



Emma Eccles Jones College of Education & Human Services
Center for the School of the Future
UtahStateUniversity

Early Reading: The Science of Reading (SOR) A Policy and Research Brief

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The purpose of the Center for the School of the Future is to promote empirically validated practices in public education systems and to encourage cooperative and research relationships between K-12 and higher education institutions.

The Context

Of all the skills needed for academic, social, and economic success in the United States today, none is more important than the ability to read and read well. Many people ask, “What is so important about early reading?” The answer, “Early reading is a powerful predictor of later life success.” Many studies link early reading proficiency to academic, social, emotional, legal, economic, and psychological outcomes for students. One study found that children who did not read proficiently by the end of third grade were *four* times more likely to leave school without a diploma (Fiester, 2013; Hernandez, 2012). Drakeford (2002) argued that adolescents with poor literacy skills are disproportionately represented in correctional institutions. These studies suggest that educational equity is devastatingly imperiled when young children fail to learn to read well by the end of third grade.

Over the last several decades, an increasing body of research has been amassed in the sciences and neurosciences to understand better the cognitive processes involved in learning how to read. This research describes how reading is accomplished in the human brain (Deheane, 2009; Seidenberg, 2017; Willingham, 2017) and has been labeled the “science of reading” (SOR).

SOR has entered into the mainstream media conversation (Hanford, 2022; Wexler, 2022) as well as into U.S. state and federal education policies (Utah Code § 53E-3-1003). With this heightened attention, many SOR myths and misunderstandings have developed and spread. These myths hinder the effective implementation of SOR implications in classrooms and schools, and therefore, must be dispelled. The purpose of this policy brief is to define what SOR is and to discuss and dispel several myths and misunderstandings around SOR.

Definition of the Science of Reading

What SOR is



A collection of basic research studies into how humans read and learn to read

Research based on empirical investigations that employ scientific research methodology, e.g., controlled random trials (CRTs), experiments, etc.



Research that represents multiple replicable and converging findings

Research that is published after blind peer review or rigorous review by a similarly objective panel or board



Research that is ongoing based on best evidence available

What SOR is not

A program, curriculum, intervention, or instructional practice derived from applied research or research synthesis*



More or different phonics instruction

Professional development trainings such as LETRS



Another educational fad

**applied research findings are considered the Science of Reading Instruction (SORI)*



Myths and Misunderstandings About SOR

Myth #1: SOR = Science of Reading Instruction (SORI)

Fact #1: SOR is a set of research studies about how children learn to read, not how to teach reading

SOR explains what happens in the brain when we read, but it does not tell us how to teach reading. Fortunately, we have an emerging body of research evidence on reading instruction that tells us much about how to teach children to read well. This research is derived from the research on SOR and is known as the *Science of Reading Instruction*, or SORI (Reutzel, 2021; Shanahan, 2020) and represents applied science findings as compared to basic science findings.

SORI is based on empirical findings of instructional research and identifies instructional practices that have been research-tested in schools and classrooms (Duke & Martin, 2011). This is a critical distinction. For example, knowing how the heart works in the circulatory system (basic science) is vastly different from knowing how to perform a successful open-heart surgery (applied science). The same is true of SOR and SORI. It is one thing to know how humans cognitively accomplish the feat of learning to read (SOR); it is quite another to know how to effectively teach a young child to read (SORI).

Myth #2: SOR (and SORI) = More phonics instruction

Fact #2: SOR and SORI are bodies of research that go well beyond phonics instruction

This myth asserts that SOR and SORI are about more phonics, phonics, phonics. First, SOR does not address how to teach reading

via phonics or any other means. Since SOR is a collection of decades of studies converging on the elements and processes employed by readers, at least four other elements of reading must be included as well – phonemic awareness, fluency, vocabulary, and comprehension (Castles et al., 2019; National Reading Panel, 2000). Equating SOR simply with an increased emphasis on phonics instruction is a serious misunderstanding of the SOR.

Another problem with this myth is that it is not just about the quantity of phonics instruction but also the quality. SORI provides much information about effective phonics instruction. Phonics instruction needs to be explicit, systematic, and structured (Castles et al., 2019; National Early Literacy Panel, 2008; National Reading Panel, 2000). Simply adding more time to and intensity on some types of phonics instruction, in and of itself, will be unlikely to yield gains in reading outcomes for young students.

Myth #3: SOR is a scripted (or unscripted) reading program

FACT #3: SOR is not a reading program

SOR is not a core, supplemental, or reading intervention program; it is a set of *research findings* on what happens in the brain as we learn to read. SOR cannot be a program because the studies that comprise SOR do not directly explore how to teach reading, let alone evaluate program effectiveness (Petscher, Cabell, Catts, et al., 2020; Shanahan, 2020). Furthermore, there are no SOR validated core reading programs or materials that can be purchased or adopted at this time (Petscher et al., 2020).



Myth #4: SOR = LETRS training

FACT #4: SOR is different from LETRS training

LETRS is a professional learning program designed to increase teachers' *knowledge* about educational linguistics applied to reading, spelling and other language related skills and concepts. LETRS is an excellent program for filling gaps in teacher knowledge, often resulting from inadequate teacher preparation in reading, writing, spelling, and other language related skills and concepts. LETRS is not a reading curriculum either. This is explicitly stated in the *Welcome to LETRS* statement found in LETRS, Vol. 1, pg. xv (Moats & Tolman, 2019).

LETRS training does not provide teachers with the *skills* needed to teach reading. Currently available evidence suggests that training in LETRS does not produce changes in teacher instructional practices nor does it result in increased student reading proficiency (Garet, Cronen, Eaton, et al., 2008; Schwartz, 2022). Teachers need additional professional development as well as on-going expertise and support from knowledgeable literacy coaches and other reading professionals to translate SORI research results into effective reading instruction in the classroom.

Myth #5: SOR is a curriculum

FACT #5: SOR is not a curriculum

SOR cannot be a curriculum because the SOR research body does not tell us *how* to teach reading. Instead, *SOR is about learning how humans learn to read*. Teachers should resist the impulse to teach young children

everything they learn in LETRS trainings as if LETRS were a curriculum. Doctors do not share with their patients the knowledge they acquired to practice medicine effectively; teachers should not either. Young students need far less, and often different kinds of information, from that provided in LETRS.

Myth #6: SOR is just one more educational fad that will pass

FACT #6: SOR is not a fad that will go away but is subject to change based on evolving evidence

SOR consists of a body of empirical research studies; and therefore, it is not a fad. Fads gain notoriety from social and media trends rather than from bodies of research evidence. Science is far more stable and reliable than fads that come and go. Like any research, SOR is subject to the typical adjustments that result from ongoing scientific investigation, debate, and progress.

At present, though, the amount and coherence of converging scientific evidence about SOR is considerable. The educational community would clearly stumble if it viewed SOR as a passing educational fad. Such a view would perpetuate the already large percentage of children reading below proficient levels as well as encourage the use of many existing ineffective instructional practices and programs (see “What is the Science of Reading” blog, Shanahan (2021) @ <https://www.shanahanonliteracy.com/blog/what-is-the-science-of-reading-1#sthash.FfrsBTVI.dpbs>; “Sold a Story,” Hanford, 2020 @ <https://podcasts.apple.com/us/podcast/sold-a-story/id1649580473>).



A Utah Example of Effective Use of SOR and SORI

When the knowledge of SOR and instructional practices of SORI are combined, they can significantly improve reading outcomes in young students. One district in Utah has engaged a trifecta of supports for implementing the *Science of Reading* and *Science of Reading Instruction* in its primary grades. First, every primary grade teacher, elementary principal, and literacy coach has or is completing LETRS training. Second, the district contracted with two nationally recognized SOR and SORI experts to learn how to effectively translate SOR and SORI research into practice. Third, the district utilized coaching support for primary grade teachers in each of their elementary schools.

At mid-year 2022-2023, Kindergarten Acadience Data showed impressive gains. This district now has 66% of its K students at established benchmark levels or what is known as “blue” and has increased their blue K Acadience composite scores by 26% where the state average increase was 2%. Combining kindergarten established (blue) and basic benchmark (green) proficiency, this district is now at 85% when just a year ago students who scored blue and green were only at 41%.

These results suggest that the school district is making major strides in helping young children learn how to read. It is likely that the LETRS training, the additional professional development, and the school coaches all play a part in the improvement of reading scores in the district.

We dismiss SOR and SORI at our peril. SOR should become the central core for understanding how children learn to read, and SORI should become central in identifying the most effective instructional practices that lead to reading proficiency. SOR and SORI do not answer all our questions about how children learn to read and how to teach them, but they provide a solid start.



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D. Ray Reutzel
Senior Research Fellow
Center for the School of the Future



Janice A. Dole
Senior Research Fellow
Center for the School of the Future



Parker Fawson
Director
Center for the School of the Future
Emma Eccles Jones Endowed
Chair in Early Education



David E. Forbush
Associate Director
Center for the School of the Future

The Center for the School of the Future | Utah State University | 2605 Old Main Hill, Logan, Utah 84322-2605
www.csf.usu.edu | (435) 797-0240

Twitter: @USU_CSF | Facebook: USU Center for the School of the Future

