Structured Word Inquiry - with Dr. Pete Bowers

Triple R Teaching Podcast #192

Hello, Anna Geiger here, author of *Reach All Readers* and creator of the Reach All Readers website. Today I'm very excited to welcome Dr. Peter Bowers. If you're at all familiar with structured word inquiry, then you're very familiar with Dr. Peter Bowers.

I want to tell you a little bit about him before we get into the conversation today. He's the founder of the Word Works Literacy Center in Ontario, Canada, and for most of his 10 years of teaching in international schools and in Canada, he held the idea that many of us have that English spelling is highly irregular and full of exceptions and so we need to memorize a lot of those spellings.

In his ninth year in the classroom, he started to make sense of English spelling when he began working with a resource called Real Spelling. We'll talk about that in this episode. Instead of studying lists of words or spelling patterns with countless exceptions, he and his students used scientific inquiry to investigate underlying structures and conventions that link related words.

For example, if a child wanted to know why there's a G in sign, they would look for related words and find words like signal, signature, design, designate. He found that there was a reason for that letter G, and they also discovered connections between words.

This experience inspired him to begin his graduate work, and then he published an article in *The Journal of Reading and Writing* in 2010, and there they called this approach structured word inquiry, and you can find a lot about it all over the place. There'll be lots of links in the show notes. There's a big Facebook group where people work on this all the time.

In today's episode, we're going to talk about the research behind morphology and the importance of morphology in instruction and how it actually improves phonology. Dr. Bowers will also walk us through some English spellings and we'll talk about why those are not irregular. We'll also talk about why morphology is so important for understanding connections among words.

There's a lot to this episode. It's rather deep, which is why I recorded last week's episode, so make sure you listen to that if you haven't. That's where we defined a lot of the terms that are going to be coming up in this episode quite a bit.

It's also much longer than my typical episodes, but I really couldn't find much to cut out. We're going to put all of it here. There are show notes with the PDF version, so if you want access to this in printed version for a future reference, you can head to the show notes and get that. Here we go!

Anna Geiger:

Welcome Dr. Bowers!

Peter Bowers:

Hey! It's great to be here.

Anna Geiger:

Can you talk to us a little bit about your history in education and what brought you to what you're doing now?

Peter Bowers:

Sure. I grew up in Ontario where I still am. I went on to teachers' college and started teaching. I actually started teaching overseas. I went to Faculty of Education at Queens, and they had a job fair. My first teaching job was in Ecuador, and then Romania, and Indonesia was where I did most of my teaching, and then a little bit in Ontario too.

The irony, as I often tell in my workshops, is that I was a terrible speller through all of this and really had very little interest in spelling instruction because I'd never seen it work. I had never met a teacher who loved their spelling instruction. I never met anybody who had kids come in their class as terrible spellers with bad self-concept around their spelling, and then that teacher did something that had a transformative effect on their spelling.

Whereas I had kids come in my class who didn't like to read, and some of them I could get going, or they thought they were bad at math or science… Every other domain seemed as if it was something that instruction might have a possible effect on. Spelling just seemed to be immune and there was so much memorization stuff. I did what I could, but I was sitting here being a terrible speller. I was kind of thinking how important could spelling be?

By chance when I was teaching in Indonesia, I went to a teacher conference in Bangkok where I met a guy who was born in Egypt, grew up in and trained in England, and lived in France. That was how I got introduced to how my own writing system worked. That story is funny because it's like, wow, I was in my ninth year as a classroom teacher, and never had anybody give me the slightest suggestion that there was anything logical about English spelling. That was the first. My own experience is a terrible speller made me think, what's that?

The funny thing is, about a week or two before I went to this conference, I was trying to write in a kid's homework book. I was trying to write the word really, "Johnny had a really good day," because he was on a contract with behavior or whatever, but I had to stop after the first L because I didn't know how many L's there were.

You've got to think about how many times my brain has encountered the word really in print by the time I've been teaching for nine years and for whatever reason it is, my brain will not remember a spelling it doesn't understand, but I just didn't know there's any understanding to be had.

Then I go to this conference and this thing says that Real Spelling has a blurb for 45-minute talk, "English spelling makes sense, is about meaning, and has no exceptions," and I think that's insane. I decide I'll go check out this snake oil salesman, and I go, and within five minutes he's explained so many spellings that my brain had never been able to remember, and the first word he put on the board by chance was the word real. He drew a line after the L, and he said, "Well, this is the word real, but we could use it to build other words," and he puts an L-Y suffix after that line. In an instant I knew I'd never have to look up in a dictionary again how to spell really.

When I was writing in the homework book, I had to look in the dictionary to see it's got two L's, hoping the kid doesn't miss his bus because I couldn't spell really. But I had made the comment to a librarian friend a couple days after that saying, "You'll never guess. I didn't know really had one or two L's."

She just laughs and rolls her eyes at me. Well, not laughs, she kind of scoffs and rolls eyes at me and says, "Come on, Pete. Of course it's two L's, it's real-ly."

To which I say, "Well, how do I know to syllabify it real-ly, how come it's not real-y?"

That question she just shoves under the rug. But she's thinking she's helping me because she is thinking, oh, what's going on with the great education today if a grade four teacher can't spell really. If they just taught like they taught me, we wouldn't be in this horrible state, is I think what she's thinking.

But think about, how many people who are really accurate spellers have spent lots of time studying righteously to be better spellers?

Anna Geiger:

No, not many.

Peter Bowers:

No. People are born with brains that remember how to spell, and some are born with my kind of brain, but she thinks it was her instruction, but it was just that...

And the bottom line is how did she know to syllabify it? Well, she knew to syllabify it because she was taught to syllabify between the L's, but that means this syllabifying trick she was trying to use to help me is only going to work if I already know there's two L's!

Now I wasn't traumatized by being a terrible speller. My parents were nice to me. I've seen kids get beat up by their parents for their spelling in ways that is just heartbreaking. That kind of thing can be really harsh.

Anyways, but she just shoved that under the rug.

But to a kid who is in school and being kind of traumatized by their failure, if you say to them, "Just go real-ly," well, now it's just as hard for me to remember to go real-ly or real-y as it is to know how many L's there are.

But the worst part is it feels like it makes sense to everybody else. If it's making sense to everybody else, then I just must be stupid is the only way. I don't know how else you process that, right?

The person's trying to help me, but does it with a snark that she wouldn't do anywhere else. We have this weird thing about spelling as if people who are good spellers are somehow righteous or something.

Anna Geiger:

Yes. Yeah, we do.

Peter Bowers:

Anyways, so I see that, but the instant I see the word real, and I know how to spell the word real, and I know there's an L-Y suffix, and I've never had any reason to believe there's any suffixing thing where you drop L's. Once I have the word structure, the word real and its structure, and I know there's an L-Y suffix, I know why there's two L's, because there's an L in the base and there's an L in the suffix!

Once you understand something, there's no sense you have to memorize it, which is why I knew instantly I'll never have to look at that again. That was a, "Whoa! that's crazy! Just the other day, I didn't know how to spell that, and now I do and I'll never have to look at it again."

But the really wild one... We built all these other words, surreal, realistic, and all sorts of things, and then he puts an I-T-Y after the R-E-A-L. What word is that, Anna?

Anna Geiger:

Reality?

Peter Bowers:

Why is that the one that totally blew my brain when I saw that?

Anna Geiger:

Because the spelling of real stays the same, but the pronunciation has changed.

Peter Bowers:

Exactly, and now I know why you can't spell a real nice day or really or anything with the base R-E-E-L, which is the homophone for a fishing reel. I can't put R-E-E-L.

We were doing this in the matrix. I'm talking as if you're seeing, but a matrix is a central tool in structured word inquiry. It is this kind of set of boxes with a central, it's called a banner, where the base goes, and then all sorts of morphemes on either side. It can be prefixes, suffixes, or other bases. You can see the structure of a whole family of words. When the I-T-Y is added, and I see it's reality, and now I can understand. Now I can even remember which homophone is which because I need the spelling.

Here's the thing that is the transformational thing in the whole business for me, it's not that I need to know the grapheme-phoneme correspondences for a single word, but I need to know how the grapheme-phoneme correspondences work in the whole family. I'd never heard any such thing anywhere in my ninth year of classroom teaching, and I still don't see it out there much in the world, but we've been doing that.

To get back to my story, I talked to the guy afterwards and said, "That was crazy! I'm a terrible speller, and that made sense."

And he says, "Oh, you'll be very quick at this then," which made me laugh because I didn't know what he meant.

Now I totally do because those of us who've had some kind of spelling or reading issue in the past where we get introduced to the spelling making sense, nobody's more interested.

If you've just always known how to spell committee and exorbitant or whatever and you never thought about it, this is cool but you can think, "Well, why do I have to learn all these terms: morphemes, graphemes, twin bases, da da da? I never knew any of that and I spell perfect." Well, okay, great. You get a brain that just remembers spellings, but you can't teach someone to have your brain. Other kids you're teaching might need to know these things.

The thing that we'll get into today is that actually those of you who are really good spellers out there, but haven't looked at how the writing system works to link words connected in meaning and spelling, you have missed out on so many fascinating connections. Actually, if you're one of those people listening, we're going to give you some surprises too.

I go back to my school, I'm teaching in my grade four class, it's near the end of the year, and things are really blowing me away with these matrices and word sums and the kids.

I have one summer and I'm reading the Real Spelling manual. These resources that I first found, a version of them is now available online called Real Spelling Toolbox 2. We can put links to it. That's a revised version that's now subscribable.

I come home and I read this manual and I'm knocked out. I go back, I teach grade four, and I've just never seen anything like it before. I've got kids fighting over dictionaries and things.

One story I often tell is I'm working with some kids and there's a big thwack because a kid has gone to my reference section, which was usually never used, and now he's gone there and he gets this dictionary and he's thrown it on the ground and he says, "This dictionary sucks! It doesn't have any Latin roots!" He was right and we threw it away!

Anna Geiger:

How funny.

Peter Bowers:

If your dictionary doesn't have etymology, it's not a dictionary. But we never knew there was any reason to use etymology before. I never knew. So now, because of working with the histories and structures of words, we now go in there all the time and the kids are angry when somebody hasn't put back the book.

Anyway, so then I come back the next year, I come back to Canada, and I remember talking to a principal I had worked with and saying, "Hey, I want to show you something I ran into overseas. It's really wild." I go and I talk to her, and I probably look at the word sign and does and rough and some kind of classics that we look at all the time and explain them.

She goes, "Well, that's wild!" Because she couldn't explain those spellings before that. But then she asked me a question that really threw me at first, which was, "So what does the research say?"

I thought, what a strange question.

Now I'm not dissing the idea of research. I'm involved in the research and I think it's important, but I hadn't thought about it then because I'd just spent the last year and a half researching how the writing system works. That was the research I was doing from this reference that was explaining it to me. But I hadn't thought to think about what did the research say?

The real thing that threw me is that if a kid had asked that principal five minutes earlier, how do you spell does, the principal would've said, "Yeah, sorry kid. That's one of those irregular words you've got to memorize." But now within five minutes of seeing me, she could explain it.

What I couldn't understand is what could possibly be out there in the research that would have... If I have the question, should I teach kids to memorize the spelling of does or should I explain how it works? I don't see how there could be any research that's going to convince me that I should go back to tell the kids to memorize it. It's like, I don't understand!

What I realized though was that that wasn't the reason for her question. The reason for her question was, if I'm going to do PD with my teachers in this public school, my uppers, the first question they're going to ask is what is the research saying? That got me to realize, well, I'm not going to get anywhere with this if I can't address that.

I was home from teaching overseas with my wife. I went and did a master's at Faculty of Ed at Queens with John Kirby as my supervisor, which was a very lucky person to land with, and then ended up continuing with the grad work. The reason was I did my intervention study, that was the study that came out in 2010, and that introduced the phrase, structured word inquiry-

Anna Geiger:

2010. Okay.

Peter Bowers:

... And we found vocabulary games. I taught with my experimental group compared to typical instruction classes, we flipped a coin, the whole bit, and we found that the kids in the experimental group were not only better at defining words that they were exposed to... And hopefully in your web page we can show some illustrations of matrices and things.

Anna Geiger:

Definitely.

Peter Bowers:

When you see a matrix, you'll see that it's got a base and a bunch of other words it builds with other morphemes. If we have a matrix that shows, let's say ten words, the kids were not only better at defining any of those ten words, they're better at defining words that weren't on that matrix but could have been.

That means that's general vocabulary learning, and that's the issue of vocabulary is how do you teach... You can't teach everybody every word, that's crazy. You have to teach some way that the kids learn more than the words you teach them.

That's where I think morphology first got people excited in the research, it was really on the vocabulary side. After the National Reading Panel explained that they couldn't recommend any kind of vocabulary instruction because there weren't enough intervention studies in 2001, that's why I made my first study vocabulary because I knew this is a place that is deeply needed in the research.

Morphology is so obviously linked to vocabulary that I think the initial jump in morphological instruction was around vocabulary, but now it's expanded to much more.

And so I finished my PhD and now I just work as a consultant working with teachers and kids and whoever is interested.

Anna Geiger:

That study that you did, what grade was that?

Peter Bowers:

Grade four/five.

Anna Geiger:

As a quick summary of the research so far, you've told me that it helped build vocabulary. Are there other findings from research about structured word inquiry?

Peter Bowers:

Well, there's not a lot of research directly on SWI, but there are a number of studies, and there's one of the earlier ones in 2013. Now, it's not called structured word inquiry, but Victoria Devonshire and Morrison Fluke, I think it was in 2013. It was funny because she had an earlier paper that is in my meta-analysis, but this one was after the meta-analysis, and when I read the abstract, it said something like, "English spelling represents the interrelationship of morphology, etymology, and phonology." I had not heard anybody say that anywhere except in Real Spelling.

I thought, that's wild, and so I emailed her and asked her, "Do you know Real Spelling?" And yes, she had been a teacher working with Real Spelling. It's striking that you could just tell from that.

She did a study in 2013 with five to seven year olds comparing an SWI-like intervention they used. They mentioned word sums. They didn't mention the matrix, but she confirmed via email that they used the matrix and they did etymology with things like the W in two and stuff, and compared it to phonics instruction and found significant effects for spelling and reading.

Anna Geiger:

What grade? Do you know what grade that was?

Peter Bowers:

Five to seven year olds. It's in the UK so I don't know, they do their years different, but I think it's five to seven.

There have been other studies I've been involved in. The main issue is often getting enough training to the people doing the instruction. The two SWI-like interventions that had people who had actually worked with it for a long time, mine and Victoria's, had good effects. The other ones have some okay effects, nothing huge and exciting to report, but there are actually a couple of things going on right now.

My brother and I and Melvin Ng did a study of the matrix with adults, presenting words around a matrix or around a base or affixes, compared to no morphological organization. We found the memory for words was significantly better for both morphological conditions than no morphological order. But crucially, the memory was better when you were presented with words centered around the base, which is our argument that that would make sense because the base carries the main meaning that links everything.

It's nice to have that evidence because a lot of the time when you see morphological instruction in teacher resources, it's affix-centric, which I find frustrating. It's like, no, the base, we organize around the base, and that's when you also find the interrelationship of the spelling and the pronunciation.

Anyways, that's happening, and I'm involved in another group that's just got the ethics approval, I believe, for doing the replication of that study with kids.

But the main source of the research evidence for SWI is really a little less direct, but pretty close, in the morphological instruction. The evidence that we have for morphological interventions is really powerful. The main findings, I think there have been five, well, let me see, I can look at it. There's our intervention, there are two by Goodwin and Ahn, there's one in 2020, and there are a couple reviews, and there's a brand new one by Galuschka and a bunch of people.

All of these studies coalesce around the finding that including morphological instruction benefits everybody. But the striking finding is the biggest benefits are for the younger and the less able.

Now that's a striking finding because for decades, the researchers have been suggesting if you teach morphology, leave it to later because they have to learn the phonology first.

Goodwin and Ahn studies did really important stats that the others of us didn't. What they looked at is what were the greatest outcomes from morphological instruction in their two meta-analyses? The biggest effects of morphological instruction were for phonological outcomes.

Anna Geiger:

Can you put that in everyday English for people that might not know all those words?

Peter Bowers:

Yes. What it's saying is that when you add morphological instruction to whatever instruction you're doing, everybody gets a benefit compared to not having that morphological instruction added.

But the striking thing is the effects are the biggest effects from adding morphology when you're teaching about bases and affixes, it was not even for morphological awareness. The bigger effects were for phonological awareness. Teaching morphology was helping kids with phonological outcomes.

I do have a slide, I can read what they say, "Similar to Bowers et al.," that was our 2020 meta-analysis, "these results suggest that early morphological instruction may be particularly helpful, perhaps because of the synergistic relationship between phonology and morphology and the larger repertoire of root and base." And the main thing, "If a reciprocal relationship exists between morphology and literacy, it makes sense to jumpstart this at an early age."

I know I didn't simplify it for you yet, but I'll try. The idea is one of the fears that I totally get when people look at structured word inquiry is that it looks like it's morphological instruction. Well, it certainly is, but it's not a morphological intervention.

What I would call it, it's orthographic instruction. It's teaching how the whole writing system works. But that requires teaching morphology. It also requires teaching of grapheme-phoneme correspondences, it's non-optional if you're going to teach how the system works.

The thing that is being highlighted by that finding is supporting the argument that we make in structured word inquiry. We also have our theory that morphology is a binding agent, which we can talk about later.

We have what's called a morphophonemic language. Now, it's kind of a funny phrase because every language is morphophonemic. Every language has morphology and phonology. You can't say an English word without using phonology and without using morphemes because every word is at least a base. Everything's like that.

But the reason we talk about English that way is because there's something... Oral English is, if we're on a spectrum, we're kind of far end where the pronunciation of those morphemes changes all over the place.

This would be a good example that your listeners could do. Go and grab a pen and paper and I'll treat you as my guinea pig. Go ahead and write the word jumped like I jumped over the fence.

Now this one might sound more complicated, but it's just a comparison. Write the word assignment like I have an assignment to do for work tomorrow.

Anna Geiger:

Got it.

Peter Bowers:

Now, what suffix did I add to assign to make the word assignment?

Anna Geiger:

M-E-N-T.

Peter Bowers:

Nice. And what suffix did you add to jump to make it jumped?

Anna Geiger:

E-D.

Peter Bowers:

Excellent. Now you did something interesting both times. Both times I asked you for the suffix, you spelled the suffix. Now a lot of times I do that people will call the suffix in assignment ment, but they never call the suffix in jumped /t/.

Anna Geiger:

Interesting.

Peter Bowers:

Now you did what I teach people to do, which is you referred to the morphemes, not by their pronunciation, but by their spelling. Because notice if I say I have an assignment to do tomorrow, I pronounce that M-E-N-T suffix men, yeah, I didn't say ment. I think this happens a lot because the word ment is already kind of in our head and we say ment, but we're used to pronouncing these things.

But of course, no teacher ever calls the suffix at the end of jumped the /t/ suffix, they always call it the E-D. Well, because if you say played, how do you pronounce that suffix?

Anna Geiger:

/d/.

Peter Bowers:

And if you say painted?

Anna Geiger:

/ĕ/ /d/ or /ĭ/ /d/.

Peter Bowers:

It's even more /ĭ/ /d/, yeah, but we can't call it the /ĭ/ /d/ suffix here and the /t/ suffix there and the /d/ suffix there. We do the very logical thing, which is to name the morpheme, the meaning unit, the meaning bearing unit, by the one thing that's consistent, it's spelling.

That's what we're talking about when we're talking about morphophonemicness, we're really talking about the shift of the phonology with the consistency of the spelling of the meaning unit, the morpheme.

The E-D suffix shows that, but it's the whole system. If I talk about emotions, you could analyze that back and you say emote, you don't say emosh, right? It turns out the base there is a bound base in M-O-T-E, and that has to do with moving. You can promote, you move up, and you demote and you move down, and emotions are about moving.

The point being that this is the shift that happens, but in all those morphological interventions that we talked about, the meta-analyses... In our study we looked at 22 morphological interventions, the one we published in 2010, and I think about five of them had any explicit instruction about the relationship between the phonology and the morphology.

And so what we need to understand is that evidence that Goodwin and Ahn show, they showed that the biggest effects from morphological instruction were for phonological outcomes. I can make sure that your readers have access to this research. The biggest effect is for phonological outcomes, and that's without even being taught how it works.

People at home could always do this, but do me a favor and have a go at writing the word musician. Okay, what's the base of musician?

Anna Geiger:

Is it M-U-S-E?

Peter Bowers:

Oh, that's very good. It is. Now you have some background in Latin or something.

Anna Geiger:

I've been reading your book and I did take Latin years ago, but-

Peter Bowers:

There you go.

Anna Geiger:

... I've been studying this, yeah.

Peter Bowers:

But okay, what word would most people think is the base of musician.

Anna Geiger:

Music?

Peter Bowers:

There you go. But you're right, M-U-S-E is the base. It's the muses. It's great, and museum is the same base.

Anna Geiger:

Sure.

Peter Bowers:

But anyways, but let's treat the word music as the base, you can call it the stem of musician.

Anna Geiger:

Sure.

Peter Bowers:

If I was treating it like the base, I still wouldn't call the base music. I would call it the base, M-U-S-I-C for the same reason that I don't call it the /t/ suffix in jumped.

This goes back to a really classic article that is so powerful that is cited all the time, but widely not recognized for what its real value is from Carol Chomsky in 1970. She says something along the lines of, "As soon as their vocabulary allows it, children could be taught that a morpheme doesn't have a pronunciation until it's in a word."

Anna Geiger:

That's so interesting. I have to write that down.

Peter Bowers:

Isn't that great?

Anna Geiger:

Yeah, I like that.

Peter Bowers:

Isn't that great? If I say to you, "How do you pronounce the E-D suffix," your answer should be, "Well, it depends on the word."

If I ask you, "How do you pronounce the base M-U-S-I-C, if I think it's a base?"

Then you should say, "Well, it depends on the word. When it's a word, music. When it's in musician, musish."

What's writing the sh? Well, it's got to be that C.

Anna Geiger:

Yeah.

Peter Bowers:

That's what the matrix does. It lets you see music next to musician. The word sums do that as well. You draw attention to that.

What I want to highlight is in our 22 intervention studies, of which Goodwin and Ahn, we've overlapped many of those studies, the biggest effect is for phonological outcomes and yet most didn't teach that at all. They didn't teach the interrelation at all. They taught morphology over here.

This is what I see in the world right now, but I've got to tell you, I'm very excited about what I'm seeing in the current research theory. There's the Active View of Reading model by Duke and Cartwright. There's Morphological Pathways Framework by Levesque and Deacon and Breadmore. I'm just seeing so many different places where people are highlighting, all of a sudden, that our old models of reading, most of them didn't specify any role for morphology. They didn't avoid it, they didn't say it doesn't play a role, they just didn't mention it as a part of the model, like the Reading Rope and the Triangle Model and all these things on which...

I can actually, I have to show you a slide that we can talk about. I just used this one.

David Share, the person who came up with the self-teaching hypothesis and all that, he and others have talked about how morphology can have a self-teaching mechanism as well. His 2021 article he's got, it's really a powerful one, I think, goes to the four most cited research reviews in the science of reading. He has Ziegler, Goswami, National Reading Panel, and the UK Rose Report, and he compares the number of occurrences of phonology or phonological compared to the number of occurrences of morphology or morphological. The numbers are like 334 to 6, 109 to 3, 240 to 5, 51 to 0. The theory that has been driving so much of the research hasn't given the researchers any thought, any focus on the role of morphology-

Anna Geiger:

Yeah that makes sense.

Peter Bowers:

... it's coming in so late. If you look at the actual model, influential model, Simple View of Reading, Reading Trial, Reading Rope, orthographic mapping does include morphology compared to the other

ones. But she makes the claim that it's after the phonology started, which I have an argument with, but at least she is pointing to morphology and argues that it's important.

Just think about what that means for what the teachers are getting. What we see right now is I have yet to see a high-profile research-based instructional program out there that has any systematic attention to the relationship between morphology and phonology, let alone the role of etymology that I also think is key.

But anyways, I don't know if I've gone on so you can direct me where I should go.

Anna Geiger:

Well, what you're talking about is what you've mentioned in one of your workshops that I've watched, that there's this idea that English spelling represents sounds, but there are many exceptions. That's kind of our framework and that's how we teach it.

For example for the word does, we might say that O-E spells /ŭ/, that's what I used to say.

Then another quote that you had about how a particular word might be spelled, it's not a bug, it's a feature. It's not a weird thing; there's a reason.

Can you talk a little bit about etymological markers and what those are, and why even primary teachers should understand that?

Peter Bowers:

Yeah. I want to do that, but since you've just mentioned the does thing, let's explain what that is. By the way, I can put a link to a video of me teaching a young class this. You just made a key point that you look at the word does, and of course it's regularly described as irregular. Misspellings you see all the time are D-U-Z or D-O-S-E and stuff like that. What makes it irregular? Well, it doesn't have the letter sound correspondences we're taught.

There's a statement in there that needs to be unpacked. What if the letter-sound correspondences we're taught aren't right?

Anna Geiger:

Or that that's not the only thing that goes into spelling.

Peter Bowers:

Exactly. Right. But we act like it's just a known fact so we never test it because every experience we've had is that. This is why it's such a danger to call something an exception. That was the point that I want to get to. That word exception is so central here.

Here's my analogy to get a sense of that, imagine that you are a biologist and your life's work is studying frogs. You have the grand theory of frogness and you're going to publish your paper saying I can explain 90% of frogs. Of course, 10% of frogs are exceptions. That is not going to fly anywhere scientific.

Statements that English spelling is about 80% regular or 90% regular... Actually when you call the things you can't explain exceptions, what I argue you're doing is you're rejecting the concept of falsification.

I can give you any hypothesis, two vowels go walking, one does the talking, or any phrase you've ever heard, I before E, etc. Every time the data doesn't match that hypothesis I'm going to call it, we just say, "Oh, that's because the spelling is broken."

No, when the spelling doesn't follow your hypothesis, it's falsifying your hypothesis so you have to change your thinking about how spelling works.

Anna Geiger:

That's a really interesting thing to think about.

Peter Bowers:

Right. Every time you hear exception, you just have to think falsification. We don't talk about exceptions in science. We have anomalies that we have to account for. We have outliers that we have to account for. But when you call something exception, you're saying we don't have to account for it because the system's broken, and that's just anti-scientific.

What we should do is say, "Whenever you hit a word that you can't explain, let's see if we can understand it."

With the word does that you brought up. The first thought is, "Well, it doesn't have the letter-sound correspondence that I was taught." But what we've missed is that we have a system that is morphophonological, that the pronunciation of these morpheme units can shift despite this consistent spelling.

I might start to say, "Well, what if I wrote the sentence, I do my work."

Now if I go to a grade one class and I say I blank, or she blanks her work, they don't say, “She do her work.” What would you say? Kindergartners can say, “She does.”

Native English speakers have morphological awareness. They have as much morphological awareness as they do phonological awareness. They use it all the time. We hear kids say, "Oh mommy, I runned really fast." Not because they heard people say runned, but because they know that if I put /d/ at the end of some things, it means past tense, so I just did it. It turns out they've got to learn that ran is different.

My favorite one is a friend of mine whose four year old recently said, "Mommy, I don't want to be outcluded," which it's actually profound because it wasn't that she paused to think about searching for the word. This happened at the speed of speech. She wants to say, "I don't want to be excluded," but she doesn't have that vocabulary. She does have the word included, but she knows that's the opposite of what she means. She just rips off that in, puts on an out, and goes on. And who knew, maybe that was the word. It's not, we happily use the E-X, which has the exact semantic force of out. It's perfect!

But notice cluded isn't a word. This kid is processing morphology at bound-base element levels that people don't think are...

Anyways, we know the kids have that knowledge. If I go to the kid, "I do my work. She what? She does her work. Oh, here's the do for I do my work. When I write does look at this, it's D-O, and then I add an E-S. D-O-E-S. And that's how you spell does.

"That's the same as I like to go to work. She goes to work. Oh, G-O or G-O and E-S. But when I say go and goes, the pronunciation of the base doesn't change. When I say do and does in one the do is pronounced /d/ /ū/. and the other is pronounced /d/ /ŭ/."

That's fine because that's how the system works. When you call does an exception but not goes, you are misunderstanding the system because the job of the grapheme-phoneme correspondences is to represent the pronunciation of meaning to those who already know and speak it.

Anna Geiger:

Can you say that sentence again? That's a really good sentence.

Peter Bowers:

I don't know if I can.

It uses grapheme-phoneme correspondences to represent the meaning of the language to those who already know and speak the language. If you see D-O-E-S on the page, you don't know how to pronounce it unless you've heard people say does. The letters don't tell you how to speak. It's being an English speaker that tells you how things are pronounced. The writing system has to be able to represent it.

What we have is we have a bank of available grapheme-phoneme correspondences. You need that, and that's what phonics is teaching about. We've got to know what are the possible grapheme-phoneme correspondences, a very important thing that phonics does. We've got to know I can't spell play with a T. There are only so many graphemes, but when you get to the word play, I've got to know which grapheme I'm going to use for which one, right?

Music was a good example. In musician, why don't I use an S-H, musician, /sh/? Well, because that S-H can't write the /k/ of music, but the C can do both as long as you learn the conventions for it.

We have what are the available grapheme-phoneme correspondences, and then we need to know how does those work in the orthography system. One of the crucial things that does is very helpful for teaching, is that the graphemes are single letters, combinations of two - digraphs, or three - trigraphs, that can represent a phoneme and they can do other things. They can do things without representing phonemes. Certainly, phonemes are represented by graphemes, but that doesn't mean the only thing graphemes do is represent phonemes.

Anna Geiger:

Okay, that's a really good one.

Peter Bowers:

It is.

Anna Geiger:

That's really good because... How would you define grapheme?

Peter Bowers:

It's the minimal orthographic unit.

Anna Geiger:

Okay, so you would not define it as something that represents a phoneme?

Peter Bowers:

Well-

Anna Geiger:

Or it can?

Peter Bowers:

One of its primary jobs is representing phonemes, but it's the only thing that can do that, right? Graphemes represent phonemes. Nothing else can represent phonemes.

Anna Geiger:

But it can do other things.

Peter Bowers:

But that doesn't mean that it can't do other things, that's right. And we'll get to that. That's why the etymological mark or the graphemic marker is so important. We'll get to that.

Just to finish the does thing, you see how I can talk about oral language with kids that makes sense to them? I do. She does. They have that in their oral language. All I'm doing is linking the orthography to how the interrelationship of the phonology and morphology leads to the meaning.

Our entire system is that way. When we teach kids that we have a letter-sound correspondence system with lots of exceptions, the exceptions are just the ones that you can't explain because you haven't taught how the system works. There's nothing weird about does. It does exactly what the system has evolved to do. That's that example.

But now you asked about the graphemic marker. Now this is something that very few people would hear about, but the funny thing is, one of the things that you see in research-based instruction is you see instances of morphophonemic instruction because that E-D thing we just talked about, I see that all the time.

When you have a phonics program or something like that, and it teaches you the E-D suffix has three pronunciations, I'm arguing it's moving out of phonics instruction into orthographic instruction because now it's actually the only way you can know how to spell the ending of jumped when you recognize the meaning is the past tense.

Here's the phrase that I'm trying to get people to consider. Everybody has heard the phrase letter-sound correspondence, grapheme-phoneme correspondence, or at least like anybody who's been in school in English. There are at least phrases like the S sound or the Z sound that illustrate that idea.

I don't hear people talking about spelling-meaning correspondences or phrases for that, and yet in English, it's well-established that English spelling favors consistent spelling of meaning over consistent spelling of pronunciation. The thing that it is more tied to is the thing we don't talk about.

Anna Geiger:

Yeah, that's so interesting.

Peter Bowers:

Then we talk about the one that's really crucial, but we end up with this situation where it's like...

So for myself as a terrible speller, when I misspelled really my question was how many L's, it wasn't is there a P somewhere? We terrible spellers, we typically at some point learn the available grapheme-phoneme correspondences.

What is beyond us is that we can't understand how the heck the rest of you do this. How do you know which grapheme to use when? It's not that we don't know what they are, we don't know which to use when.

What you're doing is, I think of this as a triangulation issue. If you're trying to pinpoint a spot on a map, you need more than two reference points. If you just have two reference points, the spot is anywhere on the line; you need to triangulate to get a specific point.

Well, that's why I'm going to show you, and I know that nobody else can see this, but I'll just share my screen with you for a second. What we're looking at is kind of a modified version of the Triangle Model of Reading-

Anna Geiger:

Interesting.

Peter Bowers:

... Which I totally agree with. I don't know anybody who disagrees that when you're trying have kids become literate, they need to link the spellings, pronunciations, and meanings of words. The Reading Triangle has orthography and phonology at the bottom and meaning at the top. You're trying to link those three things.

The thing that John Kirby and I point out is that the only part of our language system that has spellings, pronunciations, and meanings is morphology. You can't put syllables there because syllables don't carry meaning, you can't put onsets and rhymes there. What you need is this third point that can help you choose.

When we're trying to write musician, how do we choose between the S-H and the C? If you don't use morphology, you can't.

Anna Geiger:

Right.

Peter Bowers:

What we're doing is we're putting so much energy on linking the graphemes and the phonemes, but very little effort on how to understand which one to choose when more than one is possible.

One of the things that the does matrix and word sum shows... Here's a key point about graphemes that I have never seen any contradiction to but I don't see taught, and that is that graphemes are constrained and explained by morphology.

What I mean by that is many resources present like you thought and I thought in the past, I'm sure, “Does, I guess that's an O-E digraph for /ŭ/, that's weird." Well, now it feels like an exception because it's the only time you see it.

But can you write...

Everybody at home I recommend you do what I'm just going to ask Anna to do. Take your pen and write out loud D-O, and then a plus sign, and then an E-S, and then a little arrow. After it write out loud D-O-E-S, notice the plus sign is between the O and the E, isn't it? That means it's not possible for that to be a digraph because graphemes only happen inside morphemes.

Anna Geiger:

I got that from, I think maybe I read that in your book or heard that somewhere that really struck me. Graphemes only happen inside morphemes. I like that.

Peter Bowers:

When you see the word hothouse, you don't miss mistake it as hothus because you don't miss mistake that T and H as a T-H because one is in one base and one is in the other.

Anna Geiger:

Contrast that with syllables.

Peter Bowers:

Well, syllables, okay, that's a great one. Do me a favor, everybody, and think about the word action. The first question that I encourage people to think at home is what would you think is the suffix in the word action?

Anna Geiger:

I-O-N.

Peter Bowers:

No, I bet you many people said T-I-O-N.

Anna Geiger:

Oh, I used to say that, until I heard that it wasn't a suffix.

Peter Bowers:

I'm sure that many people say that, and I can go to my Oxford on my Mac and I look and it says T-I-O-N is a suffix, and it gives me the words completion and relation. Well, there ain't no comple and there ain't no rela. It's relate with an I-O-N replacing the E, and complete with an I-O-N replacing the E. The Oxford's got it wrong.

Anna Geiger:

Interesting.

Peter Bowers:

This is because the syllables and morphemes are these chunks that people conflate. Think what happens if you now make a false word sum with a T-I-O-N suffix in action. Write that out loud.

Anna Geiger:

A-C plus T-I-O-N is-

Peter Bowers:

What's an AC?

Anna Geiger:

Yeah, nothing.

Peter Bowers:

You can see there's no way that action has a T-I-O-N suffix, or you say A-C-T plus T-I-O-N. Now you have act and then two T's?

Anna Geiger:

Yeah.

Peter Bowers:

Syllables, whatever they are, the key thing to realize is they aren't meaning-bearing. When you think about our modified triangle model, the morphology is a binding agent.

This is building on Perfetti's work with the lexical quality hypothesis. He talks about having what orthographic mapping would call a sight word. You want to have a sight word in your head. A sight word is when you have the representation of the spelling, pronunciation, and the meaning so tightly bound in your head that you have automaticity. You don't have to sound out, you don't have to do anything. You just see the letters on the page and you instantly have access to the word. That's what we want. Everybody wants that.

Now, what Perfetti argues is you can have higher or lower quality representation of the spelling of a word, higher or lower quality representation of the phonology of a word, higher or lower quality mental representation of the meaning of a word. Improving the quality of any of those improves the overall access to the word.

Now, you might wonder... For example, people use cat, right? The C-A-T, the spelling of cat, the pronunciation cat, and then I can think of the furry thing that purrs. But what if you are reading about a book about the wild cats of the jungle? If your semantic representation of cats is only kitty cats, you have a very bad image of little kitty cats running around the jungle. The semantic representation of cat can expand to tigers, but you have to be taught that.

Anyways, Perfetti's saying each of those can be better, but he says something else that is what really grabbed my attention. There's also another feature of lexical quality, which lexical quality again, is to build tightly-bound mental representations for words that you have access to, and that is constituent binding. The extent to which any of those corners of the triangle are bound together, the boundedness of it is a unique feature of lexical quality.

Anna Geiger:

I think you're over my head a little bit. You'll have to explain that one a little more.

Peter Bowers:

For example, we have the triangle. You have orthography, spelling, pronunciation, phonology, and semantics, meaning. Any of those, you want to increase the representation for a word, but how well you bind any two corners of the triangle increases the overall lexical quality of the word.

It's not just the independent items, it's the extent to which they're bound together because that's what we're trying to do. We're trying to bind them so it becomes a tight mental representation. Cognitive load would talk about that. You want to bind complex information into a unit so that you have access.

What he's saying is it's not just the individual features of words, it's the boundedness of the features.

Anna Geiger:

If you're talking about the word does, would that be...

Peter Bowers:

Perfect, yeah. With does, by analyzing the morphology of it, you get the semantic cue of do, I do my work, she does. When I say that, I'm giving you a meaning cue that do and does relate it. That meaning cue is represented by the base spelled D-O, and then I have to teach you, there's a suffix E-S that we use sometimes. In go and goes, we use it too.

Now that I've identified the D-O orthography, and that orthography is a spelling-meaning correspondence to the idea of do, now I can understand the phonology. Now I can bind the /d/ /ŭ/ of does to the spelling D-O, because I know that that spelling-meaning correspondence is the same even though the pronunciation changes. Now the phonology of the word do is helping me with the spelling of does.

It's the same way with action. What is writing the /sh/ in action?

Anna Geiger:

A T, right?

Peter Bowers:

I have yet to see a single resource out there in research-based instruction outside of SWI and Real Spelling that explicitly teaches teachers that a very common job of the T grapheme is to write a /sh/ phoneme or a /ch/ phoneme.

The base A-C-T is very useful because you can have the word act. I do this with young kids, "Oh, who's your favorite actor? A-C-T-O-R. I like Bruce Willis in his action movies." A-C-T plus I-O-N. Now I see the A-C-T for actor and action or acting if I want to put an I-N-G.

Now I can say, "Well, in actor I pronounce the A-C-T act. In acting, I pronounce act, but in action I pronounce it /ă/ /k/ /sh/." Now I have to learn that the T grapheme's default job is to write /t/, but if there's an I or a U immediately after that T in a word that can signal the pronunciation of the T could be /sh/ or /ch/. In actual I pronounce that T as a /ch/, in action I pronounce it as /sh/, in acting I pronounce it as a T.

There's a grapheme-phoneme correspondence that I don't even see being taught out there! The reason it's not taught is because I've yet to see a T grapheme writing /sh/ or /ch/ where it's not in one morpheme and the I or U is in another morpheme.

If you treat action like a base, well then you think it's a T-I digraph. But it can't be a T-I digraph because graphemes are constrained by morphology, which is why word sums...

Literally, you cannot understand English orthography without word sums. I argue you need matrices as well. I mean, theoretically you can make a list of word sums and do what a matrix does, but it's not as good as to see them.

The point is you need a concrete, this is where cognitive load theory comes in for me, one of the many places. We need to have diagram. We use these worked examples to understand complex information. The matrix and the word sum allow me to look at the spelling D-O and think about its pronunciation in do and does at the same time.

That's also why we use the IPA symbols all the time to have a physical, concrete representation of this abstract thing called the phoneme that's gone the second you talk about it.

You can have grapheme-phoneme diagrams next to your matrices and word sums that explain what the graphemes are doing in a way that's not possible without them.

You can't understand grapheme-phoneme correspondences in English without morphology and etymology. It's simply not possible.

Now you can get away with a bunch of them. With cat, I don't have to think about much else, but if I'm going to get into words with these pronunciation changes, which is everywhere, then that's what you're left with.

Anna Geiger:

Even in a simple word like dogs. Right away, right there, we've got that-

Peter Bowers:

Exactly. And you mentioned the syllable comparison, so a couple of things there. Notice syllables and morphemes have nothing to do with each other. Dogs - monosyllabic, two morphemes. Table - bisyllabic, one morpheme. We just have...

When people conflate them and they hear that /sh/ /ŭ/ /n/ at the end of a word all the time and they see a T-I-O-N, it can be conflated as if it's a suffix, but it destroys what's there. Think about that, /sh/ /ŭ/ /n/ can be spelled with a T and then an I-O-N, a C and then an I-A-N, or double S and then an I-O-N. Even knowing /sh/ /ŭ/ /n/ is a common syllable, how do I know which of those to use.

If I'm writing passion, the base is P-A-S-S. I use the P-A-S-S and then there's an I-O-N. If the word's musician as we showed. You have to look at the meaning.

This is the triangle, this is morphology as a binding agent every time you invoke morphology to understand grapheme-phoneme correspondences. It comes baked in with meaning, and there's nothing more powerful for memory than meaning, especially for dyslexics with poor phonological processing or whatever. If we are given a meaning cue that helps us understand why something is spelled, like I was given with really with two L's, by just seeing the word real in an L-Y suffix, then once I understand, I don't have to memorize. I just will never understand if I don't. I will never memorize if I don't understand.

Now you mentioned before, I want to make sure we get to your graphemic marker question. One thing we mentioned that is often out there is we teach the morphophonemics of the E-D suffix, but it's a one-off. We don't teach that as systemic of the whole system. If we think it's important to do with the E-D suffix, why would we not teach it with the D-O base in does and the reason is because it's not known.

We do a similar thing with graphemic markers with the W in two. Lots of people have heard the story that the W in two is there to link it to twice, twin, twenty, and between, because that's in lots of books, but it's not a mnemonic device. It's part of the system.

We can use this word two, not to just teach the word spelling of two, but to teach how the system works.

One of the biggest gifts of this word is it is clear evidence graphemes don't have to write phonemes because in the word two there are three graphemes, there's the T, the W, and the O. The T grapheme is writing /t/. The O grapheme is writing /oo/. The W grapheme isn't writing any phoneme. But why is it there? It's there to give a spelling meaning, of course.

See that language, if we could use that, "Oh, the W in two doesn't have a grapheme-phoneme correspondence; it does have a spelling-meaning correspondence." It's linking to the meaning of words like twin and twice and twenty, where the W is writing the phoneme you expect, and it has to do with the history of the word. I think we used to probably say twoo or something like that but the phonology changed, but we kept it because it's providing this meaningful signal to words with this idea of two-ness. It's also helping us by distinguishing the spelling of homophones like the T-O and the T-O-O.

That's another principle which is etymological, the homophone principle, that says that wherever words can be pronounced the same way where possible are spelled differently. The key thing with that, so I call the W in two a graphemic marker because there's a grapheme.

There's a great book by Richard Venezky called *The American Way of Spelling*.

Anna Geiger:

Yes, I have that right back here.

Peter Bowers:

I always tease it saying, "That's a terrible title. As a Canadian, I'm very offended," but it's such a good book that I don't hold it against him.

He talks about things like the homophone principle. Think about the homophone principle according to the theory that spelling is a sound representation system with exceptions, well then homophones should be spelled the same. That's what we're taught, that homophones are hard because they're not spelled the same, but it's the exact opposite. The primary job of spelling is to represent the meaning of the language to those who already know and speak the language. When you have homophones, it's very useful if they're spelled differently.

Anna Geiger:

Right, and you talked about how they-

Peter Bowers:

This is where your bug not a feature comes in. This is why we need many ways to spell the phonemes because otherwise we couldn't separate homophones. We need many phonemes that can be represented by different graphemes because the pronunciation is changing. It's not a bug; it's a feature.

The other piece of this graphemic marker, which Venezky talks about as well, is that it's a grapheme that isn't writing a phoneme.

Everyone think about the spelling of people. What phoneme is running the E in people?

Anna Geiger:

E.

Peter Bowers:

And the O, why is the O there?

Anna Geiger:

Related to popular, population.

Peter Bowers:

If you tell me that, I can remember it! But I can't memorize people without that meaning-based cue.

In all of these places, spelling-meaning correspondences are explaining grapheme-phoneme correspondences, but what we do is we teach grapheme-phoneme correspondences and leave everybody just to pray for the spelling-meaning correspondences.

Anna Geiger:

That's so interesting. Yeah.

When teachers are teaching homophones, I saw one you did on a workshop somewhere for heel and heal... Instead of just telling them, "Well, you just have to memorize that when you heal somebody it's H-E-A," you can show them heal is related to health, healthy, and in those words. Now of course they need to see those other spellings because maybe they don't know those either, right?

Peter Bowers:

Yeah, yeah. We have to teach what are the grapheme-phoneme correspondences.

A basic practice of SWI is what I call spelling out orthography. We never did this one, and I know you've demonstrated you've been doing your homework, so you're going to get this right away.

Anna Geiger:

Oh boy, I'm not sure.

Peter Bowers:

For people out there who might be listening, I do a thing. It's not as good to do without a visual, but I do it all the time anyways. I like the Rorschach test where you throw up a blob of ink and say the first thing that comes to mind, no wrong answer.

I flash a word on the board and ask everybody to jot down the first words that come to mind, so it's a Rorschach test for words. We'll say the word is disease. Jot down whatever words come to mind. Now, usually we'll get words like illness or sickness, which is totally logical, but here is the process that I'd like you to have a go at, which is to...

Normally I have to show you the word here because I'm not asking you how to spell this word. This only works if you know how to spell disease. But what I would ask you to do, Anna, is just write out loud the word disease.

Anna Geiger:

As in say the spelling?

Peter Bowers:

Sorry, I didn't explain it. When I say write out loud, it means you're going to name each letter as you write it. That's all it means.

Anna Geiger:

Okay.

Peter Bowers:

Go ahead, but you have to write it as you do it though.

Anna Geiger:

D-I-S-E-A-S-E.

Peter Bowers:

Now when you do that, do you notice something in that word?

Anna Geiger:

Dis or D-I-S, dis-ease means not feeling comfortable.

Peter Bowers:

Now, have you ever had that observation before just now?

Anna Geiger:

I think I saw it in one of your workshops-

Peter Bowers:

Exactly.

Anna Geiger:

... but maybe not before that.

Peter Bowers:

Yeah, but my guess is for anybody listening, when people see disease, they don't think that way.

Anna Geiger:

No.

Peter Bowers:

We have this habit of mind of syllabifying. If I was to syllabify disease, I'd probably go di-sease.

If I was writing on the board I would say, "Okay, class today we're studying the word disease," and I'm writing as I say disease. I'm not drawing any attention to the D-I-S, the pronunciation or the spelling. When I go disease, I don't draw your attention to the D-I-S or the dis pronunciation, and I don't notice an ease because I said zees, disease, I said zees.

The syllables are hampering our access to the meaning. I would argue that if you are out there and in your entire life, you have not noticed the ease in disease, then you too have been harmed by this lack of instruction, even if you're an accurate speller. Because once you see the ease in disease, it's a one-way door. You can't go back. Then you think, how could I have not have seen that before?

Now, do me a favor and spell the base out loud for me.

Anna Geiger:

E-A-S-E.

Peter Bowers:

Okay, now I'm going to tap so that maybe you can hear, I don't know, but I would tap it like this. EA-S-E.

Anna Geiger:

Okay.

Peter Bowers:

Okay. I do a thing called tapping out. I only tap in the base, and I give one tap for every grapheme. I have an E-A, an S, and an E. What I've just done is I've told my class what the graphemes are in the word ease.

This could be kids just learning the names of the letters as well as graphemes if I'm doing this, "Say ease everybody."

Do me a favor, Anna, say ease.

Anna Geiger:

Ease.

Peter Bowers:

What do you feel at the beginning?

Anna Geiger:

/ē/.

Peter Bowers:

/ē/. How do you write the /ē/ in the word ease?

Anna Geiger:

E-A.

Peter Bowers:

You can say that because I've just made you say E-A many times. See, I'm scaffolding your ability to identify the phonemes by giving you the graphemes that represent them.

Then I say, "Okay, say ease."

Anna Geiger:

Ease.

Peter Bowers:

Say ease without the /ē/.

Anna Geiger:

/z/.

Peter Bowers:

How you write the /z/ in ease?

Anna Geiger:

S.

Peter Bowers:

Ah, so we have the E-A is writing the /ē/, the S is writing the /z/, and then we still have an E hanging out. What's that E doing there?

Anna Geiger:

I think it's changing the sound of the S, correct?

Peter Bowers:

It's a good idea, but I can prove to you that it's not. Take a look at the word please. P-L-E-A-S-E, but that could also be P-L-E-A-S. More than one plea is pronounced identically to please help me.

The E is not playing any role in phonology in ease. The problem you're having is that the main...

If people are taught about the single silent E, in structured word inquiry, we use this phrase, final non-syllabic E, it's the same thing. That's a graphemic marker because the silent E, if you want to call it that, the final non-syllabic E, never writes a phoneme. It's a graphemic marker. It's everywhere.

The thing is, the job we teach kids is that it's one job is to make a vowel letter long. Well, it's one of its many jobs. I think I've run into about 14 of them. In the word ease and in the word please, it's got a very cool job, and Venezky talks about it in his book that I mentioned, it's a plural canceling marker.

Anna Geiger:

Oh, right.

Peter Bowers:

There's a convention that no complete English word is allowed to look like a plural if it's not a plural.

Anna Geiger:

Right, right.

Peter Bowers:

And so when you plug an E on the end, you can't confuse it for more than one something.

Now why would we not teach kids that? When we don't, look what happens. The single silent E is more commonly not singling long vowels than it is, and yet we teach them this one thing that is not its most common job compared to the 13 other jobs it's got.

With have and love and give, we call those irregular. Well, no, there's a convention that no complete English word ends in V because if it did, you would end up with double Vs and that looks like a W. There are all these great stories.

What we can do, instead of getting to a word and telling a kid that it's an irregularity you have to memorize, we can tell you a cool story that happens to have the virtue of being accurate, and it develops this habit of mind of seeking those things.

The W in two to twin and twice and twenty is great, but its real power is when you get into word where you think, I don't know why that letter is there, I can't explain it. If you don't know that one thing is it might

be a grapheme not writing a phoneme, we just squish every letter into a grapheme box, a grapheme-phoneme box, even though it doesn't belong.

Another common one is the word been, like I've been here. Write out loud been for me.

Anna Geiger:

B-E-E-N.

Peter Bowers:

Is that a double E or is it two E's?

Anna Geiger:

Two E's.

Peter Bowers:

Why is it two E's?

Anna Geiger:

Because we're showing the-

Peter Bowers:

Give me the word sum.

Anna Geiger:

B-E plus E-N.

Peter Bowers:

There you go! It can't be a double E, but many resources say been is irregular.

A double E digraph is really boring, I only know it writing the phoneme /ē/.

But then I say, I've been here and people mistake it as a double E digraph, but it cannot be because the base is B-E, there's a plus sign, and the second E is in the E-N. That single E grapheme in the B-E base can be pronounced /ē/ and can be pronounced /ĭ/, and that's totally normal.

There's no advantage I can possibly imagine to telling kids to memorize those things and build within them the sense that this system is frustrating and every time I learn something, there's another change. It drives me crazy. That is the message we give to dyslexics.

Whereas we can say, "Actually the system is really cool. It works. We're going to be scientists; we're going to investigate it. Some questions we'll get to, we won't be able to answer, but we always know there is a reason. We just have to find it."

If you approach it from that perspective, which is a much more scientific one, then you have an attitude of this, a habit of mind, for looking for spelling-meaning correspondences to explain the grapheme-phoneme correspondences.

But we can't do that when we don't even have the language spelling-meaning correspondence in schools, let alone the concept.

Anna Geiger:

No. Well, we could talk about this obviously much longer, but it's already about three times as long as my typical episode. We'll just add a little bit more. I think I'm going to have to make this part of a series so I can get into a lot more of it.

Just to wind it up, as you said, part of the reason this isn't catching on as well as we might want to see is because it requires knowledge in the part of the teacher, and that's not always really available. It's not something we were taught when we were learning to read and spell. We weren't taught it in our colleges usually, so where can teachers go to start figuring this stuff out? I know you said once you start to see it, you can't unsee it, and it all starts to make sense. I know your book, *Teaching How the Written Word Works*, is excellent. I'll provide a link to that in the show notes, but what else would you suggest?

Peter Bowers:

Well, this is the thing that's wild. When I ran into that conference in 2001, I worked with Michel Rameau who's the author of Real Spelling. I'd go back to my classroom and I would get lost and I'd email him. Then when I came back to Canada, if I had a spelling question, there was one person I could email.

There are multiple Facebook groups that are really full-on. There's a new research group called SWIRV, SWI Research Vanguard that is just getting together, and that's the group that is doing this matrix study, replicating it with kids. But there are all sorts. Sue Hegland is doing great with her book-

Anna Geiger:

Yes, I love it!

Peter Bowers:

... *Beneath the Surface of Words*. That's the starting place. I'd say that should be-

Anna Geiger:

I think every English speaker should read that book, anybody-

Peter Bowers:

Absolutely.

Anna Geiger:

... Teacher or not.

Peter Bowers:

I will say all of this, that book, my work, there are all sorts of people out there studying this. If you search, you can find my website is Word Works Kingston, and I have a section with links to all sorts of other people doing this work. There's a great resource called High Frequency Word Project by two colleagues that I've worked with for years. Rebecca Loveless has a great website, Rebeccaloveless.com. She's at Nueva where I was for a year. She's been the SWI coach there since I left. Then Fiona Hamilton is in wordtorque in Thailand, and they made this high frequency word project that uses all those high frequency words that people are trying to memorize, but uses structured word inquiry concepts to explain them. The thing is, you don't just gain from the words they give you; you gain from that idea of how to look for words.

There are just many places to go and people doing PD all over the world with this now. Now it's still small, there's no doubt, but if you Google it, you can find lots of places to study, and what I see is all the people doing this are doing great stuff.

There's no certificate saying you are an official SWI person and I hope there will never be, but there are a couple things that I would want to touch on before we go, if I could steal a couple more minutes.

Anna Geiger:

Sure. Go ahead.

Peter Bowers:

One thing that's really grabbed my attention recently was a Maryanne Wolf's book *Reader Come Home*. I think it gives a really useful frame for the stuff that you're asking about, like not knowing this and getting your head around it and all this. Her book is about a different topic, but it's fascinating.

She discovered people my age have a common experience. I used to read a lot more than I do now, and I used to read long-form New York Times Sunday paper or something, and now I start reading an article online and I give up after a bit with this ridiculous brain. I used to have books going all the time, where's my...

And so she's thinking about that for herself, and then she started to look into the research and found that there's tons of evidence that our experience of reading in the digital medium is having negative effects on our reading brain that have implications for reading in any medium.

Examples that she points out is we get these habits of skimming text all the time when you're digital and you're reading shorter things. Then also when you read a book, you're reading a book and you get lost a bit in some concept or something, so you turn back a couple pages because you know that in the bottom left-hand corner I can find what I'm looking for, and then I can go back. Now if I read ahead, my comprehension is better because I didn't just skip this thing I knew I didn't know. A book gives you this affordance, her word, to know where to look, so you do. It's physically possible to do in a digital medium, but you don't as much.

What's happening, she's saying, is we get these habits of mind that are not good for reading comprehension. The habits of mind that digital affords us don't lead to the kind of deep reading that we do in paper. There are lots of studies where if you're reading the same text on digital and paper, the comprehension is better on paper.

What she's saying, she has this great idea that our attentional systems are biological spotlights, wherever they're not looking, nothing can happen. If you don't have these experiences on paper, you literally stop getting the connections in your brain that lead to this deeper comprehension.

My point about all that is it's astonishing to me what looks like, on the surface, a tiny difference, reading the words in a digital medium or a paper, is a big enough difference to shift our attention as such that we are not as good at reading comprehension.

Well, if that difference has that effect, there must be other things that are affecting our attentional systems, and I would say instruction would be a way bigger effect than digital versus paper.

What we see is we have not given the affordance to look for those spelling-meaning correspondences that we've been discussing, the morphological and etymological ones. We never even know they're there because we have these instructional spotlights that are blinding us from other things.

But once you get a matrix, once you get this W in two and O in people and all those kinds of examples, now you gain this experience of learning. Now you look where it used to be on the edge of your spotlight-

Anna Geiger:

Exactly, yes.

Peter Bowers:

And so now the more you look, the more you see, and the more you realize you don't know, and so the more you see. Now your attentional spotlights are building, and this ties so much to statistical learning that people talk about.

I read a great quote the other day about statistical learning. Even infants seek out structures in the environment, and the repeated exposure to those structures is statistical learning. I want to change it by one line. We extract the structures not necessarily in the environment, but the ones we perceive in the environment.

We know illusions work. When you see an illusion, you see the two boxes and you swear one's bigger than the other, but when you measure it, they're identical. Well, that's because statistically speaking, when you see this shade of color, it signals farther back, and when you see this shade, it signals closer. They manipulate the environment so that you mistake things. You're not seeing the structures in the environment; you're perceiving a structure that isn't there.

That's like the syllables that have prevented people from seeing the ease in disease. Yeah, you can say that there's a T-I-O-N letter sequence that you see all the time, and it's usually pronounced /sh/ /ŭ/ /n/.

You can say there's a pattern that you're seeing and you pick up on it, and it might even help you in some ways.

But the problem is you're not realizing that's not a structure in the spelling system. It's a surface pattern that commonly occurs. The actual structure is the T is in the base or the stem, and the I-O-N is over there. If you train your brain to notice the /sh/ /ŭ/ /n/, you can't notice the act.

How many people have ever told their kids that when you ask a question, you're going on a quest for knowledge. When I first saw that, it blew my mind because questioning was all about what I was in teaching! It wasn't until my first week of Real Spelling when I saw the word question, that I did a word sum in my head and said, "Quest! How could I have not seen it?" My statistical learning had been built on not the right structures.

What I'm arguing is that instruction... I mean there are two basic principles of structured word inquiry. Instruction should accurately reflect the domain you're teaching.

Anna Geiger:

Be specific.

Peter Bowers:

In does, if you can explain does, your instruction should reflect it.

Anna Geiger:

Okay. Oh, I see what you mean. Okay.

Peter Bowers:

First of all, make sure that you are at your instruction; we should strive always to make our instruction reflect the writing system as well as we can.

Now, you can have debates about that. You can say, "Well, maybe how it really works is way too complicated for kids."

That's a fair question. I'm not suggesting we treat cloud theory version of atoms in grade five. We can teach a simplified version. We tell people it's simplified, but the evidence that we have is that teaching morphology helps the youngest and less able the most. We seem to have good reason to do that.

The other piece of it is the inquiry part. When I came with the phrase structured word inquiry, it's because I've seen so much bad instruction done in the name of inquiry where people just try things and no, I don't want that. I want structured inquiry.

The joke is it's structured inquiry about word structure. Structure is central. Now, if I could go back, I'd call it scientific word investigation because that is what it is. It's literally applying science to your ongoing learning.

The reason that's so important is because once you get some of the tools for how to... It's not just to teach you to understand the writing system, it's to teach you to be an understander of the writing system even with words I haven't run into with you. That's why the inquiry part is scientific inquiry.

Actually I can point to one other thing. I'm very happy I just found a new, recent meta-analysis on inquiry versus explicit instruction because there are a lot of arguments out there that I very much disagree with really criticizing inquiry-based instruction.

Now there's good criticism of some bad inquiry-based instruction, but it's presented as if we are in this weird world where you have to choose between inquiry or explicit instruction. No, I would say the only kind of inquiry instruction that's ever had any value requires explicit instruction. I have to give you the pieces that you can work with.

Anyways, this new meta-analysis is criticizing the criticisms about inquiry and has lots of evidence that actually inquiry-based instruction in their meta-analysis is always as good and often better than explicit. But that's not even the point. The point is some things are better to do with an inquiry and some things are better to do explicit, and we have to use them in a combined way.

Structured word inquiry is... A funny thing I always laugh at, people will criticize that the instruction in SWI is too advanced and it's not explicit enough. It's like, you don't like me teaching about these big words, but then you want me to have the kids just figure them out. That's why structured word inquiry has those two ideas. How does the system work and how can you become an independent learner of it?

The teachers, every year, their learning grows, and that means the kids benefit every year. You don't have to be an expert to start. Some of my favorite stories are people on their very first go with this stuff. You're going to make tons of mistakes, of course, but if you keep teaching does is irregular, you're always going to be making mistakes there.

Anna Geiger:

So interesting, so interesting. Thank you for all of that.

I know I'm going to put an episode before this to explain a lot of these words because I know if I'd had this conversation five years ago, it would've made no sense to me at all.

That's great, and thanks for all the work you're continuing to do to get this out there and I will continue following you.

Peter Bowers:
Well, I appreciate you showing this interest and spreading the word, and I'll send you an email with things that I can share, and you can ask me for links so that people can see, because hearing this is very hard.

Anna Geiger:

Yeah, I know. We'll make it-

Peter Bowers:
You need print in front, so I'll try to collect some things with references to the language I've been using so they can look at it when they're listening.

Anna Geiger:

Well, thank you so much!

Peter Bowers:

Thank you, Anna.

Anna Geiger:
All right, so how did you do? That was a really good, but deep, conversation. I hope if you're new to morphology, it wasn't too much over your head, but I would save it and listen to it again in the future if that's the case, because once you get into this and you start learning more, this is going to make so much more sense.

It would not have made sense to me five years ago, which is why I recorded the episode that comes before this with Michelle Sullivan to talk about a lot of these individual words and big concepts related to morphology.

Dr. Bowers has provided me with graphics and links that are going to flood the show notes so you have everything you need to make sense of what we talked about in this episode, as well as learn more.

And also, please stay tuned for other podcast episodes in this series. I'm really excited to be talking to other experts that Dr. Bowers actually mentioned in this episode, so stay tuned for those. They're coming the next couple of weeks, and leave any comments on the show notes.

You can find the show notes at reachallreaders.com/episode192. Talk to you next time!

Closing:
That's all for this episode of Triple R Teaching. For more educational resources, visit Anna at her home base, reachallreaders.com, and join our teaching community. We look forward to helping you reflect, refine, and recharge on the next episode of Triple R Teaching.