“Science of Reading:” Is it the Answer to our Literacy Problems?

Dory Lightfoot

Independent Scholar, Madison, WI
ORCID ID 0000-0001-6576-6654

Abstract

Recently the “science of reading” has dominated discourse on literacy. Advocates assert that it is the only scientific way to understand reading and literacy instruction, and that every other understanding is incorrect and unscientific. Advocates of the science of reading believe phonics and decoding are correct while other views are incorrect. There are laws in forty states mandating phonics instruction in schools and explicitly forbidding the use of other methodologies. In this essay I question this orthodoxy. I first examine the scientific model on which the science of reading is based and questions its adequacy for human subjects’ research. I then unpack the way science of reading discourse positions teachers as ignorant and poorly educated, and shifts power away from teachers, schools and local administrators toward distant experts. Finally, with help from the voices of classroom teachers, I offer other ways we can understand the teaching and learning of reading.[1]

Context

Science of reading is a teaching methodology which mandates the use of phonics to teach reading. It is an ideology which encompasses a theory about how the human mind works and how people learn, as well as the role of “experts” in curricular decisions and even in teacher education. It shifts power from teachers, administrators and teacher educators to an elite group of researchers who know the proper research methods for determining who the students are and how best to teach them. This is my take on the science f reading, explaining what it is, what it has brought to the field of reading, but also the problems inherent in it. It is intended as an informed critique rather than a totally neutral account.

This shift in power can be seen quite dramatically in the fact that forty states (as of this writing) have passed laws mandating the use of “science of reading methods and explicitly forbidding the use of other methodologies. I use Wisconsin Early Reading Law: Act 20, 2023 as an example of this legislation.

This law mandates the use of “science of reading,” including 1) Phonological awareness, 2) Phonemic awareness, 3) Phonics… It explicitly forbids the use of techniques outside of the science of reading such as three cueing by which they mean any method using cues such as meaning, structure and syntax, and visual cues.” (Wisconsin Early Reading Law: Act 20, 2023.) The law fundamentally changes the power structure in schools. Previously many decisions about curriculum were made at the local level. Local superintendents were able to make free choices about curriculum and materials. Individual classroom teachers could make some modifications to the local curriculum to fit the needs of their students (for example if not all students learned the same way or had the same interests) - especially if supported by their principals. Teachers could bring in supplemental materials they found valuable. Curricular materials were expensive but could be changed periodically if they didn’t seem to be meeting the needs of the district. All of this has been fundamentally changed by state law. In a real sense, power has been shifted away from teachers and local administrators to the state, but also, ultimately, to the “expert

researchers who have designed the science of reading and done the research which they feel justifies it.

What is the research behind the "science of reading?

The fundamental research underlying the "science of reading" consists of a series of large-scale meta-analyses of the effects that various reading methods have on scores on reading tests, most of which emphasize decoding over comprehension. Science of reading researchers looked at a very large number of studies comparing methodologies, which used a particular type of experimental design, and averaged out the results, finding that the use of phonics was best at improving reading scores. There have been many objections to these findings which will be discussed in the following sections. Nevertheless, it seems likely that when students are viewed in aggregate, reading scores - at least on phonics-focused tests, and in the earliest stages of reading instruction are better when a strong phonics component is included in the curriculum.

Why, then are there still strong critiques of "science of reading?" Why not accept the data its proponents present and move on?

Taylor (2026) has argued that "science of reading" is not in fact scientific, because the studies justifying it are fatally flawed. In addition, this way of teaching eliminates any activity in the literacy classroom which encourages or even allows thought. Diane Ravitch (2026) argues that interpretations from the science of reading are one-sided and ignore key elements in the process of reading. Meyers and Whitmore (2017) feel reading cannot be divorced from meaning and argues that "science of reading" is based more on whims than actual science. Tierney and Pearson (2024) argue that many prestigious reading researchers justify science of reading by defining reading very narrowly.

One fundamental objection has been alluded to earlier. „Science of reading" as a movement involves taking decision-making power away from schools and teachers and put it in the hands of university-based researchers who share this perspective. In fact, many prominent proponents of "science of reading" explicitly dismiss both classroom teachers and most teacher educators as too poorly educated and ignorant to make fundamental decisions about teaching. One prominent researcher and public advocate of "science of reading" dismisses both teachers and teacher education faculty as too ignorant to be allowed to make decisions about children.

American education is a failed profession. There is no widely agreed upon knowledge base, and …training is brief or nonexistent, the criteria for passing licensing exams are much lower than those in other fields, and there is little continuous professional guidance. (Seidenberg, 2017, p. 250)

The methodology and the theory behind "science of reading" is popular with policy makers but has sparked some controversy.

"Science of reading" theorists are proud of their reliance on "experimental methodologies (although it is worth noting that meta-analysis is observational—not experimental). However, there are some basic problems with applying this type of methodology to human subjects without a larger understanding of human variation. "Science of reading" researchers base their ideas on the theory of "scientific reductionism. This is a theory dating back to the Enlightenment that assumes that complex phenomena can be reduced to simple formulas by looking at similarities between objects or phenomena. For example, if you roll two very similar balls down the same hill, they will move in the same trajectory, at the same speed, etc. It relies on the concept of interchangeable parts. Reductionism has proved to be helpful in the physical sciences. In the biological and social sciences, it has recently become more controversial

as it obscures the ways in which one organism or one human individual differs from one another.

Potential problems with "science of reading

In discussing reading, the question of reductionism raises several fundamental problems. First, can reading be reduced to one simple skill, or is it a complex skill that includes decoding but goes beyond it to encompass a complex set of processes? "Amy,"[2] a teacher I interviewed discussed one (of several) concepts that children with a phonics-only curriculum don't get. This is the idea of reading for meaning and the realization that people are supposed to understand the story or interesting information from written text.

> Nobody's doing read-alouds, for example in kindergarten and first grade. Which is horrific. It's not just heartbreaking. It's not just sad. It's horrific…There's always the kids who will get it. They are the kids who get read to at home… But then there's the kids who aren't getting it… who aren't being read to at home… If you gave me all the time in the world and a stack of books and a comfy chair and some kids I would just go in and do any old-fashioned reading program to the kids who weren't getting it and they'll be reading. (September 22, 2023)

In other words, children whose reading programs focus exclusively on decoding often do not get the idea of reading for meaning… to enjoy an engaging story, or to get useful information. Privileged children often get this experience at home from being read to. But what happens to children whose only experience with reading is in school and only through the process of decoding?

"Grace," pointed out that even on the word level meaning is an important component to reading.

> You know I think phonics is important as a tool but I think some of the other tools have a place and it isn't just one strategy. If I'm reading a story the kids might say "What does that word mean:" You can know a word, pronounce it but you want to pair it with meaning so it all comes together. (May 21, 2025)

Even on the word level phonics may not be enough to fully decode text. Those of us who sing choral music have had the experience of being able to decode text in languages such as German or Latin and pronounce words correctly while having no idea what they mean. There is a further problem with languages such as English, French or Danish where words are not always spelled phonetically. How can children decode words like cough or through without at least guessing the meaning from context (which, remember is now forbidden.) Then there is the problem with heteronyms. How can we know whether to say read (present tense) or read (past tense), What about minute (time) or minute (size?) Can we guess this entirely from phonics?

Another problem, drawn directly from the use of reductionist theory and the methods of meta-analysis, is the tendency to assume all children learn in the same way. Reductionism derives its formulas from the concept of interchangeable objects or phenomena.

Sayer (2005) asserts:

> In social science, the term 'reductionism' is used largely pejoratively…As many contemporary researchers argue, reductionism makes it impossible to see the complexity of factors that influence the behavior of a living organism. (Sayer, 20, 34)

When interviewed, many veteran teachers assert that whether or not they like phonics as a method, it works better for some children than for others. While science of reading sees all children as fundamentally the same, and asserts that all children can, should, and will learn in the same manner, and at the same pace, classroom teachers see differences in culture, in backgrounds, in pace of acquiring reading, in learning styles and in personality which make it difficult to impose a one size fits all program on a diverse audience. Genevieve said,

> I generally like phonics. It is the way I was taught as a child.[3] … I found that phonics works for about 70% of children. The problem is that it didn't work for about 30% of my students. I had to find another way to teach them so they would learn to read. For example, one little boy I worked with just didn't learn with phonics. I discovered that giving him books with graphics—like comic books helped him to start reading. (July 23, 2023)

Claire, a first-year teacher who works in a high-needs school said the following:

> I work with very low-income children. Many of the teachers in the school have very creative ways of teaching these kids but they aren't't allowed to because the curriculum we are given in our district is so structured. (December 15, 2024)

Grace said the following: "I feel like it's a big pot. And there's so many strategies that go into it. And now they're eating soup with only one ingredient." (June 23, 2025) Finally there is the issue of the shift in power from classroom teachers to cognitive science researchers, who do not value qualitative research, and only enter schools to tell teachers what to do, not to listen to them, or to observe them interacting with students.

Wrigley reflected that

> Reductionism affects policy and administrative systems, but goes right down to fundamental assumptions about learning and knowledge. In practical terms, reductionism is disempowering because it denies to professionals, as well as policymakers, the understanding they need to operate skillfully and with agency in challenging situations. …[and] disempowers practitioners. (Wrigley, 2019, 145)

As Michael Apple argues,

> Schools do not only control people; they control meaning, since they control and distribute what is perceived to be "legitimate…" Schools confer cultural legitimacy on the knowledge of specific groups… The ability of a group to make their knowledge into "knowledge for all" is related to that group's power in the larger political and economic arena. (Apple, 1979, 63)

This question of the shift in power is an important one. We as a society need to think carefully. Who do we want to be included in debates about curriculum? Do we want to have a conversation where classroom teachers negotiate decisions with academics and policy-makers? Do we want decisions t be imposed by law and inspired only by "qualified" academics? If so which academics do we listen to, different types of researchers or only one group? Is there only one voice or can there be participation by various groups. Advocates of "science of reading say that teachers are too poorly

educated to make intelligent decisions about curriculum and need to be told what to teach. Is that indeed true?

Conclusions

In summary, the teaching of reading is a complex subject. "Science of reading" has contributed one valuable insight into the field. It has affirmed that the inclusion of phonics as an early reading curriculum adds something valid. In the past phonics was downplayed or neglected in some curricula. But has this insight come at a cost?

"Science of reading" comes from an intellectual tradition based on inanimate, physical objects. It assumes that treating students as a uniform aggregate makes it possible to find one correct profile fitting every student. All students should be the same and learn the same way, and all teachers should be comfortable using the same lockstep method. It also assumes reading is a simple skill, involving little but decoding words using the rules of phonics, and that those rules are sufficient for decoding all English words. Finally, it advocates for (and has succeeded in imposing) a radical shift in the balance of power in schools, from some degree of power sharing between teachers, administrators and policymakers to a top-down system where policymakers, guided by a small group of academics, have an extraordinary amount of control over what happens in the classroom. This assumes that most teacher education programs are poorly planned and executed, and that the teachers who graduate from them do not have the skills and knowledge to make their own decisions. This raises disturbing implications.

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[1] Dory Lightoot has a longstanding interest in the philosophy of science and the philosophy of education which aid her in exploring the theoretical and practical implications of the :science reading on teaching and learning.
[2] All teacher names are pseudonyms.
[3] Interestingly Genevieve was one of those children who already knew how to read when she entered school.