

Mark Seidenberg

[00:00:00] Hello, this is Mark Seidenberg. I am recording a new version of a talk that I gave on December 4th, 2023 at Yale University. This is the same talk as I gave then, but I've added a little material because I don't have the same time constraints as I did then I hope that it'll be helpful to people.

[00:00:28] The talk is called, where does the Science of Reading go From here,

[00:00:34] I'm a researcher who studied reading and language and dyslexia for a number of years. Over the past several years, I've emphasized looking at ways that we could improve literacy outcomes by using basic research in these areas. That would be via change of sin. Teacher education, classroom practices, instructional materials, [00:01:00] people's attitudes and awareness.

[00:01:05] I try to maintain a focus on learners from minority and lower income backgrounds for whom needs are greatest, but low achievement isn't limited to any one group, and it, it's certainly a, a broad concern.

[00:01:23] Connecting research and practice is an obvious idea. Much is known about skilled reading relations between reading and speech, learning to read the brain basis of reading. The causes of reading impairments and these kinds of issues have been studied in many different writing systems of languages. To compare that with an obvious need to improve outcomes, there are many indicators of this.

[00:01:51] There are assessments such as the Nathan Pisa state assessments, and of course, everyone's aware of the gaps that exist [00:02:00] between higher achieving and lower achieving groups. So you put these two things together and you get the science of breeding.

[00:02:11] I should point out here that the science of breeding doesn't mean the same thing to researchers and educators for researchers. It's a body of research. This is a recent volume that has chapters summarizing extensive research on many topics.

[00:02:31] For educators, the science of reading is a little different. It's an approach to reading instruction and teacher education. It's reflected in science of reading laws in more than 30 states, which stipulate things like. The use of curricular are consistent with the science of reading instruction, consistent with the science of reading and in-service teacher professional development about this.

[00:02:55] There are new curricula and guides to instruction. There are new [00:03:00] professional organizations and enterprises, all of which are elements of this science of reading approach.

[00:03:12] Just as a side note. The chapters in the Science of Reading Volume, which was published in 2022. Review, cognitive developmental and Duro Biological Research on many topics. The research that's taken as foundational in the Science of Reading approach and education is either not mentioned at all in this volume, which is things like the reading rope or mentioned in passing as the historic precursor to modern VE modern work.

[00:03:46] Science of reading movement in education is an important development. It's been successful already in largely dislodging, dislodging, the whole [00:04:00] language balanced literacy approach. This has opened the door to change, and I think it's really important to recognize that from the start. Where it's still a work in progress is incorporating research-based principles and practices.

[00:04:18] This has been a concern of mine for some time. At present, the science of reading approach is based on a small number of concepts taken from a few simple and dated studies, which are being used to justify a variety of classroom practices, including ones that aren't supported by research. So the general gist of this, part of the message is that we need more science in the science of reading.

[00:04:51] Okay. Well, what does this talk about? This is an important moment in attempts to reform reading education. [00:05:00] I think it's important to examine what's being taught under the science of Reading rubric and to resist the creation of the new dogma. And to not squander a really remarkable opportunity.

[00:05:18] Here's some recent history. In 2017, I published a book. It had a lot of chapters about how reading works, and it had three about the disconnection between research on reading and education. And it, it did, um. Effectively point out the need for change.

[00:05:43] Emily Hanford's podcast brought concerns about how reading is taught to a much, much larger audience. There's some irony in that a story about how reading is taught really reached a large audience [00:06:00] via this auditory medium. Still, it was enormously successful in raising awareness of the issues and generating concern and, and a demand for change.

[00:06:18] There's been quite a lot of other media coverage since this is just a little of it.

[00:06:25] There was a third important development. There's my book, there was Sanford podcast. There was also the creation of ADV advocacy groups such as Decoding dyslexia. It's a national organization with branches in every state in many states. Decoding DYS dyslexia reflects the fact that parents of dyslexics were angry at the lack of responsiveness from education, and they organized.

[00:06:59] Uh, they [00:07:00] focused on legislative re remedies at the state level. Things like screening for children at risk of dyslexia, language impairments, and they're demanding the provision of appropriate instruction.

[00:07:16] So a science of reading movement emerged. You know, we can tell there's a science of reading movement 'cause there's merch. Which I love. It's just great. It really reflects people's enthusiasm about adopting a research-based approach to reading instruction.

[00:07:40] So this looks like great news. Science wins, and it is pretty amazing given the antipathy to science elsewhere in the culture. Here we have thousands of teachers and other educators. Who wanna know more about research, which is great. [00:08:00] This is progress, but there's a hitch. Identifying what was wrong with reading education turns out to be a lot easier than figuring out what to do instead.

[00:08:11] Kind of a typical situation, right? Easier to say what's wrong. Then you have to figure out what, what to do that's better. It's particularly difficult because of this disconnection between education and science that I wrote about. So we have a, we were successful in generating a huge amount of interest in reading research and a demand for change, but it's hard to get the research into the system given the lack of background in among educators and among people interested in education.

[00:08:52] It's also, uh, a problem. I think that there aren't that many scientists who really engaged with these issues. [00:09:00]

[00:09:04] In my view, the science of reading laws were a necessary evil. They were necessary because other attempts to reform reading education had failed. People had tried and been brushed off. But you know, mandating something via, uh, via legislation doesn't make it happen. Some people may recall that No Child Left Behind legislation actually mandated that all fourth grade children would read at grade level.

[00:09:32] By 2014,

[00:09:39] these laws stipulate that an instruction and curricula be consistent with the science of reading. What science are we talking about? Who decides it's something that we need to look at.

[00:09:54] So let's back up for a moment and look at what the science of reading is replacing. Thankfully [00:10:00] now, the whole language balanced literacy approach. What were the major assumptions? Well, the main ones for these, the assumption about phonology was that it was relevant for poor readers, not skilled readers.

[00:10:18] It was assumed that word reading was dependent on the context in which the word occurred. Something that researchers call sophisticated guessing. Basically, this is the view that Ken Goodman promoted, and it's reflected in the three cueing method at related sorts of methods, the assumptions about learning, where basically that learning to read could be made.

[00:10:45] To be like learning a first language. If you have a literacy rich environment and the children are highly motivated, they will absorb the mechanics of reading without a huge [00:11:00] amount of instruction. So the role of instruction then is guided discovery. Kids gonna figure it out with some assistance from an an instructor.

[00:11:13] The problem with these assumptions occur is they weren't right. Reading depends on spoken language. Phonological information is crucial to skilled reading. It's not just something for poor readers. Linking printed sound, understanding is an enormous important for step in learning to read. Child needs to grasp the alphabetic principle, which is that units in spelling, correspondent units in the pronunciations of words.

[00:11:43] Of course it's important that they learn spelling, sound, mappings, which involve phonological information. Contextual guessing is an inefficient, error prone approach to teaching subject to read. That's why I said that the most reliable [00:12:00] cue to a word is the word itself, not the context of which it occurs.

[00:12:07] Learning to read isn't like a learning, a first language in the sense that the child has to be taught that there is this thing reading and that there is a code and that it works in a certain way. You don't have to teach, you know, an infant, that there's this thing spoken language. So reading does involve explicit instruction in a way that learning a first language spoken language does not.

[00:12:31] Those assumptions weren't right. Why did people accept so much that was wrong? Because they were vulnerable. They teachers and others rely on experts who weren't reliable

informants, and they didn't have the background to independently assess mistaken claims. Those would be things like Richard Allington saying that dyslexia didn't exist.

[00:12:55] It was only an excuse for poor teaching. Can Goodman [00:13:00] saying that good readers only sample the words and tests. They only beat some of them, which is just blatantly, empirically wrong. Who could tell that these people were saying things that were false?

[00:13:16] Okay, well, we've got the Science of Reading approach. What are its major assumptions? Well, science of reading is taking a variety of forms, but I think there are a few major. Strands to it at this point. One of 'em, of course, is that learning to read isn't like learning a first spoken language. Phil Goff wrote an article in which he said it was an unnatural act compared to learning a, a spoken language.

[00:13:45] The idea was that explicit instruction was required and that it wouldn't just happen naturally, like learning a first spoken language. There's an emphasis on print. So I think this follow follows from the simple [00:14:00] view of reading from Goff and Tumah and Goff and other colleagues. What people tend to say about this is that the child already knows spoken language, which is true, and the first task is to learn how print represents it.

[00:14:18] So there's a lot of emphasis on how to teach kids about print.

[00:14:26] Phonemic awareness turns out to be a foundational concept here. It's supposed to be a basic enabling skill. This is based on the national Reading panel report. So we have the idea that there are 44 phone names in the, in the spoken English, that children should learn to identify. So these phone names in the dark, meaning without print, because there are units of spoken language and the [00:15:00] tasks that are favored for teaching and assessing phonemic awareness or tasks like phon, name deletion, and phone name substitution.

[00:15:10] Uh, there are a number of major figures here. There's the Kilpatrick materials, the Hagerty curricula, and this is also emphasized in letters.

[00:15:24] There's the idea that reading skills is something that you build, build up by components. So there's a lot of discussion about components of language and components of reading. So you can start with the phon names. Then you could talk about the graphemes. Then you could get into the correspondences between them, which is phonics syllables, morphemes vocabulary.

[00:15:50] Fluency is like a pot, and we're gonna add ingredients one after another.[00:16:00]

[00:16:00] Finally, there's, there's this idea that you can't really have too much of a good thing. So I think people recognize that some learners don't need all of this explicit instruction, but there's a, uh, an, uh, there's the view that this isn't gonna be harmful in any case. So at worst, a kid might get additional practice with essential skills.

[00:16:23] It's like, you know, getting additional practice with your tennis server or something. I, I would say this is a leave no stone unturned kind of approach. There's the idea that if this, these various components of reading are taught, then no child will be left behind. And for the ones who don't need all the explicit instruction, it's okay.

[00:16:44] It's just additional practice. Those aren't all the assumptions, but I think they're, they're major ones. Well, we should look at them. Are they valid? The answer is yes and no. So learning to read is [00:17:00] not like learning a first language. It's an unnatural act. Explicit instructions required, yes, but there is another kind of learning.

[00:17:08] It's called implicit learning. The important point here is that most of the knowledge that supports reading isn't learned via explicit instruction. There must be another way to learn because we aren't taught all these things. So a good, obvious, straightforward example of that is vocabulary. People know thousands of words.

[00:17:28] Even young children know a couple thousand words, and very few of them were ever taught. They were picked up some other way. Same is true about spelling, phonics, morphology, many other things that we're talking about here. Most of it isn't ever taught, and yet it's learned.

[00:17:55] The emphasis on print. Yes, print is important obviously, [00:18:00] but developmentally the thing that has the biggest impact on children's progress by far is their language background. Oh, and you know, some of the pioneering work here was done by Hol Scarborough, who's reading Rote. People know. I think this work really deserves to be as well known as that.

[00:18:22] So language development before the child is taught to read has a huge impact on their progress with reading. Indeed, most reading problems aren't about print. Print isn't the problem, it's the knowledge of language on which print depends. So. A simple view of reading might be emphasizing print when we also need to be emphasizing language development, at least as much phonemic awareness as a foundational enabling [00:19:00] skill.

[00:19:00] Learning the 44 phone names, I, I think this is where the one place where the sites of reading has really gone off the rails. Uh, I, I don't think it's a, an accurate interpretation of

the research literature. Um. Phonemic awareness is the result of becoming a skilled reader, not the precursor. Of course, it is associated with skilled reading.

[00:19:21] It's something that develops in the course of learning to read. Phonemes aren't literal units of articulation. They are abstractions. They don't have correct pronunciations to teach children.

[00:19:43] People are really into phoning. So I make fun of the, you know, merchandise here. But it, it does reflect people's enormous enthusiasm for certain ideas, and it, it pains me to observe that this might be based on a misinterpretation of the [00:20:00] research literature, something we have to look at.

[00:20:09] How did the science of reading settle on teaching Phonemes first? Uh, I think this is a little digression about Phonemes. How did we get to the idea that you teach the Phonemes first and then you, that's the thing that enables learning about print and print sound relations and so on. Uh, it might have come from several places.

[00:20:30] One is clearly a national reading panel report. Said, you know, phonemic awareness is a teachable component of reading, and I think some people hearing about this, perhaps secondhand, um, took it to imply that, well, if phonemic awareness is associated with skilled reading, these things, that's not actually what the National Reading Panel Review showed it.

[00:20:56] It, it, it isn't a review of studies showing that teaching phone [00:21:00] names. Took more rapid reading acquisition or higher levels of reading skills. In fact, there's a long discussion of phonemic awareness in the National Reading Panel report and their, their conclusion about the relevance of phonemic awareness derived from studies of phonics and other activities that paired printed sound, that's where the phonemic awareness arises.

[00:21:27] Decision to teach Phonemes first as elements of spoken language is an extra assumption. It's not derived from research. It wasn't in the national reading panel period around 2000, and there isn't any research showing that the learning the phonemes first is important. Now, either it's a poor decision because it treats phonemes as pronounceable elements of words rather than abstractions.

[00:21:56] You know, phonemes are a way to think about language. They're not [00:22:00] actually things you say,

[00:22:05] my reading of the research literature is that teaching phonics as units of speech using tasks like, you know, deciding if two words start with the same sound or not. What it does is it improves performance on those tasks. So, you know, if you teach kids to do phony matching or phony identification using spoken words, their performance on those tasks improve.

[00:22:34] But the question is whether that activity and that learning carries over to reading. And there, I think the literature is pretty clear that it doesn't, certainly doesn't support, provide strong evidence that it carries over. And I, I would say the reason it doesn't easily carry over to reading 'cause is 'cause it's not actually time spent teaching the kid to read.

[00:22:59] [00:23:00] It's teaching them to perform this kind of artificial phonemic pronunciation, identification tests.

[00:23:10] In contrast, there's lots of research showing that teaching phonics. Other kinds of activities where you pair the spellings with pronunciations that does carry over to reading performance. And I'd say the readings and it carries over is because it's time spent teaching the kid to read. It's reading aloud, but it's reading.

[00:23:38] Okay, so at this point we should take a deep breath because the story about phonics is probably not what you wanted to hear. If it isn't what you wanted to hear, don't panic. So teaching phonics to kids without print isn't damaging anyone. You know, I, I see a lot of enthusiasm about teaching [00:24:00] phonemic awareness.

[00:24:02] And it's truly, it is amazing to see teachers getting so into this, which is after all basic skills instruction, something that for a long time people were told wasn't important. And you know, just the fact that people, teachers in the classroom are so energized about teaching phonics, that itself could have an impact on children's progress in reading.

[00:24:25] You know, I, I'm not in the classroom and I don't think the relevant studies have been done. It could be that that kind of enthusiasm and those kinds of activities have an impact on engagement and the kids' receptiveness to other kinds of instruction that are actually more relevant. Like phonics, you know, you could have some progress there.

[00:24:44] Be as a byproduct, some benefits as a byproduct, not because you're literally teaching the phone phonics and, and, and, and, uh, and or, or, because that's important to read it. So, you know, I find when I [00:25:00] critique these, uh, practices that don't have a solid research foundation, even a plausible one in this case, people or some people respond by going, oh, my, I'm doing the wrong thing.

[00:25:12] I'm a bad teacher. And I, I, that's not my, my message. We are all trying to arrive at best practices and the most efficient and effective use of time, in my view. Looking at the research, what, what it means, what, what these concepts, uh, um, actually mean. Things like phonics or phonemic awareness.

[00:25:45] Effective and efficient is gonna mean spending less time on phone names and more on things that are closer to reading and have a bigger impact, like phonics and language. We don't know for certain whether teaching phone is effective or [00:26:00] ineffective. We just don't have that kind of outcome research. And I think it's important to recognize that just focusing on basic skills and structure is a big advance over what came before.

[00:26:13] But that doesn't mean we have to keep doing the same thing just 'cause we started in that direction. We might have to back off and take a somewhat different direction.

[00:26:26] I have one suggestion here, which is that instead of phonemic awareness, people focus on the alphabetic principle. The alphabetic principles developed by Isabel and Alvin Liberman, Donald Shank Weiler, and a number of other people from Haskins Laboratories. The Reading Rockets website entry is good, and I would recommend reading it.

[00:26:51] The alphabetic principle is referring to the idea that the child is learning to treat units in the written code as corresponding to units [00:27:00] in the spoken code. That's the big connection that they're making. And in the beginning it's graphemes, which are letters or combinations of letters like th and phonics are the connection that they're making.

[00:27:15] And, and as I laid out in other talks that are on this website, learning about grapheme, symon is interactive. They go back and forth with each one influencing the other. Developmentally, the child then starts building larger units such as rhymes.

[00:27:41] So this phrasing alphabetic principle, makes it harder to overlook the role of orthography in shaping phonology, and it is the theoretical basis for all, all the subsequent investigations of phonemic awareness. So I'd really encourage people to think, [00:28:00] look, you're trying to get the kid to start behaving in accordance with this alphabetical principle.

[00:28:08] It somehow instruction has to lead the child into being able to treat units in spelling as corresponding to units in phonology. And the units in phonology are themselves emerging in part because of their exposure to spelling.

[00:28:24] I, I think that would probably be helpful. Okay, so that's the end of my decoration about phonemic awareness. So we were talking about the assumptions of the science of reading approach and the idea that they're kind of right, but not entirely. We're up to the one that's building reading skill by components.

[00:28:45] It's like adding bricks to a structure. First you get the phonemes and then you get clapping and so on. I, I think this is really overlooking a couple of important things. It's [00:29:00] not making use of the fact that all these kinds of information are related to one another. They're not independent. So when you're learning about one, you can also be learning about the others because they're correlated, they're related, and in, in, in.

[00:29:19] Cognitive psychology and developmental psychology. There's this idea of bootstrapping where if you get a little bit of information about one and then it provides you with a clue about something that's correlated with it, you learn about spelling, it tells you something about phonology. Phonology tells you about spelling, and they kind of go back and forth bootstrapping each other.

[00:29:42] I think the other problem with the brick by brick kind of approach is that it really can wind up being. Focused much more on the components of reading instead of reading itself. I've certainly observed this in some situations where there's so much time allocated to the [00:30:00] components that people don't get, that the kids don't get opportunities to read with feedback.

[00:30:11] I driven, this is a, these are drawings that I've shown before. There's teach the components approach is one in which you learn one kind of thing and then you learn the next one, and then you learn the next one and so on. And I think that this is pretty much what's happening with the science of reading currently.

[00:30:32] And people are stipulating that the kid has to reach a certain level of phone of performance on one type of information before they can move on to the next one. And then there's assessments and feedback and so on to. To figure out, uh, to get the kid to move stepwise through all these kinds of information.

[00:30:50] Now, the components in this approach are definitely based on research. Those are real things that are relevant to reading, but the decision to introduce them sequentially is [00:31:00] not, that was an extra assumption that I don't think should go unexamined. Uh, one can contrast this with. The view that, that this other figure is trying to convey, which is these kinds of information are all related to one another.

[00:31:18] So when you're teaching about one, the lesson might be about phonics, but you might also be teaching the kid, giving the kid opportunities to learn the words in which the phonics occur. So when you're teaching one, you're carrying along this correlated information, giving kids additional opportunities to learn it.

[00:31:42] That's potentially a way to make instruction efficient. And this approach is based on research, not just about the types of knowledge, but also about how children learn.

[00:31:55] Finally, uh, what about you can't have too much of a good thing? [00:32:00] Um, of course you can. Of course you can. Uh, the clock is ticking.

[00:32:09] There's a lot to learn.

[00:32:14] Fourth grade is looming. So in my view, the goal of Basal's instruction is to get in and get out so that you can move on to all the other things that go into comprehending texts, the varying complexity and. Other things related to reading comprehension.

[00:32:36] To me, looking at it from the outside, the science of reading, sort of structured literacy approach is pretty plotting. There are low expectations about the rate of progress. You know, I was pretty appalled to see that people might be doing phonemic awareness practice in third grade. I would raise the question here are, is this approach in, [00:33:00] its in, its, you know, in, in, in the not wanting to leave anyone behind, is this approach inadvertently teaching, treating every child as so they might be dyslexic.

[00:33:13] I, and where's the fast track?

[00:33:22] For people, for children who can do that. Um, so I've suggested that some of it is right and some of it is really kind of off. How do people come to have these beliefs? Again, I think teachers and other people who are in on this movement are relying on experts who aren't scientists and who don't turn out to be reliable Informants about research, and again, the audience.

[00:33:48] Is vulnerable because it's not part of their training. They don't have the expertise to evaluate the claims. Notice this is what happened the last time. [00:34:00]

[00:34:04] Okay. Well, where does the science of reading go next? Uh, I think as before, it's easier to see what's wrong than to figure out what to do. Instead, we're all working on this. It's a work in progress. I wanted to end this talk with a few suggestions. This isn't a curriculum,

obviously, it's just a set of research-based considerations about teaching children to read that are relevant to teaching effectively and efficiently.

[00:34:33] There are things you could take into account.

[00:34:39] All right. First one goal of reading instruction is reading. We wanna keep our eyes on the prize. Instruction about the components of reading is only justified to the extent that they advance the main goal, which is reading. And this isn't a trick question here, you know, reading, [00:35:00] what does it mean to advance reading?

[00:35:01] It means advance the kid's ability to read words and sentences and texts of varying complexity. There isn't any fixed requirement to learn a certain amount of the sub component. The requirement is that the kid gains skills in reading.

[00:35:26] So eyes on learning to read, not teaching kids about the components of reading. Language development is really key here. Everything in reading depends on knowledge of spoken language. Children's knowledge of school. English varies enormously for a variety of reasons, and this has huge effects on their progress in reading.

[00:35:57] One response to the fact that [00:36:00] children are already falling behind in reading in kindergarten and first grade. Is to start reading instruction earlier in pre-K. And in fact, some of the science of reading laws stipulate that. But notice that just moving instruction back to pre-K

[00:36:22] isn't gonna be effective if the issue, that's the limiting factor is the kid's knowledge of spoken language. You wanna think about the kid's spoken language being sufficiently developed. To support learning to read. Again, it's not that the child has a reading a language impairment, it's just things like they may speak a different language or they may speak a dialect that is different from the one that's gonna be needed in school.

[00:36:49] Children need more opportunities to talk, adhere.[00:37:00]

[00:37:01] Here's another one. The goal is to facilitate cracking the code, not teaching the code. The goal of instruction is for children to learn what there is, to learn that there is reading, and that there is this code that has certain properties, how it works, and then gain enough basic facts to enable reading texts of increasing complexity with less and less reliance on external feedback.

[00:37:31] The child can crack the code, at which point much more of the learning can occur without direct feedback and instruction. Cracking the code is a much more manageable goal than trying to teach the kid all of phonics or all the rules for spelling words.

[00:37:59] What about [00:38:00] explicit instruction? It's important, but it's there to scaffold this other kind of implicit or statistical learning. So this other kind of learning picks up on patterns that occur across utterances or across written sentences. So there are many patterns in how we talk, how texts are written.

[00:38:20] Those really are things that people's brains are very well attuned to picking up, and that's the engine behind learning things without explicit instruction. So you need an explicit instruction to scaffold this other kind of learning,

[00:38:41] not to teach at all. It's the alternative to teaching at all. So, you know, the science of reading has picked up the idea that everything has to be taught or else it won't be learned because, you know, reading is unnatural. It's not like spoken language. That's not exactly right. People have this [00:39:00] other way of learning, and explicit instruction is slow, it's not necessary, and it is slow.

[00:39:07] It's inefficient.

[00:39:11] You know, there's opportunity costs, right? The more your time you spend on one time thing, the less time there is for other things. We wanna have explicit instruction, which is costly in terms of time and effort, be as focused as possible and not more.

[00:39:34] I, I think it's really important to, to distinguish what teachers might need to know about reading and language and what children need to know. You know, I, I find. People are very excited. Teachers, educators are very excited when in their professional development they learn about properties of spoken and written language.

[00:39:57] You know, things like boning [00:40:00] syllable types, morphemes the AAM morphs of the past tense digraphs, d iPhones. Inflectional Morphemes. Listen, I spent my life studying language and how people learn it and how it's used, and it's an amazingly complex and interesting, fascinating system, and I think people should know this, but it doesn't mean that the child has to be taught.

[00:40:31] It's important for the teacher to understand how language works and how children learn to read. But it doesn't mean that you have to turn around and then teach the child all

these things. It's important for an instructor to have information about language and about how children learn, but for the kid, it's all about doing it.

[00:40:56] So I, you know, there should be some boundaries here and I, I don't really see [00:41:00] them being respected. I think people are enthusiastic about discovering all the cool stuff there is to know about morphology and, and uh, types of phone names and other things of that sort. 'cause it is really interesting. But people have to think about how much of that's relevant to the child actually getting where, where we want them to go in terms of comprehending it.

[00:41:21] Language and writing and so on.

[00:41:31] Uh, I just put in a reminder about instruction being equitable, meaning that it's effective for all children, including people who speak other dialects or, or other languages. You know, something that works for a speaker of sort of the general.

[00:41:52] I liked of English that is used in, in books might be able to make use of certain kinds of instruction [00:42:00] much better than kids who speak so much differently with something to be aware of and try to work with.

[00:42:09] Um, it's important to take a developmental approach, what's relevant to teach changes over time. So in sometimes in not obvious ways. So here's, here's why. So initially talking about kids who are getting into reading, uh, your, your knowledge of language, their knowledge of language derives from their experience with spoken language.

[00:42:30] That's how you learn about language when you're a little kid with literacy, as the child begins to read, as an individual begins to read, their knowledge of language expands because they're exposed to. Words, expressions, grammatical structures and so on that occur much more often in books than they do in speech.

[00:42:58] So there's a learning curve here with a kind of [00:43:00] changeover. First, it's the spoken language input to the child that really matters. What can they learn from in from the spoken language environment, but later it's their reading experience that's gonna advance their knowledge further.

[00:43:21] Here's another one. Components of reading and language, they're, they are related. They are not independent. So treating, learning to read as acquiring a series of sub-skills or components. I think it's popular because it corresponds to a natural scope and sequence. You teach one, then teach another one, and then another one, and you just have to monitor

children's progress to determine where they have reached a certain level of performance or where they need more help.

[00:43:58] Well, that seems natural, [00:44:00] but this step-by-step sort of approach isn't really doing justice. To either how reading works now or how children learn. So the components aren't independent when you learn about one, you could learn about others and learning. Learning, children's learning, human learning. One of the ways that we learn is by picking up on relationships between different things.

[00:44:31] Correlation, you can call them correlations, you can call them overlap. Similarities, connections between different things that are, are related. And I think it's easy to imagine how instruction can take advantage of this. So I've used the exam example where, you know, you're teaching something about how to pronounce a spelling pattern, like, uh, complex onset or something like that.

[00:44:59] So the kids got the [00:45:00] spelling and they're learning how to pronounce it well. At some point that can be taught using words. So even though the lesson is trying to get the child's to grasp the, uh, pronunciation of a, of a consonant cluster, at the same time they are getting exposed to words and are able to learn from those experiences can be learning more than one thing at a time, even if instruction is focused on a particular.

[00:45:33] One particular thing.

[00:45:37] Uh, here's another illustration of how to think about correlations between different types of knowledge rather than thinking of them as independence. So sometimes people think about language and topic knowledge as being these separate things that have to be addressed and learning to read well.

[00:45:55] Learning to read does involve three things. It involves learning about print, [00:46:00] involves learning about language. It involves learning about the world, which is the things that we use language to talk about. So basic skills instruction, you know, is predicated on the fact that printed language are related, that that's where we're trying to help the kid make those connections.

[00:46:20] 'cause they're in the way the writing system works. So print and language are clearly related. What about language and knowledge of the world? Are those related? Yes. So learning about a topic entails learning a new language. They're not independent, shouldn't be treated as such. There's a very amusing demonstration of this from Randall Monroe who has a

book called Thing Explainer, and you can get examples of it on his web cartoon, uh, comic strip, XKCD.

[00:46:53] So he did a funny thing he. Asked whether you could explain interesting concepts using [00:47:00] only the thousand most frequent words in English. So you're limited to a thousand words. Can you explain complex concepts? Well, the answer is yes, but not very well. So, you know, food heating, radio boxes, that was the closest you could come to microwave ovens.

[00:47:19] Tall roads. That was the expression for bridges that, again, if you're limited to the thousand most common words, that's as close to the concept of bridges. You can get planes with turning wings. Well, it's sort of helicopter axes that make clothes smell better. Washer and dryer. What's the point here? The point is that when you learn about new things, you learn new language.

[00:47:47] So it's kind of setting up a false dichotomy to say that language and world knowledge are these different things, and part of the day you can study language and part of the day you can study world knowledge. Child can be learning about both clearly.[00:48:00]

[00:48:02] Okay, so that's the assumptions. I think there and, and some of the tenants, I think it's pretty clear that we're gonna need a bigger toolbox. The problem with just relying on the few sources here is that they leave a lot out. Things like learning, for example. And because there's so much left out, anybody can, you know, everything is consistent with the science of reading at this point.

[00:48:25] If this is all you're working with. It is an, it is a bottleneck. Trying to get more of what we have learned into the system. It's not easy. There's, it's not a question of, you know, blaming people.

[00:48:41] It's hard and we're still work trying to figure this out. Uh, I think, you know, people draw these pictures that. Really don't say very much, but convey as kind of pseudo rigor.
[00:49:00]

[00:49:03] Uh, pictures like this one on the right really, uh, bother me a great deal. I think they imply all the wrong things. One thing of this, they apply, you need to teach all this stuff, but you don't,

[00:49:16] you know, there's a, there's a failure here to distinguish what. A kid needs to know in order to read versus what a teacher might know in terms of background about how

language and reading work it, it doesn't make any sense to me at all, but this is the kind of thing that people rely on. And what I'm saying is we need to kind of raise the bar.

[00:49:40] So here's a summary using research on reading and related topics. Learning to improve literacy outcomes is still a great idea, and there has been success in some areas. We also wanna maintain the [00:50:00] momentum, but you know, ultimately our instructional practices have to be effective. And in my view, the success of the Science of Reading endeavor isn't guaranteed because of the difficulties in getting much science into the system.

[00:50:17] Uh, what I see is people are adopting practices that are kind of loosely inspired by research, but actually not really very closely tied to it. And practices such as that heavy emphasis on explicit instruction, perhaps over heavy. Uh, I think they exist because people have, haven't adequately been able to take advantage of the research literature.

[00:50:44] Finally, relying on authorities is not a good plan. It's not a good plan in science, and it's not a good plan in the science of reading. Thank you for listening. [00:51:00]

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