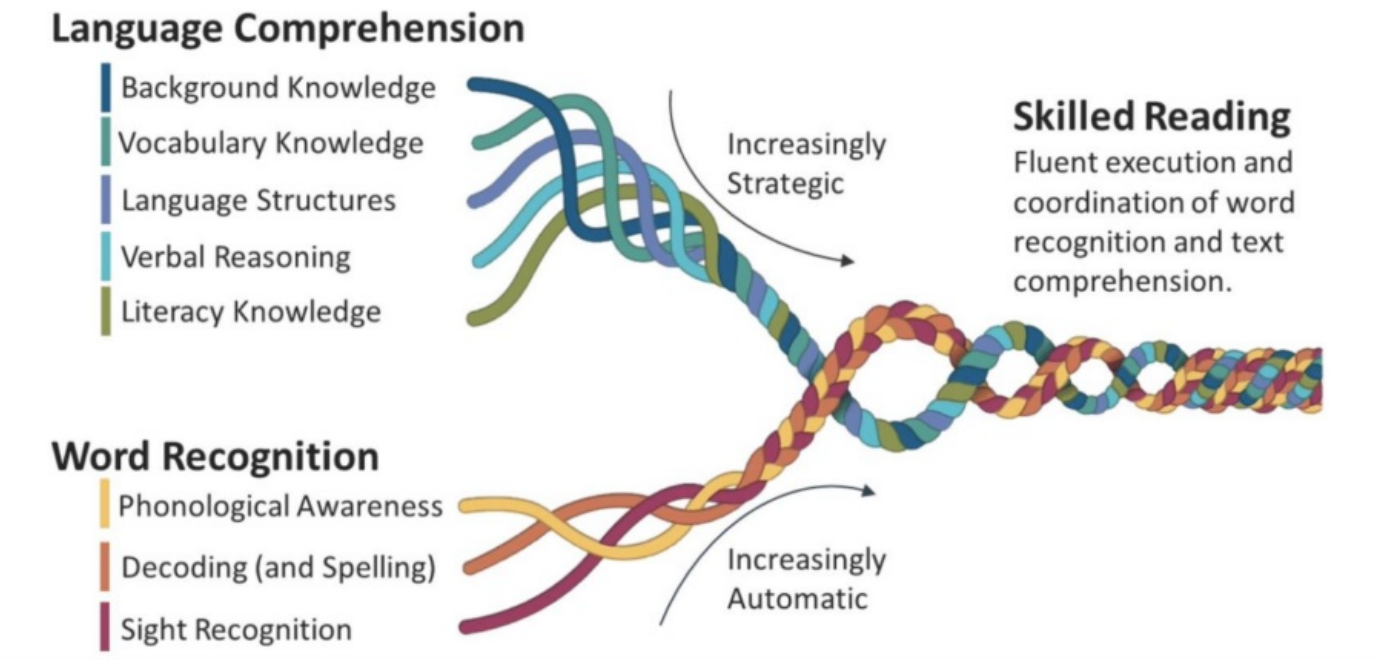
In a nutshell, orthographic mapping refers to the process in the brain where one connects sounds to letters and then connects those letter sounds to words they have in their oral vocabulary. Those words and their meanings become instantly recognizable and understood when read.

Orthographic Mapping Reduces the Reading Brain's Workload

This process is essential for students as they free up their working memory to focus on the meaning and comprehension of what they are reading rather than working hard to decode each word they encounter.

While orthographic mapping is clearly a goal of phonics instruction, and phonics instruction is a means to the end of making meaning from text, what isn't always so clear is the link between orthographic mapping and comprehension monitoring.

Often when we discuss orthographic mapping, we immediately think of the "Word Recognition" strands of Scarborough's Reading Rope (see image below). While there is clearly an aspect of orthographic mapping that is connected to word recognition, it is essential to the further "weaving" of skilled reading that is depicted further down the framework.



Source: Scarborough, H. (2001). Connecting early language and literacy to la
(dis)abilities: Evidence, theory, and practice. in S. B. Neuman & D. K. Dickins
Handbook of Early Literacy (pp. 97–110). NY: Guilford Press.

When Should Readers Start Thinking About Meaning?

As beginning readers work to connect phoneme-grapheme correspondences, they must also monitor their comprehension to ensure the decoding work they are doing makes sense and is accurate.

Students often work in decodable text to practice their burgeoning skills, and it's essential that those decodable texts also provide students with plausible scenarios so that they can monitor their comprehension while practicing their decoding skills.

Let's explore why even early readers should be monitoring meaning as a safeguard not just for comprehension but also for accurate decoding.

Meaning Supports Orthographic Mapping: An Example

Duke, Ward, and Pearson (2021) provide a clear example of how orthographic mapping can be influenced by meaning in their article "The Science of Reading Comprehension Instruction." Take the following decodable sentence:

"I can get the dog."

With the exception of the word "the," all of the words within the sentence are decodable. While a student is reading, they may miscue the word "get." It's not unusual for students to confuse the hard and soft sounds for /g/, so it's possible that the student may read the sentence as:

"I can jet the dog."

When students are also taught to monitor their comprehension while reading, hopefully, the students will recognize that "jet" is an unlikely pronunciation for that word. They will correct themselves and map the correct sounds to the word "get." This brings the word "get" one step closer to being an automatically recognized word.

Alternatively, if a student has not been taught explicitly to monitor their comprehension while reading, the word “get” could accidentally begin to be mapped as the word “jet.” The child now has begun to consolidate an incorrect mapping, which will at some point need to be untangled and re-mapped.

This simple example helps illustrate the importance of comprehension monitoring for beginning readers. As Duke reminds us, the research does not support a sequential approach of holding off on comprehension instruction until word recognition skills are mastered.

Orthographic Mapping and Vocabulary

Another important aspect of orthographic mapping and its connection to comprehension is vocabulary.

Without a word being a part of a student’s oral vocabulary, orthographic mapping cannot occur since word meaning is part of the mapping. The more words a student has in their oral vocabulary, the more likely they are to solidify the words they are decoding into their sight word memory.

Again, monitoring comprehension while reading is of paramount importance as students encounter words with multiple meanings and/or pronunciations. Consider this sentence:

“I read newspapers.”

How is the word “read” pronounced? It depends! Mapping the correct pronunciation and meaning of “read” depends heavily on the context in which it’s used.

Ensuring that students are constantly monitoring and thinking about “what makes sense” deepens the orthographic mapping connections.

Orthographic Mapping and Fluency

We sometimes think of fluency as the final destination of readers at the end of their journey. But fluency is being developed from the beginning, as orthographic mapping allows fast recognition of words and their meanings.

All the components of fluency (accuracy, automaticity, and prosody) are supported as words become mapped in readers’ brains. Teachers, however, know juggling the teaching of all these processes can be complex work.

What if there were an instructional strategy that scaffolded orthographic mapping and its role in fluency development? Good news! Shared Reading is one such technique.

Shared Reading includes the opportunity for students to keep eyes on print while their reading is scaffolded by their teacher and classmates. Consider this lesson example from Being A Reader in Grade 1. Students are reading the poem “Bulldozer” for the second day. “Bulldozer” contains contractions in several lines. Think about which components of this shared reading lesson support orthographic mapping, fluency, or both.

Bulldozer

by Hope Vestergaard

1 The bulldozer isn't sleepy.
2 He's always in a rush.
3 He pushes piles of dirt and junk,
4 and levels trees and brush.
5 He's not a bully, either,
6 although he's big and tough.
7 He waits his turn, plays well with friends,
8 and pushes just enough.

1. The teacher **explicitly teaches** how contractions work with two words repeated in the poem: isn't and He's. The children **chorally read** part of the poem and the teacher circles these words. The teacher then **writes the contractions clearly** where everyone can see, explicitly teaching how these words work. The children **read the words.**
2. The class **chorally reads** the poem, with the teacher **sliding a pointer under each word**.
3. The teacher now passes out individual copies of the poem and the **class chorally reads** again, from their copy, with each child **sliding their finger under the words**.
4. The class forms partnerships, and partners **chorally read** the poem one more time.

In this shared reading lesson, these children have the opportunity to carefully map sounds to print as they examine contractions. These new words are on their way to becoming recognized words as they read the poem three times in this lesson. They also receive scaffolded practice in reading in a natural, prosodic way, aided by their growing automaticity with words.

Conclusion

Teachers know that understanding the connections between concepts helps learners. The same is true for us, as we learn more about how children learn to read and write. We can be even more effective in our teaching when we understand orthographic mapping and its many connections to critical areas of literacy such as comprehension, vocabulary, and fluency.

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*To learn more about this Collaborative Classroom blog series, **Structured Literacy: Unpacking Nine Key Topics for Transforming Reading Instruction and Outcomes for Readers**, read the introduction.*

If you're interested in digging deeper into all aspects of what the science tells us about reading instruction, you may want to read this white paper: The Settled Science of Teaching Reading.

References

Duke, Nell K., Alessandra E. Ward, and P. David Pearson. "The Science of Reading Comprehension Instruction," *The Reading Teacher*

74, no. 6 (2021): 663-72, https://ila.onlinelibrary.wiley.com/doi/epdf/10.1002/trtr.1993.