

Building Lexical Quality: The Secret to Stronger Word Reading

Reach All Readers Podcast #252

Anna: Welcome, Dr. Strom.

Dr. Carolyn Strom: Thanks for having me.

Anna: I'm really excited to talk to you about word families and how we can help students remember words better by activating different areas of the brain, which you're going to talk about. But first, could you introduce yourself and tell us more about what you do?

Dr. Carolyn Strom: Sure. Well, I started my career as a first and second grade teacher in Compton, California, in the late '90s, early 2000s, and it was actually right around the time of No Child Left Behind legislation. I was fortunate at the time to have an evidence-based curriculum that I was able to use, and I absolutely loved teaching kids to read. So like I mentioned, I taught first and second grade, and really became passionate about teaching reading, and teaching out in LA.

After about 10 years in the classroom... I had a master's degree, I'd done all this PD, I was teaching kids with dyslexia, and I really knew how to do it... But after about 10 years in the classroom, a parent came to me and asked, "My kid sees this word 'ship' on one page, and then when he sees it again on the next page, it's like he's never seen it before." And she asked me what was going on in his brain, and I didn't know. Even though I had been in the classroom for 10 years, and I was teaching reading and doing a good job of it. I knew what to do in order to teach a kid to read, but I couldn't believe that I didn't know how a brain turned into a reading brain.

And so that's what led me to pursue more graduate school in the field. Well, at first I wanted to know what was the research that was out there, and if there is research on this, then how come it wasn't made accessible to teachers like me? So for those six years I was in PhD, and I was also running a dyslexia clinic, working with kids in a private practice in Manhattan for kids that had real difficulties learning to read.

After I finished that period of research and my PhD and working with kids, I realized that there was so much research out there, but it really wasn't accessible for educators and families. I always came back to this: if something is not accessible,

then how can it be actionable? And isn't the whole point of these research findings to help us make change and action? So if it's not accessible, how can it be actionable? Once it's actionable, it also then has to be adaptable. I became really passionate about this idea that we need people in the field doing original research, and we need people in the field taking that research and connecting it to practice.

And so that's what I'm fortunate enough to be able to do today. I'm a clinical associate professor at NYU. I'm in teacher prep, so I teach all of our literacy courses and oversee our literacy program, and also do a lot of our work in the community with our partnership schools.

Anna: We talked before we pressed record about what you want to do, which was translate the research for teachers, which is the work that I'm trying to do and to get better at. It's like you said, there's so much wonderful research out there that never gets read because teachers don't have time to read it or to make sense of it. It can be pretty hard to read through meta-analyses and all the technical terms. And so teachers do need people that can take what research tells us and understand how it applies to the classroom.

You've done a lot of that in the work that you've done when you talk about Brain City. I'll link to some of those videos. That's where I learned about you, and also the interviews you've given on podcasts. In doing that work, you've talked a lot about how we need to think differently about word families, and then think about how we can help kids learn words better.

First of all, can you talk about what word families are, and how we should think about that differently?

Dr. Carolyn Strom: Yeah. I'll just give a two-sentence statement on Brain City to contextualize it, because the families and linguistic neighbors don't make as much sense, I think, without that.

So the idea with Brain City is that... I tell families and kids that no one is wired with a brain that comes to reading. We have to build a whole new network. We build a whole new reading network, and that can be kind of abstract, right? So instead of a reading network, I tell kids and families that we're building a new city, a brand-new city in our head. And we're connecting three neighborhoods: a neighborhood that is ready for vision and visual input, a neighborhood that is ready for sound input, and a neighborhood that is ready for meaning input.

We can't read until we connect all of these cities by neural pathways, which we call neural superhighways.

The reason I use that metaphor is to really debunk this myth that's out there that reading is a visual memory process, as though there's one visual spot in the brain. I would say reading is a city, not a spot. Reading is not a visual memory process — it's actually a process that activates the entire left hemisphere, so it's more like a network. It's more like a city and a network, not a spot. It's distributed.

That then sort of contextualizes word families. Maybe some listeners right now, if you just jot down what you think of when you think of a teacher teaching with word families, then I'm sure someone out there is thinking top, hop, mop one week. Then next week is cake, rake, shake, and the next week sing, wing, thing. You're teaching in chunks, and that's traditionally what word families have been.

Yes, reading is about recognizing patterns, but it's not just about recognizing these visual chunks, because when we read, our brain is not just activating the vision area, which I call Vision Villages. We have Vision Villages, Sound City, and Meaning Mountains, and when we're reading, we're not just activating Vision Villages, we're not just activating the occipital lobe. We're activating the occipital temporal lobe and all these other regions.

And so by thinking about word families just as these rhyming units or these visual units, it's not exactly mirroring what we see in terms of a brain. It's not just the visual area that lights up; it's all of these other areas. It's sound, it's meaning, it's always a very dynamic, broad cortical process.

So when we think about word families, we actually have three different kinds. We can have sound neighbors, I call them linguistic neighbors as opposed to word families. They're families that are neighbors in these linguistic ways. We have sound neighbors. With the word "pen," a sound neighbor might be "hen," a rhyming word. But a sound neighbor might also be "pin." So "pen" and "pin" can be sound neighbors. In the Brain City model, we say they're stored in Sound City right next to each other. If anyone listening right now says "pen, pin," you just moved your mouth just a little bit to make that vowel sound, and you changed meaning.

So when we talk about families, we talk more about neighbors, and sound neighbors are one kind of neighbor.

Anna: So you talked first about sound neighbors. What's another way that words can be related?

Dr. Carolyn Strom: Meaning neighbors. There are different kinds of meaning neighbors, but some meaning neighbors can be synonyms, maybe "hop" and "jump" are meaning neighbors. But meaning neighbors can also be words that are literally pronounced the same exact way, like "bat," but they have two different meanings. So "bat" can be the flying mammal, and "bat" can also be the sporting equipment. Those are meaning neighbors. They're literally the same in Sound City, we pronounce them the same, "bat, bat," and in Meaning Mountains they're neighbors. We're saying them the same, but they have different meanings.

What I've been doing in work with classrooms around meaning neighbors as well is we talk about where a meaning neighbor might be a word found in culture or dialect. Here's an example from a classroom the other day where they were working on CCVC words, and they came across "snap." They said "snap" could be snap your fingers; snap could be break something in half; snap could also be where your friend sent a snap; or it could be the slang, "Oh, snap!" Right? So all of those are meaning neighbors, and by talking about meaning neighbors and sound neighbors, kids come alive and have a lot to offer.

The third kind of neighbor is either a Vision Villages neighbor, or more like a structural neighbor. Some of your listeners may know it as morphological neighbors. So if we take the word "snap," for example, unsnap, or snaps, or snapped, snappy, snapper, all of those are structural neighbors, or Vision Village neighbors. They're stored in a similar place called the letterbox in the brain.

The whole idea is when we see a word like "snap," we're not just triggering these visual neurons, we're triggering these auditory neurons in Sound City, and we're also triggering all the meanings of "snap," the different kinds of snap, snap, or "oh, snap." and we're also activating structural words that are related structurally to "snap," like "snaps" and "snapping."

So all of this relates to anyone who's reading the research on the role of word knowledge in reading. You may have heard of the lexical quality hypothesis made well-known by Charles Perfetti in 2007. The lexical quality hypothesis is the idea that the more you know about a word, the faster you'll recognize it, the faster you'll access meaning, and the better you'll be able to use it in speaking and writing. It's not just

whether you know a word or not, it's how well you know a word. What has been found is the higher a kid's lexical quality is, that can predict their reading comprehension.

So yeah, going in depth with these words is important. And I guess at the end of the day, if you don't link a word to its meaning, there really is no way for a word to anchor in memory.

The whole goal is that we're reading words from memory, stored in our orthographic memory. But when a word is stored in our orthographic memory, it doesn't just include its pronunciation, it includes its meaning. The sight of a word will activate its pronunciation and meaning. A word has no landing space if we're not connecting it to meaning.

Anna: So how does that explain when say you'll have a couple kindergartners reading a decodable story, and maybe the word "vat" is in there, and they maybe don't know what that is, but one kid will remember it and one kid won't, even though neither one of them understands the meaning of it?

Dr. Carolyn Strom: Vat, V-A-T?

Anna: Yeah.

Dr. Carolyn Strom: Yeah. They've both never heard the word before, and one kid will remember it?

Anna: Yeah.

Dr. Carolyn Strom: What I think research would say, and what I've observed, is: they may not have known the word "vat," but the kid that remembered it had a much larger vocabulary, and so had more connections to draw upon. Maybe they knew more words that rhymed with "vat." Maybe they knew more words for "jug" or "barrel." They had the concept, perhaps, in Meaning Mountains, of a vat, so it wasn't as much coordination of the cortical system to remember "vat," because they had a conceptual category.

But what the research tells us is the more you know conceptually, it's not just about individual words, but your conceptual knowledge is part of vocabulary. So I would think something around that was going on with that particular kid.

Anna: The presentation I saw you give at Plain Talk was about how you gave some practical ideas, and we'll get to those in a second. But just the general idea here is that just having kids read a word list and not talking about the words at all is a mistake, right?

Dr. Carolyn Strom: Right.

Anna: Or, we know this already, but just doing flashcards of "sight words" as the way to teach reading also doesn't align with this understanding of how the brain works.

Can you talk about some other concepts that you shared in your presentation? There were two that I wrote down, brain plasticity and consolidation.

Dr. Carolyn Strom: Yeah. So I'll write that down, but first I want to go back to something that you said. With the word lists, there is such value to word lists.

Anna: Yes, I agree.

Dr. Carolyn Strom: For anyone listening who doesn't know what a word list is, if a kid is working on a particular grapheme-phoneme correspondence, like let's say OU as "ow," you might have words on there like "shout" and "around" and "sound," and you want them to keep practicing them. Some people know these as blending lines.

Anna: Or roll and read, or something like that.

Dr. Carolyn Strom: Roll and reads! Kids need a lot of repetition, and they need engagement, so the roll and read is great because it basically tricks them into being engaged while they're reading word lists.

You can do this in so many ways. You can play Go Fish with them or you can play bingo, there are a lot of different ways to build in word lists or repeated practice.

It's not that that isn't valuable. That's so valuable, and some kids really need to practice building the reading network in these slower neural pathways. They need these word lists for that kind of practice. But you always want to make sure that the kids know what the words mean. It's not like we want them to decode and then we're going to tackle meaning. In order to store these words, they have to be linked to meaning.

Anna: So if I'm at work with a child and they're doing a roll and read and I notice that there's a certain word that they just never seem to map, they're always sounding it out, it might be a clue to me that we should stop and talk more about the meaning of that word. Would you say that could be true?

Dr. Carolyn Strom: I would always say that. Yeah.

And then the other thing I would say, this I didn't talk about in the presentation, but it's really important, I'm sure you've talked about it in a podcast. Sometimes if a kid is struggling with a CVC word, like m-a-t, and every time they see it, they have to go m-a-t. There's a method of decoding called continuous blending, or body-coda blending which I'm sure you've spoken about it. And what that is, is you don't just go m-a-t, you go m-a, and then you go back and blend through the vowel: "mat." And holding onto those two sounds takes some of the burden off of working memory, actually, and allows kids to blend all the way through.

That's the other thing I would do with that kid. When they're reading, I would go, "M-a. Let's go back. Mat. Now what's the word?" And they might have an easier time remembering it.

Anna: Good point. I've often thought about that as being something you would do just if they can't sound out words in general, like they're just getting stuck. But you're saying even if they can sound out, but there's a word that they're just not mapping, to go do successive blending or continuous blending with that particular word. Okay.

Dr. Carolyn Strom: Yes, and continue to link to meaning. Depending on the kid's skill, I would probably add structural neighbors just on the side, like prefixes and suffixes, some basic ones, -s, -ly, -er, just to sort of go deeper into this idea we were talking about before, lexical quality, with that little CVC word.

Anna: So in addition to giving kids lots of practice reading words over and over, because I'm definitely a fan of roll and reads and fluency reads and everything, but also think about other ways to teach the understanding of the word. It could be flashing a quick picture, using it in a sentence, making it a plural, or making it an adjective or whatever you can do. Use it in different contexts.

Dr. Carolyn Strom: Yep, using it in idiom, and using it in a child's home language, that should always be done if you're working with a multilingual learner, saying what the equivalent is in a language.

And I also say, since now we're on this topic of committing words to memory and engaging with words in these different ways, I'd also say you have to write the words.

Anna: Yes.

Dr. Carolyn Strom: Whether you call it dictation, or you call it word chaining, or you call it encoding, it doesn't matter. When you're practicing reading, you have to cross-train the brain. You have to have kids writing by hand.

If they're struggling with the word "vat" or "mat," they need to not only be reading vat and mat, but they need to be writing vat and mat. Not copying, but thinking about the sounds. "Vat." How do I make a v? I start in the middle, go down diagonal, diagonal up. V-a. They're making those graphomotor, oculomotor connections, and all of that is activating the brain and helping with consolidation and storage of these patterns.

Anna: Yeah.

Dr. Carolyn Strom: Does that make sense?

Anna: Yes, very much. And now I basically have a list of things to do when a child is not mapping a word. I'm working with a child right now myself who has this same issue, where she'll see the same word and sound it out again and again and again, when other words she has mapped. So far we've been doing a lot of practice, practice, practice, but these other tricks are really good things to try. And we are doing the writing.

Dr. Carolyn Strom: It's about varying this, varying that. Yes. I would take words, what I call them are word neighbors, but sometimes "lookalikes." So I take, let's say the kid is struggling with "pen," then we do "pin," we do "hen," and we do a whole word list of just those sound neighbors. And that's tricky; they can become tongue twisters.

I've done that with a word like "tired," T-I-R-E-D. A lot of kids struggle with that and say "tried," so then the word list I make is just sound neighbors and meaning neighbors with "tired" and "tried," to go deeper with it.

Anna: So can we talk about those two words then?

Dr. Carolyn Strom: Yeah, so then the other piece is plasticity. You said brain plasticity and consolidation were the other big ones I talked about.

If you're going to come to the science of reading with a neuroscientific framework, anyone who says they're coming from that framework, to me it tells me that they understand this concept of neuroplasticity, which means we're only able to read because our brains are plastic, and we can literally rewire the brain.

So in the Brain City model, I say it's like we're retrofitting the brain, or rezoning. We're taking an area of Vision Villages, or the occipital lobe, and we're rezoning it or retrofitting it so that it processes letters and letter sequences as speech.

We're not wired for that; our vision area is wired for faces and objects. We're not wired to turn random squiggles, lines, and dots into speech. The only way we can do that is because we reshape these vision neurons that are really meant for faces and objects, and reshape them to recognize letters as sounds. That's only because of neuroplasticity.

I know your listeners for sure know this, but I just have to remind everybody. All over the world, people learn to speak. They have rich spoken language all around the world. And all around the world, millions and millions of people don't learn to read or write. It's not because they have different brains, but because speaking is biologically primary. We're wired for speaking, and reading and writing is biologically secondary. We're not wired for it; it requires instruction. Whereas spoken language develops with immersion. And the only reason we're able to do this massive shift in our cortical system is because of brain plasticity. We literally change a speaking brain into a reading brain.

And I think I shared this at the talk, the brain plasticity rhyme, which I think is also on my website. We'd say with families and kids, "My brain is plastic, so fantastic, just like elastic, changes can be drastic." And now we put our hand on our left hemisphere, "The more I learn, the more my brain changes and rearranges." And we say this in different languages, to remind everybody of the massive work we're doing, and to realize that neuroplasticity is what allows this.

Anna: So my understanding is that with the plasticity, it's easier to rewire the brain at a certain age, and at what point does it get harder? Can you talk about that a little bit?

Dr. Carolyn Strom: Yeah. I mean, the brain is highly sensitive, especially for linguistic input, between birth and eight. So the best time to begin to set up the neural architecture for reading is really between birth and eight. That's why it's so important to be doing all of those Sound City, or phonemic awareness, activities in those years. It reshapes kids' brains to pay attention to sounds, the sounds that letters make.

You can always learn to read. You can learn to read at nine years old. You can learn to read at 20 years old. You can learn to read at 50 years old. There's even a case of someone who was, I think, 102 and learned to read.

Anna: I think I learned about that.

Dr. Carolyn Strom: 102, or 106, I don't know, I just read recently about it. So it's never impossible, but it's a lot easier when the brain is more plastic and more sensitive to input, which is in the early childhood years.

Anna: Here's a shout-out to anybody listening who's not doing universal screening, why that's so important, beginning in kindergarten at least, is so that you can see if someone's not on track. And if they're not, you can intervene early, when it's easier, versus waiting till they're nine years old.

Dr. Carolyn Strom: It's much easier, and more fun. Because to do all these activities, when the kids get older, they feel like it's babyish.

And I would also argue... Universal screening is hugely important, and intervening is hugely important. But we really need to look at what we're doing with our three-, four-, and five-year-olds before they get to kindergarten, because we can be doing more. We know that prevention is much less costly, financially and emotionally, than intervention. So for those years, I think, as a field, the science of reading really needs to do better with preparing teachers who are working with three-, four-, and five-year-olds, because their brains are the most plastic, which is so fantastic.

And then the other concept you mentioned was consolidation. Some people might know consolidation as that which leads to automaticity. The thing with reading is we don't just want to create kids who are good decoders; we want to create kids who have automatic word recognition. Kids who are decoding, but almost at the unconscious level. They're reading as a reflex. Their cognitive energy is not on decoding multisyllabic words. They've consolidated this skill, and they've moved into automaticity.

In other words, the reading network, or Brain City, is formed, and actually now a new structure has been created called the letterbox — or, those who follow the neuroscience, it's called the visual word form area. But Stanislas Dehaene, who named it, also named it the letterbox, to be easier to remember.

In Brain City, we call it Letterbox Lookout, because it's the neuronal cluster that allows you to see words and process them as meaning in milliseconds. We've gone from seeing a word, and it can take three seconds or five seconds to actually sound it out, but once you've built this letterbox, this cortical structure, and you've built this reading network, now you see the same word and you can access it in milliseconds. That's because you've developed automaticity, and automaticity results from consolidation, which is basically you consolidating your learning into chunks.

So the most concrete thing I can think about with consolidation is this idea of bigram neurons. Over time, we develop what are called bigram neurons, which actually specialize for pairs of letters, like T-H and S-H and A-U. That's how the neurons begin to specialize. It's a part of how we organize things in a hierarchical structure in the letterbox, and then we sort of specialize for syllables and we specialize for morphemes, greater grain sizes. We chunk at greater grain sizes, if that makes sense.

That's a part of consolidation, which leads to automaticity, which is the ultimate goal, because we want kids to read for meaning, and they can't read for meaning if their whole prefrontal cortex and working memory is so focused on decoding.

Anna: Can you say that word again? I've not heard that before — bigram something?

Dr. Carolyn Strom: So bigram, B-I-G-R-A-M, bigram neurons. Bigram neurons are these neurons that begin to specialize for letter pairs, but not in the beginning. It's how, once we've begun to gain some traction building this network, there's neuroscience that shows these bigram neurons.

A term related to it is called hierarchical decoding. And it's kind of like when you can begin to see the magic-E pattern, or the vowel-consonant-E pattern, and you can begin to see it sort of in parallel with other things. You may still be reading sound by sound, but you're beginning to see the relationships and patterns of letters that commonly go together.

Anna: So for example, if you could read "head" or "bread," and you see the word

"dread," you kind of figure out what that word is even if you've never read it before, because you know the pattern from the other words?

Dr. Carolyn Strom: Yes, that goes into the original word families thing though, but I think the bigram is really around two letters, like an E-A. Knowing that the E-A says /ĕ/. We are pattern recognizers, so I'm sure there is some kind of neuronal situation for the E-A-D, but bigram neurons are two letters that you've sort of specialized for, not necessarily the rime pattern.

Anna: And then we gradually build up to larger chunks.

Dr. Carolyn Strom: To larger and meaningful chunks, yes, like morphemes and syllables. When we learn anything, our brains learn in this hierarchical structure. We get the very basics, we build a little bit on top of it, a little bit on top of that, and a little bit on top of that. And that's how the letterbox works, which is the powerhouse of Brain City, or the reading network.

Anna: So in your presentation, you gave some very specific activities. We've already talked a little bit about that, but can you share any more specific things that teachers can do to help kids learn words better?

Dr. Carolyn Strom: Well, the first thing I always say is that little kids, two-year-olds, three-year-olds, and four-year-olds, they're wired to listen for meanings. So if we ask kids, "What do you want for breakfast? Bacon, banana, or blueberries?" very few kids are going to say, "Oh, you know what's so interesting, all of those words start with /b/." They're not going to do that. They're going to think about what they mean.

But we need to tune their ears into initial sounds. Paying attention to individual sounds isn't something our brains are wired to do. And so in order to do that, I always recommend a game called Guess My Lunch, or Guess My Breakfast. So if I tell you, can you guess my breakfast? I had yummy "sss" with a lot of "mmm."

Anna: Cereal with milk.

Dr. Carolyn Strom: Yes, it's cereal with milk. And that kind of game can be played in the car, it can be played at the kitchen table. I have a whole list of kitchen table practices, because a lot of families, they don't want us giving them another thing to do. Well, we all have two minutes at the kitchen table. These are little games you can play that call a kid's attention to sounds.

Similarly, we've all played I Spy. "I spy with my little eye something that begins with W." I always encourage, "I hear with my little ear something that begins with /w/, /w/, /w/," to again tune kids' ears into sounds, because letters represent sounds.

We need to have kids be able to isolate initial sounds. For anyone who's following the science of reading, it's initial sound fluency or alliteration. But in order to do that, we need to practice identifying things in the world by their initial sound.

In the early years as well, read-alouds are great for millions of reasons. We want kids to develop vocabulary and syntax and comprehension, being able to follow the thread of a story.

But there are read-alouds that play with sound, and the *Don't be Silly, Mrs. Millie* series does a lot of wordplay, where she asks kids to hang up their goats instead of their coats, and then there's a picture of all these goats being hung up. I recommend always those kinds of books. I think Mrs. Millie has three or four.

Another book along those lines is *Chester Van Chime Who Forgot How to Rhyme*. That's always a fun one to read. He's a little boy and he wakes up one day and he forgets how to rhyme. There are all these moments in the book that are about to rhyme, and the kids you're reading it to will say the rhyme, but then he gets it wrong. I recommend books like that.

Then I also recommend books like *The Word Collector*, by Peter Reynolds, which is all about appreciating the meanings of words and also how they sound. So that's for the younger set.

Then as kids get older, some of the activities I was talking about are paying attention to hybrid words. Most people know them as portmanteaus, but a lot of kids I work with, or families, can't remember "portmanteau," so we call them hybrid words. An example of a hybrid word is "hangry." What are the two words inside "hangry," hungry and angry. Another hybrid word would be "athleisure," athletic and leisure. I could go on and on.

We also play around with hink pinks, which are rhyming riddles for older kids. There are also different ways to play with morphemes as well, that I call morpheme mini-moments.

All of the activities I recommend really call attention to language and appreciating the way words sound, but also going deeper on their meaning.

I don't think I mentioned this one, the multiple meaning chart. In all different kinds of phonics lessons, we usually pick two to three multiple meaning words and put them on this special chart that we return to. We usually come up with about three. Two ways are what the word means, and then we always come up with a third that's either one in someone's home language, or from dialect, or a saying in culture, this kind of thing.

I was in a first grade class, and they did "band," B-A-N-D, and so someone said "rubber band," and then another one said "a rock band," and then someone else said, "Oh, you get banned from someone's house," or "banned somewhere." It's a different spelling, but it was awesome because we were able then to talk about what that suffix does, the -ED. And that's a student that may not have shared typically, but knew that when we're discussing multiple meaning words, and you can bring it from wherever it's being sourced in your brain.

Oftentimes when I ask people to just go back to the very first one, think what you had for breakfast, you think about the sounds, but you're also thinking about the meanings. Some people say they can feel in their brains how different areas are getting activated. That's the bottom line; learning to read isn't just this phonological-orthographic activity. We're hooking up to the spoken language system, we're hooking up to semantics, and it's all interconnected. So while our teaching needs to be explicit and structured and have lots of practice, it can also be interconnected.

Anna: Well, thank you for explaining that so well. I think so often we get kind of stuck on the one thing, like you said, the spelling or the pronunciation, forgetting that this other stuff is not a waste of time. It's actually an investment into helping students remember the word better.

Dr. Carolyn Strom: Yeah. And you know, it's great we've all sort of gotten to this idea that English has 26 letters and 44 sounds, so it's orthographically complex. If we had had 26 letters and 26 sounds, it'd be a lot easier to learn. It's orthographically complex with 26 letters and 44 sounds, but it's also semantically complex.

Anna: Yeah.

Dr. Carolyn Strom: And syntactically complex.

Anna: Yep, yep.

Dr. Carolyn Strom: It's not like once you just figure out the orthographic code, boom, it's easy. No way. We have so many multiple meaning words, we have so many idioms, we have so many words that help us organize sentences so that they mean different things, and we have to do all this inferential processing. It's semantically and syntactically complex. That's why it's essential to talk about multiple meaning words, to talk about associations within words, and to talk about how words are used, because they don't just exist in this grapheme-phoneme world.

Anna: Yeah. Well, thank you so much. I've enjoyed all the presentations I've seen you give, and I'll link to those in the show notes because there are plenty, and you also have a website where you have a lot of resources. Anything else you want to send people to?

Dr. Carolyn Strom: I would just say the website, and there is a newsletter that when I have new activities, I send them out on there.

Anna: Perfect. Well, thank you so much for your time!

Dr. Carolyn Strom: Thank you.