# Science of Reading 3.0

## Widening the lens on literacy

**By Laura Stewart**,
*Chief Academic Officer,*
*95 Percent Group*

95 Percent Group™

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# SoR 3.0: Widening the lens on literacy

## Introduction by Laura Stewart

Literacy—the ability to read and write—is far more than the mastery of a set of skills. It is a pathway to empowerment and agency—a development of capacities that spark both understanding and joy. It serves as a powerful catalyst for both personal and societal transformation, creating ripple effects that extend far beyond the ability to read and write. In The Science of Reading 3.0: Widening the Lens on Literacy, we explore how the many dimensions of literacy interweave to help every student flourish as a confident and joyful, literate citizen of the world.

The past few years have seen the ascendancy of an important body of research known as the science of reading. From the start, the science of reading has never been a single method or rigid philosophy. It is a living, dynamic body of research that has reshaped literacy education: revealing how children learn to read, what effective instruction requires, and how we can respond when challenges arise. It has been a game-changer, offering the possibility of literacy for all.

Our previous work, The Science of Reading 2.0: Implementation made easy, focused on translating that evidence into practice—turning research into classroom reality. The Science of Reading 2.0 was about the why and how of implementation. Now, there is more to explore!

This new volume sits at the crossroads of multiple big ideas that inform our work:

- the science of reading (including, importantly, language),
- the science (and art) of teaching,
- the science of learning,
- implementation science, and
- leadership

Together, these disciplines offer a more integrated vision: one where what we know from research becomes tangible in schools and classrooms. Alongside big ideas, this book offers practical guidance for instruction, differentiation, and leadership.

## Why now?

Too often, we have studied each dimension of literacy in isolation. We have studied how children decode words without fully considering how teachers learn to teach those skills. We have developed research-backed interventions without adequately addressing how schools can implement them with integrity. We have celebrated individual student breakthroughs while overlooking the systemic changes needed to ensure the success of ALL students. The Science of Reading 3.0 represents a fundamental shift—from fragmented approaches to integrated, holistic understanding.

At this critical moment, educators across the country are embracing the science of reading with passion, yet many still wrestle with implementation:

- How do I support language development within reading instruction?
- How do I meet the needs of diverse learners within a structured framework?
- As a leader, how do I identify and overcome barriers to literacy progress?

These are not just technical questions. They are human questions that require solutions that emerge when multiple sciences converge. This book does not claim to provide every answer. Instead, it is designed to invite inquiry, spark conversation, and fuel the collective journey we share in ensuring every child learns to read.

## Our shared commitment

Our goal remains constant: every child deserves to become a capable, confident reader. Our understanding, however, has deepened. We now recognize that achieving this vision requires more than good intentions or even the best programs. It requires knowing what to teach, how to teach, how students learn, and how schools can sustain success.

The future of literacy is not about choosing sides between competing approaches—it is about seeing how multiple sciences and disciplines, working together, can create transformative learning experiences.

When we set out to write this next iteration on bringing the science of reading into classrooms, we realized the importance of hearing from the brilliant minds in the field. Those who are out continuing to publish research, those who are working tirelessly to improve upon our teacher preparation programs, those who are leading the leaders, some whose stories will move and impact you long after you've finished reading, and yes, those whose work needs no introduction.

Find their essays throughout—their expertise, experiences, perspectives woven in where it helps to stand up the ideas on the page. And where you'll easily see why they—and we—continue to do this critical work.

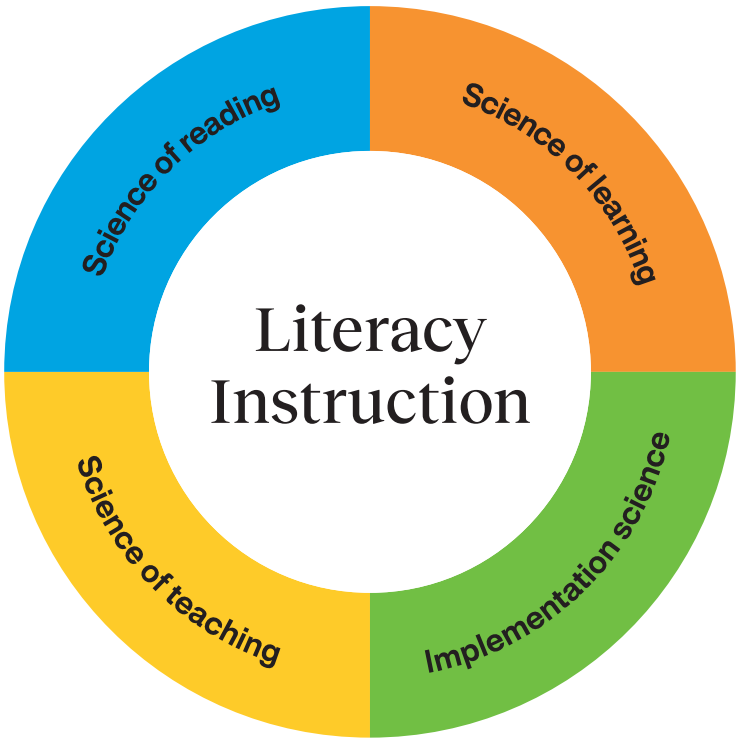
Welcome to The Science of Reading 3.0. Here, where sciences overlap and insights expand, educators gain the tools and inspiration to ensure every child thrives.

# The converging sciences behind literacy teaching and learning

Over the last few decades, there has been a movement toward understanding the reading crisis in the United States. The science of reading, largely known as a dynamic body of convergent evidence that informs effective instruction in all areas of literacy development, has provided a great start to this movement.

Literacy instruction that is effective in practice and not just in theory, that is capable of reaching all children—even and especially those that have learning differences—is rooted in the science of reading, and beyond. And it's time to widen the lens on what our instructional frameworks need in order to grow, thrive, and then remain sustainable in a school community.

In the literacy education field, we recognize that there is a convergence of sciences that all contribute in some way to literacy instruction and literacy learning. In The Science of Reading 3.0, we broaden our scope to examine how they intersect and how each strengthens and supports the others.




### Science of reading

a dynamic body of convergent evidence that informs effective instruction in all areas of literacy development

### Science of learning

the scientific study of the underlying basis of learning with the goal of describing, understanding, or improving learning across developmental stages and diverse contexts

### Science of teaching

the research that drives the principles of instruction (See principles of instruction from SoR 2.0)

### Implementation science

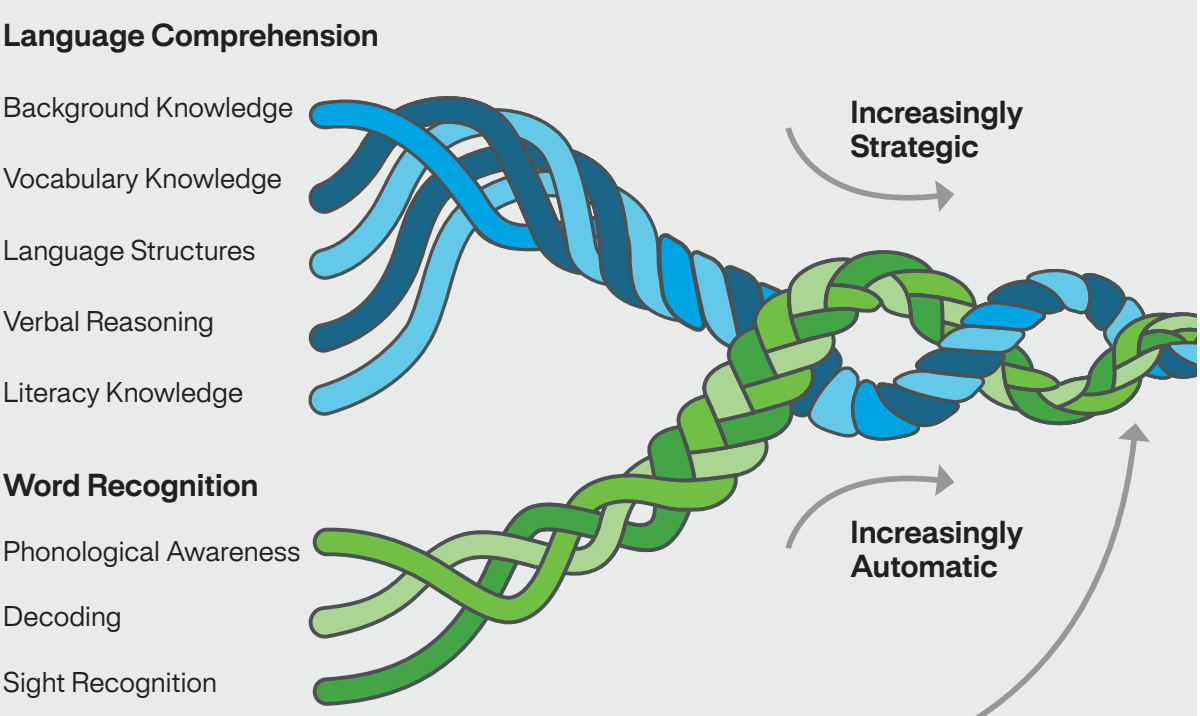
the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice

# Science of reading: Deepening our understanding in the capacities of language and literacy

Since 2019, 40 states and the District of Columbia have passed laws or policies related to evidence-based reading instruction—most of which have been largely rooted in the body of evidence we call the science of reading. When we first began to look at why nearly two thirds of the nation's children were reading below grade level, it felt obvious to examine how teachers were instructing on foundational literacy skills. In our prequel to this book, The Science of Reading 2.0, we focused on Scarborough's Reading Rope as the visual metaphor for skilled reading; in our collective examination of foundational literacy skills, we focused on the Word Recognition piece—or, the bottom half of the rope. These are skills (phonological awareness, decoding, and sight recognition) that can be practiced and mastered over time to develop accuracy and automaticity.

It is important to acknowledge, however, that as children master the "bottom half skills," they need to access and build knowledge with the top half of

# Scarborough's Rope




Based on Scarborough, 2001

the reading rope at the same time: the capacities of language comprehension. Unlike the bottom half skills, these capacities (background knowledge, vocabulary knowledge, language structures, verbal reasoning, and literacy knowledge), are not mastered, but rather developed—continually—over a lifetime.

This visual metaphor has provided a timeless, baseline understanding of skilled reading. And in Science of Reading 3.0 we are now widening our lens and expanding our thinking of the foundational core or basis of skilled reading: language.

So here we will focus on broad systems of language, and the role language plays as the very foundation of literacy, because:

## ALL written literacy actually begins with oral language.

# Reading is language

So knowing what we know, that language is the foundation of reading and writing, is it time to envision a model of reading in a different way? How do we build on our understanding of Scarborough's Rope and offer a unique model that presents a causal view of how reading develops through language—and with that view, offer an understanding that language is the basis of both word recognition and language comprehension? In the world of Science of Reading 3.0, we turn to the brilliant Reading is Language model (Snowling and Hulme, 2025). This model not only represents a more complete understanding of the developmental process of literacy, but demonstrates that language is at the center of all learning and education; thus inviting a deeper discussion around policy and practice that has been traditionally grounded in a skills-based model.

# A shift toward language as the foundation of reading

Danielle M. Thompson, PhD, CCC-SLP

Maggie Snowling CBE, FBA, FMedSci

In recent years, there has been an important shift in how we think about reading difficulties. Rather than the well-evidenced focus on the importance of code-related skills, it has become clear that reading is critically dependent on oral language skills (LARCC & Chiu, 2018; Snowling et al, 2019; Snowling & Hulme, 2025). As a recent scholarly commentary emphasizes (Odegard, Gierka, & Ormandy, 2025), progress in the application of literacy research to practice will come by reframing literacy as a developmental, language-based, and system-level process. Thus, it is time for a shift in policy and practice, currently anchored in code-focused systems, to embrace the totality of the Science of Reading. The Science of Reading 3.0 represents this shift, recognizing that reading is language.

## Reading is language

Beyond the widely accepted Simple View of Reading framework, research now shows that oral language skills are fundamental to both word decoding and reading comprehension. Put another way, language is the foundation of learning to read; it has both direct effects on understanding and indirect effects mediated by phoneme awareness (Hulme et al., 2015). More broadly, language is at the heart of learning and education; children who go through school with poor language are destined to do poorly in the educational stakes, not least because of poor literacy. The Reading Is Language (RIL) model proposes that language and reading are interconnected and interdependent throughout development.

The reasons why reading is language include:

**Oral language is a strong predictor of individual differences in phonological awareness and letter knowledge.** These two skills work in combination to support word reading in an alphabetic writing system.

**Spoken language is pivotal for learning to decode.** Basic decoding (phonics) is often considered the translation of graphemes to phonemes followed by blending, yet, beginning readers rarely adhere to this sequence. Letter-sound translation can lead to word pronunciation before blending occurs, and sometimes a reader cannot blend but still arrives at the word. Phonics provides only partial cues to word recognition; early decoding relies on language knowledge to bridge from print to meaning.

**Decoding is supported by lexical knowledge—our vocabulary store.** When phonic decoding alone does not work for irregular words, readers perform a kind of memory search to "find" a word that can complete the decoding process. The term "set for variability" describes the number of near neighbors that might be searched for any given word. Children with better vocabularies have larger sets and therefore, are more effective decoders.

**Fluent readers have good language skills and use syntax to support reading with intonation.** Fluent reading is not simply a word-by-word process; as sentences unfold, various priming processes come into play, and intonation is ascribed on-line. These processes rely on grammar and syntactic skills which children with good language have in abundance.

**Reading comprehension depends on language and develops in concert with spoken narrative skills.** Narrative skills make explicit story structures; knowledge of these can support the integration of ideas across texts. Without language, decoding is "barking at print" and text comprehension is impaired.

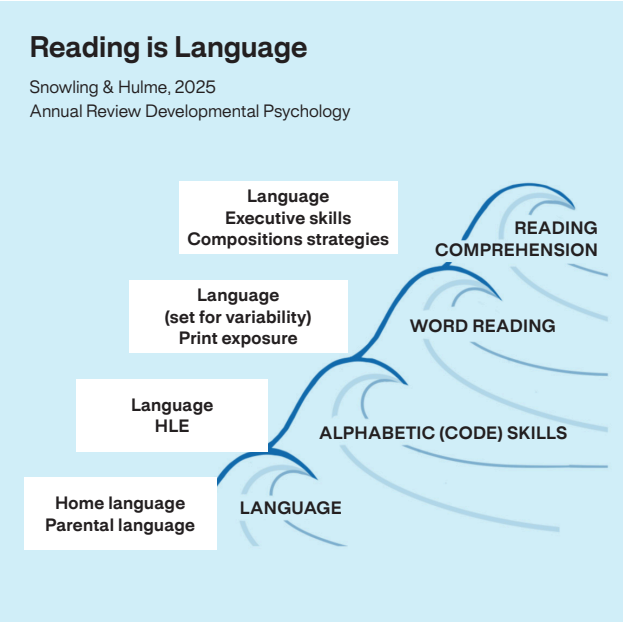
**Inferencing skills are critical for reading with understanding.** Good readers use language to link ideas across a text, fill gaps, and infer what is not explicitly stated. They leverage language to monitor comprehension and to engage in look-back clarification strategies. Children with limited language tend to be more "literal"—they can have difficulty understanding jokes and other forms of metaphorical devices that often appear in print.

**Language builds the structure through which knowledge is acquired from the spoken word and from printed books.** Knowledge of the world grows through the accumulation of key facts and how these connect. Without structure, knowledge remains piecemeal and fragmented

**The other side of reading is writing.** Writing is literally written language and draws heavily on spoken language skills. Spelling taps phonological, morphological, and grammatical language skills. Good language makes for good writing.

## Developmental nature of the model

According to the Reading Is Language model, all aspects of reading (and writing) depend on language. Reading and language are intertwined during development. The theory is explicitly developmental and argues that oral language in the early years, prior to reading instruction, forms the foundation for the later development of code-related skills, print decoding, and reading comprehension.




One of the hallmark aspects of the RIL model is that "language is everything." In the model, language is the ocean and waves of literacy development arising from it are evolutions in language.

During the early years from infancy through toddlerhood, language is developing rapidly and forming a critical foundation for all future aspects of language and literacy. Thus, the status of the oral language system at school entry is fueled by the development of the home language and forms a basis for the development of code-related skills, such as print concepts, letter knowledge, and phoneme awareness as waves ebb and flow; these, in turn, are tuned by the home learning environment. Once code-related skills are refined, new waves bring vocabulary and grammar to the service of decoding. Thereafter good decoders will read more, thereby increasing vocabulary as well as boosting reading fluency, and further waves ensure fluent readers can read for meaning, promoting knowledge of the world.

The model highlights reciprocal relationships between reading and language from preschool through adulthood. Children with preschool language difficulties are at risk of later reading problems in both learning to read words and understanding what is read. It follows that interventions to improve oral language skills in preschool and the early school years will improve later language, word reading, and reading comprehension skills. Evidence shows that oral language instruction (Core and Tier 2) are effective, can be scaled, and their effects can be sustained (Hulme et al., 2025; Thompson, et al., 2025).

## Beyond one-size-fits-all: Leadership, systems, and practice

Taking account of persistent literacy disparities across the US (NAEP, 2025), there is a need for a paradigm shift that moves leaders from fragmented, program-level solutions toward developmental systems thinking. A language-centered developmental model provides a coherent course-correction ensuring that language and development remain central to literacy improvement through an integrated MTSS framework for screening, instruction, intervention, and identification of reading difficulties. While not a silver bullet, beginning with language allows leaders the opportunity to design systems that are proactive, equitable, and responsive to how children develop.

Building momentum for lasting change will require humility. The science of reading community has significantly advanced word reading instruction; now is the time to give equal attention to reading as a developmental language-based process. When variations in language development are overlooked, so too are the students who struggle the most to become literate. This limits our collective ability to close opportunity gaps and prepare leaders and educators for the full spectrum of language-based learning differences (Hogan, 2025). Clarifying how oral language can be taught in service to life and literacy development will require shifts in educator preparation, systems design, and assessment and instructional practices. The Reading Is Language model provides a framework for this systemic change.

At present, teachers can begin this work by strengthening intentional oral language routines across all content and grade levels. Leaders can build coherence by broadening assessment systems and ensuring that current policy avoids siloing dyslexia and developmental language difficulties and disorders, instead advancing developmental language-first frameworks. Centering language in this way builds educational equity and ensures learners with language-learning differences are identified early, supported effectively, and provided with opportunities to thrive.

This next iteration of the science of reading is steeped in comprehensive language support and addresses longitudinal developmental monitoring to close opportunity gaps and ensure a more just and equitable future.

## Conclusion

Our collective movement toward the science of reading has fueled a revolution in word-reading instruction. Now, it's time for an equally coherent impact on the screening, instruction, and monitoring of language development in its relationship to literacy and life outcomes. Going forward, we advocate a shift toward understanding literacy as a developmental process grounded in the reciprocal relationship between oral and written language—moving from speech to print toward oral language to written language and back again.

The work before us is clear: to lead, teach, and legislate in ways that turn our literacy crisis into literacy transformation.

Indeed, as we think about "Reading is Language" and the implications of intentional oral language development across all content and grade levels, it is important to consider immediate take-aways for parents and educators.

# The foundation of all literacy: How oral language shapes reading and writing

Tiffany P. Hogan, PhD, CCC-SLP, FASHA, BCS-CL

The science of reading has rightly named foundational literacy skills like decoding and encoding, fluency, and comprehension as critical to reading success. But here's the truth:

All written literacy begins with oral language.

Oral language, or the ability to understand and use spoken language, is a complex system. It includes knowing and using vocabulary, understanding and using complex sentences, following and participating in conversations, comprehending oral language heard throughout the day, expressing ideas verbally, and understanding language conventions around the social use of language.

In fact, oral language development begins before children are even born. Humans are developing language in utero, long before their first day of school. Oral language isn't just a "precursor" to literacy. It is the living foundation of literacy that continues to grow and strengthen through its ongoing relation to reading and writing.

This has major implications for schools—for educators, for parents, and for anyone who's invested in the way

children develop literacy skills: if we want students to thrive as readers and writers, we must also prioritize the development of their oral language.

## Why oral language development matters

Research shows that babies recognize sound patterns and even prefer familiar voices before they are born. Newborn studies demonstrate that infants can already distinguish their mother's voice from others, and experiments show that babies will suck more vigorously on a pacifier when they hear familiar sounds.

This tells us something profound: language development is biologically ingrained and begins earlier than most educators realize. By the time children enter preschool or kindergarten, they have already been language learners for years. Every interaction, one way dialogue, story, and conversation has laid the groundwork for future literacy.

Recognizing this complexity helps schools move beyond deficit-based assumptions. Children arrive with tremendous linguistic capacity. The question is not whether they know enough, but how schools can connect their existing knowledge and language skills to academic contexts.

## A framework for thinking about oral language

One practical way to understand oral language is by turning to Bloom and Leahy's framework (1980), which breaks language into three parts:

- **Form:** the sounds (or signed movements) that carry meaning
- **Content:** the vocabulary and grammar that make up meaning
- **Use:** the social pragmatics—intonation, context, and cues that go beyond words

In classrooms, all three components matter. A child may use correct grammar to say "I'm fine," but their tone of voice (use) may tell the real story. For teachers, this framework is a reminder that oral language is multi-dimensional. Effective instruction helps students not only learn words and structures but also use them appropriately in social and academic settings.

## Moving beyond the "Word Gap"

Many educators are familiar with the "million word gap"—the idea that some children hear far fewer words before kindergarten than their peers. While well-intentioned, this idea has led to deficit thinking: the assumption that some children come to school "lacking" language.

In reality, all children come with rich language and knowledge from their lived experiences. A student may not know or have an understanding of academic terms but they may have deep, nuanced language about food insecurity, foster care, or caring for siblings. Their knowledge is real and valuable—it just may not match what schools measure.

At the same time, we know that academic language challenges often come from two main sources:

1. **Limited exposure to "book language"**—the complex sentences and structures found in written texts
2. **Developmental language disorder**—a neurodiversity that makes acquiring and using language harder

Both of these can compound over time. But when schools recognize the strengths children bring while providing targeted and intentional support, they create equity in literacy development.

## Why read-alouds are essential

Reading instruction involves two primary interacting streams: **word reading** and **language comprehension**.

Too often, schools treat these as sequential—first phonics and decoding, then comprehension. But research shows children need both at once. Just as athletes must practice mechanics while experiencing the joy and sophistication of the game—even if students' capabilities aren't there yet, they need decoding practice alongside exposure to rich, complex language, even if they can't access decoding yet on their own.

This is where read-alouds become extremely valuable. A first-grader might decode below benchmark, but be capable of comprehending stories designed for much older children. Read-alouds bridge that gap, giving students access to sophisticated vocabulary, complex syntax, and big ideas that would otherwise be out of reach.

At the same time, decodable texts give them practice at the right level. Together, these two streams prevent frustration and disengagement, ensuring that instruction both challenges and supports.

## How reading shapes language (and vice versa)

Oral language fuels reading, but reading also reshapes oral language.

A powerful study in Portugal compared siblings where one attended school and learned to read while the other did not. The child who learned to read showed measurable changes in brain circuits for processing language—evidence that reading literally rewires the brain.

This relationship is bidirectional. Rich oral language improves comprehension, while exposure to written language strengthens spoken vocabulary and complexity. Many of us have experienced this

firsthand—academic writing or wide reading often influences the way we speak.

Julie Washington summarizes it well: "Improving language improves reading, and improving reading improves language." For schools, this means oral and written language must be developed together.

## All language work is literacy work

The biggest takeaway for parents and educators?

## Recognizing that all language work is literacy work.

Knowledge and language are intertwined. Knowledge gives children something to talk and read about; language gives them the tools to express and expand knowledge. This means literacy isn't built only during phonics lessons—it grows in classrooms, kitchens, playgrounds, and bedtime stories.

Here are a few strategies to optimize the oral language experience in schools or at home:

- **Prioritize conversations:** Every discussion is a chance to build literacy. Encourage students to share ideas, explain reasoning, and ask questions.
- **Read aloud daily:** Choose texts that stretch students' comprehension beyond what they can decode. Pause to unpack rich vocabulary and complex structures.
- **Connect knowledge and language:** Build background knowledge in science, history, and the arts, while giving students the language to express what they learn.
- **Support diversity of language:** Value the linguistic strengths students bring from home and community while scaffolding access to academic language.
- **Use both streams:** Pair decodable texts for practice with complex, knowledge-rich texts for oral comprehension.

## The human drive for patterns

At the heart of language development is our human drive for patterns. From the womb onward, we detect rhythms, structures, and meaning in the language around us. These patterns shape how we learn to talk, how we learn to read, and how we connect with others.

For schools, the message is clear: oral language is not just the warm-up act before literacy.

It is the living foundation on which literacy rests. Children arrive with immense capacity for language, and when we nurture both oral and written experiences together, we unlock that capacity for a lifetime of learning.

When schools embrace this truth, literacy instruction becomes more than teaching reading skills. It becomes the work of helping students use language—in all its forms—to think, to connect, and to thrive.

# Reading begins at birth

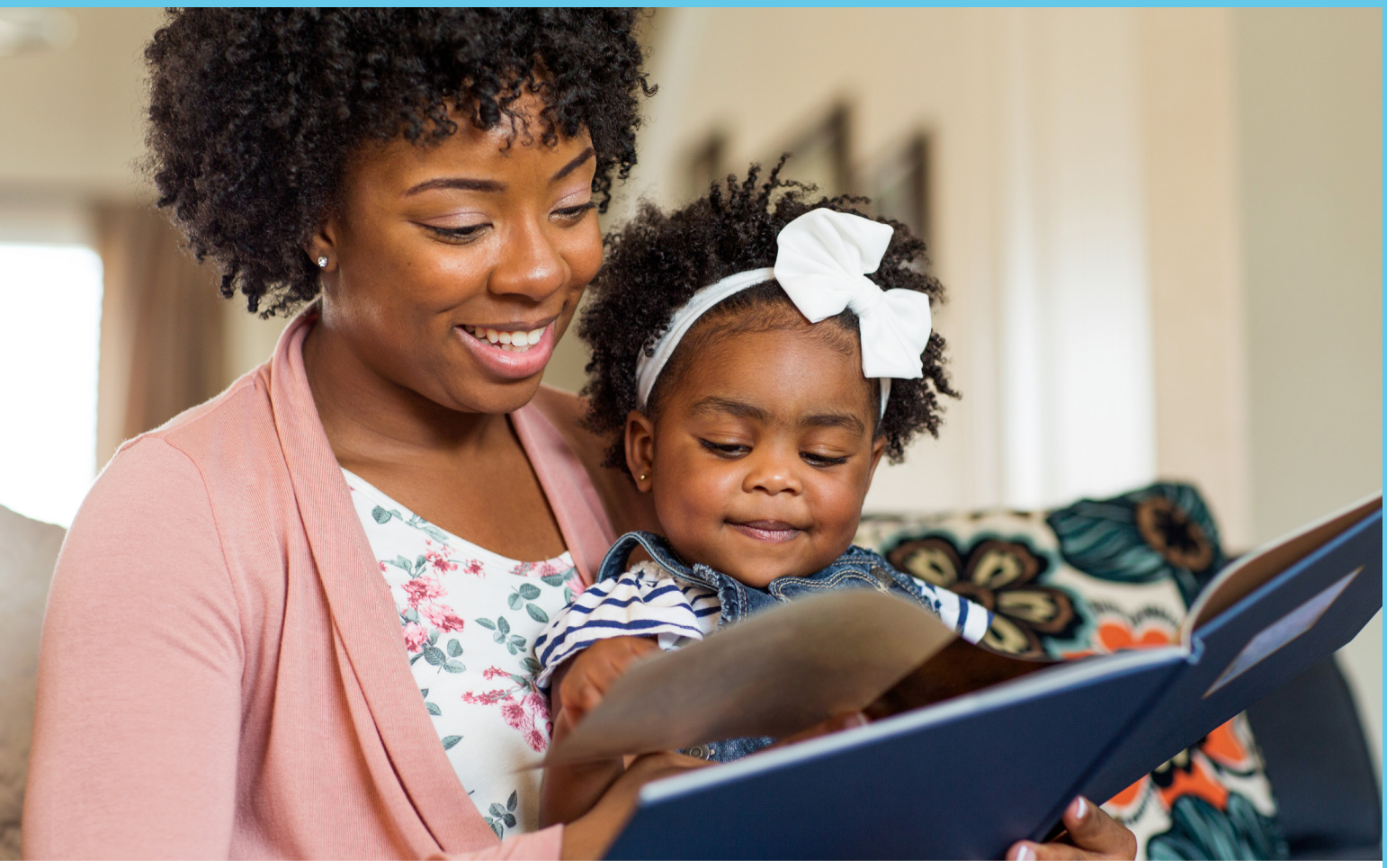
From the Reading is Language model, it is clear that with language at the core, learning to read does not begin when a child enters school! In SOR 3.0, another policy issue we need to address is to recognize and advocate for a systemic shift in the typical "K-12" mindset about learning, bringing early childhood to the forefront as a critically important timeframe that must be included.

## Early language development is the foundation for later reading

Ann Kaiser, PhD

Language development in the first three years of life lays the foundation for reading. From birth, young children are learning to communicate using spoken language. At age four, language skills are strongly predictive of both children's emergent reading skills and their long-term reading competence. Because children's early language development is linked to their cognitive development as well as their motor and social development, learning to read will also be impacted by these language-related areas of early development. This holistic, continuous view of early development provides an important framework for understanding, anticipating, and addressing learners' early difficulties in learning to read.

Language development represents the dynamic interaction of nature and nurture, of biology and environment. All children are born with a set of genetic characteristics that influence their language development. The brain is the central expression of natural genetic variability. Variability in the functioning of the brain is reflected in individual differences in efficiency for learning, remembering, regulating, and producing language. The nurturing aspects of children's environments are also variable. An ideal environment includes child-responsive interactions with adults who frequently use language that maps children's interests and focus of attention.



Such interactions are critical for rapid language learning in the earliest years. In responsive, linguistically-rich social connections, children attend to what is being said (the words), link words to referents (objects or events), and recognize the adult's social intentions (sharing their interests, inviting a response). When adult linguistic input matches the child's comprehension and emergent production of language, it is a perfect match for accelerating development.

Reading is a form of language. Language in all modes—spoken, written, signed—requires understanding (comprehension) and producing (expression) a system of rule-governed symbolic forms: how sounds combine to form words, what words mean, and how sequences of words in sentences indicate complex ideas and relationships. Learning to read depends in large part on having already learned to talk—that is, having learned to produce and understand spoken language. Early word reading, for example, largely requires children to decode printed words that represent vocabulary they already understand and use in speaking and listening. Like spoken language, reading relies on increasingly complex neurodevelopmental processes executed by the brain in response to environmental input.

Language learning and learning to read are complex processes. Because of their complexity, they are vulnerable to small variations in human physiology, social and environmental context, and access to critical learning experiences. Small differences in brain-based neurodevelopment are often markers for developmental language disorders (DLD) during the preschool years and for later diagnosis of dyslexia and other reading difficulties. While children with brain-based differences associated with DLD may be typical in most aspects of their development, early impairments of specific language processes can

cascade into more pervasive learning and behavior challenges when environmental stressors impact them, their caregivers, teachers, and peers. Similarly, limited resource settings, co-occurring stress reflected in caregiving and teaching, and limited adult support for language- and literacy-related learning can create a "perfect storm"—a context in which generally capable children do not have adequate linguistic input for acquiring the language foundations for reading and school-based learning.

Adults are the gatekeepers. Adults give children access and tools for learning the complex system of sounds, words, sentences, and narratives that support both language and literacy acquisition. Early language learning is a dyadic process, a dance between children and their primary caregivers. Both children and adults come to this dance with socio-biological predispositions and learning histories that allow them to reciprocally influence each other in learning transactions. For example, babies are interested in faces and pay special attention to adult language that is rhythmic and varied in prosody. When adults hold babies for feeding, they place them in a position where they can see and hear the adult for extended periods of time. "Baby talk" is a near universal, baby-inspired adjustment adults make when talking to young children that makes language more salient, emphasizes key words, and is repetitive. Adults are likely to talk about objects in the child's line of sight ("Mommy," "bottle," "doggie"), and this type of responsive, adapted adult talk dependably contributes to the initial spoken vocabulary of infants and toddlers.

Importantly, adults naturally respond to developmental changes in children's language, cognitive abilities, and interests by choosing more specific, advanced vocabulary and transitioning to more adult-like sentences that are longer, more complex, and contain new words as well as already known words. The general trajectory of transactions between language learning children and their caregivers is positively predictive of long-term child language development. However, there is abundant evidence that adult stress, well-being, and sensitivity to changes in children's overall development and communicative competence strongly affect children's learning outcomes.

There is potential for strengthening language foundations even as children are becoming readers. The first-grade child who struggles to learn to read and his peer who learns to read with ease are likely children with very different early language development patterns. Paying close attention to early language development in all children and intervening early with a range of evidence-based developmental supports when needed can increase the likelihood that children are successful early readers. Similarly, when children struggle with reading, examining their foundational oral language skills can signal when instructional support for oral vocabulary and syntax, as well as phonological awareness, can facilitate learning to read. Oral language skills and reading skills continue to leverage each other across the early and later school years, and language-based intentional teaching can be an important approach in ensuring strong emergent readers.

In sum, early language development is not just a precursor to reading—it is its foundation. The continuous interplay between biology and environment means that even subtle differences in early experiences can shape a child's trajectory in both language and reading. Adult-child interactions that are responsive and linguistically rich are not merely helpful—they are transformative in laying the linguistic foundation for reading, just as later intentional instruction is essential to building strong readers. From this perspective, early reading difficulties may be more than isolated challenges; they may be signals pointing back to differences in oral language abilities and suggesting the value of timely, targeted intervention to address language as well as basic reading skills.

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ANN KAISER, PHD

# Components of oral language

If we know that oral language is the foundation on which all literacy skills are built, it stands to reason that as educators we should take a deeper examination into how specific oral language components affect development of written literacy skills.

Because humans are actually hard-wired for developing oral language (whereas they are not for written literacy skills), many come to school as fairly sophisticated language users! Just think of all they have developed during those early years—not just names and labels, but an understanding of how words modify, how words fit together in sentences, and the ways in which they can express themselves. And still, not all students are equally prepared.

Research such as the National Early Literacy Panel Report (2009) has told us that young children with stronger oral language skills arrive at school better prepared to learn how to read—and have an easier time doing so. Building on this foundation, it is important to both recognize students' strengths and also to make sure we are appropriately building on what they bring to the process of learning to read.

Here we break down the specific components of oral language and why each helps to create fertile soil for the eventual seeds of written literacy instruction to be planted.

## Phonology

Phonology focuses on the sounds of spoken language, called phonemes, and how they are used and combined in language. Students learn to recognize the difference between similar sounds, such as distinguishing between /b/ and /p/, (/b/ is "voiced" and /p/ is "unvoiced"). The ultimate goal of phonological instruction is to help students recognize, produce, and manipulate sounds—or phonemes—in spoken language so that they can connect these phonemes to letters—graphemes—to unlock the alphabetic principle that is the foundation of written language.

This essential skill—which research has found is critical to early reading development (and, later, reading success and clear communication)—reminds us that literacy does not actually begin with print, but with the rich and varied sound system that each student brings to every reading and writing experience.

## Vocabulary

A robust vocabulary supports learning in many ways, including: comprehension, expression, writing, and academic cohesion—or the way literacy skills help to connect ideas across content areas. A student's vocabulary encompasses all the words they understand and use in their language "bank." Students expand their word knowledge by (for example) learning that words like *gigantic* mean very large—which builds connections between new terms and familiar concepts. The goal of vocabulary instruction should be two-fold:

1. **To learn new words directly**—so students' can expand their word knowledge (and usage) across various and increasingly sophisticated contexts
2. **To understand how to learn and break down unfamiliar words**—which we will discuss in a subsequent section.

# Morphology

Morphology examines how words are formed using morphemes—or the smallest units of meaning. Students can manipulate roots, prefixes, and suffixes to change words and create new meanings. They might learn that adding morphemes like "-ed" to the root *walk* creates *walked*, changing the tense and meaning of the word. The goal of morphological instruction is to help students understand how words are formed and modified so that they can easily access pronunciation and meaning.

This knowledge builds on the oral language foundation students already possess and helps them decode unfamiliar words and expand their vocabulary efficiently—drawing on the morphological patterns they've already internalized through their oral language experiences and applying them to reading and writing.

In the SOR 3.0, morphology is finally getting the attention it deserves! Morphology provides readers with powerful tools to decode, understand, and make meaning from text, facilitating decoding/word recognition, vocabulary development, reading fluency, comprehension, spelling, and writing. It is especially important for students as they encounter increasingly complex and morphologically-dense text.

## The importance of morphology—what we need to know and what to do about it

Deborah R. Glaser, EdD
*Author and literacy expert*

Children learn to speak without instruction, but reading requires deliberate teaching. It is a human invention, built on the insight that sounds in spoken words can be represented by symbols. Early linguists discovered that words could be decomposed into their separate speech sounds and that each sound could be assigned its own symbol to represent it, a miracle actually.

Understanding this written system, based on the alphabetic principle, requires an awareness of phonemes, graphemes (the letter or letters that spell those phonemes), and as it turns out, awareness of morphemes (the meaningful parts of words).

### Why morphological awareness?

Morphological awareness matters because it makes a powerful contribution to word reading abilities. Morphological awareness has the potential to positively affect literacy skills in multiple ways: through word recognition, spelling, vocabulary acquisition, comprehension, and motivation.

In addition: (Apel & Lawrence, 2011)

- Morphological awareness uniquely predicts reading and writing skills even when other linguistic awareness skills are considered.

- In some cases, morphological awareness is the sole or strongest predictor for reading and spelling ability.

We also know that for our vulnerable students, literacy skills are positively impacted when morphological awareness is taught during intervention (Wolter & Green, 2013; Bowers, 2010).

Given this overwhelming consensus in the field regarding morphology, it behooves us to deepen our understanding of this elusive language element, what it means, and how to teach it.

## What is morphological awareness?

To begin, a **morpheme** is the smallest unit of meaning in a language. For example, a single unit of meaning, a morpheme, is the word ***book***. However, if we change the word to ***books***, we now have two morphemes, the base *book* and the inflectional suffix, the plural, which changes the meaning. So *-s* is also a morpheme and the word *books* has two morphemes. What if we add *-ed* to the word book? "I booked it to the bus stop to be on time!" Now *book* is a verb! That *-ed* is a powerful little morpheme!

**Morphological awareness** is recognizing the morphemes in words. This linguistic ability is defined by the capacity to consciously consider and manipulate the smallest units of meaning in spoken and written language, including base words and affixes, or prefixes and suffixes (Apel, 2017).

The educator's goal is to assist students to develop an awareness of the morphemes in words to better assist with word recognition, spelling, reading fluency, and comprehension.

## How do we purposefully grow morphological awareness?

We know that when the orthographic form—the visual of a word—is linked to its meaning, the wiring to meaning in the brain becomes stronger and reading becomes more automatic (Nation, 2009).

In other words, our goal is to link printed morphemes to meaning. Creating awareness of morphemes is where we begin.

## Early grades—teaching tips

We are predominantly focused on phonological and orthographic awareness during the first three or four years of school. To include morphemes, attend to word meaning with the words students are learning to read. The first words students read are usually CVC words, single morpheme words like *cat*, *sit*, *bun* which are meaningful units.

We assume students are connecting meaning to the words they read, but many times they are not! Play little games with their reading words such as "Clue Game." Students have their reading words in front of them, you give a simple clue for a word, "This word is an animal with a tail that wags." Students find the word among their options, point to it, and read it, and then write the word—*dog*.

If you use sound spelling boxes, phoneme-grapheme mapping with your students, begin your inflectional ending awareness with the plural suffix -s. Choose a couple of nouns to make plural by adding an -s, with no other spelling changes needed. Map out the word, b / u / n. Then introduce the next word, *buns*. Use it in a sentence, explain how the word *bun* changed, explain that when we add /s/, -s, to the end of this word, we now have more than one! Explain that this is one way we change the meanings of words. Then do this with another word. Students will have a visual of the two, singular and plural forms, for visual comparison in their spelling boxes. You can then ask students to highlight the new part that changed the meaning of the word to "more than one."

Teach inflections by adding them to the words students are learning to read:

- *-s*, *-es*, *-ed*,
- *-er*, *-est*, *-ing*.
- Then, *-ly*, *-less*, *-ness*, *-ship*, *-fold*, *-ment*.

Be aware of spelling changes that occur when adding suffixes and teach the spelling rules (Treiman, 2017). We all know that it takes years of practice to build orthographic mapping for the words that require spelling changes—drop it, double it, change it (see *Morpheme Magic* and *Morphemes for Little Ones* for spelling rules and how to teach them). Continue instruction for several years. Correct misspellings and reteach continuously.

## Upper grades—teaching tips

Growth in phonological and orthographic awareness taper off after the first three or four years of school. In contrast, morphological awareness showed some growth in the early years, but more substantial growth after 4th grade (Goodwin & Ahn, 2013).

Older students in grades 4 and up are expanding their reading and as an outcome, the vocabulary they come in contact with. This is when we begin our morphological awareness instruction in earnest.

Once students are in fourth grade, they move into word roots and building word families (duct/duce: *produce*, *induce*, *production*, *induction*, *conduct*...). You do not have to wait until fourth grade to introduce these morphemes and build curiosity, but beginning in 4th grade is where a lot of your deeper instruction will lie.

Here are two ways to include morphological awareness in your literacy instruction.

Find a resource that will help you develop a systematic approach. The most common roots and prefixes will provide a basis and order with which to teach morphemes, their meanings, and to form word families.

- Teach the common prefixes affixed to Anglo Saxon bases—for example, un-, re-, de- in *unwrap*, *rework*, *deface*.
- Teach Latin roots and then introduce the meanings of prefixes as needed, for example, -ject means "to throw." In the word *reject*, re- means back. Therefore, *reject* means "to throw back," "send it back." The magazine *rejected* the article I submitted. It was sent back to me.
- Work with students to create word families around the Latin roots you teach.
- Direct students to spell words by syllable using a grid and then circle the morphemes which often have different boundaries. For example, syllables in *production* are pro-duc-tion. But the morphemes are pro-duct-ion. This analysis addresses several language components and provides attention to the internal features of words to strengthen morphological awareness.

Teach the morphemes that present in vocabulary words from literature, science, social studies, academic vocabulary, etc. Post and refer to the morphemes you teach and work with students to create a Morpheme Lexicon where they record their morphology learning.

- Model how to question the meanings of morphemes in words and direct students to do the same. "I wonder what 'ceive' means in *receive*? Is it the same root in *receptive*? What are some other words that are built upon the root 'ceive'?"
- Provide access to resources for students to use to look up morphemes' meanings and also etymology (morpheme origin).

## In closing

We can create and expand morphological awareness from the earliest grades throughout high school. Always ask students to use the terms they are learning in their oral and written language exercises. Help them to link the vocabulary they learn to the content they are learning. Model how to use the language they are learning. Immerse your students in words, their morphemes and meaning, and use—speaking, reading, and writing.

# Semantics

Semantics deals with the meaning of words and sentences—including how the context of something affects the interpretation. Students might learn that words like "bank" can have multiple meanings, referring to either a riverbank or a financial institution, depending on the context. This makes reading comprehension especially important—semantics being another example of reciprocal learning: Understanding what you are reading helps you to identify the context of a word ↔ just as understanding the context of the surrounding text helps you to know which meaning of a particular word makes the most sense.

The goal of semantic instruction is to develop students' understanding of word meanings and the relationships between words. Strong semantic knowledge enables deeper comprehension and more precise communication which further demonstrates how oral language serves as the foundation of literacy—students who are exposed to and engage in rich conversations develop the contextual understanding needed to interact with complex texts and express nuanced ideas in writing.

# Pragmatics

Pragmatics deals with the social rules of language use in context—understanding how to communicate appropriately in different situations. Students learn that the same message can be expressed in various ways depending on their audience and setting, such as knowing when to speak formally versus informally. For example, a student might say "Hey, can I go to the bathroom?" to a friend but "May I please use the restroom?" to a teacher. This discernment about who your audience is and which type of language makes sense in a situation—especially in a world of texting, shorthand, and abbreviations—may need to be explicitly modeled and taught.

The goal of pragmatic instruction is to help students use language appropriately across different social contexts. This understanding is clearly built on oral language as the foundation of literacy.

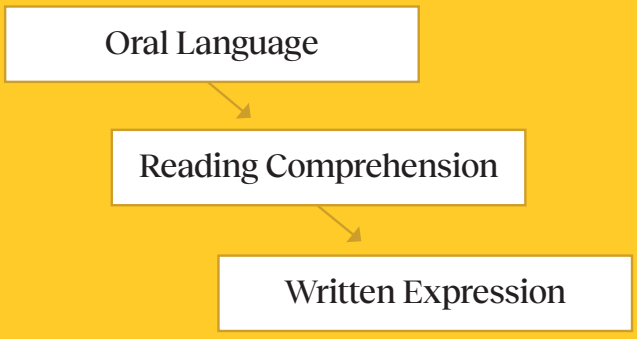
Students first develop pragmatic skills through face-to-face conversations, where they learn to read social cues, adjust their tone, and navigate different communication contexts. Then they can apply this social awareness to written communication where understanding audience and purpose becomes essential for effective reading comprehension and writing across both academic and, increasingly, real-world contexts. A great example of this is ensuring students understand the difference in the way they might greet a friend in a text, versus how they might greet a teacher or future boss in an email.

# Syntax

Syntax refers to the set of rules that govern the structure and arrangement of elements in a system; in linguistics it refers to word order, sentence structure, and how different parts of speech relate to each other. Students learn that word order matters significantly; for example: "The woman in high heels walked the dog" versus, "The woman walked the dog in high heels."

Widening the lens on literacy helps us to reveal how sentence structure knowledge flows from oral language experiences to written expression. It is understanding syntax that allows for a reciprocal language experience: students who have rich opportunities to hear and use varied sentence patterns in speech bring this syntactic foundation to their reading and writing and vice versa.

In the world of SoR 3.0, syntax is elevated not only as a player in understanding sentence structure and grammar, but as a major contributor to reading comprehension; the basic building blocks of comprehension are at the sentence level, and therefore syntactic relationships must be taught and developed.




## The importance of syntax: Aligning classroom practice to comprehension processes

Julie Van Dyke, PhD

Literacy leaders have transformed the practice of decoding instruction by putting phonology at its center. This move is grounded in decades of experimental work showing that phonemic codes become active within 1/10th of a second after seeing a word. Plus, neuroimaging research has confirmed that phonics-based instruction can "normalize" the brain of struggling readers so that it looks more like that of those who don't struggle (Eden et al., 2004; Simos et al., 2007; Richards & Beringer, 2008; Shaywitz et al., 2004; Temple et al., 2003).

These science of reading facts have fostered "instructional alignment"—meaning that classroom practices can be made to match what the brain requires to master the skill. For word reading, the brain needs to understand individual units of sound (phonemes) and letter-sound correspondences in order to lift a word off the page; therefore, this is what we teach.

But when it comes to comprehension, the picture is messier. It is easy to become overwhelmed by all the ingredients that contribute to skilled comprehension:

- multiple types of knowledge (vocabulary, morphological, syntactic, referential, world)

- diverse cognitive skills (ability to maintain focus, draw inferences, construct situation models) and
- the separate abilities necessary to generate reports about what was understood (via question answering, summarizing, or identifying main ideas).

When it comes to comprehension, how can we find "instructional alignment"?

What does the brain require to become a skilled comprehender?

The science of language processing provides a starting point. Nearly 50 years of research have shown that language is comprehended in a word-by-word fashion, with the syntactic features of each word providing reliable guidance about how each new word should be integrated with what has already been processed (Van Dyke, 2025). Simply put: syntactic processing is the engine through which our brains comprehend language.

As with phonemic information, syntactic information is active within 1/10th of a second after seeing a new word (Ashby, 2010; Pollatsek, 2015; Friederici, 2002). In fact, syntactic information can be used to anticipate what's coming next—making it even easier to process new words (Buggy and Dillon, 2025; Levy, 2008; Rayner et al., 2011). For example, if my brain has already processed the phrase "the angry", then it's obvious that either a noun or another adjective will be coming next—certainly not a verb or preposition. This information helps to narrow down possibilities even before it processes the next word. Likewise, in a sentence like "Amelia tied the string into a bow," a skilled comprehender will know right away that the pronunciation of b-o-w rhymes with "know" rather than "cow" because a verb ("bow" as in "to bend forward") does not fit in the prepositional phrase "into a ___". Thus, a person's syntactic knowledge greatly speeds up word-by-word integration (for skilled comprehenders)—and it is this ability to anticipate upcoming linguistic structures that supports fluent reading.

This perspective teaches a number of lessons about how to obtain "instructional alignment" for comprehension.

Namely, that **syntax should be a topic for active classroom instruction**. One of the biggest myths in reading instruction today is that it is not necessary to teach syntax because it is acquired naturally from birth. Here are three key reasons why syntactic instruction cannot be ignored:

1. The language that is acquired naturally from birth is vastly different from the language needed to succeed in school (MacDonald, 2025; Nation et al., 2022; Roland et al., 2007). Just consider: Are dinner table conversations of the same complexity as the texts that a fourth grader will read in his or her English or Social Studies class? Aside from vocabulary, the sentence structures are vastly more complicated—communicating complex hierarchical relationships between concepts or characters that go way beyond the conversational style of spoken language. And since brains can only learn what they are exposed to, children simply cannot rely on casual language input if we hope they will be able to process the complex language found in books.
2. The incidence of individuals who have language- or syntax-level processing difficulties is equal to that of those who have dyslexia (Hogan & Van Dyke, 2025; Adlof & Hogan, 2018). The typical statistic is that two students in every classroom will have what is termed "Developmental Language Disorder" (DLD), and this difficulty is often underdiagnosed because children with DLD can learn to read words perfectly well (see also DLDandMe.org). This means if a teacher is on the lookout for students who might have word-level processing problems, then he or she should be equally alert to children who may have sentence-level processing problems. The easiest way to find these students is to listen to the phrasing in their

oral reading and probe their knowledge of syntax (keep reading for the "how to" for this). Students who do not produce fluent phrasings will likely have syntactic deficits, even if they are entirely fluent with individual word reading (Breen et al., 2024). For these children, explicit instruction and/or visual scaffolding of syntactic forms is crucial.

3. Finally, languages differ in how syntax is conveyed, especially with respect to word order (Comrie, 1989; Hawkins, 1994). While English has a fixed word order which makes it easy to identify a Subject-Verb-Object sequence, or know that adjectives are positioned before their nouns, many other languages do not. Some languages allow for the Subject to occur anywhere in the sentence, and it may or may not be marked by specific grammatical inflections. This means that a child's brain may be wired to process syntax in a completely different way from that required by English. Thus, the syntactic instruction in the classroom could be vital for helping these children understand the language they are expected to master.

Yet, teaching syntax can feel daunting. This does NOT need to look like, "Tell me where the Verb is in this sentence." That kind of meta-knowledge isn't necessary in order to be competent in syntax (although knowing syntactic terms makes it easier to discuss). Rather, teachers can focus on whether a child can identify "who" did "what" to "whom" (Eberhardt & Gillis, 2025a,b).

Answering this series of questions forces a child to see the relationships between entities in a text—who is the "do-er" and who is the "do-ee" and what is the relation between them? For example, in the sentence "Odelia smelled soup," a student should know that Odelia is the experiencer of the smelling action, and it was the soup that was the object that was smelled (Direct Object): "Odelia" and "the soup" are linked via the act of "smelling."

Notably, these queries must be at the level of the sentence, because that's where the basic building blocks of comprehension occur. Querying at the level of the paragraph or full text can obscure basic relational misunderstandings that make it impossible for a student to understand the broader gist or main idea of a text. Crucially, a child who doesn't understand these relationships won't be able to assign the appropriate phrasings as he or she reads; their prosodic production during read alouds won't just be slow, it will be missing appropriate pauses and changes in pitch and emphasis that skilled readers do automatically.

### Here are some specific recommendations for boosting syntactic knowledge:

## Help students identify the function of words.

Looking for the "who," the "what," and the "do" in a sentence is a great way to build syntactic knowledge in younger readers (Gillis & Eberhardt, 2017). Once students reach more advanced reading levels, however, they require a more sophisticated approach that matches the complex language they are encountering. Linguistic theory can provide guidance for how to discuss syntactic structures in the classroom. Syntactic elements fill specific meaning roles in a sentence, referred to as "Semantic Roles." Table 1 summarizes the most frequent semantic roles, together with their typical syntactic realization. Teachers can build lessons around identifying these roles in individual sentences and use these more intuitive terms (rather than "subject" or "direct object") when discussing how the elements of each sentence contribute to a larger "situation model" of what is happening at the text or paragraph level.

## Help students to find the rhythm in language.

A student who reads without natural prosody (rhythmic expression) is a student who likely has poor syntactic knowledge (Breen, 2025). A substantial experimental literature shows that students who produce appropriate pauses and intonation shifts at syntactic phrases and clauses are better comprehenders—and this is true for both elementary- and high school-level readers (e.g., Veenendaal et al., 2014; Paige et al., 2014; Miller & Schwanenfugel, 2006; 2008; Wagner & Watson, 2010 for a review). Hence, techniques that help students chunk a text into its phrases (e.g., "scooping") can be helpful for promoting comprehension (see Eberhardt & Gillis, 2025b for an example).

One complication with this recommendation is that teachers can often be unsure where the correct chunk boundaries should be. Cascade Reading (cascadereading.com) is a freely available reading technology that can help with this. A teacher could transform any text (e.g., from their current curriculum) into the Cascade Format, which places syntactic phrases on separate lines and adds visual cues to indicate which phrases should be associated together. The Cascade Reading website also has an Explorer tool, which can automatically identify parts of speech, phrases, and linguistic functions (e.g., subjects, direct objects, prepositional phrases, etc.).

## Help students to read above their current level.

Promoting growth in a student's syntactic ability requires exposure to advanced-for-them syntactic structures. Many educators have recently promoted this approach for learning more broadly (e.g., Lupo, Reynolds, Hardigree, 2025; Shanahan, 2025), however, it is important to stretch students' ability while still scaffolding their growth. Presenting students with texts in the Cascade Format is a proven way to do this. A randomized controlled trial (RCT) with 4th and 5th grade students (Van Dyke et al., 2025) demonstrated that repeated reading in the Cascade Format leads to improved comprehension and the ability to "hear how the sentence should sound" (a.k.a. the rhythm of the language, discussed above.) In addition, an RCT with adult readers showed that the comprehension improvements produced by reading in Cascade were accompanied by more efficient eye-movements, characterized by less re-reading and more targeted forward saccades (Dempsey et al., 2025). Taken together, these studies suggest that repeated exposure to the visual scaffolding provided by the Cascade Format offers a means of engaging the brain's innate language comprehension mechanism—one that takes syntactic structures as its starting point.

Syntax is what the brain needs in order to build the foundation that comprehension rests on. Just as phonics drives word reading, syntax drives comprehension—let's ensure that all students have the knowledge they need to reach the finish line.

# Semantic Roles and their Syntactic Realization

| Semantic Role | Definition | Example (Role is in **bold**) | Typical Syntactic Realization |
|---|---|---|---|
| Agent | Initiator of an action; performs the action deliberately. | **Mary** broke the vase. | Subject (Noun Phrase) |
| Patient / Theme | Entity undergoing the action or being affected/changed. | Mary broke the **vase**. | Direct Object (Noun Phrase) |
| Experiencer | Entity experiencing a mental or emotional state. | **John** felt happy. | Subject (Noun Phrase) |
| Goal | Endpoint of movement or transfer. | May sent the letter to **John**. | Oblique Object (Noun Phrase), depending on verb type |
| Source | Starting point of movement or action. | Mary walked from the **plains**. | Prepositional Object Phrase introduced with **from** |
| Recipient | Entity receiving something. | Mary gave the book to **John**. | Indirect Object (Noun Phrase) or Prepositional Phrase with **to** |
| Instrument | Object used to perform an action. | He cut the bread with a **knife**. | Prepositional Phrase with **with** |
| Beneficiary | Entity for whose benefit an action is done. | She baked a cake **for her friend**. | Prepositional Phrase with **for** or **on** |
| Location | Place where an event occurs. | He sleeps in the **bed**. | Prepositional Phrase |
| Time | Temporal setting of an event. | He arrived **yesterday**. | Prepositional Phrase or adverbial |
| Manner | How an action is performed. | Andy walked **carefully**. | Adverbial |
| Path | Route of movement. | The dog ran across the **road**. | Prepositional Phrases like *through*, *across*, *over* |
| Measure | Entity representing a quantity or amount. | **The mug** holds **one liter**. | Subject (Noun Phrase) |
| Causer | Entity that brings about a change or event. | **The earthquake** made the villagers flee. | Subject (Noun Phrase) |
| Possessor | Entity who owns or has something. | The cat scratched the **man's leg**. | Prepositional Phrase with **of** or possessive structure |
| Theme (motion or location) | Entity undergoing movement or simply located in space. | **The dog** left the room. | Subject (Noun Phrase) |
| Purpose | The intended goal or reason for an action. | He studied **for the test**. | Prepositional Phrase with **for**, **in order to**, etc. |

# What about writing?

## Orthography

Orthography refers to the system of writing—the rules and conventions that tell us how spoken language is represented in print. Students learn that letters and letter combinations represent the sounds they already know from oral language, discovering connections between the phonemes they hear and speak, and the graphemes they see on the page. For example, students who can distinguish between the /k/ sound in "cat" and the /s/ sound in "sat" in their speech learn that these sounds can be represented by the letters "c" and "s" in writing.

Orthographic instruction is critical and has a clear relationship with reading. When children know how to map the spelling of a word, it fuels the decoding of that word. The same cannot automatically be said of the reverse. Said differently: encoding is a powerful contributor to decoding!

The goal of orthographic instruction is to help students understand how the writing system works and to apply spelling patterns and conventions—including letter formation—accurately. This knowledge builds directly on oral language as the foundation of literacy—students use their existing understanding of sounds, word meanings, sentence structures, and communication purposes from speaking and listening as the bridge to reading and writing. This demonstrates that orthography is not a separate skill but rather the visual representation of the language knowledge students already possess.

# The gift of writing: Small tweaks for big results

Lyn Stone
*Linguist, author, and founder of Lifelong Literacy*

Writing is often viewed as the outcome of good reading instruction rather than a tool to enhance it. But writing, when taught systematically and with linguistic precision, is one of the most powerful accelerants for literacy development. It requires students to engage deeply and actively with phonology, orthography, morphology, etymology, and syntax. These are not decorative additions to a literacy block. They *are* the block. Let us put writing back where it belongs: not as an expressive afterthought, but as a deliberate, linguistically rich practice that can and should be taught explicitly, and practised constantly, from the earliest years of schooling.

Where to start? From my travels and observations of schools and classrooms worldwide, I will list three practices that could be employed to get better results. I will suggest instruction that reflects what we know about how words are built, how we remember them, and what it takes to achieve compositional fluency (Berninger et al. 2002).

**INSTEAD OF**

## Projecting pre-written material for passive viewing, copying, or sorting

**TRY TO**

## Model and expect rapid, legible handwriting at every opportunity

As soon as a new grapheme-phoneme correspondence from your phonics program, or a new vocabulary/spelling word is introduced, why not put it to work straight away by having students write it? This means that your students don't have to hold new information in working memory. The introduction of new information does not automatically result in long-term memory change (Sweller, 2017). If a student hears a new concept and then passively observes a slide, the concept is likely to remain in working memory: short-lived and fragile.

This temporary quality is often multiplied by introducing several new or unfamiliar concepts at once, such as a phonics or vocabulary slideshow where children are invited to only pronounce the letters or words on the screen.

The act of writing, on the other hand, serves to complete a receptive/expressive loop. Displaying pre-filled slides, flashcards, word-sorting etc. does the writing for students. It removes the cognitive work and reduces engagement. Watching letters and/or fully-formed words appear via animation may look like participation, but it is not as deep a learning experience as seeing you, their teacher, write and then writing themselves. The act of writing helps students move new knowledge into long-term memory through active retrieval and use.

Observing a teacher's writing enhances student writing development much like hearing a teacher read shapes their reading development. It does not teach the entire skill, but it provides high-quality,

real-time examples to a captive audience. This can then be imitated by students close in time, releasing pressure on working memory and consolidating the new material in long term memory.

**INSTEAD OF**

## Waiting until students have mastered the alphabetic code to teach morphemes

**TRY**

## Using morphological instruction that reveals meaningful word parts as soon as possible

Traditional approaches to reading instruction in the early years very rightly concentrate on showing students the relationship between graphemes and phonemes. This is sometimes followed by an introduction to the suffixes -s, -ed, and -ing later in the sequence.

But what if you could start building morphological awareness earlier? Those three suffixes, though very common, are phonologically, orthographically, and grammatically complex. Look how -s changes its form in *cats* vs. *lives* vs. *foxes*. Look at the three pronunciations of -ed: *landed*, *helped*, *played*. Look at how the fact that -ing being a vowel suffix forces changes in the preceding base: *hop*, *hopping*, *hoping*. Suffixes come last in words, meaning that children have to hold the base in working memory while processing the word all the way through to the suffix. It's a lot.

Why not start with two simple and very useful prefixes, namely re- and un-? They can be recycled without having to alter bases or grapple with syntax very early. Start with the word *do*, a very early "heart word" in most phonics sequences and show students how a prefix alters a base. These prefixes can begin thousands of words of all levels of complexity for any single "syllable type": redo, undo, react, repay, reboot, recall, remake, restart, unfit, unkind, unlike, unfold, etc.

With these prefixes, we can quickly and efficiently show students how to analyze and synthesize word parts. This provides generalizable knowledge that transfers to novel words, expands vocabulary, and allows students to build schemas of how the writing system really works (Bowers et al., 2024).

That's not to say that the suffixes mentioned above and others are not important. Of course they are, but their complexity forces delay, whereas re- and un- are almost immediately applicable without significantly increasing cognitive load.

**INSTEAD OF**

## Writing words and sentences on erasable surfaces

**TRY**

## Show the true value of written work by making it permanent

Mini-whiteboards are terrific formative assessment tools. Students like working with them as they are easy to manipulate and their work is easy to correct. Writing development is not easy, but let's not give in to convenience when building the highly complex brain structures necessary for compositional fluency.

Students should be doing the majority of their written work, and therefore the majority of their schooling, sitting comfortably at desks with their feet flat on the floor and a straight spinal column. They should be constantly practicing correct pencil grip and correct formation of the line segments that go to make up written letters and numbers. They should be doing this on paper that provides appropriate motor feedback and holds a permanent record of their progress. How good it is to show a child the changes in their writing over the course of a month, a term,

a year! Show them that their writing, however rough at first, is valuable, not erasable.

Give them exercise books and show them how to care for and about their written output and implements. Recycle their own letters, words, and sentences for other literacy development tasks, such as paired fluency exercises, sentence fragments, and quick retrieval drills. Children like to produce and read their own writing if you show them how valuable it is. Constant use of whiteboard markers and surfaces, coupled with frequent erasure of their efforts, places very little value on writing.

When teachers demonstrate the nature and construction of words early and accurately, when they model writing, expect it frequently, and treat student writing as valuable, they foster both skill and identity as writers. Elevating writing within the science of reading is not an optional enhancement but an essential component of effective literacy instruction which equips students with tools that transfer beyond the lesson. Those tools are gifts. Give generously!

# Science of learning: Deepening our understanding of how we learn

For centuries, in the one-room school house, school and learning was primarily for the purpose of teaching students how to be "good citizens." Children learned skills like basic literacy and numeracy, and teachers largely focused on using memorization as the main teaching strategy. There really wasn't an emphasis on looking at HOW students learned at all.

What we know now is that understanding how students learn is the most effective way to provide the foundation for designing instruction that supports every learner's success. Research in cognitive science (or the science of learning) has identified key principles that guide how the brain processes, retains, and applies new information, offering educators evidence-based strategies for creating powerful learning experiences

These principles move beyond generic teaching approaches to reveal specific conditions that optimize learning—from how new concepts can

anchor in existing understandings, to the role of practice and feedback in skill development, to the environmental factors that support student engagement and growth.

The principles outlined in this section—**review, learning load, attention and active engagement, practice, feedback, and environment**—work together to create a framework for effective instruction. When educators understand that students acquire new knowledge by building on what they already know, that learning can be impeded by cognitive overload, and that meaningful practice with targeted feedback accelerates skill development, they can design lessons that honor how the brain learns. These principles apply across all subject areas and grade levels, but they are particularly significant in literacy instruction. This is because learning to read requires the development of skills that are first systematic and cumulative, and then become more complex and demand applied practice over time.

# Six principles of the science of learning

Below we look at six key principles of the science of learning, adapted from "The Science of Learning" developed by Deans for Impact, and Stanislas Dehaene's *How We Learn*, providing an explanation of each and an example of how each might look in practice.

## Principle 1: Review

### THE CONCEPT

Students acquire new knowledge by building on existing knowledge. Instruction should therefore begin with anchoring in a concept that connects students to information they already know (e.g., review of a previous lesson, revisiting a mastered concept). The learning happens when the brain forms connections between new information and previously stored knowledge, making these connections essential for comprehension and retention. When this link happens, students develop a deeper understanding and are more likely to remember and apply what they've learned.

### THE PRACTICE

Lessons should deliberately connect the "known" to the "new" through explicit activation of prior knowledge, strategic use of analogies and examples, and systematic review of previously taught concepts. Teachers begin lessons by helping students recall relevant background knowledge and make explicit connections between past learning and new content. Consistent review also supports what Dehaene refers to as "consolidation": the process by which information becomes stabilized and integrated into long-term memory. (Consolidation also occurs through rest and sleep, making learning durable and accessible for future use. Students need sleep to learn!)

### EXAMPLE

When teaching students to decode words with the silent e pattern (like *cake* or *bike*), the teacher first revisits CVC words they already know (like *cat* and *bit*). By showing how adding an e changes the vowel from short to long, students can connect the familiar CVC pattern to this new skill. This makes the "silent e" rule easier to remember, because it builds directly on their understanding of short vowels.

# Principle 2: Learning load

## THE CONCEPT

Learning can be impeded if students are provided with too much information at once. The brain's working memory has limited capacity, and when they are overwhelmed with multiple new concepts simultaneously, students struggle to process and retain any of the information effectively. Managing cognitive load allows students to focus their mental resources on the most important aspects of what they are learning.

## THE PRACTICE

Lessons should be systematic, sequential, and designed with a gradual release model that moves from teacher modeling → guided practice → independent application. Lessons include ***repeatable***, ***replicable routines*** *that reduce cognitive demand on tasks students do every day, allowing them to focus on learning new content*. Teachers break complex skills into manageable steps and introduce new elements systematically.

## EXAMPLE

Literacy instruction that is aligned across the Tiers of instruction. Research shows that when using the same language and the same routines (whether students are learning in whole or small groups in their classroom, or they are learning through 1-1 intervention instruction), students don't have to work to understand the baseline of the instructions and academic language. It becomes more automatic. This frees up their cognitive bandwidth to (for example) focus on learning a new spelling pattern rather than the instructional routine the teacher is using.

# Principle 3:
# Attention and active engagement

## THE CONCEPT

Building on the concept of cognitive load, attention serves as a "gatekeeper" of what information is processed and stored. Therefore, drawing specific attention to the learning task and connecting it to meaning is important. Similarly, learning requires active participation rather than passive reception of information; simply listening or reading passively is not sufficient for optimal learning. (To quote Anita Archer: Learning is not a spectator sport!). When students actively engage with content by questioning, analyzing, applying, and making connections, they develop deeper understanding that supports long-term retention. Surface-level memorization, without meaning, leads to a shallow understanding or isolated learning that students cannot easily transfer or apply.

## THE PRACTICE

Lessons should have a clearly defined purpose and focus that students understand and can articulate. Skills are always applied in reading and writing contexts rather than taught in isolation. Teachers consistently ask students to look for patterns, explain their thinking, provide evidence for their responses, and connect new learning to real-world applications. Lessons have multiple built-in opportunities for response.

## EXAMPLE

A teacher prompting students to look for patterns when teaching morphology, focusing on how this is important for their ability to decode and make meaning of complex words, asks, "What do the words *action*, *creation*, and *education* have in common?" This helps students think about what the suffix -tion means and how it changes each word. Students then use manipulative cards to create new words with the suffix -tion. Then they can apply that knowledge to other words with the suffix -tion moving forward.

CALL OUT

# A closer look at student engagement

Student engagement refers to the "degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught." (Glossary of Educational Reform, 2016). These are attributes we want for all of our learners as we know this level of engagement will not only reap positive benefits for students' learning but also for their overall personal growth. Engaged students typically invest in their own learning, have positive interactions with teachers and peers, have a strong sense of agency in their learning, and enjoy the learning process. Today's students face constant distractions—making engagement a significant challenge. Here are ten ideas to consider to help you find ways to proactively engage students and encourage their agency in their learning:

1 **Provide clear guidelines.** Start each lesson with clear objectives, purpose for learning, and expectations. This clarity helps students engage because they know what to expect.

2 **Make use of active learning strategies.** One of the key principles of instruction is to ask questions frequently and check responses of ALL students. While this may seem daunting, you can have students respond chorally or in groups, utilize "turn-and-talk," "jot and share," "think-pair-share," and other short, frequent opportunities to reflect and respond.

**Strategies to ensure ALL students have opportunities to respond:**

1. Tell the answer to a neighbor: "Turn and Talk" "Think-Pair-Share" "Stand and Find a Partner"
2. Summarize the main idea in one or two sentences, writing the summary on a piece of paper and sharing this with a neighbor: "Jot and Share"
3. Everyone write their answer on a card or whiteboard and hold it up.
4. Students raise their hands if they know the answer (thereby allowing the teacher to check the entire class).
5. Physical responses: Thumbs up/Thumbs down (agree/disagree); hand signals (for example, 1 finger for A, 2 fingers for B, etc.); four corners (students go to each corner of the room to show their answer choice); human bar graph (students line up according to their answer choice, creating a bar graph).
6. Choral response: Be sure to give a signal, for example, say "Think, now say" so that all students respond together.
7. Sticky notes (Students write a response on a sticky note and post it on a board).
8. Polling apps/digital tools such as Kahoot, Poll Everywhere, Mentimeter.
9. Exit Tickets (students write a response to a question on a card and turn it in on the way out).

3 **Use the Gradual Release Model.** Utilize an "I do, we do, you do" gradual release model of lessons to support student success. This allows students to grow in confidence with a new skill and for the teacher to eventually increase the amount of responsibility the student has for their learning and practicing as they feel more comfortable.

4 **Leverage incremental learning.** Provide concise lessons with a focus on incremental steps of success to keep students motivated in their learning. When students feel small successes one after the other, they are more likely to want to continue even if something becomes more challenging. And be sure to celebrate those successes and remind them that every day they are growing and learning.

5 **Apply "hands-on" learning.** Use manipulatives when appropriate; for example, many students benefit from utilizing colored chips to represent sound-spelling patterns.

6 **Build relationships.** Be intentional in creating positive teacher-student relationships. When children feel belonging and care from their teachers, there is a much higher likelihood of consistent engagement. Learn about your students and show that you care about their experiences in and out of the classroom.

7 **Make learning relevant.** Make explanations with real-world connections. When students can see their lives and their world in what they are learning, they are more likely to be interested and curious.

8 **Provide breaks to refocus.** Give regular, short "active breaks," such as a quick song or dance. This allows students to release energy, reduce cognitive load, and return to learning with renewed focus.

9 **Collaborate.** Foster collaborative learning and peer teaching when appropriate. Children learn not only from their teachers, but also from one another when given the chance.

10 **Enhance learning with media.** While technology should never replace the role of a teacher, it is possible and often appropriate to integrate technology and utilize diverse media to enhance learning.

# Principle 4: Practice

## THE CONCEPT

Practice is essential to learning—but not all practice is equally impactful. Effective practice must be consistent and purposeful, varied, and appropriately challenging to build fluency and transfer. Students need multiple opportunities to apply new skills in different contexts, with practice distributed over time rather than massed in single sessions.

## THE PRACTICE

Lessons include **guided practice** (teacher-supported), **independent practice** (student-directed), and **interleaved practice** (mixing previously learned skills with new ones to strengthen retention and prevent forgetting). Teachers provide varied practice opportunities that gradually increase in complexity and independence.

## EXAMPLE

Teaching the /ch/ sound: When introducing the /ch/ digraph, the teacher designs purposeful, varied practice across multiple days. Guided Practice: She leads students through identifying /ch/ in picture cards (chair, cheese, chip), providing immediate feedback and support as they practice the sound-symbol connection. Independent Practice: Students complete a sorting activity, categorizing words with /ch/ at the beginning, middle, or end, working at their own pace to reinforce the concept. Interleaved Practice: During the following week, the teacher mixes /ch/ words with previously learned digraphs like /sh/ and /th/ in reading passages, consolidating earlier skills while strengthening their ability to distinguish between similar sounds.

*The practice gradually increases in complexity—from isolated sounds to words to connected text—and is distributed over time rather than crammed into one lesson, ensuring students build fluency and can transfer their knowledge to new reading situations.

# Principle 5: Feedback

## THE CONCEPT

Effective feedback is essential in acquiring new knowledge and skills. Effective feedback provides specific, actionable information about performance, helps students understand what they did well and what needs improvement, and guides them toward more effective strategies. Dehaene emphasizes that the ability to recognize and correct mistakes is essential for refining knowledge and skills; errors are part of the learning process, and providing error feedback allows learners to adjust their understanding. In addition, without feedback, students may continue to practice a skill incorrectly, or develop misconceptions.

## THE PRACTICE

Teachers provide targeted practice with specific feedback that is timely, focused on learning goals, and includes both affirmation of correct responses and correction of errors.

## EXAMPLE

When during instruction on letter formation, a student writes the letter "b" but starts from the bottom instead of the top. The teacher provides immediate, specific feedback:

"I see you made the letter "b" and it faces the right direction—great job! Now, let's work on starting at the top. Watch me: Start at the topline. Pull down straight. Push up, circle forward and around. Now you try."

This feedback is timely, specific, and actionable—it *affirms what was correct*, *identifies what needs improvement*, and *shows exactly how to fix it*, preventing incorrect practice from becoming a habit.

# Principle 6: Environment

## THE CONCEPT

Students will be motivated to learn in environments where they feel safe and valued. When students experience psychological safety in a learning community, they are more willing to take risks, ask questions, and engage actively in their own learning. A positive learning environment supports both academic achievement and social-emotional development.

## THE PRACTICE

Classrooms are deliberately designed for safety, respect, and success through clear expectations, consistent routines, celebration of effort and growth, and recognition of diverse strengths and perspectives. Teachers create cultures where mistakes are viewed as learning opportunities and every student feels capable of success.

## EXAMPLE

Creating psychological safety during reading instruction. When a student struggles to decode a challenging word, the teacher responds supportively: "Good effort using the beginning sound! Let's look at this together. What other strategies could we try?" The teacher then guides the student through sounding out the word, celebrates the successful attempt, and says, "Mistakes can help our brains grow stronger."

This approach maintains the student's dignity, models problem-solving strategies, and reinforces that challenges are part of learning. Other students see that it's safe to take risks and make mistakes, creating an environment where everyone feels comfortable participating and learning from errors.

# Learning how learning works helps teachers teach

Trina Spencer, PhD, BCBA-D

As an understanding of the science of reading widens in districts across the country, supported by conferences, professional learning programs, and evidence-based curricula, an interest in the "science of learning" is emerging. A deeper awareness of the science of learning can support educators in their efforts to implement science of reading-based programs and empower their students with structured literacy.

To begin, let's clarify that the science of learning is better described as the sciences of learning, because it is a dynamic interdisciplinary body of research that helps us understand how people learn. Like reading, the domain of learning does not belong to any single discipline or area of study. Similar to the many sciences that contribute to the science of reading, what we know about how humans learn comes from cognitive science, neuroscience, educational psychology, and behavior analysis, to name a few. And, just as with reading, these sciences are not in competition with one another; they simply draw on different theories, employ different measurement tools and technologies, and examine different dimensions of learning. While this diversity might seem to create conflict and confusion, it is actually highly beneficial. Principles and practices supported by multiple learning sciences inspire greater confidence and certainty.

The purpose of the learning sciences is to discover the mechanisms by which humans acquire knowledge and skills, with the primary aim of supporting effective learning. Cognitive science defines learning as a change in memory, neuroscience views it as changes in neural connections and brain activity, and behavior analysis identifies measurable changes in behavior as evidence of learning. As humans are complex cognitive and neurological organisms who behave, it is reassuring to know that learning scientists are covering all our bases. It would be a mistake to narrow the pool of evidence by treating learning science as if it belonged to only one contributing field. Without the combined insights and diverse findings of all these disciplines, we risk overlooking valuable knowledge meant to inform and improve learning.

One of the most fundamental insights we can draw from the learning sciences concerns knowledge itself. There are many forms of knowledge, often described through various taxonomies. Numerous frameworks have been proposed, and they overlap considerably. The most useful ways of defining and organizing knowledge lead directly to clearer teaching approaches. In other words, each type of knowledge represents a distinct "what to teach" that, in turn, guides "how to teach" that specific knowledge type. For example, the simplest forms of knowledge—facts (e.g., names of objects), chains (e.g., reciting the ABCs), and discriminations (e.g., matching letters to their corresponding sounds)—involve a one-to-one correspondence between two elements.

Concepts are objects, events, actions, or situations that share one or more defining features, and rules describe specific relationships among multiple facts, discriminations, and concepts. The most complex forms are cognitive strategies, which consist of multi-

step procedures built from several simpler knowledge types. Because knowledge exists in multiple forms and levels of complexity, teaching must be deliberately tailored to fit the specific knowledge task. In other words, one size does not fit all. Imagine teaching students how to infer the meaning of an unfamiliar word from context (a cognitive strategy) the same way you would teach sound-letter correspondence (a discrimination). That would be absurd.

Findings from learning sciences translate to actionable teaching practices, but the science of teaching is an entity of its own. It refers to the empirical research that investigates the effect of specific teaching methods on learning. While the mechanisms of learning can be linked to the student outcomes of those teaching methods (e.g., program, strategy, intervention), the primary goal is not simply to explain how learning works, but to improve learning. What connects principles of learning—derived from learning sciences—to effective teaching methods—validated through rigorous research—is instructional design. The most efficient conduit for teachers to access insights from the learning sciences is well-constructed curricula, programs, and interventions that are explicitly based on learning principles and have been thoroughly tested.


In a perfect world, every available curriculum, program, and intervention would meet both conditions: carefully designed according to sound learning principles and validated as highly effective through rigorous research. Until that world exists, educators benefit enormously from understanding how learning happens. Principles derived from the sciences of learning explain why certain practices work and guide how to structure content and learning environments. Moreover, learning principles ensure teaching strategies are not merely intuitive or traditional, but deliberately aligned with how humans actually learn. Armed with this knowledge, teachers can make more informed, intentional choices that directly improve student outcomes.

**Educators who understand learning principles can:**

- Match teaching procedures to targeted knowledge types, from simple facts and discriminations to rules and cognitive strategies.
- Evaluate the alignment of current or proposed curricula with established learning principles.
- Draw on learning sciences to modify instruction for diverse learners or unique contexts.
- Supplement or compensate for weaknesses in a curriculum using what they know about how learning works.
- Advocate for adopting promising programs that, while not yet widely approved, are grounded in solid learning science.
- Explain to colleagues, administrators, or families why one procedure or program is more likely to succeed than another.
- Sequence instruction or assessments strategically to enhance retention and transfer.
- Select appropriate feedback and reinforcement strategies to strengthen understanding and motivation.

Understanding how literacy develops, by itself, does not translate to effective instruction. Teaching needs to be anchored in the broader sciences of learning. By recognizing that multiple disciplines illuminate how humans acquire knowledge and skills, we protect ourselves from narrow interpretations and outdated debates. Principles of learning lead to thoughtful instructional design and well-chosen curricula, allowing teachers to act with intention, not just tradition. While no single science or program holds all the answers, together they provide a powerful, evidence-based roadmap. Equipped with this knowledge, educators can navigate the noise, make confident instructional choices, and create richer opportunities for students to succeed.


# Mapping instruction onto learning

As we examine the science of learning, let's re-examine how our instruction matches those principles of learning so that our teaching is in alignment with our students' needs. In Science of Reading 2.0: Implementation Made Easy, we presented 10 Principles of Instruction based on the work of Barak Rosenshine (2012). Rosenshine's Principles of Instruction evolved through a decades-long research process that began in the 1980s; his approach draws from three primary sources: studies examining relationships between teaching behaviours and student achievement, cognitive science research on how the brain learns and processes information, and studies on mastery learning techniques. Rosenshines's unique contribution was his ability to synthesize decades of educational research into clear, practical principles that teachers could apply in their classrooms—making him one of the most influential educational researchers of the late 20th and early 21st centuries.

The table below represents how Rosenshine's principles map onto the learning principles just presented:

| LEARNING PRINCIPLE | ROSENSHINE'S PRINCIPLES OF INSTRUCTION |
|---|---|
| Review | Begin each lesson with a short review of previous learning: Daily review can strengthen previous learning and can lead to fluent recall. (Principle 1)<br><br>Engage students in weekly and monthly review: Students need to be involved in extensive practice in order to develop well-connected and automatic knowledge. (Principle 10) |
| Learning load | Present new material in small steps and assist with student practice after each step. (Principle 2) |
| Attention and active engagement | Ask a large number of questions and check the responses of all students. Questions help students practice new information and connect new material to prior learning. (Principle 3)<br><br>Provide models and worked examples. (Principle 4) |
| Practice | Guide student practice. (Principle 5)<br><br>Require and monitor independent practice. Students need extensive, successful independent practice in order for skills and knowledge to be automatic. (Principle 9) |
| Feedback | Check for understanding. This should be done frequently to help students learn the material with fewer errors. (Principle 6) |
| Environment | Obtain a high success rate—at least 80%. (Principle 7)<br><br>Provide scaffolds for difficult tasks. These are temporary supports that are removed as competency grows. (Principle 8) |

## THE BIG TAKEAWAY

Lesson time needs to be focused, streamlined, direct, and deliberately planned with key instructional elements to optimize learning time. These instructional elements are also key look-fors when examining curricular materials for our classrooms.

“Reading is freedom. The ability to think, to process, to reason. When you can’t read, those instruments lie dormant.”

**AMEER BARAKA**
Actor, literacy advocate, author of *Undiagnosed: The Ugly Side of Dyslexia*

# When ALL really means ALL

Learning to read is not a luxury or a "nice-to-have." It's a human right. A basic need.

When research tells us that approximately half of adults in the United States read at or below a 6th grade level, the question isn't whether we need to provide better reading instruction.

When we know that 95% or more of children can learn to read, the question becomes:

## How do we ensure that all students get the instruction they need and deserve?

> "The most equitable thing that we can do is to make sure our kids leave our buildings reading and being able to do this work. Because if they cannot read when they leave this building, then we have not done them justice."
>
> **HOLLY DAVIS-KITSON**
> Elementary principal
> Decatur Public School District, Illinois

## And to us: All means All.

Effective literacy instruction recognizes that while research provides clear principles about how children learn to read and write, successful implementation requires skilled educators who can discern what individual students need, when they need it, and how to deliver that instruction most effectively. An approach rooted in the science of reading offers a strong foundation, but it must be applied thoughtfully to meet the diverse needs of learners who come to school with varying experiences, backgrounds, and developmental needs.

This approach, sensitive to each individual, ensures that all students can access the foundational skills and knowledge necessary for literacy success, regardless of their starting point.

In the sections that follow, we will examine the importance of data-driven instruction, then explore how we might address the specific needs of our students, including guest commentary from esteemed experts.

# Data-driven differentiation: Meeting every student where they are

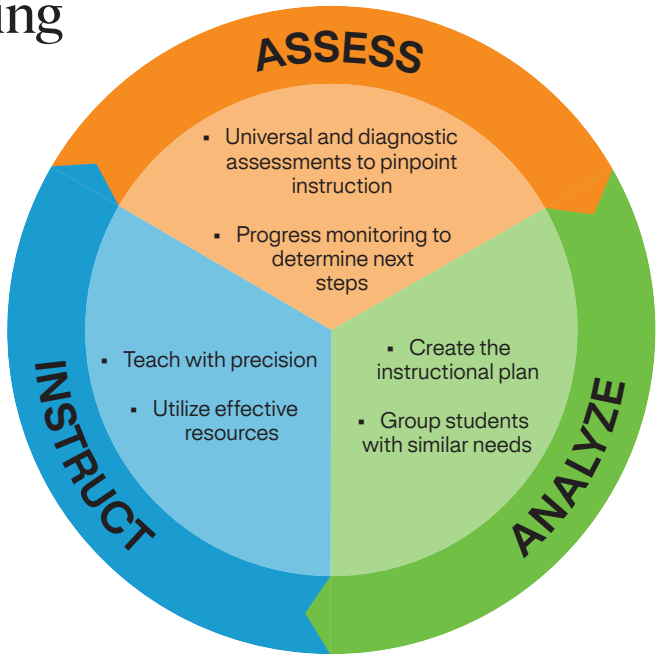
Implementation science emphasizes the critical role of making decisions that are based in data when creating responsive instruction that serves every learner. In a collaborative problem-solving model, educators systematically assess students and analyze the data, to discern which students need intervention (support or enrichment), which instructional approaches are most effective, and how to adjust their teaching to not just "remediate," but rather to accelerate learning. This evidence-based approach moves beyond assumptions about what students can or cannot do, instead focusing on what the data reveals about their current understanding and next steps for growth. This requires strong assessment instruments including:

- Valid and reliable universal screeners (to identify who requires intervention)
- Effective, targeted diagnostic assessments (to determine what needs to be taught and inform how to provide precise instruction)
- And all of this in addition to progress-monitoring tools (to determine instructional next steps).

## Data-Based Decision-Making

### Instruct effectively

- Teach with precision
- Utilize effective, evidence-aligned instruction




### Assess by using

- Universal screening and diagnostic assessments to pinpoint instruction
- Progress monitoring to determine if instruction is working and for determining next steps

### Analyze the data in order to

- Create the instructional plan for each student
- Group students with similar needs

# Challenged readers: Bridging the gap

When assessments reveal skill deficits, it is important to act with urgency. There is no time for a "wait and see" approach as it can quickly become a "wait to fail" approach, leaving students so significantly behind that bridging the gap is impossible.

For readers who have difficulty, this means addressing both upstream factors—the foundational skills and knowledge that they may not have gotten—and downstream challenges—the literacy demands they face in their current academic settings. It isn't an either-or but a yes-and. By bridging this gap through targeted, intensive intervention while providing scaffolded core instruction, educators can ensure that difficulties don't become permanent barriers to reading progress.

The International Dyslexia Association is clear on how the framework of implementation provides an ongoing roadmap for collaborative problem-solving for our readers who need more support, and those with dyslexia: *"It is during the first stage [of implementation], exploration, that the decision to adopt an effective intervention to teach students with dyslexia should be made. The implementation team must collaborate actively to determine appropriate activities to occur during each stage and then provide the leadership necessary to incorporate these stage-appropriate activities while assessing outcomes and managing expectations."*

In other words, there needs to be an intentional plan—established through the implementation team early on—that determines the cadence for assessments and the instructional protocols and curricular resources, while also providing for rigorous ongoing monitoring and reflection so that progress is maintained.

We must mobilize on the absolute necessity of identification and early intervention for our challenged readers.

# On literacy as freedom

Ameer Baraka

*Emmy-nominated actor, author, and dyslexia advocate*

"Had someone caught me when I was young, and taught me this [decoding] process, took me aside and said, 'Ameer, listen, I want to pull you out of school one hour a day and get you remediated for just one hour a day, for two years—I'm going to catch you up on your reading,'

I would have never gone to prison."

I will be the first to tell you that illiteracy takes a huge, sometimes irreversible toll on someone's life.

Not learning to read enslaved me.

If you can't learn to read, it takes away your ability to reason and think. It handicaps you—a complete mental incarceration.

Without the ability to decode properly or read fluently, a human being has only a very slight chance of being successful. Illiteracy robs you of your self-esteem and becomes a mental prison. The distorted thinking sets in. I never thought I was smart. I never thought I would be anything because I couldn't read.

It stifles you, paralyzes you, and eventually—as in my case—you give up on life.

Even though I grew up in poverty, that wasn't what stifled my growth. What held me back was my inability to read, or to put my thoughts on paper. I knew by third or fourth grade that I wasn't going to be anybody.

That's the danger.

At 14 years old I was doing drugs. At 14 years old I went to prison for the first time.

The pipeline from illiteracy to incarceration is real. Over 70 percent of America's inmates cannot read over a 4th grade level. I did four years in maximum security prison, surrounded by so many men who couldn't spell or decode. I felt right at home thinking, "These guys are dumb just like me."

Illiteracy creates a very low professional ceiling.

I experienced this personally when I was working as a pipe fitter. The union leader asked me to buy silicone and wanted me to write down five things to purchase.

I couldn't spell anything.
I couldn't climb the ladder in my work.

The truth is that it's dangerous for any human being to be denied the ability to learn to read.

## A turning point

At 23 years old, I was back in prison for a second time—reading on a third-grade level. There was a teacher there who saw my potential. After talking with me about my family history, he had someone come in to screen me for dyslexia. He understood something I didn't at the time.

Even though I never knew what the word "dyslexia" meant before this experience, it had always seemed and felt negative. Used as an insult even—synonymous to "stupid" or "dumb."

But when I learned that this was my reality, I called my mama and told her and she began to cry, having to internalize what she had been through, for not understanding why I was different.

This is the moment when I finally understood:

***I am not stupid. I am not dumb. I do have capacity. I'm just dealing with a disability.***

## Learning to read at 23

In 2016, Louisiana Senator Bill Cassidy chaired the Education Committee hearing titled "Understanding Dyslexia: The Intersection of Scientific Research & Education." I shared my story in testimony about the critical nature of early screening and identification of dyslexia, and how having that information could have changed the trajectory of my life.

After this event, I was approached by Dr. Bill Conway from the Now! online dyslexia tutoring program. He told me he wanted to teach me to read. From what I had shared in my story, he knew I hadn't really learned how to read in prison, but rather I had spent a lot of time memorizing words. He sent me a computer, and tutors came online every day saying they were going to build my phonological pathways. I didn't know what they were talking about, but they were going to do it for free, for as long as I needed.

I didn't know the sounds—it was like trying to learn Chinese. But every day, week by week, month by month, I got it. One day I was on a plane, and I saw a word I'd never encountered before: "orthodontist."

When I pronounced that word by myself, I said, "Oh my God, I did it!" I knew the rules.

**Reading is freedom.** The ability to think, to process, to reason. When you can't read, those instruments lie dormant.

## Why early screening matters

Just as we screen for diseases of the body, knowing there's a probability of sickness, we know there's a possibility a child may be dealing with dyslexia.

### Why do we let it linger on and on?

That's what happened to me.

Early screening and immediate intervention are as important as the air we breathe.

We must get children reading immediately so the gap doesn't grow. Senator Bill Cassidy once gave me an award for "overcoming" dyslexia and getting out of prison, but the real victory would be preventing children from experiencing what I went through.

## A message to educators

We have the evidence that explicit, systematic instruction can teach virtually ALL children to read. How have we allowed curricula to push children who have dyslexia further down the rabbit hole when the research shows us the way?

I'd like educators to understand two crucial things:

- First, all teachers need to have the skills to teach children with dyslexia. Educational leaders must mandate the science of reading approaches and provide teachers with the training and support they need..
- Second, you MUST identify children with dyslexia or who are at risk for dyslexia early, ensure they have the instruction and support they need—and encourage them relentlessly. That child is going to need a lot of encouragement.

"A teacher is like a pastor—their job is to attend to the flock, to be a shepherd for their souls."

## Teaching is a huge responsibility

Good teachers lay a great foundation and sow the critical seeds for academic growth:

- Teachers need emotional intelligence—knowing yourself as well as knowing others.
- Teachers must have empathy.
- A teacher has to be completely whole themselves and be competent at their own nervous system regulation.
- Teachers have to be a safe space in order for children to build trust; without trust, there is no learning.

Teachers need to be excited about going to work because you're dealing with precious lives and endless possibilities.

## Endless possibilities

For those out there who never got the help I received, who feel they're in such a deep hole they can't see daylight—I understand you, I was you.

Here is what I want you to know:

- There are gifts and talents within you that, if discovered, will bring you and others joy and peace.
- The negative thoughts you're bombarded with must change. If you can change your thinking, you can change your life.
- See yourself as you want to be, not as you are. Envision yourself doing exactly what you want to do and then do it. No limitations, no excuses.
- Establish a goal, find the faith to believe in it, and move toward it one step at a time.
- Surround yourself with people who will motivate and encourage you, and if you don't have those people, encourage yourself.

While life circumstances can be challenging, ALL of our students come to us with potential. Literacy helps unlock that potential. This is our collective calling—to ensure no child experiences what I endured.

**Every child deserves the freedom that comes with being able to read.**

# Dyslexia and diverse learning needs

## 3 ideas in action

1. **Early screening and intervention are crucial**—Identify children with or at risk for dyslexia early and provide immediate support to prevent a growing achievement gap.

2. **All teachers need skills to teach students with dyslexia**—Educational leaders should mandate a science-of-reading based approach and provide necessary training and support to teachers.

3. **Encouragement is essential**—Create a safe and trusting learning environment including relentless encouragement for students with dyslexia.

# Adolescent readers: Acting with urgency for the underserved

The outcomes for our students who fail to learn to read are heartbreaking, and there are a variety of reasons for their struggles; one reason is that they have not received the instruction they need and deserve. When students move into the upper elementary grades and beyond, the text demands increase, and without the ability to read complex texts and grapple with complex ideas, adolescents may fall further behind to the point where they feel hopeless and forgotten. These children are in peril. Therefore, the urgency is great, and it is imperative that all teachers who work with adolescent readers—ELA teachers as well as content area teachers—are equipped to address their needs. It is often said that "every teacher is a reading teacher," so providing all educators with the understanding of the principles and practices based on the science-of-reading research, and supporting them in working with this special population, is vital to addressing these sometimes underserved readers.

# The urgency of adolescent literacy: The evidence-based roadmap so ALL students can learn to read

Jeanne Schopf, MEd, NBCT, C-SLDI

It was my first day providing reading intervention to eighth graders. As I reviewed the class roster over the summer, one name stood out: Adrian. I had heard stories about him for years. Just the previous year, he had thrown a computer across the room during reading intervention. Colleagues described him as angry and disruptive.

When Adrian entered my classroom, hood up, face buried in his jacket, it was clear he did not want to be there. For several days, he remained disengaged, silent, and withdrawn. Then, one day, he got up and walked out of the classroom. Twenty minutes later, a building leader brought him back. Adrian's actions communicated what words hadn't: he wanted out.

I knew it would take time and trust to help Adrian see himself as a capable reader. I began by explaining to the class how the brain learns to read and shared a truth too few students have heard: many of them simply had never been taught how to read, and it wasn't their fault. As I said those words, Adrian slowly removed his hood and looked at me with intense eyes. In that moment, I saw something: a light dimmed by years of frustration, but still flickering with hope.

When I introduced phonics through word chaining, Adrian started to engage, quietly at first, then with more confidence. Each day, he showed up with a little more openness. He began leaving his hood off and leaning into the lessons. By the end of the month, he was reading aloud. By the end of the semester, he was volunteering. One day, he asked me, "Do I have to take a reading class next year? My reading has gotten so much better."

## How to help underserved adolescent readers and why it matters to get it right

Adrian represents far too many adolescent readers who are left behind—angry and disillusioned because they were never taught how to read. According to the 2024 National Assessment of Educational Progress, only 29% of eighth graders scored at or above the proficient level in reading, the lowest percentage since the assessment began tracking results in 1992 (NAEP, 2024). This means that a significant number of students in middle and high school still lack foundational reading skills.

Research shows that students who struggle with reading are four times more likely to drop out of school. For those who do graduate, the consequences of unfinished reading development are still profound. Limited reading proficiency is linked to academic challenges in higher education, restricted career opportunities, low self-confidence, and reduced motivation (Hernandez, 2011).

The long-term outcomes are dramatic. As the National Institute for Literacy reported, "Adults with low literacy skills are twice as likely to be unemployed and are more likely to live below the poverty line" (NIL, 2008). Even more troubling, the U.S. Department of Education found that approximately 75% of state prison inmates did not complete high school or are classified as low literate (U.S. Department of Education, 2007).

So what must educators and school leaders do to change this trajectory?

We must commit to implementing explicit, evidence-based instructional practices within a supportive system. This includes reliable assessments, progress monitoring, and targeted interventions. It is our responsibility to ensure our students graduate not only with a diploma but with the literacy skills needed to thrive in college, career, and life.

## Supporting the unique needs of adolescent readers

In early elementary, reading instruction focuses on decoding. In upper elementary, the focus shifts more to comprehension. By middle and high school, there is an expectation that students have learned to read. However, according to the 2024 NAEP fourth-grade scores, only 31% perform at or above proficient, with nearly 40% below basic—the highest rate of low performance since 2002 (NCES, 2024).

Research shows that about 95% of students can learn to read with effective, evidence-based instruction (Vaughn & Fletcher, 2012). Reid Lyon found that, "Of the 70% of children who struggle, 95% of those children are 'instructional casualties,'" meaning difficulties result from inadequate instruction rather than learning disabilities (Lyon, 2001).

Our disengaged adolescents are not simply "unmotivated" or "unsupported"—they have not been taught how to read. When secondary leaders and teachers provide evidence-based practices and interventions, 95% or more of students can graduate as readers.

## Evidence-based instructional practices to improve adolescent reading

Literacy is not limited to reading and writing in English Language Arts (ELA) classes; it is crucial for students to develop the skills necessary to comprehend and communicate effectively in every subject area, such as math, science, and social studies. All educators need to recognize their role as literacy teachers and help students develop the ability to read, analyze, and synthesize information skills critical for college and career readiness.

When educators embrace their role as literacy instructors, they contribute to supporting students across the entire school. They recognize that literacy is foundational to success in college, careers, and life; it is the key to navigating the complexities of the modern world.

The Institute of Education Sciences (IES) published the IES Practice Guide, a comprehensive guide for improving adolescent literacy, based on a thorough review of over 100 research studies examining evidence-based practices that have been shown to improve literacy outcomes for adolescents. It highlights practices that can be implemented in all classrooms.

First, the guide encourages educators and leaders to assist adolescent students in improving their decoding and language skills. It emphasizes the importance of providing individualized interventions which trained specialists can implement for readers needing support.

- Interventions should be explicit, systematic, and data-driven, based on ongoing assessments of student needs.

- Interventions should address foundational reading skills, including decoding, fluency, vocabulary, and comprehension.

In addition, the two practices with the most substantial evidence that will improve language comprehension are:

1. Provide explicit vocabulary instruction.
2. Provide direct and explicit comprehension strategy instruction.

In providing explicit vocabulary instruction, the IES guide emphasizes the importance of directly teaching high-utility words, particularly those essential for understanding complex texts across various subject areas.

- Teach high-utility words directly, especially those needed for complex texts.
- Provide repeated exposure and active use (speaking and writing).
- Teach strategies like analyzing word parts and using context clues.

For direct and explicit comprehension strategy instruction, the IES guide recommends that educators teach students specific, research-backed strategies which include summarizing, making predictions, asking questions, and visualizing to enhance understanding of texts. Instruction should:

- Prioritize specifically modeling strategies such as summarizing, predicting, questioning, and visualizing.
- Give students frequent practice, feedback, and support in applying these strategies independently.
- Encourage students to monitor their comprehension and adjust their strategy as necessary.

Identification of readers with unfinished learning is crucial, and evidence-based instruction should be employed to address their challenges. Interventions should be intensive, systematic, and regularly monitored to ensure students are making progress and improving their reading abilities (Institute of Education Sciences, 2008).

The IES Practice Guide can be accessed here.

## Assessing and monitoring of student progress

To provide the necessary interventions for adolescent readers, schools find the most success in implementing a robust Multi-Tiered System of Support (MTSS) framework that offers multiple layers of support, grounded in evidence-based practices such as screening tools, diagnostic assessments, progress monitoring, and data-driven decision-making protocols involving all stakeholders within the school community. According to the American Institutes for Research (AIR), effective MTSS implementation in secondary schools centers on these essential components, with a particular emphasis on assessment and progress monitoring (AIR, 2020):

1. Establish a Universal Screening Assessment for grades 6-12 and administer 3x a year to identify students who may require additional academic, behavioral, or social-emotional support.
2. Once at-risk students are identified, schools should utilize targeted diagnostic tools to pinpoint specific skill deficits, which can then be addressed systematically and explicitly through a tiered intervention approach
3. Students identified as requiring Tier 2 intervention should receive a standardized, evidence-based program targeting skill gaps within a small-group setting. Implement Tier 3 interventions for students requiring more intensive support which, according to AIR, involve data-based individualization (DBI).
4. Establish a system for progress monitoring to evaluate the effectiveness of interventions. AIR recommends that students receiving Tier 2 interventions should be progress monitored monthly, while those in Tier 3 should be monitored weekly.

## An MTSS model for secondary students

AIR's MTSS model for secondary schools makes these recommendations:

- Place students in Tiers based on a comprehensive review of various data sources, including universal screening, grades, attendance, teacher observations, previous intervention data, diagnostic assessments, and ongoing progress monitoring results.
- The MTSS team should make decisions collaboratively, reviewing multiple data points and adjusting tier placements based on student responsiveness to the interventions
- Create a balanced and dynamic system, forming part of a responsive education framework where supports are continuously adjusted to meet students' evolving needs.

## Creating a success roadmap for adolescent readers takes time and ongoing effort

Adrian entered my class angry and defeated, exhausted by years of ineffective intervention. With structured literacy instruction—based in the science of reading—he began to grow and truly feel the confidence that comes with foundational reading skills.

Unfortunately, when he moved up to high school, Adrian did not continue to receive the support he needed in order to progress along the success roadmap begun during his 8th grade year—a reality for far too many adolescents. NAEP data confirms the urgency: only 37% of twelfth graders read at or above proficiency.

We have the knowledge and tools to change this trajectory. Now we must act.

# Adolescent readers

## 3 ideas in action

1. **Implement explicit, evidence-based interventions**—Provide systematic instruction addressing foundational reading skills with data-driven support.

2. **All educators must embrace literacy instruction**—Extend literacy instruction beyond ELA, focusing on vocabulary and comprehension strategies across all subjects.

3. **Establish robust assessment and monitoring systems**—Use universal screening and tiered interventions within MTSS to identify at-risk students and adjust support.

# Advanced readers: Enrichment and acceleration

Initial efforts in the application of the science-of-reading research focused a great deal on how we identify, assess, and intervene when students struggle to learn to read. Rightly so, as the consequences of illiteracy and low literacy were so eloquently explained in the previous essays. As we peel back another layer of SoR 3.0 and commit to fully serving all learners, the question to ask ourselves is how can the evidence inform our instruction for advanced readers?

# Bringing early advanced readers into the science of reading conversation

Nancy Young, EdD

As the field of education evolves in its understanding of the research on learning to read, particularly why some children struggle, the unacceptable number of children reading below proficiency has galvanized the field; significant changes to the provision of literacy instruction have happened or are being planned in many states/provinces/territories. Absolutely, improvements to instruction to ensure more children learn to read warrants attention. As someone who has advocated for over two decades that we must better support children for whom learning to read is difficult, I laud changes that may better serve children who are at risk of not learning to read and write proficiently.

Yet we must continue to ask ourselves—are we serving ALL children? Given the wide range of ease when it comes to learning to read and write, must we not ensure that our educators are prepared to address the *full* range of needs in their classrooms? I have long compared the journey of learning to read and write to climbing the rungs of a ladder (Young, 2012/23). For some children, the climb up each rung is very difficult. For other children the climb requires some jumpstarting, but the rungs become increasingly easier to climb. Some children climb the ladder seemingly effortlessly and begin school already reading. Classroom teachers know this range exists. Some of their students will arrive at school demonstrating very few of the foundational skills that underpin learning to read and write. Other children arrive at school already well beyond those foundational skills and reading chapter books. Many parents and caregivers are aware this range exists as well.

Fundamental to ensuring all children continue to progress in the school setting is the understanding that children learn to read and write with varying ease and at varying paces based on numerous factors. In explaining the range of ease in learning to read and write, I like to quote the words of Colangelo et al. (2004, p. 2):

"Educational equity does not mean educational sameness. Equity respects individual differences in readiness to learn and recognizes the value of each student."

In contrast to the usual focus of the field on the needs of those for whom learning to read and write is more difficult, let's look at the different learning needs of early advanced readers and writers. WHO are these children? WHAT do they need, and WHY?

## WHO

My use of the descriptor Advanced In Reading (I created the acronym AIR) primarily applies to children who begin school already reading—children who've learned to read without formal instruction. AIR may also apply to children who acquire literacy skills atypically rapidly once in school. Additionally, AIR may apply to children who begin school reading having been taught by a parent/caregiver or in a preschool providing formal literacy instruction.

## WHAT

Children who are AIR have mastered foundational skills earlier, more easily, and more implicitly than typical. This means that, in contrast to those who start school unable to read or a child for whom learning to read is difficult, instruction will be different for AIR children. Effective support for AIR requires considering:

- Formal acceleration (following a carefully thought-out process of data and discernment) such as:
  - Early entrance to school
  - Skipping a grade
  - Single-subject acceleration (i.e., moving to a higher grade for English Language Arts)

- Extended/enrichment programming that includes:
  - Grouping with children of similar skills and abilities to engage in activities that require more advanced critical thinking and problem solving
  - Advanced texts and comprehension activities offering greater depth and complexity than age-typical
  - Ongoing independent learning opportunities (structured guidance as needed)

Whether being formally accelerated or receiving extension/enrichment, the systematic design of instruction/material selection for AIR encompasses:

- Differentiated programming that reflects their varying needs—which will include more implicit learning and child-led activities
- Instructional methods and materials for writing that reflect their early advanced reading abilities and that recognize writing development may be asynchronous (uneven)
- Judicious teaching of new skills or strategies to avoid overteaching and unnecessary repetition (Children who are AIR should not be required to receive explicit instruction on a concept they have already mastered)
- Texts offering appropriate depth and complexity as well as time to read for enjoyment based on interests
- Literacy programming that is intellectually engaging and provides continual growth and challenge

Note that supporting AIR children effectively means providing appropriate assessments. The results of certain screeners should be interpreted with caution; a child who can already read may not visibly demonstrate foundational skill knowledge using tests designed to find children at risk of reading difficulties, such as tests of phonemic awareness. Alternative data-gathering tools, including teacher observations and parent input, may be used in conjunction with formal assessments when determining how to effectively support early advanced readers.

### WHY

Needs-based instruction recognizes that children do not master literacy skills with the same ease nor at the same pace. Unnecessary instruction may not only result in learning delays but have social-emotional ramifications such as boredom and disengagement. These may lead to underachievement and behavioral issues. Apart from the visible negative ramifications of unnecessary instruction, it is vital to keep in mind the hidden costs. Unnecessary instruction takes time away from the learning opportunities that our AIR children need and deserve. This includes ongoing implicit learning opportunities that are crucial to progress in literacy development, gained through exposure to reading various forms of text for both academic progress and pleasure.

As our field continues to evolve, we must ensure that ALL children are on the radar. This means acknowledging the different needs of those who learn to read atypically early and easily, our AIR students, recognizing that:

Every student has the right to appropriate instruction wherever they are on the continuum of ease in mastering literacy skills.

# Early advanced readers

## 3 ideas in action

1. **Differentiate assessment and instruction for advanced readers**—Use appropriate assessments and avoid holding back children who have already mastered foundational skills.

2. **Provide enrichment and acceleration options**—Consider grade skipping, subject-specific advancement, or advanced texts and activities to ensure continued intellectual growth.

3. **Recognize that "educational equity does not mean educational sameness"**—Children learn at different paces, and unnecessary instruction can lead to boredom and missed learning opportunities

# English language learners: Amplifying language

Living in a diverse, multicultural society gifts us a bounty of multilingual learners. When the Science of Reading 3.0 puts language in the center of the process of learning to read, what are the implications for our English learners? "Reading is Language" challenges us to reframe the conversation on differentiating instruction.

## Amplifying language for all: Rethinking differentiation for English learners

Antonio Fierro, EdD
*Literacy Expert*

Differentiating instruction is often described as adjusting teaching to meet diverse student needs. For English learners, it's typically framed as ensuring content access while maintaining academic rigor. Yet well-intentioned differentiation can sometimes result in reduced complexity, oversimplified materials, or limited exposure to rich academic discourse.

What if we reframed the conversation? Rather than asking how to differentiate for English learners, we might ask how to design instruction that amplifies language for all students, placing language at the center of planning, rather than treating it as separate from content.

### From a deficit model to an amplification model

This reframing shifts our thinking from generalized strategies applied across the board to a more precise focus on the specific language demands of a given lesson. Instead of relying on one-size-fits-all supports, we begin with the question:

What language or language understanding will students need to access and express the learning at hand?

These specific language demands can range from repeating a newly learned phoneme to engaging in extended discourse to unpacking complex sentence structures in academic text. This shift helps teachers integrate language intentionally and purposefully—based on content, task, and learners—rather than retrofitting language supports after the fact. This outlook applies to all students. The difference is that English learners may require more frequent practice opportunities, greater intentionality in instructional design, or focused support to understand how English works (grammar, sentence structures, spelling, and morphological patterns) while learning new academic content.

English learners bring rich linguistic knowledge to the classroom and often navigate more than one language daily. They are undertaking double the cognitive work: learning rigorous content while acquiring a new language. They do not need simplified tasks or reduced expectations. They need meaningful access to academic language through guided instruction that makes visible how meaning is constructed. While they face unique demands, English learners are not the only ones who benefit from this design. When we place language at the center, we create learning environments that serve all students through instruction that is explicit, structured, and transparent.

This is where language amplification becomes essential. When we move from remediation to intentional design, we center language as the foundation of learning—not as an add-on, but as the starting point. Academic success depends on students' ability to use language to compare, argue, justify, narrate, hypothesize, and reflect. These are language functions, the purposes language serves in different academic disciplines. To support those functions, we must also make visible the language forms students need, including the broader architecture of language: phonology, orthography, morphology, syntax, semantics, pragmatics, and discourse, both oral and written.

## The power of oral language in practice

While language-rich instruction benefits all students, almost every classroom may have an English learner who faces the distinct challenge of acquiring new content and a new language simultaneously. This dual demand calls for instructional approaches that are both intentional and integrated, supporting both meaning-making and linguistic nuances that can pose additional challenges for English learners. Rather than addressing oral language, language form, and language function in perfect balance, it's about recognizing that oral language serves as the engine that drives and connects the structural and functional dimensions of language.

To support English learners in developing both the structure (form) and purpose (function) of academic language, oral language must play an active and ongoing role in their learning. Oral language enables students to engage with various language functions—such as explaining, retelling, comparing, or justifying—while simultaneously internalizing the language forms that convey those meanings, including sentence structure, vocabulary, and grammatical patterns.

Teachers can provide language stimulation techniques such as parallel talk, self-talk, expansion, or recasting. These techniques may also benefit native English speakers with limited language skills, serving as essential scaffolds that build syntactic and semantic awareness.

Oral language also supports the development of language form, especially in word recognition. Phonemic awareness activities—such as blending, segmenting, and substituting sounds—begin as oral tasks. However, to fully develop foundational reading skills, teachers use oral language activities to strengthen students' understanding of how speech maps onto written symbols. This connection between sound and print lies at the heart of phonology, orthography, and morphology—core components of

language form. Whether students are explaining a math strategy aloud, retelling a story using sequence words, or applying high-utility words in meaningful tasks, oral language strengthens both their ability to decode and their capacity to communicate.

Using oracy to connect language form and function is important for all young learners, but essential for English learners. Before discussing specific strategies that can be used during instruction, strategizing and planning for ways to promote oracy is of utmost importance. To plan for language amplification you can:

- Create speaking norms that value effort over perfection. Teachers should use professional judgement to incorporate language recasting activities.
- Use partner talk before whole-group sharing to help build confidence.
- Implement participation structures that engage everyone rather than depending on hand-raising volunteers.
- Establish "risk-free" time where grammar corrections are minimal and the focus is on communication. Teachers should use professional judgement to incorporate language recasting activities.
- Consistently model complete sentences during instruction, making grammatical structures visible through oracy and reinforced by written instruction.
- Pair English learners with peers who are supportive but yet good models of language use.
- Rotate partnerships regularly so students hear different speech patterns and vocabulary.
- Give "wait time" after asking questions. This is crucial for English learners since they are doing double the cognitive work. Allow students to consult with "peer partners" before responding.
- Allow students to explain concepts in their home language first, then in English.
- Provide sentence frames such as "I think _____ because_____." Or "This reminds me of _____ because _____." Or "Can you explain what you mean by _____?

The classic, evidence-based strategies that are specific to working with English learners include:

- Total Physical Response (TPR)
- Cognate awareness
- Realia
- Gestures
- Pictures and illustrations
- Sound/spelling walls
- Think-Pair-Share

## In conclusion: A commitment to equity through language

Supporting English learners is not an isolated goal. It reflects a broader commitment to language-rich instruction for all. Every student needs access to the complex language system that underpins academic success. When instruction amplifies linguistic features—both function and form—through oral discourse, language becomes a shared resource, rather than a gatekeeper. This outlook invites all educators to see themselves as teachers of language and meaning. It also reframes English learners not in terms of what they lack, but in terms of the linguistic and cultural strengths they bring. These strategies are not temporary supports for some; they are tools for clarity, equity, and full participation that benefit all learners.


# English Learners and literacy aquisition

## 3 ideas in action

1. **Center language in instructional design**—Begin planning by identifying specific language demands of each lesson rather than retrofitting supports after the fact.

2. **Use oral language as the foundation**—Implement structured speaking opportunities, sentence frames, and oracy strategies to connect language form and function for all students.

3. **Apply amplification strategies universally**—Use evidence-based techniques like Total Physical Response (TPR), cognate awareness, and think-pair-share to benefit all learners, not just English Learners.

# African American English speakers: Ensuring equity in the science of reading

"All means all" is a phrase often invoked in education, yet students with dialectical differences, including African American English (AAE) speakers, remain overlooked in literacy instruction that is grounded in the science of reading. AAE is a rule-governed linguistic system with distinct phonological, grammatical, lexical, and discourse features. When educators are unaware of these features, they may misinterpret students' language as incorrect, leading to instructional missteps and lowered expectations.

AAE should be recognized as a cognitive and cultural asset, not a deficit. Drawing on linguistic research and classroom practice, we need to explore the instructional implications of how the science of reading can be implemented equitably by recognizing the language patterns AAE-speaking students bring to school. Ultimately, the science of reading must be inclusive of all learners, including AAE speakers, if it is to fulfill its promise of evidence-based, equitable literacy instruction.

# All means all: Ensuring equity in the science of reading for African American English speakers

Ramona Pittman, PhD

"All means all." These three words have been echoed in education for decades, yet they often remain aspirational rather than actualized. This is especially true in literacy instruction. As the science of reading movement gains momentum in classrooms across the country, a critical question persists: Are all learners truly being served? For African American students who speak African American English (AAE), the answer is often no. Unless educators explicitly consider the linguistic assets these students bring to school, the promise of evidence-based reading instruction will fall short of its potential.

## What is AAE?

AAE is a rule-governed linguistic system used by the majority of African Americans across the United States (Rickford, 1999). Far from being a collection of slang or informal errors, AAE follows systematic phonological, morphological, syntactic, semantic, and pragmatic rules (Baker-Bell, 2020; Green, 2002; Pittman et al., 2023; Smitherman, 1977). Phonological variations such as final consonant blend (e.g., *fass* for *fast*) or different pronunciations of /th/ sounds (*dat* for *that*; unvoiced /th/ *maff* for *math*; voiced /th/ *bave* for *bathe*) can impact how AAE-speaking students perceive and produce sounds, thus influencing students' decoding and spelling of General American English (GAE) words (Pittman, 2023). GAE is the dominant language spoken in U.S. schools.

Some morphosyntactic features include zero copula (*He smart.*), the use of invariant "be" to indicate habitual action (*She be telling people I'm mad at her*), and the use of dən (*He done asked for more money*). It should be noted, however, that some morphosyntactic features, such as *She be telling people I'm mad at her* (She is always telling people that I am mad at her) and *He done asked for more money* (He has asked for more money) express more than just conjugating for tense—they convey meaning and intent, which teachers must understand to interpret students' oral and written language accurately. For example, with the statement, *She be telling people I'm mad at her*, it is probable that the person should not be telling people this or it is simply not true that the person is mad at her. With the statement, *He done asked for more money*, it could possibly mean maybe he should not have asked for more money.

In addition to phonology and grammar, AAE includes lexical innovations (e.g., "fly" means stylish or fashionable as in"He is dressed so fly." ), idioms, and aspectual markers ("He been finished"). AAE speakers also use rich discourse practices such as call-and-response and signifying, both grounded in African oral traditions (Smitherman, 1977). Their storytelling may follow circular or topic-associating structures that emphasize connection and emotion over linear sequence.

Educators unfamiliar with these features may misinterpret AAE as incorrect, leading to lowered expectations for students (Delpit, 1995). Recognizing AAE as a linguistic and cognitive asset is critical. Students who speak AAE bring valuable "funds of knowledge" (Moll et al., 1992) to the classroom, and honoring their language in instruction supports their academic success and identity (Delpit, 1995; Lee, 2024).

## A brief history of AAE

The roots of AAE can be traced back to the transatlantic slave trade, where Africans forcibly brought to the Americas were denied the opportunity to retain their native languages. As enslaved people from diverse linguistic backgrounds were forced to communicate, a common language, AAE, emerged. This linguistic system was passed down through generations and evolved over time while continuing to reflect the resilience and cultural heritage of African American communities (Lanehart, 2015).

Despite its rich linguistic lineage, AAE has been the subject of persistent marginalization and misunderstanding in schools. The 1996 Oakland Ebonics Resolution marked a pivotal moment in acknowledging AAE as a legitimate language (Linguistic Society of America, 1997). Nevertheless, decades later, educational systems still overwhelmingly treat AAE as a barrier rather than a bridge to academic success (Delpit, 2006; Pittman et al., 2024a).

## Why the science of reading must encompass all learners

The science of reading is a body of interdisciplinary research that explains how proficient reading develops, how it should be taught, and what happens when it does not develop as expected (Moats, 2020; The Reading League, 2022). Among its foundational components are phonemic awareness, phonics, fluency, vocabulary, and comprehension.

However, while the science of reading is grounded in research, its classroom applications often default to assumptions grounded in GAE (Delpit, 2006). If educators are unaware of AAE, they risk misinterpreting AAE linguistic features as reading deficits. For example, a student who pronounces *tooth* as /t/ /oo/ /f/ or *bend* as /b/ /e/ /n/ may be misjudged as lacking phonemic awareness when the student is, in fact, demonstrating phonological knowledge consistent with AAE. Most assessments' directions state that points should not be deducted for "dialect" or "language variation."

Misinterpreting students' literacy knowledge has real consequences. National assessment data show persistent disparities in reading achievement between African American students and their peers (NAEP, 2024). While many factors contribute to this gap, instruction that fails to reflect the linguistic reality of AAE-speaking students is a significant and under-acknowledged factor (Pittman et al., 2023; Pittman et al., 2024b).

## Instructional implication for teachers of AAE-speaking students

The following implications offer specific ways educators can align instruction with the science of reading while honoring the linguistic strengths of AAE-speaking students.

1

### Understand the phonology of AAE to inform phonemic awareness instruction

Phonemic awareness is the ability to blend, segment, and manipulate individual sounds in spoken words (Pittman et al., 2023). It is foundational to decoding and spelling. Instructional tools like Elkonin boxes can be helpful if teachers recognize that some students may represent fewer phonemes due to final consonant blend variation. For instance, a student may segment "test" into /t/ /ɛ/ /s/ instead of /t/ /ɛ/ /s/ /t/, reflecting a common AAE feature. The teacher's role is not to penalize this response, but to teach the phonemic structure of the word in GAE, building awareness rather than enforcing conformity (Pittman et al., 2023).

2

### Recognize AAE features in spelling as insight into phonological knowledge

Spelling offers a window into students' phonological and orthographic knowledge (Treiman et al., 1993; Treiman & Kessler, 2014). When students write *lis* for *list* or *dat* for *that*, they are encoding what they hear. This is a strength and not a weakness. Pittman et al. (2024a) emphasize that teachers must learn to distinguish between errors that signal misunderstanding and those that reflect AAE influence.

This difference is critical for assessment and instruction. Mislabeling AAE features as spelling errors can lower students' confidence and misguide instructional decisions. Instead, teachers should use these moments as entry points to discuss how sounds in AAE and GAE may differ and how both can coexist in a literate identity.

3

### Support bidialectalism through language awareness

Without devaluing either language, teaching students to become aware of the differences between AAE and GAE is important. Activities that allow students to compare structures in the two languages will help students to understand when and why to style-shift (Charity Hudley & Mallinson, 2014). AAE-speaking students are often denied the language support

offered to emergent bilingual students, even though they, too, navigate two linguistic systems (Pittman et al., 2024b). Equipping students with metalinguistic knowledge enables them to make conscious language choices while preserving their cultural and linguistic identity.

4

## Use authentic children's literature to affirm AAE

Children's literature that authentically represents AAE provides students with mirrors (Bishop, 1990) of their lived experience and validates their home language, as students should be able to "hear themselves" in books (Pittman et al., 2024c). However, Pittman et al. (2024c) found that representations of AAE in children's books are often inaccurate, inconsistent, or stereotypical. Educators must learn to critically evaluate texts for authenticity in both language and character portrayal. Books that feature AAE should be written by culturally knowledgeable authors, avoid caricature, and present AAE as a meaningful linguistic system. When used thoughtfully, these texts can spark conversations about language, identity, and justice, which can enhance reading comprehension and engagement.

5

## Invest in professional learning about AAE and the science of reading

Too few teacher preparation programs include coursework on various languages, and even fewer address AAE specifically (Pittman et al., 2024b). As a result, many teachers enter the classroom without the tools to support AAE-speaking students effectively. Professional development should go beyond generic equity statements to include deep dives into linguistic research, language analyses strategies, and language (i.e., AAE) assessment practices. Teachers should be equipped to teach phonemic awareness, decoding, and spelling in ways that affirm students' language backgrounds rather than erase them.

6

## Frame AAE as a cultural and cognitive asset

Finally, teachers must recognize that AAE is not a problem to be fixed but a resource to be honored. AAE speakers often demonstrate linguistic creativity, rhetorical dexterity, and narrative sophistication. These skills are assets in both academic and real-world contexts (Delpit, 2006; Green, 2011). When students see their language reflected in the curriculum and respected by their teachers, they are more likely to engage, persist, and succeed. Literacy instruction grounded in the science of reading must therefore begin with an understanding that language is not neutral. Instead, it is cultural, political, and personal.

## Conclusion

The science of reading has the power to transform literacy outcomes for all students, but only if it is implemented with a commitment to equity. For African American students who speak AAE, equitable literacy instruction begins with understanding and honoring their linguistic heritage. It requires that educators move beyond deficit models and embrace language-informed strategies grounded in research and respect.

All means all cannot be an empty promise. Instead, it must be a guiding principle that demands educators meet every child where they are, including those whose language is too often misunderstood. Understanding AAE and its implications for literacy instruction is critical for educators committed to equity and excellence in reading outcomes. Only then can the science of reading truly be a science for all.

# African American English Speakers

## 3 ideas in action

1. **Recognize AAE as a linguistic asset, not a deficit**—Understand that AAE follows systematic rules and avoid penalizing students for phonological variations that reflect their home language patterns.

2. **Distinguish between AAE features and reading errors**—Learn to identify when spelling or pronunciation differences reflect AAE influence versus actual misunderstanding to guide appropriate instruction.

3. **Support bidialectalism through language awareness**—Teach students to recognize differences between AAE and General American English (GAE) while affirming both linguistic systems and enabling conscious language choices.

# Parents as partners and advocates

When addressing the needs of ALL learners, it would be remiss to leave out the primary role that parents play in a child's development. It is often said that parents are their child's first teachers. As we follow in their footsteps, it is advantageous for educators to partner with parents not only to meet the needs of their students, but to understand a family's culture, language, perspectives, hopes, and expectations. Research has shown a strong link between student-teacher connectedness and better student outcomes including mental health, grades, and school attendance; a well-rounded understanding of our students allows us to better build the critical relationship foundational to the teaching-learning dynamic.

How can we enlist parents to support our literacy efforts? While not all of these may be doable for parents, here are a few suggestions we can offer them:

## Engage in rich conversations

Meaningful discussions are the building blocks of oral language, and hence the building blocks of literacy.

## Limit screen time

Excessive screen use can reduce the time spent on meaningful language-building activities. Set reasonable limits and ensure screentime is enriching for the child. As teachers, we may make suggestions for specific digital assets that promote literacy.

## Read together daily

Make reading aloud a consistent routine. This builds positive associations with books while modeling fluent reading and exposing children to rich language and ideas.

## Create a literature and print-rich environment

Surround your child with books, labels, and writing materials. Point out environmental print during daily activities.

## Make reading enjoyable

Follow your child's interests when selecting books. Create positive reading experiences that foster a love of reading together rather than treating it as a chore. One way to help encourage varied interests is to visit your local library. Talking with a librarian about what interests your child can result in finding shelves full of books for them to discover.

In the science-of-reading landscape, parents and parent groups have been instrumental in advancing evidence-aligned instruction, which ultimately supports educators in their quest to pursue the science of reading; educators are well-served by that advocacy.

# Every child, every classroom: The parent movement for reading justice

Brett Tingley, MBA, MS IOE

Each night before I fell asleep, I'd lie on my back, my belly rising beneath the sheets, while my husband sat beside me, reading aloud to our baby. We were expecting a little girl, and we welcomed her into the world before she ever took her first breath.

That's why, years later, it was so confusing when her kindergarten teacher suggested we hadn't read to her enough. How could we have read more than we did—even before she was born? The comments didn't make sense. Nor did the reassurances that she'd "grow out of it," or was just "too wiggly" and "not paying attention." I began to mistrust what I was being told.

With a background in engineering and business—and a family full of scientists—I turned to research. I discovered that up to 20% of children have dyslexia, a neurological processing difference that makes learning to read difficult. I brought this information to our school district, but they sidestepped it. They would only say she might have "dyslexic-like symptoms."

Meanwhile, I had learned about neuroplasticity—the brain's ability to rewire itself—and how that window narrows over time. I knew we couldn't wait.

But our district wasn't ready. They hadn't read the research. My advocacy wasn't welcomed. We endured multiple eight-hour IEP meetings. It was emotionally


and financially exhausting. While I was lucky to have the resources to persist, many parents don't.

We know how to teach children to read. Dyslexic students are protected under federal law—the Individuals with Disabilities Education Act. And yet, access to evidence-based reading instruction felt like a closely guarded secret. I couldn't just fight for my daughter. I had to fight for every child.

I began organizing. We built a parent group. We gathered stories. We hired counsel. We showed that the current instruction provided wasn't just failing my child—it was failing many children. After a year of hard work, 19 parents signed a systemic group complaint. The state found our district in violation of all of our allegations.

But the real win? We built the district we had always dreamed of. We trained teachers in evidence-based reading instruction they hadn't received in their Colleges of Education. We began assessing children early. We made structured literacy the foundation of our core curriculum and delivered aligned interventions before emotional damage could take root. That mattered deeply to our group—because even within our small circle, we had seen suicide, drug overdoses, and broken families. We knew the stakes were life and death. This systemic approach changed everything.

I want to make a special plea to teachers who have discovered the science of reading: please support parent groups doing this work. In our district, we had a few teacher allies, and they made all the difference. If children truly are the customer of the education system, then parents and teachers must be partners in this just cause. And to parents—take care of the teachers who join you. They will become leaders in the new district you build together.

After seeing what one determined parent group could accomplish in a single Ohio district, we expanded statewide. We now represent over 20 parent groups and advocate for more than 185,000 students. We played a key role in passing Ohio dyslexia legislation and securing approval of the state's dyslexia guidebook.

To help others replicate our success, we created the documentary *Our Dyslexic Children*. It became both a rallying cry and a proof of concept: this work can be done. Alongside the film, we launched a free master class and a roadmap to guide other parent groups on their journeys.

Eventually, we founded Parents for Reading Justice, a nonprofit dedicated to ensuring that every child—regardless of ZIP code—has the opportunity to learn to read. The data is sobering: while up to 20% of kids have dyslexia, only one-third of U.S. students are proficient readers, according to the National Assessment of Educational Progress. That means millions of children have become "curriculum casualties"—failed by outdated, debunked reading philosophies.

Today, Parents for Reading Justice is helping groups take root in states like New Jersey, Alabama, California, and Massachusetts. Our mission is to educate, activate, and organize parents across the country—so that science-of-reading instruction doesn't become just another pendulum swing, but the permanent standard in American education. Parents have the moral imperative, the legal right, and the electoral power to ensure that effective instruction reaches every child, in every seat, in every classroom.

Our children deserve to learn to read.
Our economy demands it.
And our democracy depends on it.

# Parents as advocates

## 3 ideas in action

1. **Teachers and school leaders**—support parent allies as partners in the work you are doing to advance your science-of-reading-based literacy program.

2. **Parents**—support teachers and district leaders in their science-of-reading-based literacy program.

3. **School districts**—take a systemic approach: adopt instructional practices, early assessments and interventions, curriculum resources, and professional learning aligned with the evidence. Make this a relentless priority in order to meet the needs of all students so that no student will be left behind.

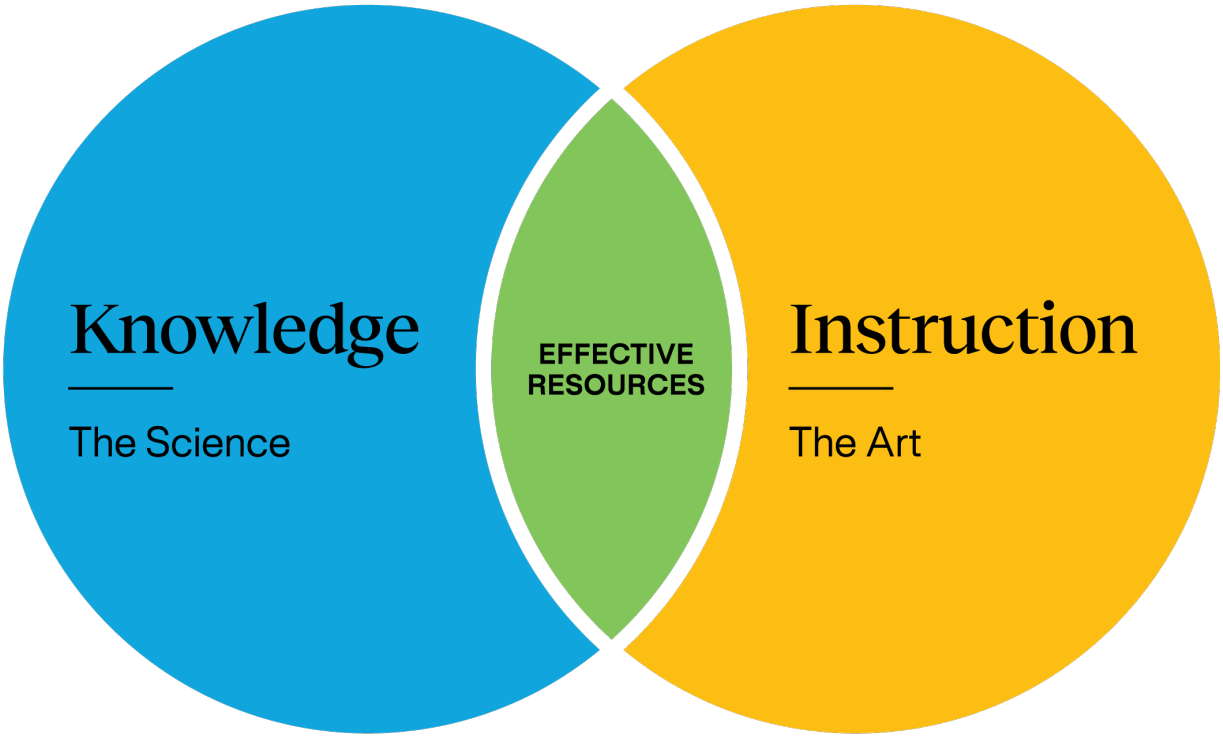
# The art and science of teaching: What it means to be a teacher

Teaching is fundamentally both an art and a science. The science of teaching literacy encompasses both the extensive research on how students learn, and the structured literacy approaches outlined in the science of reading. This scientific foundation provides teachers with proven methodologies for instruction, assessment, and intervention. This expectation is in alignment with other respected professions: a shared body of knowledge and language.

At its core, teaching is complex; this is where the art of teaching literacy comes in. It is the ability to develop the nuanced and intuitive skills and dispositions that demand high levels of initial competency and the growth and ongoing development that come from experience and reflection.

As in any profession, teaching requires tools for the practitioner. Instructional resources—if aligned to the evidence and used with integrity—can be a valuable asset to teachers, facilitating the ease of integration of both the science and the art of teaching.

## Making it happen vs. letting it happen: the science of implementation



> “Only about a quarter of the teachers who leave teacher preparation programs across our nation enter classrooms prepared to teach kids to read [in a way that is] aligned to the science and research on reading.”

**HEATHER PESKE**
President, National Council on Teacher Quality

# The science of teaching: The importance of teacher preparation and professional learning

Although there is a preponderance of evidence which points to key principles of instruction, there has been a lag in the human response—in the form of a significant teacher preparation gap. As many educators enter the profession without adequate training in these research-based practices, it highlights the critical need for widespread shifts in higher education.

# Higher education and the shift toward the science of reading

Timothy Odegard, PhD

Amy M. Elleman, PhD

Over the past decade, nearly every U.S. state has enacted legislation referencing the science of reading, structured literacy, or evidence-based early literacy instruction (The Reading League, 2024; Sawchuk, 2024). This policy wave began around 2013, with early adopters such as Mississippi and Arkansas, and accelerated after 2019, as stagnant outcomes and renewed public attention to literacy fueled bipartisan action. Between 2019 and 2022, over 220 reading-related bills were passed across 45 states and the District of Columbia (Albert Shanker Institute, 2023).

## Policy as a lever for change

In most states, these laws have focused on key areas: teacher professional development, curriculum adoption, and early screening for the risk of dyslexia, which has increasingly broadened to encompass risk for reading deficiency more generally through Right to Read and Science of Reading legislation (Odegard, Gierka, & Ormandy, 2025).

The logic behind these reforms is clear. If students are not mastering the foundational mechanics of reading and writing, improving the quality of early instruction becomes a matter of public interest. By equipping teachers with knowledge of language structure and explicit instructional routines embedded in high-quality instructional materials (HQIM) that have been empirically validated through research, states aim to strengthen the foundation on which later comprehension and writing skills are built. Legislative efforts have therefore emphasized in-service training, certification requirements, and alignment of classroom materials with the principles of structured literacy.

## Implementation through in-service training

Several states illustrate both the promise and complexity of this approach. Mississippi's literacy initiative, launched in 2013, invested heavily in professional development and regional literacy coaches trained in the science of reading. The Mississippi Department of Education paired these supports with sustained monitoring and technical assistance to districts. Between 2013 and 2019, Mississippi was the only state to show statistically significant improvement on the fourth-grade NAEP Reading assessment, a result widely attributed to coherent state leadership and a strong coaching infrastructure (National Center for Education Statistics, 2019).

Arkansas followed with its Reading Initiative for Student Excellence (RISE), which provides educators with online learning modules and face-to-face academies designed to deepen knowledge of language and literacy. Tennessee's 2021 Literacy Success Act built on these lessons by pairing teacher

training with district-level coaching networks and by requiring the adoption of HQIM grounded in evidence-based practice (Reed et al., 2025). Ohio also leveraged legislative mandates to develop state-specific training modules and required that all elementary educators complete them (Capin et al., 2025).

Across these examples, a consistent pattern emerges as states strive to implement large-scale efforts to align classroom practice with research through professional learning, coaching, universal screening, curricular guidance, and adoption. However, even in states with strong infrastructure, these efforts face a persistent challenge: the difficulty of implementing change at scale and the ongoing shortage of teachers entering the profession with the necessary knowledge and skills (Odegard, Hall, & Kloberdanz, 2025).

## The missing link: Higher education

While in-service reforms have gained momentum, preservice teacher preparation has lagged. A 2023 review by the National Council on Teacher Quality (NCTQ) found that fewer than one in four elementary teacher preparation programs nationwide provide explicit instruction in all five essential components of reading (NCTQ, 2023).

Many programs continue to rely on balanced literacy frameworks or emphasize reading motivation and strategy use without sufficient grounding in the linguistic and cognitive foundations of literacy.

The reasons are complex and deeply structural:

- Program redesign in higher education progresses slowly, often necessitating multi-year approval processes and coordination across departments.
- Faculty expertise can be uneven. Many professors in colleges of education were themselves trained in older theoretical models and lack formal preparation in linguistics or cognitive psychology.
- Practicum placements rarely guarantee that candidates experience structured literacy in action.

The result is a disconnect between what teachers are expected to know upon entering the classroom and what their preparation programs have equipped them to do.

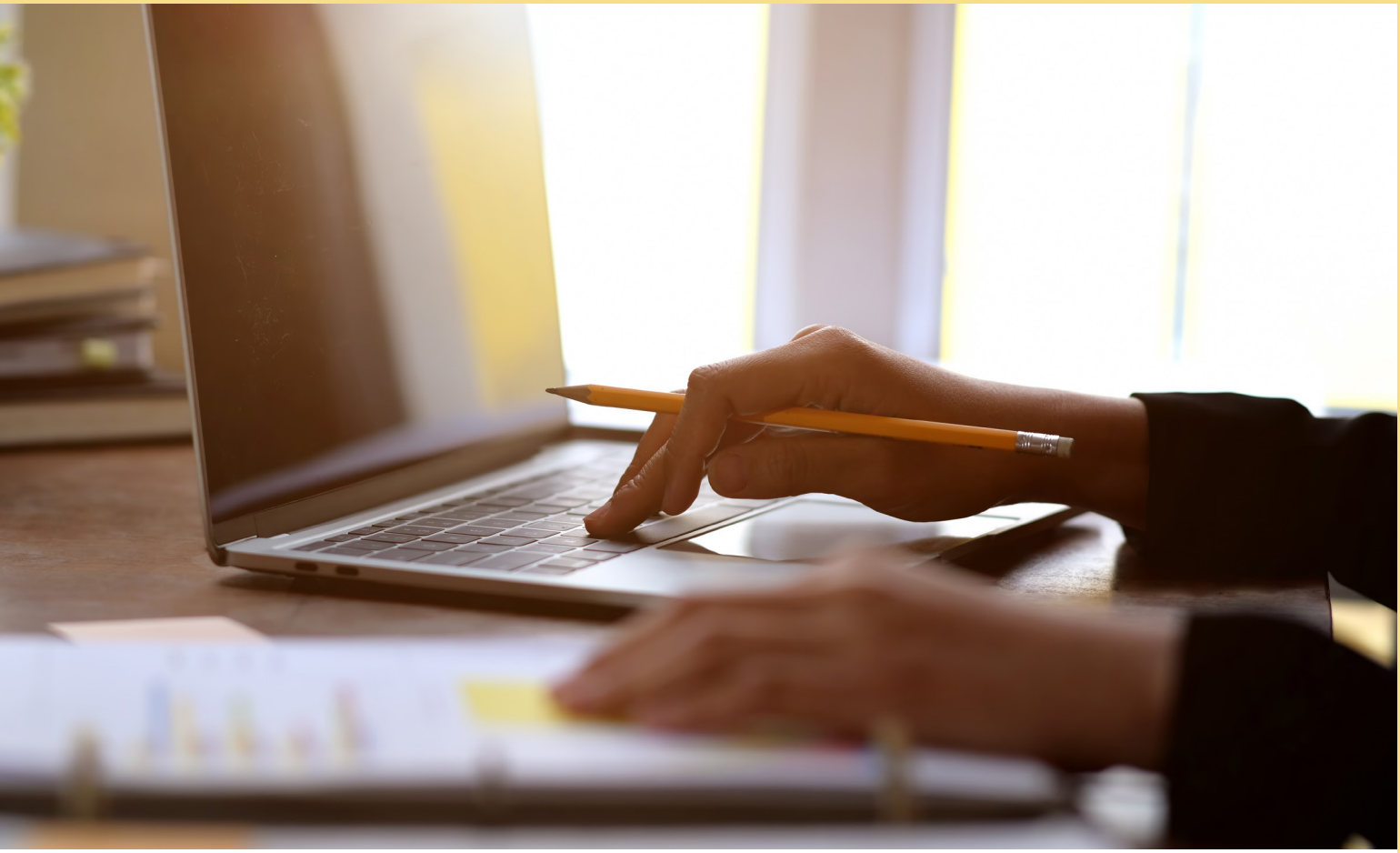
This gap matters because new teachers often enter classrooms unprepared to deliver the kind of evidence-based, language-focused instruction that state policy now requires. As a result, districts must invest significant time and resources in retraining teachers after they begin their careers.

At the same time, school districts and state agencies now find themselves in the unusual position of pressuring institutions of higher education to align with practice standards emerging from K–12 legislation. In states such as Tennessee and North Carolina, teacher preparation programs are now subject to review based on their alignment with the science of reading, and Arkansas has linked program approval to evidence that candidates receive instruction consistent with the state's legislation and demonstrate mastery through a licensure exam.

These policy shifts reflect a growing recognition that sustainable literacy reform cannot be achieved solely through in-service professional development, universal screening, standards based assessments, or the adoption of HQIM. If the goal is to ensure that every child learns to read and write proficiently, the teacher preparation pipeline must be part of the solution, rather than remaining a persistent weak point.

## Challenges and opportunities for reform

Transforming higher education presents unique challenges. Universities are decentralized, and colleges of education must navigate entrenched paradigms, accreditation requirements, and limited resources. Faculty retraining is both costly and time-intensive. Moreover, the term "*science of reading*" has become politically charged, sometimes generating defensiveness rather than collaboration within academic communities.



However, these obstacles also open new opportunities for innovation and partnership. Several states and institutions are beginning to model productive approaches. Collaborative initiatives between universities and state departments of education have supported faculty in revising syllabi, adopting new materials, and integrating structured literacy frameworks into practicum experiences. Partnerships with organizations such as the Tennessee Center for the Study and Treatment of Dyslexia, which has developed asynchronous modules specifically designed for higher education, are helping bridge gaps between what professors are ready to teach and what their students need to learn (Kehoe et al, 2025). Embedding coursework on phonology, orthography, and morphology within supervised teaching experiences grounded in empirically validated HQIM enables candidates to connect theory and practice, a crucial step for achieving long-term change.

Ultimately, aligning teacher preparation with the science of reading is not simply about compliance. It is about coherence. When preservice coursework, field experiences, and in-service professional learning all reflect a shared understanding of how reading and writing develop and how instruction should be delivered, teachers are better equipped to meet the needs of diverse learners from day one.

## Guiding principles for institutions of higher education

To ensure that teacher preparation programs align meaningfully with the science of reading, institutions should develop deliberate, multi-year plans grounded in research, partnerships, and accountability. The following principles can serve as a practical checklist.

1

## Align coursework with state literacy standards and authoritative frameworks

Review and redesign syllabi to reflect both current state literacy standards and evidence-based frameworks such as the IDA Knowledge and Practice Standards for Teachers of Reading (International Dyslexia Association, 2018).

2

## Integrate high-quality instructional materials (HQIM)

Anchor practicum and methods courses in the same research-validated HQIM being implemented in local districts to ensure candidates gain procedural knowledge of how structured literacy is enacted in real classrooms.

3

## Strengthen partnerships with schools and state agencies

Collaborate with district leaders to understand their instructional needs, screening protocols, and legislative requirements. This alignment ensures that preservice experiences prepare candidates for the systems they will enter.

4

## Develop faculty capacity

Establish clear timelines and benchmarks for recruiting new faculty, securing adjunct instructors, and supporting existing faculty to develop both declarative knowledge of the science of reading and procedural knowledge of structured literacy delivery.

5

## Embed supervised, practice-based learning

Design practicum experiences where candidates practice explicit instruction in decoding, word recognition, spelling, language comprehension, and writing, supported by feedback from trained supervisors. When possible, embed local, high quality, research-validated curricular materials that reflect what teacher candidates will use or observe in real classroom settings.

6

## Evaluate and iterate

Collect and analyze data on candidate learning, course quality, and field outcomes. Use these data to drive continuous improvement rather than focusing on one-time compliance.

## Conclusion

The national movement toward the science of reading reflects a growing consensus that reading proficiency is a public responsibility requiring system-wide coherence. Policy has been passed in the hopes of providing an enabling context for in-service change, but without shifts in higher education, progress will remain fragile and uneven. Sustained improvement in reading outcomes depends on the alignment of policy, practice, and teacher preparation.

The science of reading has brought long-overdue attention to how children learn to read. The next decade must bring that same urgency to how we prepare the teachers who will teach them. Only when institutions of higher education fully engage in this work of reexamining curricula, retraining faculty, cultivating future educational leaders and professors, and strengthening partnerships with schools can the promise of the science of reading movement be realized across generations.

# The features of effective professional development

Until institutions of higher education adequately prepare teachers to enact evidence-aligned reading instruction, professional learning can act as a critical bridge between teacher preparation and classroom practice. As teachers and administrators alike are beginning to see the importance of implementing impactful practice with integrity, the benefits of having consistent knowledge-building AND coaching have become abundantly clear.

Professional development or professional learning? In Effective Teacher Professional Development from Learning Policy Institute (2017), the authors define effective professional development as structured professional learning that results in teacher practices and improvements in student learning outcomes. Ultimately, in professional development settings, we strive for professional learning that impacts student outcomes.

This report is the result of the extensive examination of studies over three decades, resulting in seven widely shared features of effective professional development:

1. **PD is content focused** within teachers' classroom contexts; including an intentional focus on discipline-specific curriculum development and pedagogies in areas such as mathematics, science, or literacy.
2. **It incorporates active learning**: engaging teachers in opportunities to design and try out what they will be using in the classroom (as opposed to lecture-based models with no direct connection to classrooms and students).
3. **Supports collaboration**: creating space for sharing ideas and creating communities that can often improve school culture.
4. **Uses models of effective practice**: providing teachers with curricular models and modeling of instruction offering a clear vision of what best practices look like.
5. **Offers feedback and reflection**, giving teachers built-in time to think, receive input, make changes, and continue to reflect and get feedback.
6. **Is of sustained duration**, with adequate time to learn, practice, implement and reflect on practice.

This research reminds us that professional learning becomes effective classroom practice when teachers are given knowledge, modeling of instruction, opportunities to practice, and ongoing coaching.

Implementation of new literacy practices and resources without support for how the implementation is done in classrooms isn't helpful for teachers. In fact, "one and done" professional development sessions can become just another thing on their to-do list. Educators need opportunities. Not only opportunities for building their professional knowledge, but opportunities for rich discussions, collaboration, practice, and reflection to continue to build their craft. Professional learning must be comprehensive, sustained, rigorous, and practical.

# Professional development to learn the "rocket science" of reading

Louisa Moats, EdD

Preparing a novice teacher to teach reading and language, in the regular class or in an intervention group, is a complex undertaking. In a perfect world, all educator preparation programs (EPPs) would be informed by and would teach three essentials to their teacher candidates: 1) how the print system of English represents spoken language; 2) the psychology of early reading development and reading difficulties; and 3) the instructional practices that are best supported by scientific research. Although there are signs of significant progress in the offerings of many EPPs, we still cannot be confident that a novice has been adequately prepared. Consequently, states and school districts that aim to capitalize on the promise of reading science still need to invest significant resources into professional development (PD) for teachers.

Why is strong professional development worth the cost in time and money? Because teaching all aspects of literacy—including reading, writing, and the language skills on which these depend—is demanding and even with good initial preparation, expertise takes a few years to develop ("Rocket Science," Moats, 2020). Yes, it is possible for paraprofessionals and tutors to make progress with students if they follow a structured program with fidelity, but evidence is clear that teachers who know more, do better with students (Piasta; Ehri). More advanced professional learning prepares us to choose what to do, with whom, for how long, and in what way and to be accountable for student outcomes. To make these decisions and solve instructional problems, teachers must be smarter than their programs.

Let's examine the characteristics of professional development: comprehensive, sustained, rigorous, and practical—leading to better student improvement.

## Comprehensive PD

A comprehensive approach provides learning about all the critical components of instruction within a broad theoretical context. The Reading Rope metaphor by Dr. Hollis Scarborough, and theoretical models such as the Simple View of Reading (Hoover & Tunmer, 2020), or Jan Wasowicz's Language and Reading Network (2021 ), offer empirically-derived conceptual maps of what must be taught and learned in order for students to become proficient readers. Each conceptual framework allows us to see how each topic or each component of instruction may be connected to the others and reinforces the idea that each component is essential for achieving best results. With these frameworks, for example, one can easily see why the science of reading concerns far more than teaching phonics.

In a comprehensive approach, the subskills that enable both foundational reading skills and language comprehension are thoroughly examined. Underpinnings for developing word recognition include phoneme awareness, phoneme-grapheme

correspondences, orthographic (spelling) patterns, and the morphemic components of words. The subcomponents of language and reading comprehension include background knowledge, vocabulary, sentence comprehension, text organization, and the mental processes students must develop to make inferences and monitor their own comprehension.

Newer research also emphasizes the advantage of approaching word recognition through spelling, teaching syntactic awareness for both writing and reading, and having students write in response to reading. Teaching writing and reading in tandem is more productive than treating these aspects of literacy as separate and unrelated. Thus, teachers need professional development that includes management of the language arts block so that instructional time is allocated wisely to each aspect of this "whole" (Kemeny, 2025).

## Sustained PD

Professional development that "sticks" is carried out over several years and is embedded in the working context. None of the topics listed above can be adequately treated with a "one and done" approach. Lasting change in teachers' behavior is much more likely if they have time to consider why certain practices will improve their outcomes, and to understand each component of instruction in sufficient depth. Deeper thinking and understanding takes time, as does the readiness to dive in and try teaching a different way. It is more productive to allow teachers to study before they try to implement a new approach than it is to mandate immediate change that is not accompanied by insight into why the approach makes a difference.

Even after two or three years of studying and learning about various aspects of reading science, teachers may need another couple of years to attain a high level of expertise in their practice. When teachers can teach lessons fluently, use instructional time without waste, keep everyone engaged, and enable the progress of all students across reading, writing, and language, then the next challenge is sustainability—perhaps the most important role of the building's administrative leadership. The same training must be expected of all new teachers, and PD that is "old" for some can be revisited for greater depth of understanding and application. To engender confidence in science-based practices, staying the course is critical.

## Rigorous PD

The professional development courses for which I am known have been described as rigorous and demanding. Quite a few hours of study and practice are required because most participants' professional preparation was lacking in critical information, and we are compensating for the inadequacies of their licensing programs and subsequent training. Built into the course of study are progress monitoring quizzes and gate-keeping reviews. The participant must pass an exit exam. It is not possible to complete and get credit for taking the course without actually learning the material and trying out its application.

These expectations are higher than those of many PD offerings that do not hold the teacher-student accountable for knowing the information that is being taught. Nevertheless, teachers have expressed in formal and informal studies that they do not mind the rigor because they are getting better results with their students.

## Practical PD

Professional learning is not worthwhile unless it is applied. Therefore, the course of study must be set up to maximize the likelihood that the information will be translated into changes and improvements in teaching behavior.

Within the course, teachers should be asked to try out new teaching activities in a safe space, such as role-playing with colleagues. They benefit from seeing videos of other teachers doing activities with real students. They often prefer trying out new practices with a small group of students before using them with the whole class.

The context for this change and growth process must be positive and supportive, with successive approximations of a desired teaching skill being recognized and cheered. Recognition of improvement can come from coaches, teacher leaders, administrators, or from the individual who participates in collegial lesson studies.

Genuine empowerment of teachers, evidenced by the achievement of their students, is what keeps most in the classroom. Let's remember that it is teachers, not programs, that ultimately enable students to learn. Comprehensive, rigorous, sustained professional development is the key to attaining that most valuable result.

> “Every teacher who currently teaches reading would benefit from high quality education about reading development, language structure, and recent research findings. Validated instructional programs should be accessible to every teacher, along with consultation and demonstration of their effective use.
>
> Teachers need ongoing professional development that has topical continuity, practical application, and opportunities for collaboration with peers... These professional development experiences should be linked to continuous in-class coaching.”

**LOUISA MOATS, EdD**
Renowned author, literacy expert, and advocate
in Teaching Reading Is Rocket Science (American Federation of Teachers, 1999)

> “Teaching is one of the most cognitively complex professions... there is still uncertainty as to what works in various schools in diverse communities, with each unique group of students...
>
> What makes teaching a profession is the continual inquiry, expansion of repertoire, and accumulation of knowledge through practice.”

**COSTA AND GARMSTON**
2016

# Teaching as an art

What makes teaching an art lies in the ever-changing, relational nature of a profession that requires a consistent flow of curiosity, empathy, and nuanced decision-making at every turn. Teaching is inherently reflective and dynamic—demanding that educators read their students' needs moment by moment and adjust their approach accordingly.

The artistry emerges through the relationships teachers build, drawing on insight and empathy to understand each learner's unique perspective and challenges. This part of teaching requires the expert judgment that comes from deep and ongoing reflection on practice over time. At the end of each day, the most effective teachers are those who remain reflective and responsive—understanding which instructional components each student needs at different moments in their learning, while at the same time, recognizing what they need in order to grow in their own learning and artistry.

Self-reflection becomes a cornerstone of professional growth, enabling teachers to examine their practice critically and make informed adjustments.

> "The program is only a tool; teachers must know how to use it. It's a wonderful thing when we understand what we're doing, why, and for whom we're doing it."

**LOUISA C. MOATS**
Renowned author and literacy expert

# A dozen questions to ask ourselves as reflective educators:

**QUESTION 1**

Do we believe "all means all"? That ALL of our students can learn to read?

**QUESTION 2**

Are our students learning and progressing? What evidence do we have to substantiate this?

**QUESTION 3**

Are we differentiating instruction to meet diverse needs?

**QUESTION 4**

Are we accelerating learning for students who have gaps to address?

**QUESTION 5**

What patterns are we noticing in student responses? Are students engaged in their learning?

**QUESTION 6**

How are our relationships with students supporting their academic growth?

**QUESTION 7**

Are our assessments providing the data we need?

**QUESTION 8**

Are the instructional materials effectively supporting instruction?

**QUESTION 9**

What supports or resources do we need to meet our goals for our students?

**QUESTION 10**

Are families engaged as partners in their child's education?

**QUESTION 11**

Is there joy in our collective work and school culture?

**QUESTION 12**

What do I want/need to learn next to continue my growth?

This continuous cycle of reflection, combined with access to quality resources and ongoing professional learning and support, creates the conditions for teachers to excel in both the science and art of their craft.

# Resources: The high stakes of high-quality instructional materials

As stated previously, instructional resources—if aligned to the evidence and used with integrity—can be a valuable asset to teachers, facilitating the ease of integration of both the science and the art of teaching.

A wave of literacy legislation has been passed in the United States over the last decade. As part of the legislation, many states have determined a list of literacy curricula that fall under the guidelines and criteria they have established.

When there is a mandate of "science of reading-based" resources, what does that mean? How do we know what to look for? In the science of reading 3.0, it is important that we pause and consider what is meant by high-quality instructional materials.

In this next section, we will explore some of the attributes of instructional resources that are based in the science of reading, in the area of foundational skill instruction.

For a more comprehensive look at curriculum guidelines, see The Reading League's Curriculum Evaluation Guidelines.

# Foundational skills resources should be inclusive of K-5

> Teach that most words can be decoded using knowledge of phoneme-grapheme correspondences, syllable patterns, morphemes, orthographic rules, and word origin. ... Explicit instruction in the written code should extend at least through grade 3 when syllables and morphemes in longer words are tackled."

**LOUISA C. MOATS**
Renowned author and literacy expert

In the past, we thought of foundational skill instruction as focused in the primary grades, and explicit instruction as focused in intervention. The preponderance of research points to the idea that explicit literacy instruction should not stop in the primary grades nor be found only in intervention settings. Once students gain automaticity for basic decoding and encoding and have advanced beyond decodable and simple texts, they need opportunities in the intermediate grades to really secure and consolidate those skills and build upon them, with instruction in multisyllabic word decoding, morphology, and advanced vocabulary, as well as comprehension strategies to build their ability to fluently read and comprehend the more complex texts and ideas they will encounter.

# Assessment and instruction: cohesive and aligned

When students move across tiers of instruction (whether core, intervention, or intensive intervention) as well as across grades, instructional time will be optimized by aligning lesson design. This means lessons should follow a similar gradual release model, with similar, high-impact routines, and the same academic language. When students have familiar instructions, routines, and terminology, their cognitive bandwidth is freed up to focus solely on the concept or content they are learning—whether they are learning grade-level material or closing foundational skill gaps.

In addition, all tiers of instruction are aligned in scope and skills, with the placement of students driven by reliable, valid universal screeners and most importantly, diagnostic data followed by frequent progress monitoring.

The idea of a "cohesive literacy ecosystem" or cross-tier/cross-grade alignment might be a new idea, as in the past what happened in core and intervention were often two distinct instructional methodologies and two widely differentiating sets of materials. *In The Science of Reading 3.0, the power of alignment is understood, as it facilitates what we refer to as accelerated learning instead of simply remediation.*

# Five Pillars of Alignment

## 1

### Lesson design: The blueprint for student learning

- Lessons are designed with a gradual release model of: "I do, we do, you do"
- Lessons begin with a review of previous learning
- Lessons should include plenty of opportunities for student response
- Skill instruction should always be followed by contextual application of skill in reading and writing

## 2

### Focused instruction: Setting the intention for learning

- Scope and sequence of skills is the same across instructional Tiers
- Intensity of instruction increases as students move from Tier 1 → 2 → 3
- Students are clear on the purpose for learning
- There are ample opportunities for practice (guided, independent, interleaved, distributed) → with targeted feedback provided

## 3

### Resources and routines: A structured learning environment

- High-impact instructional resources and routines should be implemented consistently
- This consistency allows students to refocus cognitive energy from process to learning
- With consistent routines established, teachers can dedicate their full attention to instructional delivery and response to students

## 4

### Language: The bridge from research to practice

- Lessons include clear instructional dialogue
- Lessons include clear and consistent academic language

## 5

### Data: For informed instructional decisions

- Connects Tiers of Instruction
- Pinpoints students' needs
- Informs instructional groupings
- Provides visibility for all invested parties

“Most schools provide core reading instruction (Tier 1) to students with reading difficulties and then a supplemental reading intervention that often has little alignment or correspondence with their core reading program.

Thus, students with the most challenging reading problems are expected to integrate information from two often very different approaches to reading instruction.”

**VAUGHN, S. & FLETCHER, J.**
Three Things We Need to Learn.
American Educator, Winter 2020-2021

**Many educators bristle at the mention of a "scripted program." In truth, a program with explicit instructional dialogue written for the teacher—when done well and aligned to high-yield practices—has these advantages:**

- When starting a new program, using the instructional dialogue as written helps a teacher get used to the instruction and provides them with a starting point to begin to internalize the methodology of the lesson. In essence, it frees up cognitive bandwidth to sharpen and articulate moment-by-moment decision-making that happens with students.
- Many of us as teachers are prone to using a lot of words in our instruction and explanation; a clear, concise instructional dialogue supports our ability to tighten our speaking into essential language so as not to overtax our students' ability to listen and keep their focus.
- Clear instructional dialogue across tiers of instruction and grades ensures a similar experience for our students and creates building-wide, coherent academic language and lesson design.
- For a new teacher or a teacher new to a subject or grade-level, instructional dialogue can be a gift, allowing them to hit-the-ground-running with instruction, providing a strong scaffold as they are learning.
- In addition to the instructional dialogue for the teacher, a solid program includes expected responses from the students; this provides the teacher with a quick reminder of the goal and purpose of the lesson.

**Remember, instructional dialogue should never be designed to be read in a rote fashion; it is provided as a tool for teachers to support their implementation with the highest integrity and maximize the use of the resource.**

# Supports for English learners

English learners come to us with their own rich experiences with language, literacy, and knowledge about life. Supporting ELs is in large part about identifying and amplifying what they already know, while doubling down on literacy instruction that's based in the science of reading:

Oral language development is the most essential scaffold for English learners.

Identify a student's linguistic repertoire, capitalizing on their home language, language skills, and background knowledge.

Provide time for the processing of responses, for rehearsal, additional practice, and for repetition.

Remember that solid, evidence-aligned explicit instruction is good for all students, including English learners.

Whenever possible: Provide visuals, graphic organizers, realia (materials from everyday life), cooperative learning activities, and other verbal supports to make core content comprehensible.

*Establish high-impact, repeatable, replicable routines.*

# The right text at the right time: Decodable text to build the decoding habit

Decoding is the skill that makes it possible for word reading to become automatic. Children learn the code, or, which graphemes represent which phonemes. This is what allows people to eventually seem like they are reading "by sight." It is never really by sight. It is automatic decoding.

Knowing you need decodables is just the first step. How do you ensure that a decodable text is "high quality?"

> Decodable text should be used for a short period of time, like "training wheels."
>
> **HEIDI ANNE E. MESMER, 2020**
> Professor of Reading,
> Virginia Tech University

## A high quality decodable text will have:

- A high proportion of words with phonetically regular relationships between letters and sounds (e.g., CVC, CVe)
- A close match between the phonetic elements represented in the text and those that the reader has been taught
- Phonetic elements in the text that follow an evidence-aligned scope and sequence
- Cumulative decodability: Skills will build on one another in order to build neural connections for automaticity and fluency
- A design such that readers read the text without relying on pictures
- Natural sounding language
- A story that is engaging and appealing

# Why are decodable texts so important?

## *1*

### Application

Decodable texts allow a student to apply the phonics skills they are learning as they are learning them, leading to the "decoding habit" for accuracy, fluency, and extraction of meaning.

## *2*

### Practice

Decodable texts provide practice in reading both familiar and new words. Research has repeatedly shown us that children need A LOT of practice in order to reach fluency and eventually develop deep comprehension skills. It starts with decodable texts.

## *3*

### Confidence

Beginning readers need accessible text. You know how when you're learning something new, a quick win makes you MORE excited to keep going? For children learning to read, using decodable texts—which are very accessible for their new skills—helps them to feel like a real reader. *And THIS is what makes them want to continue reading.* As with any other skill: Confidence leads to enjoyment, which leads to more practice which leads, eventually, to mastery.

## What about "real literature"?

It is important to emphasize that decodable text is only used during a brief developmental period when students are developing their strategies for getting the text off the page. We want to ensure their first and foremost strategy is to look at and within the words—eyes on text—rather than guessing through context or pictures. Therefore, decodable text is cumulative and provides practice in the essential phonetic elements, increasing in complexity as students move through a scope and sequence of skills. Decodable text need not be used for every single phonetic element; decodability will naturally ease up as children achieve a level of confidence and capability with core patterns.

**To summarize early text use:**

- Use rich literature with no decodable controls for read-alouds and shared reading.
- Explicitly and systematically teach children decoding skills and apply those skills within appropriate text in order to build automaticity and fluency.
- Decodable text use is a temporary scaffold for the beginning stages of reading, providing the on-ramp for grade-level texts.

# Evidence-based with high quality efficacy studies

Knowing your materials are based in science is critical. But do they work with real students and teachers in real schools?

Here is where many organizations are falling short—by not investing in third party efficacy studies to demonstrate just how effective their resources are in real life classroom situations.

> "A knowledgeable teacher with high-quality, evidence-aligned materials is unstoppable."
>
> **LOUISA C. MOATS**
> Renowned author and literacy expert

## Summary of the 5 Principles of high-quality resources

1. **Foundational skills resources should be inclusive of K-5**
   Explicit literacy instruction must extend through intermediate grades, not just primary grades and intervention
2. **Assessment and instruction: cohesive and aligned**
   Cross-tier alignment through consistent lesson design, routines, and academic language creates accelerated learning
3. **Supports for English learners**
   Build on existing language skills while prioritizing oral language development and evidence-based explicit instruction
4. **The right text at the right time: Decodable text to build the decoding habit**
   Decodable texts serve as temporary scaffolds to develop automatic decoding before transitioning to grade-level texts
5. **Evidence-based with high-quality efficacy studies**
   Materials must be scientifically grounded and proven effective through third-party efficacy studies in real classrooms

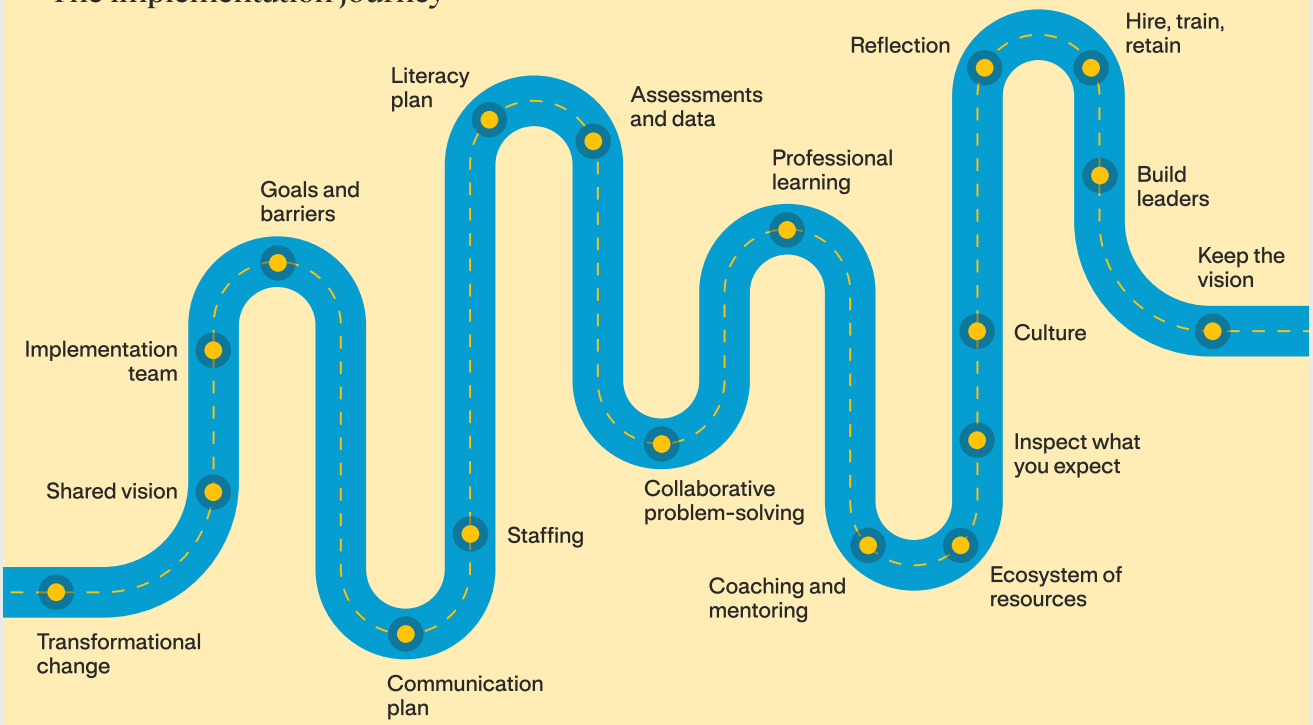
Interested in learning more about our aligned One95 Literacy Ecosystem?

# Implementation science: Bridging the Research to Practice Gap


Implementation science studies how we put knowledge into practice—in this case specifically how to take the science-of-reading research and translate it into instruction so that teachers can access this knowledge in practical ways.

Knowledge of implementation science provides several important pillars for those leading the charge. Most importantly, it provides a solid foundation on which to build and sustain a vision for literacy success.

## The implementation journey




## The phases of implementation

| EXPLORATION | INSTALLATION | INITIAL IMPLEMENTATION | FULL IMPLEMENTATION | SUSTAINABILITY |
|---|---|---|---|---|
| Setting a vision; creating a collaborative team to identify the need and the best innovation | Securing staff buy-in and leadership support; building the plan | Trying out the innovation; establishing systems of support with feedback loops | Skillfully using and integrating the innovation | Securing long-term commitment and continued growth |

In our 2024 publication, The Courage to Lead Literacy, we spoke about the importance of implementation science as a tool of those leading the way. This image of the implementation journey reminds us that moving through the phases of implementation in any initiative is a multi-year endeavor that is never linear and is marked by important milestones. Implementation science is a game-changer for crafting transformative literacy change. When leaders know this science, they can understand the process and can therefore know the importance of maintaining a relentless vision as they reap the highest and greatest return on their investment: successful student outcomes.

Knowing the implementation science is critical, but not enough. In a journey that may be filled with both progress and setbacks, it is important to have courageous conversations about those setbacks. In The Science of Reading 3.0, we need to look more closely at what can stand in the way of the clear translation of research knowledge to classroom practice. This will allow us to address those blockers and continue forward in reaching our goals.

# Bridging the gap: 5 areas to better bridge theory and practice

Education research has come a long way. In this day and age we know a lot about the way students learn and about how teachers should teach to maximize outcomes. And yet, in many cases, forward progress has continued to elude us.

So, what gives? What has gotten in our way of translating research to practice?

Here we look at five specific places where there is a clear gap—*places where intentional bridge building would help to more fully bring research and theory into classroom practice*.

1

# Utilizing misaligned practices that don't meet the needs of our students

Before the benefit of the science-of-reading research, many of us as teachers employed a "balanced literacy" framework, utilizing practices such as guided reading with three-cueing prompts and leveled text. Many of these practices still remain, and don't provide the explicit and systematic instruction needed by the majority of our students. In addition, many educators did not have the benefit of precise diagnostic assessments, and therefore "taught down the middle" with some reinforcement or reteaching as they observed their students. Both of these examples illustrate a misalignment between students' needs and our instructional practices.

## Bridging the gap

Educators must examine instructional materials and practices with a critical eye toward evidence-alignment, and be ruthless in the prioritization of what stays and what needs to go. We often must "pull weeds to plant flowers." This goes for daily lessons and curricular materials, but also applies to assessments. With reliable and valid universal screeners and diagnostic assessments (like 95 Phonics Screener for Intervention™), educators can pinpoint exactly which skills and capabilities require instructional attention. Diagnostic assessments allow a teacher to see with precision which students need which skills.

2

# Focusing on fidelity rather than integrity—Not using a program/ practice as intended

As evidenced by the implementation journey, implementation of any new program (and by this, we mean curriculum materials and/or instructional practice) can be complex. If it is a strong, evidence-aligned program, supports must be in place for a teacher to use the program with integrity; this is not the same as fidelity. Fidelity implies that we use the program with the focus on the program itself; integrity means we use the program to serve the needs of our students. An example of the difference might be a teacher reading through the "script" of a lesson verbatim vs. a teacher pausing for student response and sensing when to repeat or review a concept—in the moment—based on that student response. Ensuring that teachers have all the tools and resources they need to deliver instruction with integrity is challenging—especially on a large scale. But this is one of the primary reasons implementations "fall short," or that student outcomes are not what we want them to be.

## Bridging the gap

We can bridge this gap by adopting high-quality instructional resources and equipping teachers through professional learning. The goal is for all educators to be provided with consistent, high-quality professional learning experiences—every teacher is a reading teacher—to ensure we teach with integrity, and with students always at the center of instruction. Teachers are incredibly busy. They need support. With professional learning, teachers can fill their own foundational literacy knowledge gaps. With coaching, lesson structure and pace, as well as instructional dialogue, can be modeled so that teachers can see how all the lesson components fit together and can be delivered with integrity.

3

# Putting sustainability at risk with too many initiatives

Implementation science guides literacy leaders to begin with a vision, and then—to hold, protect, and realize that vision. When schools or districts jump from initiative to initiative without allowing sufficient time for deep implementation, programs fail to take root and produce lasting change. Implementation done with full integrity often takes years, and requires our full attention, yet many schools abandon efforts after just one or two years when they don't see immediate results. And when the initiative is focused on literacy for all, we cannot afford to just "move on" to the next shiny thing; if we don't get literacy right, we don't get anything right.

## Bridging the gap

Leaders who are knowledgeable about implementation science build the scaffolding and support needed to sustain their vision over time. Literacy leaders need long-term commitment and strategic patience. They must communicate realistic timelines to all invested parties and *resist the pressure to chase the latest trends.* With implementation science knowledge, leaders can anticipate challenges, plan for multi-year rollouts, and maintain focus on their core literacy vision—ensuring that vision remains at the forefront of all decisions and actions throughout the extended implementation process.

4

# Struggling to scale as a system—Moving from isolated success without intentional scaling strategies

Literacy success in one classroom or grade level is exciting. . . but how do we scale that to an entire school? Literacy success in one school is thrilling…but how do we ensure literacy growth and success across an entire district? When individuals achieve remarkable results but colleagues continue to struggle, the system as a whole fails to serve all students equitably. Without intentional scaling strategies, successful practices remain isolated and cannot create the widespread impact needed for systemic change.

## Bridging the gap

Districts must establish coherent systems that ensure consistent, high-quality literacy instruction across all schools and grade levels. Scaling requires deliberate infrastructure and alignment. Districts need explicit instruction on skills using a specific scope and sequence that creates consistency across classrooms. They must embed systems that help to scale, including centralized places to track and store student data where it remains visible to all invested parties—teachers, administrators, and support staff. Most critically, districts must invest in resources and establish routines that are aligned across grades and tiers of instruction, ensuring that successful implementation can be replicated and sustained at every school, transforming isolated islands of excellence into a comprehensive system of literacy success. We want to be able to guarantee to our communities that regardless of the teacher or the school, all our students are getting an equitable, high-quality education. All means all.

5

# Isolating administrators in management tasks and neglecting leadership growth

Administrators' time is often consumed in day-to-day school management, and while they are surrounded by humans all day long, it can create a sense of isolation as a leader. In this next iteration of the science of reading, let's build on what leaders need to know and do to examine leadership growth itself. Literacy initiatives may have all the right ingredients in place, but it is a true leader who provides the momentum for literacy transformation to happen and sustain across a system.

## Bridging the gap

Leaders need to invest in leadership growth. When leaders engage in their own leadership growth—for example, increasing self awareness, practicing emotional intelligence, and improving communication—they can move from simply managing programs to inspiring and sustaining the deep cultural shifts that ensure every student achieves literacy success.

Literacy leaders Terrie Noland and Danielle Thompson share their wisdom on the importance of aligned systems to literacy breakthroughs.

# Literacy breakthroughs begin when leaders align systems

Danielle M. Thompson, PhD, CCC-SLP

Terrie Noland, PhD, CALT

## Everyone is a systems-shaping leader

When we think about literacy breakthroughs, we often imagine extraordinary individuals: visionary superintendents, transformational principals, or master teachers. History and our lived experience reveal a more hopeful truth: sustainable breakthroughs are born when individuals team together as leaders who know how to build, align, and act as a system.

Over time, we've learned that reaching and sustaining consistent, high-level outcomes *requires leadership beyond position or title.* It is a responsibility shared by all educators, coaches, administrators, and leaders who influence the literacy learning experiences of children.

It is in the expansion of our definition of leadership that we unlock a collective potential and a new way of being. And, we believe that when this collective potential is rooted in systems thinking, it becomes something greater: a unified group whose leadership creates generative, life-giving spaces where ideas can take hold and transform thinking—ultimately transforming lives.

## Systems thinking as the foundation

*Don't chase easy. Chase alignment.*

At the heart of every literacy breakthrough lies systems thinking, a shift from linear to circular thinking that recognizes everything is interconnected. From a child born in a hospital, to loving and language-rich family inputs, to well-funded and supported early learning centers, to schools humming with evidence-based practices with community partners, to productive, engaged citizens, none can be accomplished without the others.

Interdependence is not abstract; it is the lived reality of how literacy develops across a lifespan. As the pace quickens towards AI-human integrated systems, understanding this interconnectedness won't be optional; it's the foundation for sustained success.

As Donella Meadows observed, "We can't impose our will on a system. We can listen to what the system tells us, and discover how its properties and our values can work together to bring forth something much better than could ever be produced by our will alone." Literacy leadership, then, is not command-and-control; it is listening, aligning, and shaping conditions so the collective can produce outcomes greater than the sum of its parts.

Peter Senge's *The Fifth Discipline* reinforced this truth: every element belongs to a larger system. In literacy, no single educator, program, or practice can succeed in isolation.

As leaders, we must recognize that systems, best viewed through data, may demonstrate intelligence or ignorance. *Systems Ignorance* occurs when the complex interplay between humans, curriculum, instruction, assessment, and support is overlooked, resulting in oversimplified solutions that fail to meet expectations. This could look like a child being assessed, yet the data is ignored, and the student is placed in the existing curriculum, missing the chance for targeted, data-driven support.

In contrast, leadership using *Systems Intelligence* is leadership at its best: listening deeply, aligning with evidence, and drawing on cognitive, emotional, and social skills to see the whole picture, diagnose

misalignments, and take purposeful action to bring the system back into sync. This could be a child being assessed, given further diagnostics, and placed into an instructional setting that is targeted and prescriptive.

Once leaders learn to navigate Systems Ignorance and Intelligence, they begin to use a next-level skill, *Systems Intuition*: the ability to sense where components interact and anticipate how shifts in one area ripple across the entire system. Leaders with this skill detect signs of misalignment, spot opportunities for innovation, and design changes that reinforce rather than disrupt progress. They also highlight positive systems in action, such as effective whole or small group literacy protocols or innovations, and model collaboration across silos.

*Alignment is the catalyst for transformation.*

When systems 'talk' to each other—linking professional learning, coaching, hiring, resource allocation, and data—new actions emerge and systems evolve. Misalignment, on the other hand, means recognizing student gaps but failing to take the leadership actions needed to close them.

Effective literacy leaders lean on Systems Intuition to:

- Diagnose breakdowns.
- Applaud and amplify systems that consistently produce positive outcomes.
- Anticipate ripple effects of new initiatives.
- Build connective tissue between people, processes, and resources.

They prioritize ongoing training, evidence-based practices, resource coherence, and intentional hiring, all to ensure that every part of the system supports student growth.

The takeaway is clear: Sustainable literacy success doesn't come from chasing shortcuts and defaulting to what is easy and convenient. It stems from chasing alignment, developing systems that reinforce one another, cultivating leaders with systems intelligence and intuition, and continually evolving those systems to meet the needs of all students.

## Systems thinking without teaming is a null concept

The best systems will collapse without effective teaming. Structures alone do not move mountains; people working together do.

Teaming and collaboration are critical leadership levers in a Multi-Tiered System of Support, and Dr. George Batsche's work at the University of South Florida shows that when educators engage in authentic problem-solving processes together, the impact on student outcomes can reach an effect size as high as 1.78, making it one of the strongest predictors of organizational success.

In education, this impact is especially critical in large districts, where multiple layers of teaming must function in sync: teacher teams, grade-level teams, leadership teams, and district collaboratives. The bold leader move is to ensure that the time is dedicated and teams are established to engage in this problem-solving process.

When teaming is embedded into systems thinking, collective intelligence multiplies. A single teacher's expertise in phonics can spark a school-wide breakthrough. District innovations emerge not from a single voice, but from many voices aligned around a shared mission. Protocols are agreed upon and followed, data is discussed, grouping is responsive, and instruction adapts to student needs.

Teams will be the ones that create solutions to scheduling, solve instruction and curriculum alignment, build trust and cohesion, and discuss each child they interact with, to problem solve the best instructional pathway for that child.

The message is clear: Systems thinking requires teaming, and teaming requires intentional leadership.

## Leaving room for innovation

One of the biggest misconceptions about systems is that they must be rigid, unchanging frameworks that apply carte blanche to every situation in every room. In reality, no system is permanent or fixed. Different grade levels may have varying MTSS protocols, depending on the needs of students and the teachers' knowledge. The most effective literacy leaders design systems that are strong AND flexible—strong enough to provide clarity and consistency, yet flexible enough to leave room for innovation.

- Teacher leaders: Instruction and curriculum are systems in themselves. Teacher leaders innovate when they adapt lessons based on evidence, integrate new insights from the science of reading, and create learning environments responsive to their students' needs.
- Building leaders: Principals and administrators innovate when they align schedules, resources, and professional learning in ways that give teachers agency plus room to experiment and grow.

Leaders who invite innovation cultivate a culture of possibility rather than compliance.

## The hallmark of a literacy leader lives in duality

Great literacy leadership is defined by a delicate duality: systems that produce positive results and an energetic and loving culture. Both are essential, and neither can stand alone.

*Consider this:* A district may have beautifully laminated MTSS posters, detailed teaming protocols, and well-designed professional learning plans. Yet, if the culture is marked by fear, mistrust, or burnout, the systems will crumble.

The true hallmark of literacy leadership is ensuring that systems serve people, not the other way around. Leaders must cultivate cultures of trust, respect, joy, and love. When students feel seen, teachers feel valued, and teams feel united, then systems can thrive.

At the same time, a great culture without results from the system is not leadership. Leaders must hold themselves accountable for outcomes. Great cultures paired with stagnant results fail to serve children. The dual responsibility of literacy leadership is to foster thriving cultures and deliver measurable student progress.

## A greater calling

The call of Literacy Leadership challenges us to think bigger and lead bolder while having an unwavering commitment to continual growth. Literacy Leadership is not about perfection; it is about progress through alignment, knowledge, and inspiration.

The future belongs to leaders who understand that:

- Every teacher, coach, and administrator is a leader seeking opportunities for growth.
- Systems thinking transforms quick fixes into lasting change.
- Teaming is not optional; it is essential.
- Innovation requires both stability and flexibility.
- Culture fuels systems, and results must always honor students.

Let us step into this work with optimism.

Let us commit to leading with courage and compassion.

And let us remember that every scalable literacy breakthrough begins with leaders who align systems.

Don't wait for it to be easy.
What transforms us rarely is.

# The future of education in the world of technology

There is no doubt that the educational landscape is rapidly evolving—with key technologies reshaping how we approach teaching, assessment, and the educational experience for our students. Today, artificial intelligence and machine learning can help us personalize learning, adapting content difficulty and pace to individual student needs; tutoring systems can be used to provide support and immediate feedback; teachers can take advantage of automated grading to streamline assessments; and predictive analytics can identify at-risk students for early intervention.

Virtual and augmented reality allow immersive learning experiences where students can explore ancient Rome or manipulate molecular structures; remote field trips provide access to museums, historical sites, and global destinations. Innovative application design patterns improve accessibility and usability for Learning Management Systems, streamlining access to centralized learning hubs while analytics dashboards track student progress and engagement for 360 degree views of data in real-time for all invested parties supporting students.

Technologies that are continuing to emerge include virtual campuses, global collaboration platforms, and simulation-based learning. Smart classrooms provide automated lighting, temperature, and equipment management, attendance tracking, and interactive learning environments. Natural language processing technologies create more sophisticated, conversational AI tutors for student support, access to real-time feedback and practice in language learning, and automated evaluation of writing quality.

Microlearning and just-in-time learning can provide teachers with short, focused professional learning modules to accommodate their busy

schedules. Lesson integration can provide learning resources exactly when needed.

All of this sounds incredibly helpful and exciting, but these are not without limitations. Data protection, student privacy, AI bias, and digital access disparities must be addressed. There are implementation challenges with teacher training, infrastructure requirements, budgets, and change management. A tension exists between proven resources and instructional pedagogy and the personalized student experiences through AI that are more experimental than proven. Future developments in advanced AI must be viewed through an ethical lens.

What does this mean for literacy? Successfully using these technologies—and many others that haven't yet been envisioned—depends on thoughtful integration that prioritizes pedagogical effectiveness over technological novelty, ensuring that these tools genuinely enhance learning outcomes rather than simply digitize old methods. Without question, these technologies have the potential to change the educational experience for students and to enhance teachers' professional lives, but the key is finding the right balance between technological innovation and proven educational principles—like those informed by the dynamic body of science-of-reading research. Most importantly, we must consider the impact of technology in our young learners' development, ever mindful that nothing can replace a skilled teacher who builds relationships with her students and provides thoughtful, intentional instruction within a deep human connection.

# Joy follows accessibility

# The joy of reading

There has been some criticism over the last few years about the focus on explicit, structured literacy instruction as "skill and drill."

"What about the love of reading?"

"What about using literature rich with nuanced vocabulary and a depth to characters designed to elicit emotion and provoke thought?"

"Don't we want our children to experience the magic of reading?"

"Aren't these things important?"

The answer is that it is not a dichotomy. It's not a "this OR that."

It's more like: Yes...And.

## Yes...

The reasons we read are as varied as the people we are, and Joy is chief among those reasons. Joyful reading—without a single doubt—has the power to change the life of a reader. We want our students to love reading and be lifelong readers in love with books.

## And.

The part that must be acknowledged is that in order for every child to have the opportunity to find joy in the books they read, they first must have access to the books they read. For the vast majority of humans, this requires instruction, and for us to cast the widest net around our young learners, instruction that is explicit, systematic, differentiated, evidence-aligned—including the development of oral language—is necessary. Without this, we are putting many of our children at risk to never be able to truly read for joy.

## And.

While students are beginning on their journey to being readers, they must be afforded the right instruction at the right time, acknowledging for some students this will not be easy. This is where the art and science of teaching are on full display! We want to provide them with the tools to unlock literacy as well as plentiful opportunities to practice, as they experience incremental steps of success and develop their reading stamina to persevere through challenges.

## And.

Rich literature and sophisticated content are always prominent and integrated in every classroom at every level, first as read-alouds, to surround our students with language and concepts while laying the blueprint for comprehension that will become their own as they build competence and confidence as readers.

## And.

Lastly and most importantly, we must acknowledge that reading is a human right that can and must be guaranteed to ALL of our students.

We want all students to know that they have access to the "magic" of reading. Because for so many children, it does feel like magic.

But the true power lies in the fact that we know—without a doubt—that it's not magic.

## It's hard work.

It's hard work on your part as educators—armed with evolving science, dedication to your profession, perseverance and resilience, collaboration with colleagues and community, relentless curiosity, and devotion to your students.

Make no mistake, this is hard work, but it is the work of utmost urgency and profound importance.

Never forget that.

And never forget that you are deeply appreciated, every day.

Thank you.

“

. . . we must always keep our eyes on the true prize: deep reading and deep thinking—they are each other’s isotope.. . . Deep reading includes analogical processes that link background knowledge to the new text; perspective-taking that builds empathy; inferential skills that build discernment; critical analysis that builds a foundation for insight and the evaluation of truth (never more important in our age’s bombardment of dis- and mis-information); and the contemplative or reflective processes that build an interior space for the reader’s best thoughts, sometimes novel, sometimes empowering, often generative, always contributing to deep thinking in an age where that goes missing.”

**MARYANNE WOLF**
The Courage to Lead Literacy, 2024

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I also want to give a huge shout out to the dream team in editorial and design, including Meredith Cooley and Mickaela Morgado, for all they have done over these past few months to make this book come to life. Thank you all for your support (and patience).

I am truly humbled by and grateful for the experts who contributed to this book. The work they have put into the world has enriched our community greatly, expanded our thinking, and they model the ideals of ongoing learning and inquiry that inspire all of us every day.

As I reflect on my long and winding career, I am proud to be in the education profession and it has always been my desire to serve my fellow educators. It is my dearest hope that this book will be part of that service.

Thank you to teachers everywhere for all you do, every day.

# Author Bios

## Danielle M. Thompson, PhD, CCC-SLP

Danielle "Nell" Thompson, PhD, CCC-SLP, is a nationally recognized literacy leader, leadership coach, and founder of The Transformative Reading Teacher Group and The Big Sky Literacy Summit. A Speech-Language Pathologist turned systems-change leader, she has served children and educators from Alaska to Mississippi, always guided by her belief that language is the foundation of learning, leadership, and human connection.

A former national LETRS trainer with a doctorate in literacy studies, Dr. Nell is also a certified John Maxwell Leadership Coach and High Performance Coach. As the volunteer president of The Reading League Montana, she leads with contagious energy and systems-level clarity, helping educators and leaders re-think, unlearn, and elevate their practices. Through her work, Dr. Nell inspires schools—and the people within them—to thrive, build culture, and unlock every learner's potential.

***A shift toward language as the foundation of reading** (11)*

***Literacy breakthroughs begin when leaders align systems** (120)*

## Maggie Snowling, CBE, FBA, FMedSci

Maggie Snowing, CBE, FBA, FMedSci served as President of St John's from 2012 to 2022, and is Professor Emerita in the Department of Experimental Psychology. She earned her psychology degree at Bristol and doctorate at University College London under Uta Frith's supervision, later qualifying as a clinical psychologist.

Previously Professor of Psychology at University of York, she co-directed the Centre for Reading and Language. She served as Past-President of the Society for the Scientific Study of Reading and Joint Editor of the Journal of Child Psychology and Psychiatry. Her advisory roles include Sir Jim Rose's Expert Advisory Group on Dyslexia (2009) and Education for All Fast Track Initiative (2011). She has advised government departments on early years education and specific learning difficulties.

Her accolades include Fellow of the British Academy and Academy of Medical Sciences, Member of the Reading Hall of Fame, and CBE for services to science and dyslexia understanding (2016). Her research focuses on children's reading difficulties and intervention efficacy.

***A shift toward language as the foundation of reading** (11)*

## Tiffany P. Hogan, PhD, CCC-SLP, FASHA, BCS-CL

Tiffany P. Hogan, PhD, CCC-SLP is a Professor in the Department of Communication Sciences and Disorders at MGH Institute of Health Professions in Boston, Director of the Speech and Language (SAiL) Literacy Lab and the Center for Translational Research: Implementation science, and Dissemination, (cTIDE), and Research Associate at Harvard Medical School. Dr. Hogan has published over 100 papers on the genetic, neurologic, and behavioral links between oral and written language development, with a focus on improving assessment and intervention in schools, especially for neurodiverse children with Developmental Language Disorder, Dyslexia, and/or Speech Sound Disorders. Her advocacy for children with language, speech, and literacy differences has led her to co-found a DLD informational website: www.dldandme.org, host a podcast (www.seehearspeakpodcast.com), organize an annual conference on implementation science, and contribute information for articles in numerous news outlets.

***The foundation of all literacy: How oral language shapes reading and writing** (14)*

## Ann Kaiser, PhD

Ann P. Kaiser is the Susan W. Gray Professor of Education and Human Development at Peabody College of Vanderbilt University. She is the author of 180 articles and chapters on language and behavior interventions for young children. She is the primary developer of Enhanced Milieu Teaching, a naturalistic early communication intervention and the co-developer of Toddler Talk, a Tier 1 language and social emotional development model for teachers of young children. Her research has been funded by the National Institutes of Health and the US Department of Education. She has contributed more than 30 empirical studies investigating the effects of naturalistic interventions provided by parents and teachers on language development of English and Spanish speaking children. She has received numerous awards for her research including the American Psychological Association's Edgar Doll Award for Research in Intellectual Disabilities and the Council on Exceptional Children's J. E. Wallace Wallin Life-Time Achievement Award.

***Early language development is the foundation for later reading*** *(18)*

## Deborah R. Glaser, EdD

Deb Glaser, EdD, is a consultant, author, and teacher educator known for deepening teachers' understanding of reading and effective instruction. After her teaching career, she led educational programs for students and educators at the Lee Pesky Learning Center. A founding National LETRS trainer, she also serves as a policy advisor to the National Council on Teacher Quality and evaluates teacher preparation programs. Dr. Glaser has authored or co-authored five books, including N*ext STEPS*, *2nd Ed.*, *Morpheme Magic*, and *Morphemes for Little Ones*. She also created *The Reading Teacher's Top Ten Tools*, an online course now hosted by 95 Percent Group.

***The importance of morphology—what we need to know and what to do about it*** *(24)*

## Julie Van Dyke, PhD

Dr. Van Dyke holds a joint appointment as an Associate Research Professor at the Institute for Brain and Cognitive Sciences, University of Connecticut; Clinical Assistant Professor at the Yale Child Study Center; and Research Scientist at the Yale-UConn Haskins Global Literacy Hub. She is also the Inventor and Chief Scientist at Cascade Reading, a reading technology that provides in-the-moment visual scaffolding for reading comprehension. Previously, Dr. Van Dyke served as a Senior Scientist at Haskins Laboratories for 22 years, where she investigated the cognitive and neural basis of syntactic processing. Her deep dedication to improving reading outcomes for all children is fueled daily by her experience as the parent of a child with Dyslexia, Developmental Language Disability, Dyscalculia, ADHD, and Autism.

***The importance of syntax: Aligning classroom practice to comprehension processes*** *(28)*

## Lyn Stone

Lyn Stone is an educational linguist, author, and founder of Lifelong Literacy, an education coaching and training organisation.

Her work is guided by two central questions:
How are words built?
How do we remember them?

For more than three decades, she has created a substantial body of publications and resources exploring these questions. Through ongoing professional development and collaboration with educators worldwide, she continues to refine her practice and remain connected to classroom realities. This combination of scholarship and global connection informs the strategies she shares to foster linguistic curiosity, grounded in scientific consensus and best practice.

***The gift of writing: Small tweaks for big results*** *(35)*

## Trina Spencer, PhD, BCBA-D

Dr. Spencer is a senior scientist and director of the Juniper Gardens Children's Project at University of Kansas and a professor in the Department of Applied Behavioral Sciences. Drawing from various learning sciences and multiple disciplines (e.g., speech-language pathology, school psychology, and behavior analysis), she designs structured oral language instructional programs and assessment tools that help educators build strong oral language foundations of literacy in primary grades. Dr. Spencer's multi-tiered interventions and assessment tools are used broadly in the United States, but also internationally.

***Learning how learning works helps teachers teach*** *(48)*

## Ameer Baraka

Ameer Baraka is an Emmy-nominated actor, author, and dyslexia advocate who transformed his life from incarceration to inspiration. Born in New Orleans and diagnosed with dyslexia in prison, he overcame illiteracy and discovered the power of education. He currently stars as Jeremiah on BET's ZATIMA and has appeared in American Horror Story: Coven, Tales of the Walking Dead, and more. Author of *Undiagnosed: The Ugly Side of Dyslexia*, Ameer is a national voice for awareness, speaking at Harvard, testifying before the U.S. Senate, and mentoring at-risk youth. His work continues to prove that with support and determination, anyone can rewrite their story.

***On literacy as freedom*** *(56)*

## Jeanne Schopf, MEd, NBCT, C-SLDI

Jeanne Schopf, MEd, NBCT, C-SLDI, is a literacy expert, keynote speaker, and Certified Explicit Instruction Trainer of Trainers with 30+ years in K–12 education. A Literacy Coach, Reading Specialist, and Dyslexia Interventionist, she has led state and national literacy efforts while transforming instruction for students and educators. A Certified John Maxwell speaker, Jeanne delivers research-based professional development grounded in MTSS and the Science of Reading. She is founder of Pathways Towards Literacy and collaborates with The Reading League, CORE Learning, and others to equip educators with strategies that ensure all students receive high-quality reading instruction.

***The urgency of adolescent literacy: The evidence-based roadmap so ALL students can learn to read*** *(61)*

## Nancy Young, EdD

Dr. Nancy Young is a Canadian educational consultant specializing in literacy programming grounded in research. Her background includes over 40 years teaching/supporting a wide range of exceptionalities, including dyslexia and advanced/gifted. Nancy is the creator of *The Ladder of Reading & Writing©*, a widely recognized translational framework reflecting the variations of ease in skill mastery and implications for instruction. She is co-editor, with Dr. Jan Hasbrouck, of the book *Climbing THE LADDER OF READING & WRITING: Meeting the Needs of ALL Learners* (2024). Nancy presents internationally, advocating differentiated programming and multiage grouping to address the broad range of literacy needs.

***Bringing early advanced readers into the science of reading conversation*** *(67)*

## Antonio Fierro, EdD

Antonio A. Fierro, EdD, is the former vice president of professional learning and academics at 95 Percent Group and co-author of Kid Lips, a curriculum that teaches the articulatory features of English phonemes. For nearly 20 years, he was part of the national LETRS cohort of literacy consultants led by Dr. Louisa Moats. He has led numerous initiatives nationwide to improve instruction for English learners. Dr. Fierro currently serves on the national board of The Reading League and the advisory board for LETRS 3rd Edition. He is also a former Texas State Teacher of the Year.

***Amplifying language for all: Rethinking differentiation for English learners*** *(70)*

## Ramona Pittman, PhD

Dr. Ramona T. Pittman is an associate professor in the Department of Teaching, Learning and Culture at Texas A&M University. She has a BS and MEd degree in Elementary Education and a PhD in Curriculum and Instruction with an emphasis in Literacy. She has taught PK-12 and higher education for over 20 years. Her research interests include African American English and literacy, preservice and in-service teachers' knowledge, and literacy development especially in decoding and encoding (spelling), with the idea that each of these topics are intertwined to create equitable learning experiences for all students.

***All means all: Ensuring equity in the science of reading for African American English speakers*** *(75)*

## Brett Tingley, MBA, MS IOE

Brett Tingley empowers parents to advocate for effective literacy instruction in schools. Through her work as President of UA-KID, OH-KID, and Parents for Reading Justice, she mobilizes parents to demand change at the district, state, and national levels. Tingley's efforts have led to systemic reforms, including improved identification and support for dyslexic students. She also produces educational content, such as the documentary "Our Dyslexic Children" (over 200,000 views), a free online class to activate parents, and the podcast "Literacy Now," to further support parent advocacy and understanding of literacy issues. She is a National Council on Teacher Quality (NCTQ) Reading Fellow, a member of the Evidence Advocacy Center Parent Team, and an advisory board member of the International Dyslexia Association Central Ohio.

***Every child, every classroom: The parent movement for reading justice*** *(82)*

## Timothy Odegard, PhD

Dr. Tim Odegard is a nationally recognized leader in literacy and dyslexia. He holds the Katherine Davis Murfree Chair of Excellence in Dyslexic Studies at Middle Tennessee State University, where he has led major undergraduate and graduate program improvements to strengthen literacy and dyslexia preparation. Dr. Odegard was the lead author of an online course module on the science of reading and dyslexia, which has been adopted by universities and departments of education nationwide. He is also a contributing author of the International Dyslexia Association (IDA) Knowledge and Practice Standards and served on the IDA Educator Training Initiatives Committee, providing oversight for the accreditation of university programs.

***Higher education and the shift toward the science of reading*** *(89)*

## Amy M. Elleman, PhD

Dr. Amy Elleman is a former public educator and a national expert in reading comprehension, vocabulary development, and disciplinary literacy. She is the Director of the PhD in Literacy Studies program and former Chair of the Department of Elementary and Special Education at Middle Tennessee State University. Dr. Elleman has served as a CAEP accreditation site reviewer and has led programmatic redesigns to strengthen literacy training within educator preparation programs, including coursework aligned to accreditation standards and evidence-based practice.

***Higher education and the shift toward the science of reading*** *(89)*

## Louisa Moats, EdD

Louisa C. Moats has been a teacher, psychologist, researcher, graduate school faculty member, and author of many influential scientific journal articles, books, and policy papers on the topics of reading, spelling, language, and teacher preparation. After 15 years as a licensed psychologist specializing in evaluation and consultation with individuals who experienced reading, writing, and language difficulties, she served as a site director of the National Institute of Child Health and Human Development's Early Interventions Project. She has consulted with many states, districts, and organizations over her career. Her professional development program, LETRS, has been used to support several hundred thousand educators.

***Professional Development to Learn the "Rocket Science" of Reading*** *(95)*

## Terrie Noland, PhD, CALT

Terrie Noland, PhD, CALP, is an education leader dedicated to unlocking the potential of learners of all ages. A former educator, school leader, and nonprofit executive, she is a dynamic keynote speaker and certified Maxwell Leadership coach. She holds a doctorate in Literacy and Educational Leadership and is known for her contagious energy and heartfelt storytelling. Dr. Noland believes great leaders cultivate success in others and strives to ignite motivation and purpose wherever she goes. When not mentoring emerging leaders or expanding her knowledge, she shares her vision of a world transformed by literacy and leadership.

***Literacy breakthroughs begin when leaders align systems*** *(120)*

# Sources


Adlof, S. M., and T. P. Hogan. 2018. "Understanding dyslexia in the context of developmental language disorders." *Language, Speech, and Hearing Services in Schools* 49 (4): 762–773.

Albert Shanker Institute. 2023. *Reading Reform Across America: A Survey of State Legislation.* https://www.shankerinstitute.org/read

American Institutes for Research. 2020. *MTSS Training Modules: Essential Components of MTSS.* Southeast Comprehensive Center. https://www.air.org/sites/default/files/downloads/report/SECC_MTSS_Training.pdf

Apel, K. 2017. "Morphological awareness development and assessment: What do we know?" *Perspectives on Language and Literacy* 43 (2): 11–16.

Apel, K., and E. Diehm. 2014. "Morphological awareness intervention for kindergarteners and first- and second-grade students from low SES homes: A small efficacy study." *Journal of Learning Disabilities* 47: 65–75.

Apel, K., D. Brimo, E. Diehm, and L. Apel. 2012. "Morphological awareness intervention with kindergarteners and first- and second-grade students from low socioeconomic status homes: A feasibility study." *Language, Speech, and Hearing Services in Schools* 44: 161–173.

Apel, K., E. B. Wilson-Fowler, D. Brimo, and N. A. Perrin. 2012. "Metalinguistic contributions to reading and spelling in second and third grade students." *Reading and Writing* 25: 1283–1305.

Apel, K., J. Lawrence. 2011. "Contributions of morphological awareness skills to word-level reading and spelling in first-grade children with and without speech sound disorder." *Journal of Speech, Language, and Hearing Research* 54 (5): 1312–1327.

Apel, K., V. S. Henbest, and Y. Petscher. 2021. "Morphological awareness performance profiles of first- through sixth-grade students." *Journal of Speech, Language, and Hearing Research*.

Asher, J. J. 1993. *Learning Another Language Through Actions*. https://ci.nii.ac.jp/ncid/BB10696321

Ashby, J. 2010. "Phonology is fundamental in skilled reading: Evidence from ERPs." *Psychonomic Bulletin & Review* 17 (1): 95–100.

Baker-Bell, A. 2020. *Linguistic Justice: Black Language, Literacy, Identity, and Pedagogy.* Routledge.

Berninger, V. W., K. Vaughan, R. D. Abbott, K. Begay, K. Byrd Coleman, G. Curtin, J. M. Hawkins, and S. Graham. 2002. "Teaching spelling and composition alone and together: Implications for the simple view of writing." *Journal of Educational Psychology* 94 (2): 291–304.

Bowers, J. S., and J. R. Kirby. 2024. "The effects of morphological instruction on literacy outcomes: A meta-analysis." E*ducational Psychology Review* 36: 89–117.

Bowers, P. N., J. R. Kirby, and S. H. Deacon. 2010. "The effects of morphological instruction on literacy skills: A synthesis of the literature." *Review of Educational Research* 80: 144–179.

Breen, M. 2025. "Using prosodic production to support reading comprehension." *Perspectives on Language and Literacy* 51 (2): 20.

Breen, M., J. Van Dyke, J. Krivokapić, and N. Landi. 2024. "Prosodic features in production reflect reading comprehension skill in high school students." *Journal of Experimental Psychology: Learning, Memory, and Cognition*.

Buggy, R., and B. Dillon. 2025. "The science of syntax and predictability." *Perspectives on Language and Literacy* 51 (2): 12.

Capin, P., D. Telfer, S. Giammarco, et al. 2025. "Uniting for literacy progress: Ohio's systems approach to preparing and supporting P20 educators to teach all children to read well." *Annals of Dyslexia.* https://doi.org/10.1007/s11881-025-00350-1

Charity Hudley, A. H., and C. Mallinson. 2014. *We Do Language: English Language Variation in the Secondary English Classroom*. Teachers College Press.

Colangelo, N., S. Assouline, and M. Gross. 2004. *A Nation Deceived: How Schools Hold Back America's Brightest Students.* Center for Gifted Education and Talent Development.

Comrie, B. 1989. *Language Universals and Linguistic Typology: Syntax and Morphology.* University of Chicago Press.

Costa, A. L., and R. J. Garmston. 2016. *Cognitive Coaching: Developing Self-Directed Leaders and Learners*. 3rd ed. Rowman & Littlefield.

Darling-Hammond, L., M. E. Hyler, and M. Gardner. 2017. *Effective Teacher Professional Development.* Palo Alto, CA: Learning Policy Institute. https://learningpolicyinstitute.org/product/teacher-prof-dev

Deans for Impact. 2015. *The Science of Learning.* Austin, TX: Deans for Impact.

Dehaene, S. 2009. *Reading in the Brain*. New York: Viking.

Dehaene, S. 2021. *How We Learn: Why Brains Learn Better Than Any Machine . . . for Now.* New York: Penguin Books.

Dempsey, J., K. Christianson, and J. A. Van Dyke. 2025. "Eye-tracking evidence for benefits from linguistically driven text formatting while reading." *Reading and Writing.*

Eberhardt, N. C., and M. Gillis. 2025a. "Teaching syntax: What teachers are asking, part 1." *Perspectives on Language and Literacy* 51 (1): 38.

Eberhardt, N. C., and M. Gillis. 2025b. "Teaching syntax: What teachers are asking, part 2." *Perspectives on Language and Literacy* 51 (2): 24.

Eccles, M. P., and B. S. Mittman. 2006. "Welcome to implementation science." *Implementation Science* 1 (1). https://doi.org/10.1186/1748-5908-1-1

Eden, G. F., K. M. Jones, K. Cappell, L. Gareau, F. B. Wood, T. A. Zeffiro, … and D. L. Flowers. 2004. "Neural changes following remediation in adult developmental dyslexia." *Neuron* 44 (3): 411–422.

Edmentum Inc. 2025. *Putting Legislative Policy Into Practice: Achieve Schoolwide Success With the Science of Reading.* https://www.edmentum.com/articles/from-policy-to-practice-achieve-schoolwide-success-with-the-science-of-reading/

Ehri, L. C., and M. Snowling. 2004. "Developmental variation in word recognition." *In Handbook of Language and Literacy: Development and Disorders*, edited by A. C. Stone, E. R. Silliman, B. J. Ehren, and K. Apel, 443–460. New York: Guilford Press.

Eunice Kennedy Shriver National Institute of Child Health and Human Development. 2010. *Developing Early Literacy: Executive Summary of the National Early Literacy Panel*. Washington, DC: U.S. Government Printing Office.

Friederici, A. D. 2002. "Towards a neural basis of auditory sentence processing." *Trends in Cognitive Sciences* 6 (2): 78–84.

Gillis, M., and N. C. Eberhardt. 2017. *Syntax Knowledge to Practice.* Literacy How Professional Learning Series. Independently published..

Goodwin, A. P., and S. Ahn. 2013. "A meta-analysis of morphological interventions in English: Effects on literacy outcomes for school-age children." *Scientific Studies of Reading* 17 (4): 257–285.

Gough, P. B., and W. E. Tunmer. 1986. "Decoding, reading, and reading disability." *Remedial and Special Education* 7 (1): 6–10. https://doi.org/10.1177/074193258600700104

Green, L. J. 2002. *African American English: A Linguistic Introduction.* Cambridge University Press.

Green, L. J. 2011. *Language and the African American Child.* Cambridge University Press.

Hawkins, J. A. 1994. *A Performance Theory of Order and Constituency.* Cambridge University Press.

Hernandez, D. J. 2011. *Double Jeopardy: How Third-Grade Reading Skills and Poverty Influence High School Graduation.* The Annie E. Casey Foundation.

Hogan, T. P. 2025. "Picture it: Systemic support for children with DLD." *The ASHA Leader* 30 (9): 26–27. https://leader.pubs.asha.org

Hogan, T. P., and J. A. Van Dyke. 2025. "Developmental Language Disorder (DLD): Syntactic processing difficulties are a key factor." *Perspectives on Language and Literacy* 51 (1): 44.

Hulme, C., H. M. Nash, D. Gooch, A. Lervåg, and M. J. Snowling. 2015. "The foundations of literacy development in children at familial risk of dyslexia." *Psychological Science* 26 (12): 1877–1886. https://doi.org/10.1177/0956797615603702

Hulme, C., G. West, M. Rios Diaz, S. Hearne, C. Korell, M. Duta, and M. J. Snowling. 2025. "The Nuffield Early Language Intervention (NELI) programme is associated with lasting improvements in children's language and reading skills." *Journal of Child Psychology and Psychiatry.* https://doi.org/10.1111/jcpp.14157

Institute of Education Sciences. 2008. *Improving Adolescent Literacy: Effective Classroom and Intervention Practices.* U.S. Department of Education.

International Dyslexia Association. 2018. *Knowledge and Practice Standards for Teachers of Reading* (2nd ed.). https://or.dyslexiaida.org/wp-content/uploads/sites/20/2018/10/ida-standards2018.pdf

J. Rothwell. 2020. *Assessing the Economic Gains of Eradicating Illiteracy Nationally and Regionally in the United States.* Gallup, Inc. https://www.barbarabush.org/wp-content/uploads/2020/09/BBFoundation_GainsFromEradicatingIlliteracy_9_8.pdf

Kehoe, K. F., K. Schrodt, and T. N. Odegard. 2025. "Implementation of an online module to prepare pre-service teachers to serve students with dyslexia: A case study." *Annals of Dyslexia.*

Kim, Y. G. 2020. "Toward integrative reading science: The direct and indirect effects model of reading." *Journal of Learning Disabilities* 53 (6): 469–491. https://doi.org/10.1177/0022219420908239

Kirby, J. R., S. H. Deacon, P. N. Bowers, L. Izenberg, L. Wade-Woolley, and R. Parrila. 2012. "Children's morphological awareness and reading ability." *Reading and Writing: An Interdisciplinary Journal* 25: 389–410.

Language and Reading Research Consortium, and Y. D. Chiu. 2018. "The simple view of reading across development: Prediction of grade 3 reading comprehension from prekindergarten skills." *Remedial and Special Education* 39 (5): 289–303. https://doi.org/10.1177/0741932518762055

Levy, R. 2008. "Expectation-based syntactic comprehension." *Cognition* 106 (3): 1126–1177.

Linguistic Society of America. 1997. *Resolution on the Oakland "Ebonics" Issue Unanimously Adopted at the Annual Meeting of the Linguistic Society of America, Chicago, IL.* https://websites.umich.edu/~jlawler/ebonics.lsa.html#top

Logan, J. A. R., L. M. Justice, M. Yumuş, and L. J. Chaparro-Moreno. 2019. "When children are not read to at home: The million word gap." *Journal of Developmental & Behavioral Pediatrics* 40 (5): 383–386. https://doi.org/10.1097/dbp.0000000000000657

Lyon, R. G. 2001. "The research we need to guide our efforts to ensure that all children can read." National Institute of Child Health and Human Development.

MacDonald, M. C. 2025. "Book language: What it is, how children can 'get it.'" *Perspectives on Language and Literacy* 51 (2): 16.

Mariani, B., G. Nicoletti, G. Barzon, M. C. O. Barajas, M. Shukla, R. Guevara, S. S. Suweis, and J. Gervain. 2023. "Prenatal experience with language shapes the brain." *Science Advances* 9 (47). https://doi.org/10.1126/sciadv.adj3524

McKinsey & Company. 2024. *Spark & Sustain: How All of the World's School Systems Can Improve Learning at Scale.* https://www.mckinsey.com/industries/education/our-insights/spark-and-sustain-how-school-systems-can-improve-learning-at-scale

Meadows, D. H. 2008. *Thinking in Systems: A Primer.* Edited by D. Wright. Chelsea Green Publishing.

Mesmer, H. A. E. 2020. "'Decodable' Books: Boring, Useful, or Both?" *Education Week,* March. https://www.edweek.org/teaching-learning/decodable-books-boring-useful-or-both/2020/03

Metz, M. 2018. "Challenges of confronting dominant language ideologies in the high school English classroom." *Research in the Teaching of English* 52 (4): 455–477.

Miller, J., and P. J. Schwanenflugel. 2006. "Prosody of syntactically complex sentences in the oral reading of young children." *Journal of Educational Psychology* 98 (4): 839.

Miller, J., and P. J. Schwanenflugel. 2008. "A longitudinal study of the development of reading prosody as a dimension of oral reading fluency in early elementary school children." *Reading Research Quarterly* 43 (4): 336–354.

Minai, U., K. Gustafson, R. Fiorentino, A. Jongman, and J. Sereno. 2017. "Fetal rhythm-based language discrimination: A biomagnetometry study." *NeuroReport* 28 (10): 561–564. https://doi.org/10.1097/WNR.0000000000000794

Moats, L. C. 1999. *Teaching Reading Is Rocket Science: What Expert Teachers of Reading Should Know and Be Able to Do.* Washington, DC: American Federation of Teachers. https://www.aft.org/sites/default/files/moats.pdf

Moats, L. C. 2020. Speech to Print: Language Essentials for Teachers (3rd ed.). Brookes Publishing. https://products.brookespublishing.com/Speech-to-Print-P1167.aspx

Nation, K. 2009. "Form-meaning links in the development of visual word recognition." Philosophical transactions of the Royal Society of London. Series B, Biological Sciences 364 (1536): 3665–3674. https://doi.org/10.1098/rstb.2009.0119

Nation, K., N. J. Dawson, and Y. Hsiao. 2022. "Book language and its implications for children's language, literacy, and development." *Current Directions in Psychological Science* 31 (4): 375–380.

National Center for Education Statistics. 2019. *The Nation's Report Card: Reading 2019 (NCES 2020-018)*. https://www.nationsreportcard.gov/highlights/reading/2019/

National Center for Education Statistics. 2024. *The Nation's Report Card: 2024 Reading Assessment*. https://www.nationsreportcard.gov

National Center for Education Statistics. 2025. *The Nation's Report Card: Reading Results for Grades 4 and 8.* https://www.nationsreportcard.gov/reports/reading/2024/g4_8/?grade=4

National Council on Teacher Quality. 2023. *Teacher Prep Review: Strengthening Elementary Reading Instruction.* https://www.nctq.org/research-insights/teacher-prep-review-strengthening-elementary-reading-instruction

National Institute for Literacy. 2008. *The State of Adult Literacy in America: A National Perspective.* U.S. Department of Education.

Odegard, T. N., M. Gierka, and N. Ormandy. 2025. "Reframing dyslexia: Language and linguistic complexity, developmental risk, and the future of science of reading policy." *Annals of Dyslexia.* https://doi.org/10.1007/s11881-025-00344-z

Odegard, T. N., C. Hall, and K. Kloberdanz. 2025. "Literacy legislation in practice: Implementation, impact, and emerging lessons." *Annals of Dyslexia.*

Paige, D. D., T. Rasinski, T. Magpuri-Lavell, and G. S. Smith. 2014. "Interpreting the relationships among prosody, automaticity, accuracy, and silent reading comprehension in secondary students." *Journal of Literacy Research* 46 (2): 123–156.

Perfetti, C. 2007. "Reading ability: Lexical quality to comprehension." *Scientific Studies of Reading* 11 (4): 357–383.

Petscher, Y., S. Q. Cabell, H. W. Catts, D. L. Compton, B. R. Foorman, S. A. Hart, C. J. Lonigan, B. M. Phillips, C. Schatschneider, L. M. Steacy, N. P. Terry, and R. K. Wagner. 2020. "How the science of reading informs 21st-century education." *Reading Research Quarterly* 55 (1): 267–S282. https://doi.org/10.1002/rrq.352

Pittman, R. T., M. Rice, E. Garza, and M. J. Guerra. 2023. "The importance of phonemic awareness instruction for African American students." *The Reading League Journal* 4 (5): 27–32.

Pittman, R. T., L. O'Neal, K. Wright, and B. R. White. 2024a. "Elevating students' oral and written language: Empowering African American students through language." *Education Sciences* 14 (11): 1191. https://doi.org/10.3390/educsci14111191

Pittman, R. T., R. E. Piper, W. McCoy, and M. Alanis. 2024c. "African American language in children's literature." *Journal of Literacy Research* 56 (2): 157–183. https://doi.org/10.1177/1086296X241244702

Pollatsek, A. 2015. "The role of sound in silent reading." *In The Oxford Handbook of Reading*, edited by A. Pollatsek and R. Treiman, 185–201. Oxford University Press.

Privitera, A. J., S. H. S. Ng, and S. H. A. Chen. 2023. "Defining the Science of Learning: A scoping review." *Trends in Neuroscience and Education* 32: 100206. https://doi.org/10.1016/j.tine.2023.100206

Rayner, K., T. J. Slattery, D. Drieghe, and S. P. Liversedge. 2011. "Eye movements and word skipping during reading: Effects of word length and predictability." *Journal of Experimental Psychology: Human Perception and Performance* 37 (2): 514.

Reed, D. K., and H. Zhang. 2025. "The impact of teacher professional development on the grade 3 reading performance of students with characteristics of dyslexia." *Annals of Dyslexia.* https://doi.org/10.1007/s11881-025-00338-x

Richards, T. L., and V. W. Berninger. 2008. "Abnormal fMRI connectivity in children with dyslexia during a phoneme task: Before but not after treatment." *Journal of Neurolinguistics* 21 (4): 294–304.

Rickford, J. R. 1999. *African American Vernacular English: Features, Evolution, Educational Implications.* Blackwell.

Roland, D., F. Dick, and J. L. Elman. 2007. "Frequency of basic English grammatical structures: A corpus analysis." *Journal of Memory and Language* 57 (3): 348–379.

Rosenshine, B., and International Academy of Education. 2012. *Principles of Instruction.* American Educator, Spring. https://files.eric.ed.gov/fulltext/EJ971753.pdf

Sawchuk, S. 2024. "The science of reading in 2024: Five state initiatives to watch." *Education Week*, January 3. https://www.edweek.org/teaching-learning/the-science-of-reading-in-2024-5-state-initiatives-to-watch/2024/01

Science of Reading: Defining Guide. 2021. *The Reading League.* https://www.thereadingleague.org/wp-content/uploads/2022/01/Science_of_Reading_Defining_Guide_eBook.pdf

Schoolin' Around. 2024. "MTSS is not another thing, but THE Thing — Live podcast with Dr. George Batsche and Dr. Judy Elliott." *Schoolin' Around Podcast*, February 6. https://podcasts.apple.com/us/podcast/mtss-is-not-another-thing-but-the-thing-live-podcast/id1653176434?i=1000644331074

Senge, P. M. 2006. *The Fifth Discipline: The Art and Practice of the Learning Organization* (Rev. ed.). Doubleday.

Shanahan, T. 2025. *Leveled Reading, Leveled Lives: How Students' Reading Achievement Has Been Held Back and What We Can Do About It.* Harvard Education Press.

Shanahan, T., National Early Literacy Panel, National Center for Family Literacy, and U.S. Department of Health and Human Services. 2008. D*eveloping Early Literacy: Report of the National Early Literacy Panel.* https://www.nichd.nih.gov/sites/default/files/publications/pubs/documents/NELPReport09.pdf

Shaywitz, B. A., S. E. Shaywitz, B. A. Blachman, K. R. Pugh, R. K. Fulbright, P. Skudlarski, and J. C. Gore. 2004. "Development of left occipitotemporal systems for skilled reading in children after a phonologically-based intervention." *Biological Psychiatry* 55 (9): 926–933.

Simos, P. G., J. M. Fletcher, S. Sarkari, R. L. Billingsley, C. Denton, and A. C. Papanicolaou. 2007. "Altering the brain circuits for reading through intervention: A magnetic source imaging study." *Neuropsychology* 21 (4): 485.

Smitherman, G. 1977. *Talkin and Testifyin: The Language of Black America.* Houghton Mifflin.

Snowling, M. J., and C. Hulme. 2025. "The Reading Is Language (RIL) model: A theoretical framework for language and reading development and intervention." *Annual Review of Developmental Psychology* 7. https://doi.org/10.1146/annurev-devpsych-111323-084821

Snowling, M. J., H. M. Nash, D. C. Gooch, M. E. Hayiou-Thomas, C. Hulme, and the Wellcome Language and Reading Project Team. 2019. "Developmental outcomes for children at high risk of dyslexia and children with developmental language disorder." *Child Development* 90 (5): e548–e564. https://doi.org/10.1111/cdev.13216

Sweller, J. 2017. "Cognitive load theory." *Psychology of Learning and Motivation* 55: 37–76.

Temple, E., G. K. Deutsch, R. A. Poldrack, S. L. Miller, P. Tallal, M. M. Merzenich, and J. D. E. Gabrieli. 2003. "Neural deficits in children with dyslexia ameliorated by behavioral remediation: Evidence from functional MRI." *Proceedings of the National Academy of Sciences* 100 (5): 2860–2865. https://doi.org/10.1073/pnas.0030098100

The Reading League. 2022. *Science of Reading: Defining Guide*. https://www.thereadingleague.org

The Reading League. 2024. *The Reading League Compass: Science of Reading State Policy Map*. Syracuse, NY. https://www.thereadingleague.org/compass/policymakers-and-state-education-agencies

Thompson, D. M., N. Nelson, C. Hulme, M. J. Snowling, and T. P. Hogan. 2025. "From research to practice: The Nuffield Early Language Intervention's (NELI's) journey across the Atlantic." *In Advances in Learning and Behavioral Disorders: Case Studies of Research-Based Practice*, edited by B. Cook and T. Landrum, 113–129. Emerald Publishing.

Treiman, R., D. Berch, and S. Weatherston. 1993. "Children's use of phoneme-grapheme correspondences in spelling: Evidence from misspellings of digraphs." *Journal of Educational Psychology* 85 (4): 626–637. https://doi.org/10.1037/0022-0663.85.4.626

Treiman, R. 2017. "Learning to spell words: Findings, theories, and issues." *Scientific Studies of Reading* 21 (4): 265–276.

Treiman, R., and B. Kessler. 2014. *How Children Learn to Write Words*. Oxford University Press.

U.S. Department of Education. 2007. *The Condition of Education 2007* (NCES 2007-064). National Center for Education Statistics. https://nces.ed.gov/pubs2007/2007064.pdf

Van Dyke, J. A. 2025. "Language comprehension one word at a time." *Perspectives on Language and Literacy* 51 (1): 29.

Van Dyke, J. A., and J. Dempsey. 2025. "Linguistically-driven text formatting improves reading comprehension: Evidence from 4th and 5th graders." *Journal of Educational Psychology.*

Vaughn, S., and J. M. Fletcher. 2012. "Response to intervention with secondary school students." *In The Voice of Evidence in Reading Research*, edited by P. A. McCardle and V. Chhabra, 319–335. Brookes Publishing.

Vaughn, S., and J. Fletcher. 2021. "Three things we need to learn." *American Educator*, Winter 2020–2021.

Veenendaal, N. J., M. A. Groen, and L. Verhoeven. 2014. "The role of speech prosody and text reading prosody in children's reading comprehension." *British Journal of Educational Psychology* 84 (4): 521–536.

Wagner, M., and D. G. Watson. 2010. "Experimental and theoretical advances in prosody: A review." *Language and Cognitive Processes* 25 (7–9): 905–945.

Wolfram, W., and N. Schilling. 2015. *American English: Dialects and Variation* (3rd ed.). Wiley Blackwell.

Wolter, J. A., and L. Green. 2013. "Morphological awareness intervention in school-age children with language and literacy deficits: A case study." *Topics in Language Disorders* 33: 27–42.

Young, N. 2012/23. *The Ladder of Reading & Writing*© infographic. https://nancyyoung.ca

Young, N. 2024. "A Closer Look." In N. Young and J. Hasbrouck (Eds.), *Climbing the Ladder of Reading & Writing: Meeting the Needs of All Learners*, 12–23. PD Essentials/Benchmark Education.

Young, N. 2024. "Advanced in Reading (AIR)." In N. Young and J. Hasbrouck (Eds.), *Climbing the Ladder of Reading & Writing: Meeting the Needs of All Learners*,184–197. PD Essentials/Benchmark Education.

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