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Debating the “Science of Reading” and its Impact on Policy

Debate sobre la «ciencia de la lectura» y su impacto en la política

Debater a “ciência da leitura” e o seu impacto na política

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ABSTRACT
In the past 20 years, the United States has witnessed the emergence of a “science of reading” movement that has fueled new reading legislation in 45 states and the District of Columbia. This article examines debates about and within the “science of reading” and discusses its impact on reading policies across the United States. It highlights concerns generated by the overly narrow focus on phonics and the lack of attention to the broader evidence regarding reading instruction. Studies have shown that the impact of the "science of reading" has had implications that deserve further analysis. Contemporary public policies have reduced the focus of curricula and assessments to phonics. By focusing on phonetic aspects, other facets of reading have been overlooked, such as the use of language in different communicative contexts, the relationship between reading and writing, and student motivation and interest. There is a need for more studies on the "science of teaching reading," as well as attention to the acute shortage of trained teachers and the ways in which a multitude of social inequalities shape children’s opportunities to learn.

Keywords: Science of Reading; Reading Policy; Reading Instruction.

RESUMO
Nos últimos 20 anos, os Estados Unidos assistiram ao aparecimento de um movimento de “ciência da leitura” que impulsionou nova legislação sobre leitura em 45 estados e no Distrito de Columbia. Este artigo examina os debates sobre e no âmbito da “ciência da leitura” e discute o seu impacto nas políticas de leitura nos Estados Unidos. Destaca as preocupações geradas pelo enfoque demasiado restrito na fonética e a falta de atenção às provas mais amplas relativas ao ensino da leitura. Nossos estudos evidenciaram que os impactos da “ciência da leitura” trouxeram

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implicações que merecem ser mais bem analisadas. A elaboração de políticas públicas que têm reduzido currículos e avaliações baseados na fonética. Ao focalizar os aspectos fonéticos, se desconsiderou outras facetas da leitura, como o uso da linguagem em suas diferentes situações de comunicação, a relação entre leitura e escrita, a motivação e interesse dos alunos. Há a necessidade de mais estudos em torno da "ciência do ensino da leitura", considerando os diferentes contextos em que se encontram alunos e professores. Da mesma forma, tem limitado as oportunidades de escolha por parte de distritos, escolas e professores. Não resolveremos o problema da leitura até e a não ser que resolvamos uma série de outras desigualdades.

Palavras-chave: Ciência da Leitura; Política de Leitura; Ensino da Leitura.

RESUMEN

En los últimos 20 años, Estados Unidos ha sido testigo de la aparición de un movimiento a favor de la «ciencia de la lectura» que ha impulsado nuevas leyes de lectura en 45 estados y en el Distrito de Columbia. Este artículo examina los debates sobre la «ciencia de la lectura» y dentro de ella, así como su repercusión en las políticas de lectura de todo Estados Unidos. Destaca las preocupaciones generadas por el enfoque excesivamente estrecho en la fonética y la falta de atención a las pruebas más amplias relativas a la enseñanza de la lectura. Nuestros estudios han demostrado que el impacto de la "ciencia de la lectura" ha tenido implicaciones que merecen un análisis más profundo. El desarrollo de políticas públicas que han reducido los planes de estudio y las evaluaciones basadas en la fonética. Al centrarse en los aspectos fonéticos, se han pasado por alto otras facetas de la lectura, como el uso del lenguaje en sus diferentes situaciones de comunicación, la relación entre lectura y escritura, la motivación y el interés de los alumnos. Son necesarios más estudios sobre la "ciencia de la enseñanza de la lectura", que tengan en cuenta los diferentes contextos en los que se encuentran alumnos y profesores. Asimismo, ha limitado las posibilidades de elección por parte de los distritos, las escuelas y los profesores. No resolveremos el problema de la lectura hasta que y a menos que resolvamos otra serie de desigualdades.

Palabras clave: Ciencia de la Lectura; Política de Lectura; Enseñanza de la Lectura.

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Introduction

The United States has long witnessed “reading wars,” or sharp debates about the ideal way to teach reading (Pearson, 2004). Public perception and policy have vacillated between an intense focus on phonics and a greater emphasis on meaning-making and comprehension. Several developments have influenced contemporary public debates.

First, in the midst of these debates, measures of reading in the U.S. continue to lag. According to the 2022 National Assessment of Educational Practice (NAEP), only 32% of students were meeting benchmark standards for reading. Access to reading is racialized: according to that same assessment, the average score for Black students was 28 points lower than that for White students (NCES, 2022). There are clear consequences: not reading well by the third-grade correlated with conflict with peers and teachers and a higher risk of failure and drop out (Miles; Stipek, 2006, 2008).

Second, at the same time, parents and professional associations have increasingly protested the lack of attention to the specific needs of students with dyslexia (Gabriel; Woulfin, 2017). In the past decade, 37 states have “passed legislation related to identification, remediation, and/or awareness of dyslexia in public schools,” though policies fall along a range of restrictiveness (Gabriel 2018). This legislative activity has been promoted by a parent-led group called “Decoding Dyslexia,” active in all states, with five policy goals:

1. A universal definition and understanding of “dyslexia” in the state education code
2. Mandatory teacher training on dyslexia, its warning signs and appropriate intervention strategies
3. Mandatory early screening tests for dyslexia
4. Mandatory dyslexia remediation programs, which can be accessed by both general and special education populations
5. Access to appropriate “assistive technologies” in the public school setting for students with dyslexia (Decoding Dyslexia, 2013)

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Proponents have pushed for most of these goals for some time. However, the first goal is quite unique; “no other legislation requires reinforcing the very definition and meaning of reading difficulty” (Gabriel 2018, p. 26). This requirement is surprising, because there is so much debate over the definition of dyslexia. Indeed, “there is no official definition of dyslexia that is universally accepted by academics and researchers,” and methods for diagnosing dyslexia vary across locations (ibid). However, the International Dyslexia Association (IDA) and affiliates have vociferously argued that “popularly employed reading approaches, such as Guided Reading or Balanced Literacy, are not effective for struggling readers. These approaches are especially ineffective for students with dyslexia because they do not focus on the decoding skills these students need to succeed in reading” (IDA, 2017, np). Instead, they promote “structured literacy,” an “umbrella term that has only recently been applied to a small set of similar approaches,” including IDA-related products, that have “limited evidence of effectiveness” (Gabriel 2018 p. 29). IDA insists that structured literacy will benefit a wider audience, beyond those with dyslexia. Further, dyslexia advocates insist that 1 in 5 people have dyslexia, although current identification levels average 10% (National Center on Learning Disabilities, 2017); this lack of agreement has led to “a distrust of public school personnel as either ignorant or negligent” (Gabriel 2018, p. 29).

Third, educational journalists, often drawing on cognitive psychologists, have circulated unfavorable representations of teachers and teacher education programs, stoking negative public opinion about reading instruction. Media stories frame teachers as “morally deficient and scientifically negligent” (MacPhee et al., 2021, p. S150). Articles often feature claims that neuroscience has provided definitive evidence of the primacy of phonics, despite questions about reliability, the inferences required to attribute brain activity to reading and not other factors, and the pronounced “difficulty in moving from brain scans to pedagogy” (Tierney; Pearson, 2024, p. 98).

Responding to these pressures, a new consensus has emerged that the “science of reading” indicates a clear path to reading instruction. Since 2013, 38 U.S.

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states have passed legislation requiring reading instruction based in the “science of reading” (Schwartz, 2024).

This article asks: What is the science of reading, how has it shaped reading policy, and what concerns does it generate? To address those questions, we first briefly outline contemporary models of reading. We then explain how public discussions of the “science of reading” misrepresent current pedagogical practice and oversimplify the existing research. Next, we discuss how this limited version of the “science of reading” has affected educational policy in the United States. Finally, we conclude by discussing the negative implications of this latest phase in debates over the science of reading.

Influential Models of Reading

Models of reading have gradually evolved over the past sixty years. One influential model, the “Simple View of Reading” developed by Gough and Tunmer (1986), states that reading comprehension (RC) is the product of decoding (D) and language comprehension (LC): RC = D X LC. The scholarship suggests that, early in a student’s reading development, their reading comprehension is constrained by decoding abilities; later, comprehension weighs more heavily. Scholars have spent the intervening decades complicating the “simple view.” Some have emphasized the “prerequisites” to decoding, such as “phonological awareness, rapid word identification, and letter knowledge” (Tierne; Pearson, 2024, p. 40). Others “have noted that vocabulary, grammar, and the ability to read extended text are important predictors of language comprehension, which has come to include working memory, inferencing, and background knowledge (Cromley; Azevedo, 2007; France et. al., 2018)” (Tierney; Pearson, 2024, p. 40).

A more complex vision was codified by the influential report, *Teaching Children to Read*, issued by the National Reading Panel in 2000. Based on a meta-review of published studies, the Panel identified five consequential “pillars” of reading:

1. phonemic awareness, or the ability to identify the individual sounds in spoken words;

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2. phonics, or the correspondence of letters (graphemes) to sounds (phonemes);
3. fluency, which is the ability to read text accurately and quickly, with natural prosody;
4. vocabulary; and
5. comprehension, which is the ability to understand and communicate meaning from what is read.

The report has been critiqued for centering experimental studies and excluding qualitative research (and thus considerations of socioeconomic and material inequities), relying on work done primarily with monolingual students, and oversimplifying key terms (Allington, 2002; Garan, 2001; Shanahan, 2003). Nonetheless, the influential report made important contributions. The National Reading Panel made a substantiated argument that a systematic, structured phonics program, with 25 minutes of dedicated instruction per day, is most effective–particularly in the early years (NRP 2000). Because English has a deep orthography, making phonics challenging for some words, teachers may also need to teach some ‘sight words’ that are memorized.

In addition, this summary of available research emphasizes the role of fluency, the ability to read with accuracy, automaticity, and prosody, or expression. Fluency is often represented as the “bridge” between word recognition and comprehension. The “theory of automaticity” posits that achieving greater fluency frees up energy and attention to focus on meaning and make connections between the text and their background knowledge. Fluency also directly influences motivation to read, because lower fluency makes reading more onerous; students who must work harder to read are less likely to practice reading, creating a vicious cycle. Strong fluency is critical for school success in Grade 3 and beyond.

In 2001, Scarborough produced a related but distinct representation of this relationship by explaining the robust nature of the components, developing what is now widely called the “reading rope” (see Figure 1).

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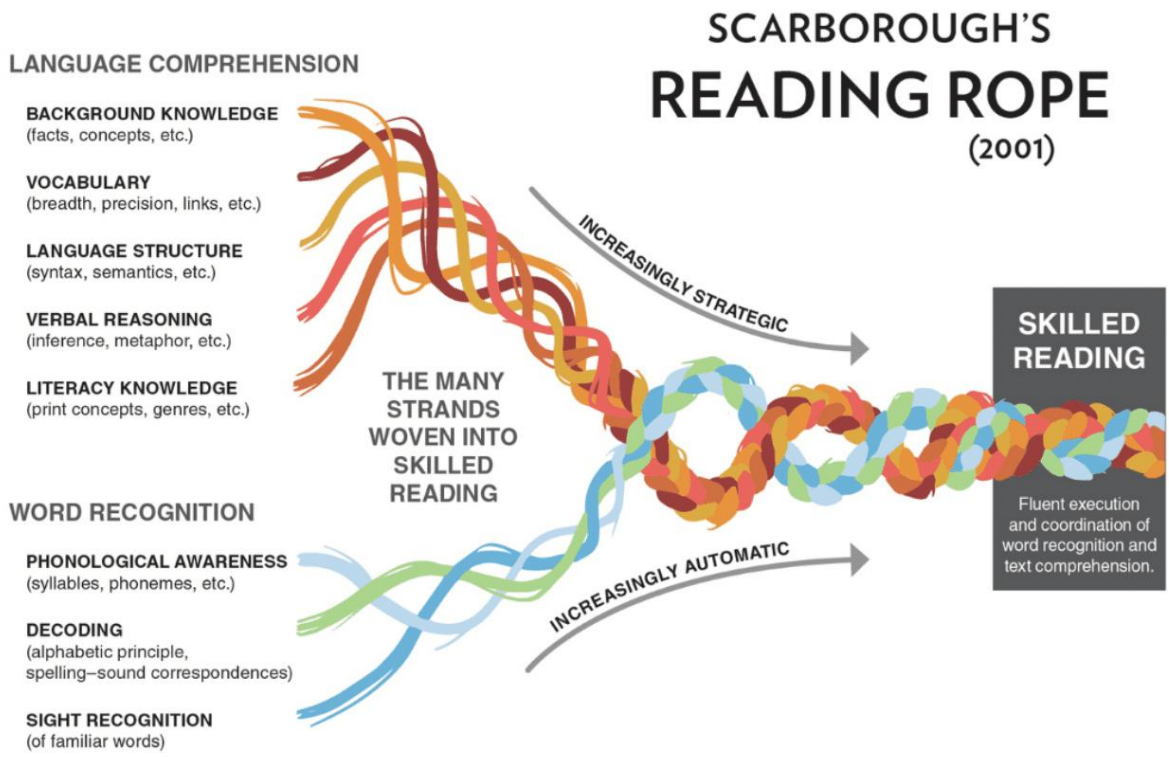
Figure 1: Scarborough's Reading Rope



Reference: Really Great Reading, https://www.reallygreatreading.com/scarboroughs-reading-rope

The rope features two main sections: Language Comprehension and Word Recognition. Each of these comprises several smaller strands. The bottom half, word recognition, relies on recognizing sounds, relating letters to sounds, blending letters, understanding silent letters, and building up sight words. The top half, language comprehension, includes: building up background knowledge across a range of topics; expanding vocabulary; understanding language structures like syntax (the order of words) and semantics (word choice, and how words combine to create meaning); verbal reasoning (like figurative versus literal language); and literacy knowledge, including print concepts and genres. The rope image makes each element of the "simple view" more complex. It also emphasizes the interdependence and interconnectedness of the skills: weakness in one area affects the whole. These strands, woven together, produce complex, skilled reading.

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In short, the broad body of reading research emphasizes that reading is a composite capacity that requires multiple, complex skills. It draws simultaneously across phonemic awareness, letter recognition, print concepts, decoding and spelling, blending sounds, morphology, consonant-vowel pattern recognition, sight word recognition, background knowledge, vocabulary in target language, fluency, spatial and visual reasoning, metalinguistic awareness, and ability to monitor comprehension; it is deeply informed by oral language development, exposure to print and opportunities to read, extensive experience and practice with print, learning dis/abilities, and the interests, backgrounds, and motivations of students (Duke; Cartwright, 2021; Scarborough 2001; Snow, Burns; Griffin, 1998; Tierney; Pearson 2024; Yaden; Reinking; Smagorinsky, 2021).

However, widely circulating representations of reading often isolate and emphasize select areas. That is precisely what continues to happen in public debates about “the science of reading.”

Misrepresentations and Oversimplifications in the “Science of Reading”

The “science of reading” (SoR) is a phrase that is meant to represent the converging evidence regarding how people learn to read. Like any scientific endeavor, science of reading is not definitive or settled; it is provisional, based on the available evidence, and open to modification based on further studies (Reinking et. al., 2023). This point could be illustrated, for example, by the flurry of studies in recent years that question the overemphasis on auditory skills in phonemic awareness and instead recommend pairing sounds with letters early in the process (Barshay, 2024). Unfortunately, people often use the term “science of reading” to suggest that there is a clear and uncontestable path to better instruction.

The journalist Emily Hanford (2018, 2022) has done a service by insisting that explicit, systematic phonics helps young readers translate print into sound, and that teachers and schools are not providing systematic, structured approaches to learning

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phonics. She has also revealed that the most popular reading programs do not adequately emphasize structured phonics instruction.

However, in their efforts to generate broad public support for improved literacy instruction, some proponents of the SoR have misrepresented existing reading instruction and oversimplified scientific evidence.

Misrepresentations

Some SoR proponents misrepresent existing instructional practice and teacher preparation.

First, they disparage “balanced literacy” approaches, which have predominated for the past 30 years (e.g., Hanford, 2018, 2022). Balanced literacy emerged in the 1990s as a compromise between the two approaches that, at that time, were dominant and were in conflict: phonics and “whole language,” an approach that emphasizes exposure to narrative and experience with stories and books above attention to letters. Balanced literacy sought to combine strengths from both approaches. It incorporates skill-focused and comprehension-focused instruction, as well as reading and writing, and whole-group and small-group work (see, e.g., the widely used approach promoted by Fountas and Pinnell 1996).

Balanced literacy has been roundly critiqued for three primary reasons. First, while many iterations included an analytic approach to phonics, they rarely included the structured, systematic phonics now recommended. The K-2 program by Fountas and Pinnell, published by Heinemman, did promote analytic phonics through word study; however, according to an EdWeek evaluation, “the program does not present a research-based or evidence-based explanation for the sequence” of instruction[1]. The report also claims that Fountas and Pinnell doesn’t consistently devote enough time to systematic instruction in phonological awareness, phonics, and fluency. Second, many balanced literacy programs differentiated students by their reading level, encouraging students to read texts whose complexity was right at or just beyond their level in order to reduce frustration and encourage practice. This practice has been criticized for not

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exposing low-achieving students to complex texts that challenge their reading. Finally, and most widely, balanced literacy practitioners are criticized for using the "three cueing system," or encouraging students to use meaning (semantic), syntactic, and visual clues to guess unfamiliar words, as promoted in Reading Recovery and other approaches. As education journalist Emily Hanford wrote in her 2019 piece sensationally subtitled "How a flawed idea is teaching millions of kids to be poor readers":

> For decades, reading instruction in American schools has been rooted in a flawed theory about how reading works, a theory that was debunked decades ago by cognitive scientists, yet remains deeply embedded in teaching practices and curriculum materials. As a result, the strategies that struggling readers use to get by — memorizing words, using context to guess words, skipping words they don't know — are the strategies that many beginning readers are taught in school. This makes it harder for many kids to learn how to read, and children who don't get off to a good start in reading find it difficult to ever master the process.

Instead of including 3-cueing strategies, SoR folks want students to rely on phonics. However, reading scholars Tierney and Pearson (2024) argue that "SOR advocates have been too quick to dismiss the positive contributions of multiple cueing models and approaches–namely, that they support word identification and understanding, as well as the development of word learning, word solving, and orthographic mapping" (p. 65). They argue that cueing is fundamentally about matching phonics, syntax, and meaning, and that it should not be rejected out of hand.

SoR proponents have blamed balanced literacy for persistently low NAEP scores. For example, Seidenberg cites stagnant NAEP results over time, demonstrating that more than half of U.S. children score at or below the basic reading level (2017). Journalists have interpreted these results to mean that students who perform at the below-basic level are 'unable to read,' but that is an oversimplification (Hanford, 2019). There is an ongoing debate about NAEP scores and their significance that is too broad to represent here (see, e.g., Hiebert 2022). However, one thing is clear: NAEP's reading assessments require students to answer comprehension questions based on level passages; it stretches credulity to try and causally connect

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those scores directly to schools' lack of systematic phonics programs. As Tierney and Pearson (2024) write, "It is well-nigh impossible to ascribe causality with any confidence…. We ask more of these assessments than they were designed to accomplish, as they spread unwarranted–and potentially harmful–claims about both the positive (phonics first will solve our woes) and negative (Balanced Literacy is the culprit) effects of curricular change" (p. 84-87). In fact, a study examining the profiles of 4th graders scoring at the below-basic level showed that students mostly had trouble with vocabulary and comprehension, not with decoding (Buly; Valencia 2002). More recently, other scholars have confirmed that fluency, rather than decoding, is the main impediment to improved reading at higher grade levels (Hayden; Hiebert; Trainin, 2019).

Furthermore, SoR proponents are quick to overgeneralize about teachers and what they, purportedly, fail to do. However, given the variability in district practices, it is difficult to characterize reading teacher practices nation-wide. According to an Education Week survey of what they call a "nationally representative sample"[2] of 674 early reading instructors conducted in 2019, only 22% K-2 grade teachers reported that they believed phonics should be taught explicitly and systematically. Sixty-eight percent indicated that they subscribed to balanced literacy, and 43% reported specifically using Fountas and Pinnell's Leveled Literacy Intervention; they nonetheless reported spending 39% of their literacy instructional time on phonics, for a median of 31 minutes a day (EdWeek Research Center, 2020, p. 4). Overall, "the survey results neither suggest that explicit, systematic phonics instruction is absent from U.S. schools nor that it is universally embraced. Instead, they indicate that most educators are using a mix of instructional techniques, some of which are in conflict with each other" (ibid, p. 5).

Finally, SoR proponents insist that teacher education programs are not preparing teachers to teach systematic phonics, which they see as the key to improving reading outcomes (Tierney; Pearson, 2024). For example, Seidenberg charges that schools of education are "well-established, well-funded, trusted institutions" staffed by an "isolated, inbred community of scholars and practitioners" who "developed an arms-

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length stance toward research" (2017, p. 285). Education journalist Emily Hanford (2018) stated, "Most teachers nationwide are not being taught reading science in their teacher preparation programs because many deans and faculty in colleges of education either don't know the science or dismiss it." In her 2018 op-ed "Why Are We Still Teaching Reading the Wrong Way?," she extensively cites a flawed study (conducted by the National Council on Teacher Quality, a think tank funded by the conservative Thomas Fordham Institute), which (based on a review of syllabi alone) deemed early literacy courses to be incomplete and low quality. Here, too, programs are rebuked for including approaches like the three-cueing system and for not featuring the favored approach to phonics.

Oversimplifications

After blaming balanced literacy for lagging reading outcomes, proponents then posit the "science of reading" as the cure. In doing so, they narrow existing research to focus primarily on systematic phonics.

Recent years have seen the emergence of a strong, research-based consensus on the value of systematic phonics instruction during the initial periods of reading instruction. SoR emphasizes phonological awareness and phonics, which includes sound-symbol correspondence, word-level decoding and blending sounds together. Science of reading proponents argue that reading instruction should be explicit and systematic. To be sure, phonics is challenging in a "deep" orthography like English, which lacks a direct correspondence between its 26 graphemes/letters and 44 phonemes/sounds (unlike Spanish and other Romance languages) (Share, 2021). Nonetheless, it is an essential component of a robust reading pedagogy. Students who struggle with reading likely need more systematic instruction on decoding and learning how to pronounce unknown words as well as master common, high frequency words that do not look like what they sound like (Duke; Cartwright, 2019). Systematic and explicit phonics instruction promotes strong foundational reading skills, particularly for struggling readers (Torgesen et. al. 2001).

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However, the existing literature frames systematic phonics as one key component of a robust approach to reading instruction; it should be accompanied by attention to other key elements. Even when children develop strong decoding skills in early elementary, reading scores often lag through upper elementary grades, particularly for students living in poverty and/or whose variety of English doesn't match the middle class variety used at school (Tierney; Pearson, 2024; Westall; Cummings, 2023; Wexler 2023). One explanation is that comprehension plays a larger role after grade three, but the overemphasis on decoding is crowding out basic instruction in science and social studies, and thus impacting the background knowledge that is so crucial to comprehension (Wexler 2023). A competing explanation is that students are having difficulty applying decoding skills to multisyllabic words; "students in upper elementary and middle school often encounter texts that feature sentences with more complicated syntax than those used in early elementary texts or in their everyday speech" (Reading Reimagined, nd; see also Wexler 2024). Both likely play a role. It is critical that, starting from early grades and continuing through late elementary, teachers provide foundational decoding skills while also building students' vocabulary and their background knowledge of diverse topics and subjects.

Other scholars have challenged the dominance of phonics instruction. Smith and Jones (2015) insisted on the need to integrate phonics with comprehension strategies. Their research emphasized the importance of context and comprehension in reading development, raising important questions about the potential limitations of exclusive focus on phonics. Similarly, a meta-analysis by Brown et al. (2020) synthesized findings from multiple studies on reading policy and instructional practices in the United States. The analysis revealed that the combination of phonics instruction, vocabulary development, and reading comprehension strategies offers the most comprehensive approach to fostering literacy skills among students. Scholars working in this vein emphasize the importance of language-rich environments and authentic reading experiences that fuel students' motivation to read. Cummings (2021) considers the scholarship on early literacy policies and concludes that their contraction to an emphasis on phonics is short-sighted. Based on a meta-synthesis of 55 experimental

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studies that included longitudinal designs and a survey of 2205 teachers in England, UK scholars Wyse and Bradbury (2022) concluded that “balanced instruction is the most effective way to teach reading” (p. 1). In their review of the available literature, Tierney and Pearson (2024) state that “the inclusion of code-based instruction, as part of a comprehensive early reading curriculum, yields consistently positive and moderately-sized effects on isolated measures of word reading—but inconsistent and small effects on comprehension” (xi). They conclude that phonics instruction “is warranted as part of a comprehensive curriculum” that also includes a relevant curriculum, careful attention to student motivation, and instruction in oral language, background knowledge, and writing (xi).

In summary, the broad body of reading research endorses a systematic, explicit approach to teaching students the correspondence between letters and sounds, while at the same time developing with children a broad vocabulary and a large content knowledge for comprehending text.

Implications for Reading Policy

Unfortunately, a narrow representation of the science of reading has directly and materially affected public policy.

Though the National Reading Panel’s review of “scientific” research emphasized five pillars, when translated into the multi-billion dollar Reading First component of the No Child Left Behind Act of 2001, the focus narrowed to phonics-based curricula and assessments in K-3 reading programs (Roller 2014). Predictably, evaluations documented that modified curricular, assessment, and instructional practices yielded an improvement in students’ decoding skills but no statistically significant development of their reading comprehension (Gamse et. al., 2008). In other words, the evaluation showed that phonics is necessary but alone insufficient to develop strong reading skills (Tierney; Pearson 2024). Furthermore, Reading First was heavily criticized for steering lucrative reading contracts to individuals with a marked conflict of interest.

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In the 2010s, what Reinking et. al. (2022) call the “phonics-first ideology” resurfaced. This approach emphasizes phonics as “the essential component” and as the one that should be learned first. The media has contributed to this narrow reading of the “science of reading.” We have already discussed Emily Hanford’s work, whose influential series on “how teaching kids to read went so wrong” (2022) insisted that balanced literacy is wrong-headed, that phonics offers a panacea, and that schools of education failed to teach phonics instruction to prospective teachers. This framing has been picked up and compounded in media stories on the science of reading. As MacPhee and colleagues (2021) showed in their critical metaphor analysis of 37 stories, “journalists have relied on strategic metaphorical framing to present reading education as a public crisis with a narrow and settled solution” (p. S145). They continue that “frames used in recent media reporting have intensified the reading wars, promoting conflict and hampering conversation among stakeholders and across research paradigms and methodologies. The media have asserted a direct connection between basic research and instructional practice that, without sufficient translational research that attends to a variety of instructional contexts and student populations, may perpetuate inequities” (ibid).

“Policy entrepreneurs” (Cummings et. al., 2023) in conservative think tanks and philanthropies have organized parent and teacher groups and dyslexia advocates to exert pressure on lawmakers using policy scripts to insist on “bills that centered phonics instruction, screening and diagnostic assessments, as well as SOR-aligned curricula, and professional development for teachers over the last decade,” and “required changes in teacher preparation, including literacy coursework revisions and additional licensure test requirements focused on reading” (Aydarova, 2024, p. 557; see also Reff, 2018; Thomas, 2020). As a result, almost all of the U.S. states have passed legislation requiring reading instruction based in the “science of reading,” focused on systematic phonics (Schwartz 2024; see also Reinking et. al. 2023; Neuman et. al. 2023).

A review of reading-related legislation enacted between 2019-2022, which included 223 bills enacted in 45 states and the District of Columbia, praised the bills

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for including the five pillars of reading, not just phonics, and for including an adequate focus on teacher preparation and professional development (Neuman et. al. 2023). However, it developed six key critiques of the legislation:

- Oral language and writing receive less attention than the Five Pillars although many studies have established their crucial role in reading. Background knowledge, another critical pillar, is mentioned in legislation from only six states.
- Assessment is prioritized, yet comprehensive supports for students receive limited attention. Only two states, Florida and Michigan, enacted bills extensively discussing all these supports.
- Teachers take center stage, but additional supports are crucial. Only about one-third of states enacted legislation that delves deeply into curriculum or school leadership, with a mere 11 states extensively addressing both areas simultaneously in their laws.
- The legislation pays unequal attention to different student groups. Dyslexia gets a lot of attention, with laws in 33 states thoroughly addressing students with dyslexia. However, English learners are less emphasized; laws in only 10 states discuss this population in-depth.
- Community engagement receives limited focus. While 26 mention community initiatives in their legislation; only 14 of these discuss community engagement in more detail.
- The bills lack coherence. Most bills pay limited attention to alignment and coherence across different aspects of reading education, suggesting an insufficient focus on how various components of the system interact. (ibid)

Even as legislation develops, districts are scrambling to get new professional development for teachers and reading curricular supports in place. At present, billions of dollars are being spent on these initiatives, but their efficacy has not always been demonstrated. For example, Louisa Moats (e.g., Foorman; Moats, 2004; Moats, 2000, 2020), a psychologist, has co-led the development of the 160-hour Language Essentials for Teachers of Reading and Spelling (LETRS) professional development

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series for educators. Many states and school districts directed their Elementary and Secondary School Emergency Relief (ESSER) COVID relief funds toward SoR training like LETRs; in fact, by 2022, LETRs had contracts with 23 states (Schwartz 2022). Thousands of teachers have undergone LETRs training. According to a 2022 report, North Carolina spent $54 million, Alabama spent $28 million. South Carolina spent $24 million, Kansas spent $15 million, Oklahoma spent $13 million, and Utah spent almost $12 million on LETRS and related supports (Schwartz 2022). This “manufactured” crisis (Berliner; Biddle, 1999) serves to undermine public schools and justify vast outlays on new, costly, and lengthy professional development and curricular products–much of it paid for by the $122.7 billion in supplemental federal funding provided to school districts following the acute phase of the COVID pandemic[3]. However, a review by Professor Rachael Gabriel (2022) of the paltry independent evaluation literature available–only three dissertations and two reports–found no impact of LETRs training for teachers on student achievement. Particularly given the amount of money being spent on LETRs training, this question merits much more sustained attention.

Conclusions

Analyzing the impact of the “science of reading” on reading policy, we draw five key implications.

First, the dominant, narrow popular version of the “science of reading” has limited the focus of policy-makers, educational leaders, and teachers to phonics and ignored other facets of reading curriculum and pedagogy that are critical to improving reading outcomes, including (but not limited to) the key roles played by vocabulary, background knowledge, fluency, language learning (including academic language), student motivation and interest, textual relevance, and the reciprocal relationship between reading and writing. Current reforms continue to neglect fluency (Duke; Cartwright 2021; Rasinski, 2023), oral language, and writing (Shanahan, 2017), in particular.

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Second, casting these reforms as “science of reading” frames them as settled, when in fact they (and all science) are provisional (Reinking et. al., 2023). Most troubling, the current wave of policies exceed “the warrants provided by the available evidence,” and they should be “reined in…so that districts, schools, and teachers can choose from the full range of evidence-based practices warranted by the research” (Tierney; Pearson 2024, p. 127).

Third, there should be more research into the “science of reading instruction”—that is, how to translate what we have learned about the science of reading into high-impact instruction, across a variety of settings, teachers, and students (Shanahan 2020; Seidenberg et. al. 2023). As Solari et. al. (2020) explain, “a profound gap exists between empirical findings and the implementation of evidence-based practices in the assessment and instruction of reading in school settings. The debate regarding the practical implications of the science of reading (SOR) and its implementation in authentic school settings is palpable…. The persistent gap between the SOR and its school-based implementation exists because the field has yet to invest in the appropriate methodologies and processes to develop an effective model of translational science” (S347).

Fourth, the current wave of “science of reading” policies steers limited funds toward expensive and lengthy phonics-related training and curricula while failing to address the pressing need for coordinated and coherent approaches. As Woulfin and Gabriel (2020) argue, “curriculum, professional development, and leadership are mutually supportive” and there is a crucial need to “attend to the alignment of the pillars” across “the classroom, school, and system levels” (S109). In addition, across the country, there is an urgent teacher shortage and a pronounced need for more qualified classroom teachers, particularly special education teachers. Based on data from the 2020–21 and 2021–22 school years, the Learning Policy Institute documented that “47 states plus the District of Columbia had an estimated 286,290 teachers who were not fully certified for their teaching assignments” (Franco; Patrick np). Further, “the 21 states with published data on vacancies had 27,844 unfilled teacher positions” (ibid). Nationally, 10% of positions were either unfilled or filled by teachers not certified

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for the position. In Texas alone, “10,691 special education teachers did not have special education and content certification for their assignments” (ibid). Perhaps funds could be better spent staffing schools with well-prepared educators and paying them a reasonable salary.

Finally, there is a tendency among some proponents of Science of Reading to disparage attention to social inequality. For example, Seidenberg writes dismissively about teachers whose concerns that the gap between home and school language causes difficulties for many working-class and/or minoritized children as “agents of social justice” who have “tried out … educational theories” on children (ch. 10). But we cannot and should not ignore the relationship between social inequality and reading instruction. Indeed, the NAEP scores and the “achievement gap” make it essential to do so. Most broadly, the preoccupation with phonics as the key to improving reading outcomes is myopic. As Tierney and Pearson (2024) note,

> We won’t solve the reading problem … until and unless we solve a host of other inequities … [including] good health care; preschool learning opportunities; decent and affordable housing; satisfying jobs; safe neighborhoods; equitable school funding; and fair justice systems … [which ultimately require] fundamental reforms to redistribute wealth, income, and privilege. (p. 126)

These social factors, rarely considered, have a huge impact on a child’s life chances and learning opportunities.

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Notas

[1] https://www.edreports.org/reports/overview/fountas-pinnell-classroom-2020

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[2] Whether the survey is actually representative is open to debate. The survey "was sent to a randomly selected sample of all the K-2 teachers in this country. It was also sent to a random sample of all the K-12 teachers in the country. The samples were provided via a commercially available list that contains every or almost every K-12 teacher in the country, according to the company. Respondents were excluded from the survey if their responses indicated they had not taught kindergarten, 1st grade, 2nd grade, or elementary special education in the past 10 years. The survey was restricted to K-2 and elementary special education because its focus was early reading and these teachers are most likely to teach children how to read." (Education Week 2020, p. 6, emphasis added).

[3] https://www.lexialearning.com/blog/esser-funds-invest-in-programs-based-on-the-science-of-reading