What is the 'Science of Reading?'

Tim Shanahan

That depends on who you talk to. There is no agreed upon definition. Nor is there any official body like the *Académie Française* that can dictate a meaning by fiat. In 2020, *Reading Research Quarterly* published a science of reading issue (it blossomed into two with more than 50 articles). There weren't 50 definitions, but it was close.

The disagreements turned on two points: the role of instructional research and the scope of reading covered.

Some use the term in reference to neurological and cognitive science studies of how brains process written words (e.g., *Reading in the Brain: The New Science of How We Read* by Stanislas Dehaene or *Language at the Speed of Sight* by Mark Seidenberg). The problem with that approach, as valuable as those studies are, is that it ignores instructional research – the studies that consider the impact of how and what we teach. That approach wouldn't bother me if its purveyors weren't trying to tell us what and how we should teach.

No one in medicine would willingly apply basic scientific findings to medical practice without some intermediary tests of effectiveness and safety. Imagine, for instance, physicians administering COVID vaccines without proof that they work. Despite careful attention to basic research, only about 10% of medical therapies ever make it all the way through the testing process. 'Can't miss' hypotheses based on terrific basic science research often fail to work in medicine and there is no reason to think it would be any different in reading education. A century of failed hypotheses in teaching (e.g., right-handedness training, learning styles, programmed readers, eye training) should disabuse us of this idea (Shanahan, 2020).

To me, a science of reading – if we are talking about education – requires that our prescriptions for teaching be tempered by rigorous instructional evaluations. If a claim hasn't been tried out and found effective, then the claims – no matter how heartfelt – aren't part of reading science.

Basic research shows that phonological activation takes place when people read words silently and simulations are showing that computers' responses to words are affected by the statistical properties of the words they process. Such findings suggest that readers look for visual patterns when they read and that reading requires that those patterns be processed phonologically. That's fascinating, but it doesn't reveal how we can best teach reading.

As cool as those studies are, I don't argue for explicit systematic phonics and phonemic awareness instruction because of them. I advocate such teaching because there are more than 100 studies showing that it improves kids' learning (National Early Literacy Panel, 2008; National Reading Panel, 2000). Those brain studies strengthen the case admittedly, but without them I'd still support phonics. Conversely, if I only had the brain evidence, then no deal – not enough support for me to include that in my teaching routine.

When someone tells you what to do in the classroom based on what they think a 'science of reading' shows, be sceptical. Ask to see the research that shows that teaching those things or in those ways improves learning.

The other definitional disagreement has to do with the scope of what counts in a science of reading. Historically, that term was used to refer to word reading ('decoding' in current parlance) – a tradition that goes back more than 200 years. Current claims align well with those historical uses. If someone says your school isn't aligned with the science of reading, they likely mean that you are not teaching phonemic awareness and phonics in the ways that they think you should.

There is nothing wrong or misleading about using the term that way. If my child had dyslexia and he was being taught to guess words based on the pictures – an approach inconsistent with the basic science but also with the instructional science – I'd complain. That a science of reading or, more properly, a science of reading instruction, includes much more than that wouldn't mean that I was being misleading – only that I was applying a general category to a specific case.

Many of those *Reading Research Quarterly* articles were aimed at trying to expand the scope of how science of reading is currently being discussed. It's great to try to reveal the entire scope of evidence that is encompassed by science of reading,

unless the point is to distract folks from ensuring their kids get explicit phonics teaching.

I make that point because I know of no-one who uses the term science of reading to exclude research on vocabulary, reading comprehension, domain knowledge or oral language, no matter how narrowly they may be using the term in a specific instance. Reading researchers shouldn't feel threatened when parents try to make sure that a particular part of the research is applied and applied well.

In case that isn't clear: indeed, a science of reading instruction includes more than phonemic awareness, letter name learning, phonics, decoding and text reading fluency. But importantly, a science of reading includes all those aspects of reading, as well.

How does Science of Reading differ from National Reading Panel?

The last time these science of reading debates broke out was in the 1990s. That time, the U.S. government intervened. The term then was not 'science of reading,' but 'scientifically-based reading instruction (SBRI)'. That term focused specifically on instructional studies and provided a specific legal definition of the term; then scientists were empanelled to determine the scope of the matter based on research reviews.

I served on that panel. That effort led to strong public support for explicit teaching of phonemic awareness, phonics, oral reading fluency, vocabulary and reading comprehension. Based on those reviews, the feds adopted policies that promoted such instruction in the primary grades. At that time, fourth grade reading achievement rose in the U.S. – something we haven't seen since those policies were allowed to lapse.

To me, the National Reading Panel results are part of a science of reading. But remember that was carried out in the late 1990s. During the past two decades, research has expanded and we know more about what should be included in a science of reading instruction. Topics like writing and spelling to improve reading, text complexity, teaching reading comprehension within science and social studies, differentiation of instruction, quality of instruction and text structure have all generated extensive bodies of research since the Panel closed its books. (A science of reading is always a moving target since knowledge is always conditional and research is always ongoing.)

How do I know if an instructional program or approach is part of a science of reading?

This question comes up a lot these days. And no wonder.

A couple of weeks ago I issued a blog that explained that some widely touted practices are not part of a science of reading. You wouldn't believe the messages that I received from people angry with me for daring to write that. They assured me that those practices were part of the science of reading, and they knew it because they believed it.

I asked an author of a program touting some of those practices under the science banner about this.

She knew there was no research supporting what she was selling as 'science of reading', but she defended her approach since it was 'just logical that those things work given the science'.

She may or may not be right about that. I don't know. I do know that my hunches, biases, deeply held beliefs and inklings aren't science – and I don't know how hers get to be so sanctified.

In this case, she not only was embracing practices that haven't yet been studied, but those which research hasn't supported.

Unfortunately, the only real protection against that kind of logical overreach is *caveat emptor,* buyer beware. When someone tells you that something is part of the science of reading, you need to ask for the study or studies that proved that to benefit learning. Finding support for those claims shouldn't be on your shoulders but on theirs.

The lack of research supporting an instructional approach is NOT proof that an approach does not work. It may work, even if it hasn't been tested yet. Lots of time is necessary to stretch research findings beyond what was directly studied. There is no other information to go on.

There is nothing wrong with advocating or adopting instructional approaches without evidence – as long as everyone recognises that to be the case. When untested practices are promoted under the guise of a science of reading, it isn't okay. It's dishonest, false advertising, fake news; it's just another case of someone trying to manipulate you to do what they want you to do.

This article originally appeared on the author's blog, Shanahan on Literacy.

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