"Whatever You Want to Call It": Science of Reading Mythologies in the Education Reform Movement

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In recent years, a wave of science of reading (SOR) reforms have swept across the nation. Although advocates argue that these are based on science-based research, SOR remains a contested and ambiguous notion. In this essay, Elena Aydarova uses an anthropology of policy approach to analyze advocacy efforts that promoted SOR reforms and legislative deliberations in Tennessee. Drawing on Barthes's theory of mythology, this analysis sheds light on the semiotic chains that link SOR with tradition, knowledge-building curricula, and the scaling down of social safety nets. This deciphering of SOR mythologies underscores how the focus on "science" distorts the intentions of these myths to naturalize socioeconomic inequality and depoliticize social conditions of precarity. This study problematizes the claims made by SOR advocates and sheds light on the ways these reforms are likely to reproduce, rather than disrupt, inequities and injustices.

Keywords: reading instruction, science of reading, education policy, nonprofit organizations, politics of education, advocacy

Since 2018, news outlets have run stories about a pervasive literacy crisis: a large proportion of US students from different socioeconomic, racial, ethnic, and linguistic groups cannot read at grade level (Hanford, 2018; Wexler, 2020). Widely circulated articles and reports capitalize on the long-standing "reading wars" (Pearson, 2004; Schoenfeld & Pearson, 2012) that emphasize a dichotomy between phonics-based and balanced literacy instruction. Critics of balanced literacy blame schools and colleges of education for utilizing an approach that they maintain fails to teach decoding skills. While claims about the literacy crisis or its causes have been challenged (NEPC & Education Deans for Justice and Equity, 2020; Thomas, 2020), some continue to argue

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that science of reading (SOR) offers the solution (MacPhee et al., 2021). According to SOR proponents, this "interdisciplinary body of *scientifically-based* research about reading" (The Reading League, 2022, 6) is derived from cognitive psychology, neuroscience, linguistics, and other fields.

In response to these crisis calls, twenty-nine states and the District of Columbia introduced early reading reforms by July 2022. Using policy scripts provided by think tanks and philanthropies (Cummings et al., 2023; Reff, 2018), decision-makers introduced bills that centered phonics instruction, screening and diagnostic assessments, as well as SOR-aligned curricula, and professional development for teachers over the last decade (Schwartz, 2022). Most states also incorporated third-grade retention for students demonstrating "reading deficiencies" and required changes in teacher preparation, including literacy coursework revisions and additional licensure test requirements focused on reading (Schwartz, 2022).

Yet, even amid these dramatic changes, there is still little research about how the science of reading is advanced by its advocates and perceived by decision-makers, particularly in policy-making and legislative contexts. This is an unfortunate gap given that intermediary organizations (IOs)—think tanks, nonprofit and for-profit organizations, research institutes, and advocacy groups—target decision-makers with their interpretations of what research says and offer their policy prescriptions for how education problems should be addressed (Lubienski et al., 2016; Scott & Jabbar, 2014). Since "federal, state, and local policymakers are granting [IOs] both authority and financial resources to carry out policy agendas" (Scott et al., 2017, 26), it is important to interrogate how these policy actors construct narratives about the science of reading when they interact.

In this article I trace how the SOR gets discussed across advocacy efforts and legislative deliberations. Drawing on Barthes's (1972) theory of myth, I attend to the signs and concepts tangled up in debates on SOR reforms and show the distortions, substitutions, and misplaced causes that naturalize socioeconomic inequality and depoliticize social precarity.

Reading Wars and Education Reforms

The reading wars—"the rancorous debates over how best to teach reading" (Shanahan, 2003, 646)—have long dominated policy debates in the United States (Thomas, 2020). Historically, the debate was between phonics-based and whole language approaches. Phonics focuses on learners sounding out each letter in a word to decode it and matching print symbols with speech (Seidenberg, 2017). In the early 1980s, phonics-based instruction not only utilized repetitive drills but also relied on basal readers with patterned texts, which lacked substance, depth, or interest for learners (Pearson, 2004). Critics of phonics questioned the meaning-making aspect of reading this way. The whole language approach was developed to address this, to center meaning-

making in reading by using children's literature and as-needed skills instruction. In practice, however, some classrooms reflected misinterpretations and misapplications of the whole language approach. Some teachers conflated whole language with whole-class teaching, assuming that reform approaches required reading the same books to the entire class instead of tailoring reading instruction to specific students' needs (Pearson, 2004; Schoenfeld & Pearson, 2012). By the mid-1990s, politicians began to blame whole language instruction for students' declining scores on standardized assessments, with phonics proponents arguing that students were unable "crack the code" of the English language (Pearson, 2004).

By the end of the decade, several high-profile commissions had been assembled to provide a systematic review of research studies on reading and reading instruction, including the report of the National Reading Panel (NRP, 2000), which received much public and policy attention. The report named five main components of reading: phonological awareness, phonics, vocabulary, fluency, and comprehension. By emphasizing that "systematic phonics instruction should be integrated with other reading instruction to create a balanced reading program" (2-136), the report sought to settle the debate between phonics and whole language camps in favor of a balanced approach to reading instruction. Nevertheless, the report engendered wide range of myths, including a claim that it prioritized phonics instruction over other domains of reading (Shanahan, 2003).

The National Reading Panel's narrow approach of focusing only on experimental studies and excluding qualitative research reflected a wider turn toward evidence-based and scientific studies in education (Lather, 2004). This was most visible in the Reading First component of the No Child Left Behind Act of 2001 (NCLB, 2001), which focused on K–3 reading programs based on "scientifically based reading research." Under the banner of "science," districts had to adopt phonics-based curricula allegedly supported by science, decodable books, screening and diagnostic assessments, as well as professional development aligned with reform priorities (Roller, 2014). However, the implementation of the program was mired in scandal when it became known that the Department of Education officials were promoting specific curricula and assessment products (Roller, 2014). Also, subsequent evaluations of Reading First showed a change in instructional practices and improvement in students' decoding skills but no statistically significant growth in their reading comprehension scores (Gamse et al., 2008). This evaluation aligns with findings from psychological sciences: although phonics plays an important role in the development of novice readers, it is insufficient for moving students to the expert level of reading acquisition (Castles et al., 2018).

Despite such well-documented failures of phonics-based reforms to improve reading achievement (Wyse & Bradbury, 2022), the late 2010s saw a renewed push for phonics in SOR bills (Thomas, 2020), with proponents claiming that whole language and balanced literacy instruction have failed to develop American schoolchildren into proficient readers (Seidenberg, 2017). Works that approach

literacy as liberatory praxis offer a different perspective on the issue of reading underachievement (Freire & Macedo, 2005; hooks, 2014). Research rooted in critical theories has shown how multiply-marginalized students are subjected to hypersurveillance, hyperlabeling, and hyperpunishment through early literacy standardized assessments and scripted curricula, which reproduce the logics of a carceral state (Beneke et al., 2022). Viewed from this perspective, the problem of low literacy rates stems from instruction that alienates and disempowers learners, regardless of the labels attached to it.

A larger question that deserves consideration is whether what scientists call the science of reading ultimately serves as the foundation for the current reforms. Media portrayals of SOR reforms have reflected the oversimplification of research evidence and the cherry-picking of findings that support reformers' position at the expense of studies offering a more nuanced perspective (Lefstein, 2008; MacPhee et al., 2021; Thomas, 2020). For example, in legislative sessions, dyslexia advocates have shared stories about private providers' ability to address the literacy crisis with the tools and materials they sell rather than the empirical evidence that evaluates the effectiveness of approaches deployed by private-sector actors (Gabriel, 2020; Gabriel & Woulfin, 2017). And through SOR proposals, some think tanks, nonprofits, and philanthropies have promoted third-grade retention policies even though empirical evidence has shown their detrimental effects (Reff, 2018). Thus, what gets discussed as "science of reading" in policy contexts deserves further investigation. For this reason, in this study I pursue the following research questions: How does the science of reading become conceptualized in policy deliberations around early literacy reforms? What do interactions between SOR advocates, legislators, and decision-makers reveal about meanings and agendas attached to these reforms?

Theoretical Approach

Policy studies have noted the disconnect between claims about science and reform measures, pointing to the paradox of policy in the age of spectacle: not everything is what it seems (Anderson, 2005; Aydarova, 2019; Koyama, 2010). What comes to matter in such reform is not rational action based on empirical evidence but, rather, how various policy actors perform their positions for the audiences watching them (Edelman, 1988). Policy as performance, Edelman (1988) observes, illuminates how "the link between problems and preferred solutions is itself a construction that transforms an ideological preference into a rational governmental action" (22). Applied to SOR advocacy and legislative deliberations, this observation leads to questions around whether "science" as it is evoked in a variety of narratives about reading has anything to do with science per se.

To explore answers to these questions, I draw on Barthes's (1972) *Mythologies*. Unlike commonly accepted notions of myths as fabrications and illusions

that misrepresent facts, Barthes focused on myth as ideology working through language and images: as "depoliticized speech" (143) that "transforms history into nature" (129). By removing politics from consideration, myth turns issues of social inequality and injustice into natural givens. One example of this mythmaking is treating discrepancies in academic performance among different racial, ethnic, and socioeconomic groups as achievement gaps rather than education debt (Ladson-Billings, 2006). Such treatment erases historical and sociopolitical antecedents of present-day injustices, paving the way for the introduction of education policies rooted in science as a "neutral" and "objective" intervention.

Like other semiologists, Barthes (1972) focused on the sign—or the relationship between the form of a word, or signifier, and its meaning as signified. When words are used to name objects or processes in a straightforward fashion, the relationship between them is described as *denotation*. When additional meanings are added, connotations emerge. Barthes argued that myths substitute denotations with connotations, adding new levels of meanings consumed by the audience without full realization that they now "live the myth as a story at once true and unreal" (128). Agreeing on one signifier, speakers and listeners do not necessarily agree on anything, because meanings evoked and imagined were never subjected to analysis or scrutiny. To break the spell of myths, Barthes called on analysts to focus on the relationships between form and meaning to decipher the distortions they impose on each other. In what follows, I describe how Barthes theorized relationships between form and meaning as empty and full signifiers, how various signifiers make up semiotic chains and produce sums of signs, and how rationalizations of signifieds by the means of signifiers create artificial causality on which myths rest.

One way myths operate is through empty signifiers—words or phrases that lack conceptual stability and become attached to different meanings. Empty signifiers become slogans calling for action or justifying what has already been done, yet they do not appear to be naming anything in particular. Words like *freedom, equality,* or *science* in political discourse often serve as empty signifiers deployed strategically to allow the speakers and the audience to fill them with the meanings they see fit. Barthes (1972) also described instances where signifiers become attached to distorted meanings as *full signifiers*. Because myths operate as "turnstiles" that constantly rotate between form and meaning, one sign can be attached to signifiers that can be empty and full at the same time (Barthes, 1972).

In myths, signs, signifiers, and signifieds form semiotic chains, where one vague term can be substituted with another without a noticeable change in meaning. Concepts that appear to be equivalent on the surface are linked together and form a global sign, or a sum of signs. Distorted meanings of words, phrases, and images connect different signifiers through substitution at the conceptual, symbolic, or material levels. For instance, when audience members look at an image of a Franciscan priest with a distinctive beard and

easily recognizable haircut, they are exposed to a sum of signs for "benevolence" and "charity." Barthes's (1972) concern is that this experience serves as "the alibi," which is used "to substitute with impunity the signs of charity for the reality of justice" (49). In education reform, punitive accountability measures cloaked in the charitable language of leaving no children behind and allowing everyone to succeed have been used as substitutes for reparative and compensatory investments in public education (Granger, 2008). The promise of equality has become a substitution for the reality of justice.

Finally, an indispensable element of myths is *artificial causality* (Barthes, 1972), which replaces true causes of events with fabricated ones to mystify the relationships of power and control. For instance, media reports on standardized assessments tend to ascribe differences in student performance to teacher quality, thereby oversimplifying the effects of de facto segregation, social inequality, and other situational factors (Berliner, 2013; Kennedy, 2010). In this case, artificial causality is used to obscure the interaction between social inequality and education outcomes. Artificial causality masks social realities and replaces action to address injustice with a performative intervention that creates little meaningful change in social conditions (Barthes, 1972). In education policy, myths obfuscate structural inequalities, such as poverty, substituting direct action needed to address them with calls for skills instruction or greater parental choice (Berliner, 2013; Granger, 2008). Applied to the science of reading advocacy and legislative deliberations, Barthes's theory of myth affords an opportunity to examine the semiotic chains that make up the "science of reading" sign and how SOR mythologies naturalize social inequality of neoliberal capitalism.[1]

Methodology

I conceptualized this study in the tradition of the anthropology of policy, which approaches policy as a performance as well as a site of struggle over meaning and power: "Policies can be studied as contested narratives which define the problems of the present in such a way as to either condemn or condone the past, and project only one viable pathway to its resolution" (Shore et al., 2011, 13). Anthropology of policy combines the use of ethnographic observations with the analysis of policy discourses to elucidate the interworking of power and reproduction of inequality that mythmaking in policy contexts helps sustain (Wedel, 2011; Wedel et al., 2005).

Researcher Positionality

I approach policies and discourses surrounding them as a mythologist who interrogates the relationships, meanings, and connections in the narratives produced by advocacy groups and legislators during debates about SOR reforms. My positionality is informed by several intersecting identities. As a scholar who taught literacy courses at the university level and conducted action research

on the knowledge preservice teachers need for effective reading instruction, I recognize the need for improving teachers' linguistic knowledge for teaching reading. But I remain skeptical that this is a matter of "settled science," as SOR proponents claim. My own experiences with poverty and other forms of marginalization also inform my critical stance on claims that better reading instruction can undo the effects of intersecting forms of oppression. In conducting this research, I do not dismiss experimental studies of reading that have been conducted by linguistics, psychologists, neuroscientists, or scholars in other fields; rather, with this study I seek to shed light on how oblique references to science of reading have been deployed in political contexts.

Research Context

I focus on the SOR debates in Tennessee because of the networked involvement of intermediary organizations and major philanthropies in the state's policy-making context (Russell et al., 2015). From the battles against school integration to the ardent support for charter school expansion, Tennessee has pursued many of the policies promoted by venture philanthropies and organizations aligned with the disruptive education reform movement (Schneider & Berkshire, 2020). As one of the study participants active in the Tennessee legislative context explained to me, "Rarely is there a bill that's been filed that came from [a legislator's] own head. They go to these legislative conferences, like ALEC. You can pick a topic, anything from parents' rights, library books, you name it. They're created by associations and think tanks that throw model legislation at them all the time" [Interview 3, April 2022].[2]

A Republican governor appointed a commissioner of education who spearheaded efforts to introduce SOR reforms in the state since 2019. The Republican-controlled Tennessee General Assembly—with 73 percent of the members at the time identifying as white—tends to lean toward "less government" and more "local control." These leanings affected how the state engaged with Common Core State Standards (CCSS) in the early 2010s, which were eventually revoked and substituted with state-developed standards.

Data Generation and Analysis

To trace advocates' and legislators' interactions around SOR reforms, I used publicly available video recordings of legislative meetings. I identified the bills that introduced SOR and collected thirty video recordings dedicated to those bills, as well as video recordings of additional meetings mentioned during legislative deliberations between August 2019 and February 2021. These video recordings captured the interactions between legislators, policy makers, advocates from K–12 and the higher education sectors, teachers, and private-sector providers around reading reform. I also examined various drafts of the bills to trace the evolution of ideas embedded in the policy; reports issued by intermediary organizations, advocacy groups, and philanthropic organizations that promoted the concepts discussed in the bills; and media coverage of reading

reform in Tennessee. Finally, I conducted eight interviews with various policy actors—legislators, a Department of Education official, members of advocacy groups, and educators—to test my initial observations and gain an insider perspective on the processes that unfolded during these policy deliberations.

Video recordings and interviews were transcribed verbatim and together with other textual data were uploaded into NVivo for analysis. I used several rounds of iterative coding (LeCompte & Schensul, 2013). First, I applied descriptive and In Vivo coding (Saldaña, 2015) to identify preliminary patterns in the data. The co-occurrence of codes "science of reading," "foundational literacy skills," and "phonics" with "knowledge-based curricula" and "prison/incarceration" prompted me to recode the data with theoretical and thematic coding (Saldaña, 2015) to connect those patterns with the theories of policy as performance. I marked transcripts with "substitution," "replacement," "shift," "disguise," and "avoidance" to note performative moves deployed by advocates, legislators, and policy makers during their deliberations. I also compared different versions of the bills and advocates' reports to trace textual mutations over time.

While coding the data, I wrote memos documenting my observations, emergent findings, and questions that needed further exploration. I kept a research journal in which I recorded associative chains of signs that were evoked by various policy actors, linking science of reading with phonics, poverty, or imprisonment rates. These chains and the interplay of meanings they captured prompted me to turn to Barthes's (1972) work and apply the notion of myth to the work that SOR signs and meanings were performing in policy contexts. Situating my work in critical approaches to policy analysis (Apple, 2019; Fischer, 2007), I make no claims to the objectivity or neutrality of my observations.

Findings

Since the early 2010s, Tennessee has had "a revolving door of reading reforms"—from the Ready to Read initiative in 2016 to the revisions of English language arts standards that in 2017 introduced "foundational literacy" skills. Legislators began public discussions about the need to reform early literacy in October 2019 when they invited SOR advocates to testify. Legislators who supported science of reading measures also invited a group of advocates to conduct an hour-long demonstration of SOR teaching in January 2020. House Bill 2229/Senate Bill 2160, the SOR bill, was introduced in February 2020. The bill underwent revisions with "science of reading" getting substituted for "foundational literacy skills" and despite opposition it moved through the legislature until it died in the House Finance Committee in June 2020 because of pandemic-related budget cuts. It was reintroduced in a revised form during a special legislative session in January 2021 when, despite objections from several Democratic politicians, it received majority support and was subsequently

signed into law as the Literacy Success Act in February 2021. This legislation changed how literacy instruction was framed in the state code (Public Chapter 3) and introduced a dramatic reorientation of what was required of Tennessee public schools and colleges of education.

In the legislative debates over the "science of reading," the signifier "science"—with the assumed signified "a source of authoritative truth and established facts"—distorted the meanings attached to constructions of reading, creating chains of associations and relationships of artificial causality.[3] Across contexts and artifacts produced by various actors, the meanings of "science of reading" shifted and were frequently replaced with new signs, such as "foundational literacy skills," "phonics," and others. In what follows, I first document how "science of reading" was invoked both as an empty signifier that could be "whatever you want to call it" and as a full signifier with a meaning that was continually distorted. I then examine several symbolic and material substitutions that comprised the sum of SOR signs in Tennessee policy debates.

Empty Signifiers

As an empty signifier, "science of reading" appeared in interactions when policy actors who promoted SOR used it interchangeably with "multi-sensory instruction," "structured literacy," "phonics-based instruction," "SMILA (Simultaneous Multisensory Institute of Language Arts) program," or "evidence-based practices." This was exemplified during a presentation on early childhood literacy for the Tennessee House Curriculum, Testing, and Innovation Subcommittee prior to the introduction of the SOR bill in January 2020. The subcommittee chair invited dyslexia advocates from the private sector and public schools to share how reading should be taught. The individual who presented a demonstration of SOR practice, a private consultant who offered training in the SMILA program, repeatedly used lists of substitute words and phrases to describe the approach advocates came to demonstrate:

> We are pretty pumped about multisensory instruction/structured literacy/the science of reading—whatever term you want to use.The philosophy is using the science of reading and/or structured literacy and/or multisensory instruction—whatever you want to call it—to teach language arts.[4] [Early Childhood Literacy Presentation for the House Curriculum, Testing, and Innovation Subcommittee, January 21, 2020]

These substitutions occurred within the same phrase, setting in stark relief the instability of the concept and its loose relationship to the meanings attached to it. Despite this, legislators subsequently referred to this presentation as a demonstration that "science of reading works."

Full Signifiers

Full signifiers emerged when the SOR bill was introduced one month later. One set of distortions dealt with the notion of "science." When, in February

2020, House Bill 2229/Senate Bill 2160 was filed to propose changes in Tennessee code relative to literacy instruction, the media described the legislation as the "science of reading" bill [Aldrich, 2020a]. The original draft referred to the instructional approaches that lawmakers were pursuing as "evidence-based and scientifically-based systematic phonics instruction . . . with a focus on phonemic awareness, phonics, vocabulary development, fluency, oral reading, and reading comprehension" [House Bill 2229/Senate Bill 2160, 2].

The original bill also defined the meaning of "scientifically-based" as "practices or programs that have been evaluated using the scientific method with rigorous data analyses" and "accepted through general or majority consensus by independent experts through objective and scientific peer review" [House Bill 2229/Senate Bill 2160, 1]. In policy advocacy and legislative deliberations, however, this definition gave way to various interpretations of "science." SOR supporters and advocates gave neuroscience, cognitive science, and psychology an elevated status of true science. Yet, both in advocates' testimonies and in legislative deliberations, neuroscience as SOR's foundational element was reduced to vague references to "brain" and was often accompanied by casual excuses that speakers did not know what "it all" meant. For instance, during a presentation on what reading instruction should look like, an advocate explained that she used "gross motor skills" to teach letters, spelling, and reading because that's how the "brain works":

> The brain doesn't work like our report cards—we have writing, spelling, grammar, reading. That's not how your brain works. Your brain does this [intertwines the fingers of both hands]. It's all synthesized. Don't ask me how because that's not my bailiwick at all. But it all works together. [Early Childhood Literacy Presentation for the House Curriculum, Testing, and Innovation Subcommittee, January 21, 2020]

Later in the presentation, during the demonstration of how cards are used to teach children to recognize consonant blends and digraphs, the presenter explained:

> I need to go to a visual impetus. I show you a card and you tell me what it says. Before I said, "What says *th*?" And you said, "*t-h*." Now I'm going to show you *t-h*, and you're going to say it says *th*. That's reading. And you go, "Well, duh. If they can do one, they can do the other." No, no, no. That's not how it works. Sometimes they can, and sometimes they can do one thing so much better than the other. It's the brain, that's what it's about.[5] [Early Childhood Literacy Presentation for the House Curriculum, Testing, and Innovation Subcommittee, January 21, 2020]

The presentation showed that literacy instruction should integrate auditory, visual, and kinesthetic activities and emphasized that all of these were necessary because "that's how the brain works." When SOR supporters asked about the data supporting these claims, the presenter noted that she did not have any. Vague references to "the brain" was the extent of neuroscience research that informed how these advocates presented SOR to legislators.

Another set of distortions related to how reading was conceptualized. In Tennessee, one of the main IOs involved in promoting SOR was the think tank State Collaborative on Reforms Education (SCORE) directed by a group of philanthropists from national networks of education reformers (Aydarova, in progress). When legislators discussed SOR bills or sought support for other education-related bills, they invoked SCORE as *the* source of authoritative policy knowledge. In its own reports, however, SCORE presented a variety of interpretations of what "science of reading" meant—from Scarborough's Reading Rope, showing how knowledge building and language skills intertwined to demonstrate the complexity of reading [SCORE, 2020a] to a statement that "'science of reading' refers to literacy instruction best characterized by the 'Simple View of Reading'" [SCORE, 2020b, 9]. The complex view of reading was backed by references to the work of the National Reading Panel (2000), whereas the Simple View of Reading came from an article published long before the term "science of reading" came to dominate policy debates (Gough & Tunmer, 1986). Overall, although the emphasis on "science" was meant to convey an established body of knowledge and a "majority consensus" [House Bill 2229/Senate Bill 2160, 1] what IO publications, SOR advocates, and policy makers referred to as "science of reading" was both contradictory and unstable across contexts.

Semiotic Chains: Science of Reading, Phonics, and Foundational Literacy Skills

The instability of meanings attached to "science of reading" allowed for semiotic chains to emerge across bill presentations and deliberations. When reform discussions started, the commissioner of education, who championed these reforms, said SOR emphasized explicit skill instruction in phonics, phonemic awareness, and decoding. Even though these concepts were being discussed as "new" approaches, they did not differ in any meaningful way from what was already set out in the state reading standards introduced in 2017. At the same time, semantic boundaries were drawn between "science of reading" and "balanced literacy" that would be discarded as a result of the reform:

> When we talk about the science of reading, it's really making sure that when children learn to read, they're understanding how to decode words. That is separate from a balanced literacy approach, which uses cuing. What we're saying is with the science of reading, we want to make sure that children build the skills to decode and understand meaning using evidence-based systematic phonics instruction. [House Curriculum, Testing, and Innovation Subcommittee, February 25, 2020]

This boundary drawing laid the groundwork for the first conceptual substitution. In response to the commissioner's presentation, some Tennessee legislators expressed concern about mandating SOR as the "only approach" that the state had to follow. And media outlets pointed to the tension in the field, with teacher unions opposing SOR because it pushed teachers to adopt yet another

program in the midst of constant change [Rau, 2021]. As a result, in March 2020 the bill moved forward "minus the phrase 'science of reading'" [Aldrich, 2020b]. The legislative deliberations shifted to phonics as the primary method of instruction. While this conceptual substitution was not necessarily backed by science (Shanahan, 2003), it did bring more legislators on board to support the bill. It's worth noting that a few outspoken politicians who raised concerns about phonics were silenced during the debates.

In the final version of the bill that was signed into law, the focus shifted to "foundational literacy skills instruction," even though legislators continued to emphasize phonics in their deliberations. In an interview, a Department of Education official pointed out that "you won't see the word *science of reading* throughout the law; it is *phonics-based approach foundational literacy skills*" [Interview 2, April 2022]. Another department official explained that this substitution was strategic:

> We use "science of reading" on national calls, but we never use it in the state of Tennessee because we have been in that "neuroscience versus our science versus this science." With our legislators, we do use "a phonics-based approach" because that is something that they can wrap their heads around. Sometimes when you're with different stakeholders, you have to use those terms that make sense and resonate with those stakeholders.

When the Literacy Success Act became law, it required "foundational literacy skills" as the "primary form of instructional programming" and only allowed instructional materials based on this framework [Public Chapter 3, 2]. The same definition that incorporated five elements of reading to describe "science of reading" in prior versions of the bill was now used to describe "foundational literacy skills" [Tennessee Literacy Success Act, 2021; Wesson et al., 2022]. According to the law, districts had to "adopt and use English language arts textbooks and instructional materials from the list approved for adoption by the state board" [Public Chapter 3, 2]. Three times a year K–3 students were required to take universal reading screeners approved by the state. Parents had to be notified if their children displayed "significant reading deficiency" and what steps schools would take to address them, with third-grade retention looming for those who fail to make adequate progress in reading. Every school district had to submit "a foundational literacy skill plan" for Department of Education approval. All K–5 teachers had to take a professional development course on foundational literacy skill instruction. Educator preparation providers had to follow new "foundational literacy skills standards," and teacher candidates had to take "a reading instruction test" and "provide evidence documenting the candidate's completion of a foundational literacy skills instruction course."

Overall, these semiotic chains reveal an agenda behind SOR myths: introduce reading reforms that prescribe curriculum, assessment, and professional development packages. After the SOR bill began moving through the legislature,

"science of reading" emerged as a contested sign. As such, it no longer served a useful function in pursuit of that agenda and disappeared from legislative deliberations. Other signifiers replaced it, with "foundational literacy skills" offering the same definition and taking center stage in the final version of the bill. However, semiotic chains comprising SOR myths remained in the state's policy documents. For example, the Tennessee Comptroller's Report [Wesson et al., 2022] on the first year of the Literacy Success Act's implementation explained reform principles in the following way: "Because research on how students learn to read has found that a phonics-based approach is most effective, reading instruction based on foundational literacy skills has been referred to as the 'science of reading'" (4).

Conceptual Substitutions: Science of Reading, "Knowledge-Building Curriculum," and "High Quality Instructional Materials"

During legislative sessions, "science of reading" was frequently used alongside "high quality instructional materials" and "knowledge-building curricula." When the commissioner of education presented the main points of the SOR bill to the House Curriculum, Testing, and Innovation Subcommittee, she was asked to explain what science of reading was and whether she had any examples of its implementation locally. Her response addressed both questions: "Within the state of Tennessee, we've had a number of districts who have utilized knowledge-based curriculum, as well as the science of reading in terms of how they provide phonics instruction" [House Curriculum, Testing, and Innovation Subcommittee, February 25, 2020].

"A number of districts" refers to the LIFT (Leading Innovation for Tennessee) network created by SCORE and revived in 2016 to reform literacy approaches in partnership with TNTP (previously The New Teacher Project). Districts that joined the network piloted "knowledge-building" curricula that were *not* on the state-approved list, and TNTP identified "high quality instructional materials" for them to use [LIFT Education, 2018]. The districts could choose among Core Knowledge Language Arts (CKLA), developed by the Core Knowledge Foundation and distributed by Amplify; Wit & Wisdom, developed by Great Minds; and EL Education, developed by Open Up Resources. These largely scripted curricula were developed by nonprofit organizations supported by major philanthropies and think tanks. TNTP belonged to these organizations' networks and had long been involved in efforts to introduce curriculum reform. Originally, the focus of these efforts was the introduction of "knowledge-building literacy curriculum" [Palmer, 2016] encapsulated in the Knowledge Matters Campaign that brought together many of the influential actors in the education reform movement (Aydarova, in progress). Over time, this focus was expanded to include SOR methods of teaching reading [Knowledge Matters Campaign, 2020].

The Knowledge Matters Campaign identified several knowledge-building curriculum packages as "high quality," along with CKLA, Wit & Wisdom, and

EL Education, and began what ostensibly became a marketing campaign to promote these resources. It asserted that these curricula "coherently build knowledge of words and the world; teach students to read through *systematic foundational skills instruction* [emphasis added] until word recognition is automatic and students are fully fluent" [Knowledge Matters Campaign, 2022]. Most of the packages were relatively new to the textbook market, since they were designed for the implementation of Common Core State Standards. But as states began moving away from CCSS to develop their own standards, SOR and its related signs became a tool to advance the use of the CCSS curricula, even though Tennessee bills, for example, explicitly prohibited such a move.

Through a National School Tour first funded by the Charles Koch Foundation and later supported by Amplify, Core Knowledge Foundation, Great Minds, Open Up Resources, and other publishers, the Knowledge Matters Campaign [2020] "lift[ed] up the stories" of the districts where these curricula were being implemented. More than two dozen of those stories were published in *The 74 Million,* an education-focused news outlet. Op-eds and feature articles focusing on the improvements districts saw after implementing these curricula appeared in various education magazines, blogs, and newsletters.

Stories from Tennessee districts began to be published in February 11, 2020, soon after Governor Bill Lee announced "a $70 million state-wide initiative to support district adoption and implementation of high-quality English language arts curricula"—or the SOR bill [Gewertz, 2020]. Stories from district leaders focused on "a transformative journey" with *CKLA* curriculum [Baker & Dinsmore, 2020], *EL* curriculum "leveling the equity playing field" [Hoglund, 2020], and "real success implementing *Wit & Wisdom* curriculum" [Kimble, 2020]. Each story highlighted what districts had gained after partnering with the LIFT network and receiving professional learning support from TNTP. These stories were accompanied by events that the Knowledge Matters Campaign organized in partnership with SCORE where district leaders and politicians were invited to learn more about "high quality instructional materials" and "knowledge-building curriculum." As one of my study participants noted:

> The school tour is getting a little bit of cachet. The chief academic officer in Tennessee, told [the Instructional Materials and Professional Development Network of the Council of Chief State School Officers] group from the stage about the role of the Knowledge Matters Campaign in promoting the success that they've had with adoption of high-quality instructional materials in their state. Because of the school tour, everybody wanted to be one of the cool kids, and so that has worked. [Interview 7, 2023]

As soon as literacy appeared on legislators' agendas in October 2019, most of the invited testimonies on SOR for the House and Senate committees came from principals and directors of instruction from the districts that were a part of the LIFT network, that had implemented the curricula the Knowledge Matters Campaign promoted, and that had received professional development support

from TNTP. For instance, one invited expert, a supervisor for K–5 instruction in a public school, described great results from "instruction [grounded] in reading science" accomplished "through the use of high-quality curriculum"—CKLA. As soon as she finished her testimony, one of the legislators asked her to explain "science of reading":

> I want to talk about the science of reading, because, a lot of times, in science, you think, "If you do X, Y, and Z, this happens." Gravity, you drop a ball, it does this. The planets rotate like that. I know with children, it's a lot more nuanced. Is there a strategy or a methodology that 60 percent of the kids will respond to if you just do it? Somebody says there's something that really works, but teachers hate it because it's very scientific. "Do this," "Do that," as opposed to "Be creative." Can you talk a little bit about, more, the science? [House Education Committee, October 9, 2019]

The presenter's response went straight to the CKLA curriculum her district had adopted:

> Our results show that we are not only moving children out of the at-risk category, but we're also moving many children into the 75th to 100th percentile. This tight curriculum is moving all children, but it's only as impactful as the person who's executing that curriculum. [House Education Committee, October 9, 2019]

This exchange exemplifies a persistent pattern of conceptual substitutions afforded by SOR semiotic chains: when asked to explain the science, advocates named the products and programs that they implemented through their partnership with SCORE and TNTP.

The Literacy Success Act passed in 2021 required Tennessee school districts to use ELA curricula from the state approved list. Close to half of the districts chose curricula promoted by the Knowledge Matters Campaign (Aydarova, in progress). In addition, teachers had to receive training provided by third-party providers, such as TNTP, which in 2021 received an $8 million extension for its $8 million contract despite concerns about ethical violations in vendor selection [Stockard, 2021]. This literacy reform was not an unfunded mandate. In the first year of implementation, $100 million was allocated for the reform, with $60 million coming from COVID-19 relief funds. Most of these resources, however, went toward covering the products and services provided by nonprofit and private-sector organizations. The Tennessee Comptroller's Report [Wesson et al., 2022] described contracts with Pearson for the universal reading screener, with TNTP for professional development, and with Education First Consulting for analytic reports. As the reform moved along, the Tennessee Department of Education gave "$100 million in grants to help schools to pay for literacy materials aligned with the science of reading, training for thousands of teachers on their use and frequent student screenings" [Hawkins, 2022]. Together, these symbolic substitutions revealed the parasitic nature of "science of reading" mythologies: although the new legislation

overtly addressed changes in literacy instruction, it ultimately served to secure a market share for certain private providers of curriculum, assessment, and teacher professional development.

Symbolic Substitutions: Phonics and Tradition

Across presentations, discussions, deliberations, and interviews, an equivalence emerged: "the science of reading, or systematic phonics instruction," which one bill sponsor referred to as "scientific phonics." From the governor to legislators in both chambers, supporters of the SOR bill described it as going "back to basics." Similar to the national media coverage, "science" gave way to "phonics," which resonated as the approach long seen on the Right as the solution to the country's education crisis (Laats, 2015). During the special legislative session in January 2021, the chair of the Senate Finance Committee passionately explained to the other committee members the significance of these reforms:

> I love this bill, not only because it brings attention to something that we've been talking about here ever since I've been here, but actually this dates back probably to the 1990s, if not earlier, about *Why Johnny Can't Read,* which was published in the fifties. This is a struggle. And members, the challenge here isn't the phonics part of it. The challenge is executing this. Because, as I've said on the floor a couple of days ago, there is no new idea in this legislation. [Senate Finance, Ways, and Means Committee, January 21, 2021]

Intertwined in this legislator's monologue were important references to the past. *Why Johnny Can't Read,* by Rudolf Flesch, was originally published in 1955, long before the notion of science of reading was introduced into public debates. The book and subsequent references to it presented phonics as a singular approach for teaching reading and for remedying reading disparities among students from different socioeconomic, racial, ethnic, and linguistic groups. This legislator's admission that there was "no new idea in this legislation" underscored how the solutions being offered were not about new advances in cognitive science but, rather, about finding new tools for "executing" what had been traditionally promoted by conservative groups (Laats, 2015).

For many white legislators, phonics was about "teaching kids to read the way we were taught" and "how we taught our kids to read," as Governor Lee said when he introduced this legislation. The link to science disappeared, and instead the sign shifted toward tradition rooted in these politicians' own past experiences. During final deliberations, legislators shared that they knew phonics worked because they had learned to read with its help themselves. As one senator said, "I'm one of the older members here, and phonics was taught as I came up through school." Another echoed, "Most of us learned with phonics, and many of us had schoolteachers that had on silk stockings with lace-up shoes" [Senate Floor, January 21, 2021]. These reminiscences about the past

on the Senate floor were interspersed with stories about teachers using rulers to discipline children or nuns harshly punishing students for their misbehavior. Thus, phonics as a sign of tradition also signified disciplining bodies and minds to create order and compliance.

The discussion around phonics also evoked comments about teaching basic skills even if students are bored. In a demonstration where legislators were asked to pretend they were children learning to read in school, one SOR advocate had them practice different skills for an imagined grade level: "Now, we're in first grade. We know all our letters. We feel good about it. We've been doing this forever. In fact, we're kind of bored. 'Oh, this lady's making me write this letter again.' Yes, I am. I teach ad nauseam." She presented mind-numbing, "ad nauseum" repetition and lockstep instruction that resulted in student boredom as being necessary steps toward helping children develop automaticity and become "successful." "We're going to do the same thing over and over again. We're just going to do it longer. We're going to have to do more repetitions, and we're going to have to do it" [Early Childhood Literacy Presentation for House Curriculum, Testing, and Innovation Subcommittee, January 21, 2020].

Opponents of the bill raised concerns about repetition and boredom that phonics-based approaches create. As one of the legislators, a former teacher, explained to me during an interview, "To limit everything to phonics is a huge mistake. And a lot of these programs are scripted, they're boring" [Interview 5, May 2022]. During legislative debates she emphasized that bored children are more likely to "act up."

The turnstile of form and meaning rotated. Phonics as a signifier for tradition, order, and discipline also became the signifier for boredom and disorder. Ultimately, however, the SOR sign, with its connection to phonics, tradition, and repetition, works to naturalize students' alienation from reading and learning. If students do not achieve expected results, "it comes down to the biology, the brain, the development of the brain" rather than reforms that turn reading into a meaningless exercise of sounding out words and doing "the same thing, over and over again" [Early Childhood Literacy Presentation for House Curriculum, Testing, and Innovation Subcommittee, January 21, 2020].

Material Substitutions: Science of Reading and Phonics as Replacements for Social Reforms

The opening statement of the bill that became the Literacy Success Act laid out several motivations for the reading reform which, in addition to addressing the "literacy crisis" stoked by both state and national media, claimed that literacy was "essential to maintaining a free society" [Public Chapter 3, 1]. Even though this can be interpreted as a rhetorical move to affirm democracy and oppose authoritarianism, how the notion of freedom played out through the sixteen months of debate on reading reform challenges this interpretation.

The neoliberal version of freedom—as individual choice not constrained by state safety nets or support structures—was prevalent in the statements of the legislators who supported SOR reforms.

Fundamentally, "science of reading" came to play an important role in material substitutions. Instead of providing financial or social support for impoverished families and communities, legislators discussed literacy reform as a means of ensuring that those who come from historically underserved communities could "take care of themselves," "find employment," and "move out of poverty." In the chain of SOR signifiers, "explicit phonics instruction" became a substitution for investing in communities and creating the safety nets that were necessary for families to climb out of poverty. As one of the bill sponsors explained in his statement during the special legislative session:

> The cost of not [reforming reading] is actually greater in the long run. Not only for the individuals whom we are failing in the education system but for our citizens who support the prison system, the welfare state, and a host of other things that we have as safety nets which would be unnecessary if our citizens were properly educated and able to find good employment. [House Education Committee, January 20, 2021]

The sentiment that reading reform could replace state provisions in other areas was shared by other legislators and manifested itself in discussions where a variety of policy options were presented for legislators' consideration. For example, during the summer session in October 2019, Tennesseans for Quality Early Education, a nonprofit promoting early education reform, brought in experts to testify about the necessary changes in early childhood education. Legislators, however, rejected the group's call to expand access to free or subsidized preschool for low-income families and ignored their request to ensure that more social workers were available in schools that served historically underserved communities. They perceived these proposals as "state overreach" and dismissed them because it was "each family's responsibility to care for their own children" [House Education Committee, October 9, 2019]. Only one Black male representative raised a concern that politicians who spoke up against supports for impoverished families had not themselves experienced social precarity. These politicians did not know what it was like to live in "a survival mode, when you don't know where your next meal is coming from, or if you're going to have roof over your head" [House Education Committee, October 9, 2019].

In contrast, the testimonies about SOR received questions and extensive positive comments from legislators who emphasized the importance of proposing legislation to reform reading instruction to solve other social issues. SOR advocates and legislators supporting the reforms emphasized that "phonics" would not only steer people away from poverty but also keep them out of prisons. Advocates noted that addressing incarceration rates was among their motivations for lobbying for SOR reform. For instance, during the SOR demonstration in January 2020, the presenter stated, "If we say approximately

20 percent of the population is dyslexic, maybe 32 percent of prisons are—Why don't I just let people learn to read and maybe it'll cut down on our crime rate?" In response, the chair of the committee who invited the advocates offered her own perspective:

> Phonics-based [instruction] opens up so much. When you mentioned the prisons, I was able this fall to go to Northwest penitentiary. I asked the lady there, "Okay, so give me an idea of how many inmates do you have that are still struggling with reading." We went in a room that was probably double this size that was full [points to the room for about fifty people]. And they're teaching them to read. And then there was another lady across the hall that even had a smaller group that just about—they need one on one. But I thought, "Man." I'm not saying that's why they're there. There's personal choices and things like that involved. But I thought, "My goodness. What could have happened, if we could have intervened earlier?" [House Curriculum, Testing, and Innovation Subcommittee, January 21, 2020]

This interaction revolved around an empty signifier. While the advocate was referring to the science of reading, SMILA, and multisensory instruction, the committee chair turned the conversation to phonics. The point of agreement between the two was the relationship between reading and imprisonment: if people were taught to read, imprisonment rates would will decline. The artificial causality established by this claim links crime rates to individuals' reading skills rather than to their social conditions or deteriorating social safety nets.

When the Tennessee House Majority Leader sponsored first the SOR bill and later the Literacy Success Act, ushering it to passage in 2021, he was praised by fellow legislators for introducing measures that would "bring down the state's prison budget [of] $1.1 billion." In 2022 the Leader served as a cosponsor for the "truth-in-sentencing" bill and advocated for it through state media outlets. The bill extended sentence terms and eliminated possibilities of early release for good behavior for certain offenders. The America Civil Liberties Union said the bill would likely increase mass incarceration, and Governor Lee pointed out that "this policy will result in more victims, higher recidivism, increased crime, and prison overcrowding, all with an increased cost to taxpayers." Nevertheless, the bill became law as Public Chapter 988. Alongside other bills that criminalized homelessness [House Bill 0978] and protests [House Bill 8005], these legislative efforts led by many of the same legislators entrenched the carceral logic of the neoliberal state.

In the broader context of legislative efforts and deliberations, SOR reforms emerged as a substitution for social and criminal justice reforms. Based on artificial causality—poverty and imprisonment rates would decline if phonics was used for reading instruction—these reforms naturalized the widening socioeconomic inequities and depoliticized social conditions of precarity that contribute to growing prison populations. Through these material substitutions, the SOR legislation promised students and their communities freedom, and robbed them of it at the same time.

Discussion

Semiotic chains permeate SOR advocacy and legislative deliberations. This sum of signs reveals mythologies constructed around SOR in policy-making contexts. Science has little bearing on what is proposed or discussed, despite various policy actors' claims to the contrary. Instead, SOR myths link tradition, curriculum products, and divestment from social safety nets.

Studying policy conceptualization in Tennessee, I interrogate how advocates approach SOR not as a stable concept with a coherent core but as anything that advances their position and creates traction for the reform measures they support. From variations in terminology—be it "science of reading," "scientifically-based instruction," "evidence-based practices," or "foundational literacy skills"—SOR advocacy and legislative deliberations are full of signifiers that get filled with contingent meanings far removed from actual advances in psychology, neuroscience, linguistics, or cognitive sciences.

Although misappropriations of "science" for political and private sector gains are not new in reading policies (Pearson, 2004, Schoenfeld & Pearson, 2012), this analysis of "science of reading" mythologies sheds light on why the actual science becomes irrelevant in policy contexts. On the one hand, SOR links with phonics—an approach that reading researchers find to be "limited," "pejorative," and "problematic" (Goodwin & Jimenez, 2020, S8)—resonates with some policy makers and legislators because it stands for tradition, order, and discipline. On the other hand, the manufactured literacy crisis that was allegedly caused by balanced literacy or three-cuing instruction makes SOR a useful tool for marketing curricula from publishers that banked on Common Core State Standards in the development of their materials (Aydarova, in progress). As implementation of Common Core began to decline (Loveless, 2021), SOR was brought in to confine districts' choices to "high quality instructional materials" that offer scripted instruction. Under the guise of SOR, states are mandating select diagnostic and screening assessments, curriculum packages, and professional development on how to implement particular curricula. As a multifaceted sign, SOR can be used to sell a variety of products and services that only private or nonprofit entities can provide, since public schools and university-based teacher education programs have been found wanting and unfit for the job of reform (Ellis et al., 2023; NCTQ, 2020; Wexler, 2020, 2022). Framed as "science," SOR appears "neutral and innocent" (Barthes, 1972, 125) and allows legislators and policy makers to appear aboveboard when discussing reading approaches that, beneath the surface concern corporate profits and private sector services. At the same time, SOR mythologies afford for-profit and nonprofit entities opportunities for market expansion (Aydarova, in progress).

Like any other neoliberal policy in the disruptive education reform movement, SOR bills benefit private companies at the expense of historically underserved communities. As millions of dollars go into reading reforms to pay for

products and consultants that offer SOR services, the US sees the growth of child poverty (Parolin et al., 2022), food insecurity, and homelessness (Mitchell, 2022). When legislators who support these reforms treat them as a substitution for social safety nets and regard phonics as a solution for poverty that will decrease incarceration, SOR's more sinister meanings emerge. Instead of introducing reforms of policing and the criminal justice sector that BIPOC communities are calling for (Kaba, 2021), legislators perpetuate myths that phonics instruction will decrease imprisonment rates. Positioned within the webs of legislators' policy activities, SOR reforms reveal legislators' reluctance to address directly the needs of those who live precarious lives. As a result, reading reforms naturalize inequities and injustices of a carceral state with disintegrating social safety nets. SOR "substitute[s] with impunity the signs of charity for the reality of justice" (Barthes, 1972, 49). Flanked by the stark realities of growing social inequality, the SOR sign, with its many signifiers, calls on the audience to accept the neoliberal capitalism as natural forces necessary for the maintenance of a "free society."

Concluding Thoughts

As debates rage about the best approaches to teach reading, this study sheds light on mythologies that drive the introduction of science of reading reforms. This analysis problematizes the use of "science" to preclude the possibility of social critique and transformative justice. By focusing on the ways SOR mythologies advance the agendas of the private sector and naturalize social inequality, this article extends understandings of how education reforms are introduced to maintain the status quo instead of disrupting it. These observations raise important questions about the role of education researchers, literacy experts, and reading specialists who support or disrupt SOR narratives. Responding to SOR agendas requires careful consideration of their role in the reproduction of social inequalities despite the movement's claims to the opposite. No matter how neutral or innocent a sign might appear, myths that preclude the possibility of social critique and, ultimately, social transformation are dangerous tools in the hands of those who hold power in the society.

Notes

1. By *neoliberal capitalism* I mean an economic system whereby the state serves the market rather than the society and economic elites enjoy the benefits of deregulation, marketization, and privatization while those at the lower rungs of the society experience criminalization, marginalization, and life-threatening precarity (Bourdieu, 2003; Harvey, 2007; Wacquant, 2012).
2. Square brackets indicate data sources.
3. I analyze "science of reading" as a sign and use quotations around this phrase and related concepts to capture their unstable and ambiguous use in policy contexts.
4. The list of video data sources is available on request.

5. Consonant blends are combinations of letters in which each letter makes a sound (e.g., *cl*, *str*, *br*, *sp*). Digraphs are combinations of letters that make one sound (e.g., *th*, *ch*, *sh*, *ck*). Prior reading approaches focused on getting children to read letter combinations correctly, whereas SOR adoptions require that children learn the linguistic terms and name what different letter combinations are in addition to recognizing and reading them.

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