



## Glean Education's Research to Practice Podcast Episode #18 - Adrea Tuckenmiller (Michigan State University)

Jessica Hamman: Hi, and welcome to Glean's Education's Research to Practice Podcast, where we talk to education experts from around the world about their latest work, and bring their fascinating findings out from the journal pages and into your classroom. First, a word from our sponsors.

Speaker 2: Go ahead and state your name and title and what you enjoy about working here.

Alisa VanHekken: My name is Alisa VanHekken and I serve as the Chief Academic Officer for Heggerty Phonemic Awareness. And what I like most about working for Heggerty is the impact that we have on classrooms across the country, across the world with instruction that aligns to the science of reading, is engaging, and is really helping our students to be readers.

Jessica Hamman: Heggerty's daily phonemic awareness curriculum is used by over 450 school districts nationwide. Learn how you can get started at [heggerty.org](http://heggerty.org). That's H-E-G-G-E-R-T-Y-O-R-G. I'm Jessica Hamman, founder of Glean Education. And today we're thrilled to welcome Young-Suk Grace Kim, professor and associate Dean of the school of education at the university of California, Irvine.

Jessica Hamman: She received her doctorate at Harvard University and holds master's degrees in teaching English to speakers of other languages, as well as in human development and culture. She was a former classroom teacher in San Francisco, California. Dr. Kim's primary research areas include language, cognition and literacy acquisition and instruction across languages and writing systems.

Jessica Hamman: Her research is supported by IES, the Institute of Educational Services, the U.S department of education, The National Institute of Child Health and Human Development and The National Science Foundation. Dr. Kim received the presidential early career award for scientists and engineers by president Barack Obama in 2012 and the developing scholar award and the university teaching award from Florida State University.

Jessica Hamman: She currently serves as an associate editor for the journal of educational psychology and will be the incoming editor in chief for the scientific studies of reading. We are here to talk with her about her recent journal article, the relations of online reading processes, eye movements with working memory emerging literacy skills and



reading proficiency. Young-Suk, thank you so much for being here. It is such an honor to have you

Young-Suk Grace Kim: Thank you so much Jessica for having me. It's such a pleasure to be here.

Jessica Hamman: I would love to talk first about the background behind this really interesting study that you have written. Can you tell us a little more about your research area and what interested you specifically on the relations of online reading processes or the eye movements that happen in students when they are reading?

Young-Suk Grace Kim: So I was a classroom teacher before in San Francisco. And after that I got my degree. So my interest is in looking at the language development and reading and writing development in their intersections. And of course their implications for instruction and practice. In research, there are two large categories of work in the world of reading. One is reading process.

Young-Suk Grace Kim: What's going on as you read written text. Another line of work is measuring reading skills, right? So if you think about reading process, what it means is, as you look at the written text, right? Visually you look at it, you start to decode the text, you parse sentence into different chunks to analyze the meaning.



Young-Suk Grace Kim: And then in your mind, you start constructing ideas, right? That's propositions. And then of course, those ideas in... From sentences and phrases are local, right? It's specific part of the text. For you to have accurate understanding of the given text, you need to integrate information, right? Using your background knowledge also information in different parts of the text.

Young-Suk Grace Kim: So this is the process that's ongoing as you read the text. So that's a lot of work spent time on looking at the processes that are occurring. Researchers have used different tools, such as ERP, Event Related Potential or eye movements, tracking movements of eye. Another huge line of work is looking at reading skills.

Young-Suk Grace Kim: So reading skills means that if you think about typical assessment, you give students a words... List of words and ask them to read a verse, or in comprehension you give passages, ask kids to read it and then ask questions related to the passage, right? But then what we are measuring there is the products of the reading processes, right? So there's this product and skills and there's processes. And what's been happening in the field, is these two have been kind of a two separate tracks of research.

Young-Suk Grace Kim: So a group of researchers have been very active in looking at two processes, another group of researchers have looked at skills, right? So the reading skills development looks like over time, what are skills that are predictive, right? Important skills that contribute to reading skills. But these two lines of work tend to be really separate and they don't really seem to meet, right?



Young-Suk Grace Kim: Reading processes and skills should be really highly intimately related. If you have efficient reading processes, you are reading product, meaning you are reading performance will be good. If your processes are inefficient, if there's any issues or difficulties in processes, then the product is... It will show it.

Young-Suk Grace Kim: We wanted to merge these two lines of work, meaning gather process data and skills data and merge them together. We felt that that was necessary because especially for developing readers, because for example, research using eye movements have been primarily with adult readers. So we have pretty good understanding of eye movement patterns for adult proficient readers, for example, but we don't know really, exactly what's happening with the children's eye movements and reading processes that are captured by eye movements. So we decided to merge and combine these two methods and integrate them in this study. I

Jessica Hamman: I Think that's really interesting because you're already starting to see we... In the field are already starting to see some interventions based on eye movements for children. So when I read in your study that most of the research is focused on adults. I thought it was kind of fascinating that the developers are making the leap that we can make assumptions about pediatric eye movements based on adult information, is this one of the reasons that you wanted to get some more data on use eye movements?



Young-Suk Grace Kim: Absolutely. The eye movements have... There are theoretical models on eye movements during reading and they were primarily based on adult proficient readers. And therefore it doesn't really capture the decoding processes that are so important for reading. So that's why we... That's one of the reasons why we wanted to actually kind of integrate this work with developing readers.

Jessica Hamman: Can you explain why we call eye movements, online reading processes in research? Online in this case does not mean on the web, so it means something else. Can you walk us through this?

Young-Suk Grace Kim: Thank you for the question. That's exactly right. So online here means what's happening in the moment during reading, the opposite is offline reading. So offline reading is really kind of reading products that we just discussed. Online reading is really capturing reading process in the moment as the readers read the text.

Jessica Hamman: Were there any assumptions you had going into this research that you thought you would find?

Young-Suk Grace Kim: That's a great question. So going into it, one of the motivations was that skills need to develop, right? So linguistic skills, deep reading skills, they need to develop at a special level, so that that will enable reading processes. And that's one of the questions that we ask in this study.



Young-Suk Grace Kim: For example, the skills that we very much are familiar with, that's important for word reading, such as phonological awareness or the graphic knowledge or morphological awareness or knowing letters, letter name influence here for example, all these pieces going into it we felt that should be important for eye movement, how efficient students are processing information during reading another piece was that for these developing readers, we worked with children in primary grades for these developing readers. We felt that these so-called immersion literacy skills or word reading, which subsumes all this immersion literacy skills.

Young-Suk Grace Kim: It should be really the determining factor for our online reading processes. So in other words, we know word reading is important, right? We know also that, linguistic comprehension is important, but for beginning readers, word reading is so important that it places a large constraint on reading processes.

Young-Suk Grace Kim: And because of that constraint, their reading comprehension is compromised, right? So what we were on to look at was the path and pathways in which things are related. So, previous studies... Quite a few numbers of studies have shown that, okay, word reading is important to reading comprehension, but how does it really influence reading processes? That was one of the pieces that we wanted to address.

Jessica Hamman: What were your methods?



Young-Suk Grace Kim: This wasn't learnt through more studying. We followed 272 children from grade one to grade three. So we measured important skills in grade one, such as children's working memory logical awareness or photographic awareness, morphological awareness, letter name influence, rapid or automatized naming. All these are very well known predictors of word reading skills.

Young-Suk Grace Kim: So we measured all those pieces in grade one. And in grade three, now we follow them in up into grade three and we measure their eye movement. So children basically essentially sat in front of a computer monitor and the computer monitor displays a passage. And underneath the monitor is there's a camera that captures a students eye movements.

Young-Suk Grace Kim: It captures with precision such that it captures students movement on each letter exactly where the both eyes are and how long the eyes are spending on each letter and et cetera. So we measure their eye movement in grade three and also measure their reading comprehension in grade three. So what we wanted to look at was the skills in grade one, emerging skills and working memory in grade one. How do they predict eye movement or reading processes captured by eye movements in grade three and how eye movements are related to reading comprehension in grade three.

Jessica Hamman: What were your findings?





Young-Suk Grace Kim: Essentially found that all the emerging literacy skills matter for eye movements. So children who had better orthographic knowledge, they had better knowledge of the graphs and patterns of graphs in English. They spent less time looking at each letter, each word. The same with students who had better morphological way in grade one.

Young-Suk Grace Kim: They spent less time meaning that they didn't have... Their word reading is very efficient, right? Same thing with letter name fluency, kids who were able to name more letters per minute in grade one, they were more efficient in reading processes in grade three and all these reading process data captured by eye movements, they were related to reading comprehension performance.

Young-Suk Grace Kim: So the less time they spent on the word for the first time, the eyes land on the word, meaning that they're not... They're decoding is very proficient, right? They did better in reading comprehension. Also the students who spend less time re-reading some students look at a word, right? When their eyes lay on a word, they look at it and they move on to the next words and next words.

Young-Suk Grace Kim: But then a lot of times they come back to certain words, right? They spend time on it. So the last time they spent on really reading the words they did better in reading comprehension. There's also something called the saccade amplitude, which means that the eye... The size of the eye movement, that indicates also their



reading proficiency. The larger saccade amplitude, that they did better in reading comprehension.

Jessica Hamman: This isn't just focusing on students who may have been identified with a reading difficulty. This has implications in the classroom for students who may be less proficient with their reading, they can improve their reading comprehension down the road.

Young-Suk Grace Kim: Absolutely. So one thing I would like to share with you about one aspect of the result, is that we wanted to look at whether word reading skill and listening comprehension, those two necessary skills, according to the simple view of reading, right? So whether those two really predict reading processes captured by eye movements and according to theory is truth.

Young-Suk Grace Kim: So word reading, right? If I can read words proficiently out of context, like a list of words well, when I'm given a written text, right? In context such as passages as I read my process, the reading processes captured by eye movements should be proficient as well, right? So that's an important predictor.

Young-Suk Grace Kim: The other important predictor was a listening comprehension. So at least one of the indicators that's widely used in reading eye movement literature is rereading time. So when people reread given text, it's usually taken in the literature as an indicator of syntactic processing, right? Not decoding process, but more of a syntactic integration process, which should be important.



So if that's the case, my language comprehension ability should matter for that particular indicator or process.

Jessica Hamman: And so just for our teachers who are listening, what you're saying is, instead of, they're not necessarily trying to decode the word, but if they're going back to words in a phrase, it's an indication they're trying to process the syntax of the word, the grammar of the word, to understand the implications of the writing at a slightly higher linguistic level, is that right?

Young-Suk Grace Kim: Exactly. So it's a semantic integration process, right? That's hypothesis based on literature with adults readers.

Jessica Hamman: Interesting. And so what were your findings from this study?

Young-Suk Grace Kim: What we found was essentially, it's all word reading skill that dominates these processes, which is not particularly surprising. Once we had word reading skill and listening comprehension and all the others in the statistical model, really word reading, strongly predicted all the reading processes captured by eye movements, whereas listening comprehension was not.

Young-Suk Grace Kim: When the other word reading was not included, listening comprehension ability was related to eye movements, but when word reading was included in the model, really essentially word



reading essentially explained all the pieces that's important for reading processes. So what this indicates is that for children in primary grades, really word reading is so critical for their efficient reading processes when they read text.

Jessica Hamman: And so in terms of classroom instructional implications, how can teachers take that awareness and support instruction?

Young-Suk Grace Kim: It really underscores the importance of word reading proficiency. So, by now literally hundreds of thousands of studies have indicated the important role of word reading and reading comprehension. So even if you are superb, you have superb, linguistic comprehension ability, right? If you cannot decode words, of course it works as a bottleneck. You just cannot comprehend written text, right?

Young-Suk Grace Kim: There are a number of children in kindergarten, in first grade who have not developed proficient word reading skills. So they still need to pay attention to word reading systematic and explicit words reading instruction, even in grades three, four, and five and six. And you will actually see, unfortunately, some students in even middle school, still struggling with word reading.

Jessica Hamman: As you said, one important implication is a focus on fundamental literacy skills that would enable students to get that foundation laid. You also mentioned explicit and systematic, which is critical too. I would also love to pause on your comment concerning the discrepancy between listening comprehension and reading



comprehension. I'd love to hear more about what you learned from this study and what you know from your research in general.

Young-Suk Grace Kim: Thank you so much for raising that because I don't want the listeners to take away from what I just said to indicate that listening comprehension does not matter for these children. No, actually in the model, what we found was listening comprehension was actually very important for reading comprehension.

Young-Suk Grace Kim: What we found was that at this stage listening comprehension did not add any unique contribution over and above words reading to the reading processes. But that doesn't mean that it's not important, right? So we found actually that both were read reading and listening comprehension were important to reading comprehension.

Young-Suk Grace Kim: The piece that I want to talk about listening comprehension is that so the concept of listening comprehension was introduced by the simple view of reading, right? And so people are, I'm assuming that many people are familiar with this. So the simple view of reading is essentially that, reading comprehension requires two skills, word reading and listening comprehension, and this is a very useful heuristic framework, but it's very global level theorizing.

Young-Suk Grace Kim: It does not specify. So what it does is that it emphasizes that these two are necessary. So you need to teach both of these. One of the weaknesses of the simple way of reading is that it does not



specify. Okay, what does it take to develop word reading? What does it take to develop listening comprehension?

Young-Suk Grace Kim: When it was proposed in the late 80s, there was more work and better understanding about word reading and ever since then, there was a lot of work on word reading. And so we have a good understanding, pretty good understanding about skills that are involved in word reading, such as small word awareness or the graphic awareness, letter name knowledge, letter sound knowledge, all those pieces, right?

Young-Suk Grace Kim: But listening comprehension was as almost like a black box, what is listening comprehension first of all, and what does it take to develop listening comprehension? It took quite some time for the field to catch up on this part. So listening comprehension in a simplest way or putting it is, it's exactly the same as reading comprehension, it's just in oral context.

Young-Suk Grace Kim: So for the listeners listening to this podcast, you are doing listen comprehension, right? So the idea of the simple view of reading is that okay, as you have... As long as you have listening comprehension, because listening comprehension and reading comprehension are essentially the same, except that for reading comprehension, you just need word reading skill to decode.

Young-Suk Grace Kim: That's really the idea. Now that means that, what is this huge piece of listening comprehension? So listening comprehension is



your ability to listen to, say stories, lectures, I say lectures because when people think about comprehension, they might not think about informational text, right?

Young-Suk Grace Kim: Listening comprehension includes both narrative comprehension, your ability to engage in multi utterance conversations, your ability to listen to oral text that's more informational, right? And still understand it like lectures, right? So it encompasses all these sorts of text that's just delivered in oral mode.

Young-Suk Grace Kim: So if you look at it, listening comprehension is a very complex construct. And so studies have revealed that all the skills that matter for reading comprehension matter for listening comprehension. So let me give you an example, working memory, we have heard a lot of our working memory, your ability to hold information and process information at the same time, that's important.

Young-Suk Grace Kim: Your attention control is important, right? You need to really pay attention and sustain your attention, your vocabulary, right? You need to understand each word included in the word, in the text, whether the text is oral or in written, your syntactic understanding, right? You have to have an understanding of how words combined and generate different meaning, you also have to have higher so-called higher order thinking skills or cognitive skills.



Young-Suk Grace Kim: So think about inference, making people talk a lot about inference making in the context of reading comprehension, but studies have shown that inference is important for listening comprehension, it's not surprise, right? So very short example, if I say, in conversation, that it's cold and the window is open.

Young-Suk Grace Kim: I say, "It's cold in here." The person who's listening would may infer that and then close the window. That's inference in a simple, single sentence. For you to participate it in that conversation or in the interaction, well, you need to have an inference skill. You also have to have a perspective pick, right? You need to understand the intentions of the speaker or the storyteller or the characters in the story, right?

Jessica Hamman: I have an example of that actually, that it brings to mind. I was riding in the car with my three year old and we were listening to a sad love song. I thought, for sure, he wouldn't be listening to the words, but when it was done, he said, "Mommy, that poor guy." And I said, "Yeah. What, why? And he said "He lost something. I hope he gets it back." And I thought, wow, how fascinating. He really didn't understand the words probably in it, but he made the inference to the emotion of it.

Young-Suk Grace Kim: Absolutely. And those things all matter, right? For listening comprehension. So the reason why this is important is because when people think about reading comprehension, they tend to think about it in the context of reading only. All these pieces that I just talked about, develop, start developing as soon as his develop





language skills, right? So starting say, either eight months, nine and 12 months and et cetera, right?

Young-Suk Grace Kim: So all these pieces develop over time and they transfer this into written text context. So one of the important implications is that typically reading comprehensions instruction does not start until say grade two, when kids are expected to have developed some proficient word reading skill, the implication is no issue not wait.

Young-Suk Grace Kim: Even though kinder in first grade are really important periods for decoding instruction. At the same time, these children need to develop these thinking skills, these language skills, because these so-called listening comprehension skills and the sources that contribute to listening comprehensive take a really long time to develop, right?

Young-Suk Grace Kim: Think about vocabulary, there are written thousands of words and it takes, I'm still learning vocabulary, right? It's lifetime learning. So we need to start early on that, the same thing with thinking like inference making skill they develop early on. So if they don't... Children do not develop these skill early on, and all of a sudden they're asked to do this in written context, they will not have those foundations.

Jessica Hamman: And also I see that sometimes if a student is struggling in the classroom, there will be increased focus on decoding as there should be definitely focus on decoding. We should also keep in mind that



boosting their language comprehension is a critical component of later reading comprehension when we fill those instructional gaps.

Young-Suk Grace Kim: When we think about comprehension, we should think about it as a continuum, right? So it starts, and the context of our language starts as listening comprehension and it transitions to reading comprehension. So it's all a continuum. And I very much understand the challenges of putting everything together in a limited instructional time.

Young-Suk Grace Kim: And I was teacher... We had to cover so many things in a single day and teachers might feel that there's no possible enough time to do all this, right? My recommendation is to sprinkle these in whenever there's an opportunity. For example, when kids are lining up, I'm going to use some vocabulary kids may not hear all the time. Also whenever there's a kind of a split second, you can ask questions. Questions are really important ways to engage children to think. Again, thinking is there's higher order of skills, making inferences, understanding others perspective, and you can make this into games, right?

Young-Suk Grace Kim: So for example, one of the other pieces that I didn't comment on, the important... One of the contributors for listening comprehension and reading comprehension is monitoring your own comprehension, comprehension monitoring, right? So what we found was that, especially children from low income backgrounds, they don't monitor what they're listening.



Young-Suk Grace Kim: So the idea that when you listen to stories or when you read stories, things have to make sense to you. If things do not make sense to you, you have to pause, ask questions, right? That did not happen. Even if I give you the most obvious contradictory story, for example, two sentence story, "My favorite color is red. Then I hate red." It's so obvious, but then children just let it go. There's nothing wrong with that idea, that contradiction.

Young-Suk Grace Kim: So developing that idea is simple. So, in the classroom, what we did was, we just played a game, like say, what is that? The circle time, right? That's really widely used in the... In early education including kindergarten, they share about what they did on the weekend, for example, and the teacher asks like a funny, wrong question. So, you went to museum. And when the child said, no, I stayed home, blah, blah, blah. So it just kind of by asking that question, it gets the... Gives the idea to children, okay, when you listen, you really have to pay attention. So the things make sense to you.

Jessica Hamman: What I think is really interesting is that that strategy of asking questions is also something that broadens and deepens reading comprehension, Maryanne Wolf in her book *Reader, Come Home* about digital reading talks a lot about one of the problems with digital reading is it doesn't give us the time to pause and ask questions that deepens our understanding. So I really... What you're saying just resonates. And it just, that just clicked for me that actually our act of supporting our students, listening comprehension through questioning is a model for supporting their reading comprehension through questioning.



Young-Suk Grace Kim: Absolutely. So we think about, critical reading, analytical reading, right? The same applies to our listening in our conversations. So teachers and parents, when you engage in conversations with kids, just ask questions. Why, how, what brought you to that conclusion? So what is this character A doing? Why, right? Questioning is I think underutilized importance in teaching strategies.

Jessica Hamman: And it, it gives me an understanding of how to pose the trouble with decoding to teachers as well. You really want to get students to a point where they're fluent with text as if they were fluent with another speaker. Otherwise, you can't extract meaning just as if you couldn't extract meaning from a speaker who you don't speak the same language. So the intellectual ability may be there, but if you can't access the meaning, because you don't know what the text is saying, then you can't get there. So almost treat the text as if it's a speaker and we have to teach them the language of reading through decoding to get that.

Young-Suk Grace Kim: That's very well said, Jessica, that's exactly the idea of reading fluency, right? So when we think about reading fluency, being able to read fast with accuracy and also with the expression, what that really means is that you can read a text as if it's in kind of oral language interactions at that phase, right? So that's exactly the idea.



Jessica Hamman: Very exciting. And I love the translatable nature of your work to practice. And so tell me, where are you headed next in your research?

Young-Suk Grace Kim: I'm looking at quite a few different lines of work. So I am conducting so-called intervention studies so ways to improve children's writing skills, having spoken of actually listening comprehension, we are currently developing a program focused on improving, listening comprehensions, including all these components that we just talked about. We are also looking at using digital platform to actually improve children's thinking skills that we just talked about. So we're doing that.

Young-Suk Grace Kim: I'm also working on the integration of reading and writing. So the reading, writing relation is pretty intuitive and a lot of good teachers already do that. What I'm doing is integrating and theoretically, so that we can actually have a very coherent idea about how reading and writing are related and how they really produce synergistic effects on improving children's skills in both reading and writing. So that's kind of where I'm currently working on.

Jessica Hamman: Very exciting. And in terms of those cognitive processes, there's so much going on with the process of writing and planning. And so I think that's a really important next step in the work that you're doing. So I look forward to keeping up and following that as well.



Young-Suk Grace Kim: Thank you so much. And I'm very interested in actually... And one important line of work is writing research and believe it or not writing does not get a lot of attention, but it's so real. Writing is so critical if you think about our daily lives, right? A lot of times involves both reading and writing. And writing is actually even more challenging than reading in terms of hierarchy, right?

Young-Suk Grace Kim: Studies have consistently shown that writing is much more challenging than reading. And a lot of times, actually, observed the people do not develop a certain level of writing proficiency because they don't need it in their daily lives. So, and when they work with their school districts, they don't seem to see it's importance as much, but made data, that I have consistently shown that students, American students are struggling with writing more than reading...

Jessica Hamman: Very interesting.

Young-Suk Grace Kim: Because it's much more complex. Yes. About three fourths of American students, regardless of grades, grade four, eight or 12, three fourths of American students not right with proficiency, whereas in reading it's two thirds.

Jessica Hamman: Well, and I think it's really interesting when you look at curricula and what's materials are provided to teachers. I having been both a writing and a reading teacher, myself, the focus is on reading and often times the writing is very light. So if there is curriculars it's



teacher created, which can be very, very strong, but that you need a very, very strong foundation in understanding the complexities of writing to create those strong foundations. So there's implication there for publishers to support this research and then better understand what helps to students write well so that we can create really good curricula around writing too.

Young-Suk Grace Kim: Yeah. Absolutely. I know what the predominant approach in writing instruction is, but the evidence is pretty mixed. So we also have something good research based approaches to teaching writing, but that's not widely employed and that's not as widely known. So there's definitely a lot more work that needs to be done.

Jessica Hamman: A lot of opportunity there.

Young-Suk Grace Kim: Absolutely.

Jessica Hamman: Well, Young-Suk, thank you so much for talking with, with us today. It was an incredibly enlightening conversation and I look forward to delving into your future research as it comes out as well.

Young-Suk Grace Kim: Thank you so much for the opportunity just personally. I really love the work you're doing. So, as I told you I was a practitioner before, and I also teach in the teacher credential or teacher education program because I know it's importantness,



right? And it's so close on... To be very honest, it's a lot more work to teach courses in that program than PhD or undergrad program. But I volunteered to teach in that program because it's so critical, right? And you are doing that work. When I saw your website and doing the work that you're doing, I thought, well, this is so amazing. I just wanted you to know what you're doing, it means so much for so many people.

Jessica Hamman: Thank you very, very much. To learn more about Dr. Young-Suk Grace Kim, please find her at [faculty.uci.edu](http://faculty.uci.edu) or on Twitter at [YoungSukKim19](https://twitter.com/YoungSukKim19). To find links to the articles and resources mentioned in this podcast go to [gleaneducation.com/podcast](http://gleaneducation.com/podcast) and access them in the show notes.

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