Glean Education

Glean Education's Research to Practice Podcast Episode 2 - Tiffany Hogan & Lauren Baron (MGH & University of South Carolina)

Tiffany Hogan: We know that children with dyslexia have difficulty learning new spoken words, and we wanted to know if it would be easier for children with dyslexia to learn a new spoken word if they learned it while they were seeing it written down at the same time as they heard it.

Jessica Hamman: Hi and welcome to Glean 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.

Jessica Hamman: I'm Jessica Hamman, founder of Glean Education and today we're talking with two researchers in the field of language, literacy and speech language pathology, Tiffany Hogan and Lauren Baron. We'll be digging deeper into their study they worked on together in August, 2018, entitled Children With Dyslexia Benefit from Orthographic Facilitation During Spoken Word Learning.

Jessica Hamman: Tiffany and Lauren, thank you for joining us today. I'd love to get started by asking you both to tell a little bit about yourselves.

Tiffany Hogan: Hi, Jessica. Thank you so much for inviting me on this podcast. This is Tiffany Hogan. I'm a clinical speech language pathologist by training, and I'm also a professor in the department of Communications Sciences and Disorders at MGH Institute in Boston, Massachusetts. I also direct the speech and language literacy lab, which I call the SAiL Literacy Lab. In the lab, we study the genetic, neurological and behavioral links between oral and written language development. We focus on these links in children with dyslexia, developmental language disorders, speech sound disorders, and poor working memory. Recently, interestingly, I started a podcast myself called SeeHearSpeak podcast in which I talk about these topics with other scholars, educators and clinicians so I'm really honored to be on this podcast with you today.

Lauren Baron: Hi Jessica, thanks, and thanks, Tiffany. This is Lauren Baron. I am a post-doctoral research fellow and project coordinator at University of South Carolina in Columbia, South Carolina. I'm also a clinically certified speech language pathologist with experience working in public schools and private practice. My general research interests include child language, literacy and cognition, and I'm really excited to be here talking with you today.

Jessica Hamman: Great. Thank you both. I'm really interested in hearing a little bit about the impetus behind this research and the background that went on that made you interested in getting it started.

Tiffany Hogan: Great. This is Tiffany. We know that children with dyslexia have difficulty learning new spoken words. For example, children with dyslexia are likely to have trouble learning the name of a new science term, like for instance, constellation. We wanted to know if it would

be easier for children with dyslexia to learn a new spoken word if they learned it while they were seeing it written down at the same time as they heard it. So, back to the example of constellation, we wanted to know if they were more likely to remember how to say the word constellation if they heard it and they saw it written at the same time.

Tiffany Hogan: This is an interesting question because on one hand, we thought that having that written word paired with the spoken word would help them remember how to say it because there's a really consistent finding in the research study showing that kids and adults learn spoken words better when they learn them with the written form. An example is, as an adult, if you meet someone new and you want to know their name and they say their name, what we often want to do is look for their name written down and that helps us to remember it.

Tiffany Hogan: On the other hand though, because children with dyslexia have trouble learning to read, we weren't sure if that written form would help them or not. Maybe it would be distracting, or maybe they just wouldn't benefit from that written form because they'd have to read it and they're not good readers by definition, as having dyslexia. So that's what really drove the research that we did in this study.

Jessica Hamman: Lauren, what was the methods that you used to conduct this study?

Lauren Baron: Yeah, so in this study we had 92 children that were in 2nd grade. We considered 46 of them to have typical language and literacy development, and 46 of them had dyslexia. We determined this by their performance on the TOWRE, or the Test of Word Reading Efficiency. It's a timed test that measures the accuracy of the real and non-word reading abilities of children. It's a quick measure that captures a wide range of reading ability. A couple other things that we also controlled for and measured in these children before

investigating this question are that they had the same average non-verbal IQ, and importantly they had about the same average language abilities. Not all studies of reading account for spoken language abilities, even thought we know that language ability impacts reading performance.

Lauren Baron: So we had all these kids, kids with typical development and kids with dyslexia and they completed a large battery of computerized pirate-themed tasks, but this study looks at just one of those tasks. It's one word learning game, and in this game, we had the children learn the spoken names of four monsters. So we used these kind of non-words as a way to get at how children learn new words, because as Tiffany gave in her example, constellation is kind of a non-word until a child's learned it, if they've never heard it before.

Lauren Baron: So we have these funky monster names and we asked children to learn them across two different tasks. We had a learning task and a naming task. These tasks were repeated four times: learning, naming, learning, naming, and back and forth. Each of those has a couple different details that I'll walk you through.

Lauren Baron: First, for the learning task, we had four words that we wanted them to learn, and we presented them in two conditions. The first condition is that orthography absent condition. In this condition, children saw four monsters on the screen and they heard a spoken word like, [Bonfape 00:06:21]. They had to select one of the four monsters that they think is named Bonfape.

Lauren Baron: In the second condition, this was the orthography present condition, children saw the same four monsters and they heard a spoken word but they also saw the written word in the middle of the screen. Again, they had to select the monster that they think goes with that name. Importantly, we want to point out that the written words were not highlighted in any way and the children

were not instructed to pay attention to the words or use them in any way. These words were presented in random order over and over again as the children learned the monster names through trial and error. If they made a correct pairing, they received a virtual coin. If they were incorrect, they received a virtual rock. This is how they knew going forward if they were making the correct pairing of monster name and monster visual.

Lauren Baron: Then the way we measured this was by a naming task. After a certain number of trials, children saw one monster on the screen, and there were no written or spoken words except for the question, "What is this monster's name?" They had to provide a spoken response. So after the children had completed the learning and naming tasks four times, they would have heard each word over 50 times, and they had four chances to name each of the monsters. So kind of a bit of detail going through, but those were the two basic tasks that we had.

Jessica Hamman: Great. And just for clarification for people who may not know the terms, can you just tell us in layman terms what orthography present and orthography absent means?

Lauren Baron: Definitely. Orthography present means that when children were being exposed to the new spoken word, the written word was also present. Orthography absent refers to that when children were learning the new spoken words, the orthography, or the written word, was not present. It was absent from that.

Jessica Hamman: Excellent. What were the results of your findings?

Lauren Baron: Yeah, so early on, after only doing the learning and naming tasks one time, children from either group did not really benefit from seeing that written word at all. There were no orthographic facilitation effects. But after a few more exposures in say, the second

through fourth rounds of doing these two tasks, we did see some positive effects. I'll go through each of those.

Lauren Baron: For the learning task, where they see the monsters on the screen and they're trying to pair the name to the monster, our children with dyslexia performed just as well as or the same as their peers with typical development. So all the children were more accurate at pairing the monster with its spoken name when the written word was present, and they all became more accurate over time. It's kind of what we would expect to see in a learning task. They're growing, they're learning the pairings and becoming more accurate over time. We were really pleased and surprised to see that the children with dyslexia did the same on this task as their peers with typical development.

Lauren Baron: When we got to the naming task, the children in each group performed differently. So, our children with typical development did not show an orthographic facilitation effect at first, but they showed increasingly large orthographic facilitation effects as the task went on. In other words, the children with typical development became more and more accurate when producing words that were learned with the written word present, so over time they were able to better pronounce these words that they were trying to learn. The children with dyslexia on the other hand, showed kind of an opposite pattern. They showed an orthographic facilitation effect in the beginning, and then their performance kind of plateaued. They could produce the words more accurately if they were learned with the written word present versus without, but this effect only happened in the beginning and then it kind of evened out.

Jessica Hamman: So interesting. Tiffany, can you tell us a little bit about why this happened, and why this works?

Tiffany Hogan: That's a great question. We're not exactly sure why, but we have a few hypotheses. First, we know that speech is very transient, meaning that when you hear speech, you hear it and it's gone. But when you see a written form it's a more permanent representation of a speech form. So it may be that that written form will help and serve as a pneumonic to hold in memory the spoken production. To do that, to benefit from that pneumonic, you have to have a bit of a letter/sound correspondence knowledge so that you would remember, let's say the first letter, C, in constellation in the example I referenced, and so that may get you started. Let's say you even remember C-O-N. That may help you then trigger the production of "con" and then that helps you to tie into what the word may be. They may be remembering it kind of holistically, so remembering pieces of the word will help them to recall how to speak that word.

Jessica Hamman: Really interesting. How could teachers use this to their advantage in the classroom to support students?

Tiffany Hogan: I think there's a direct application here from this study, and that is that when you're teaching children with dyslexia a new spoken word, or just new vocabulary that they may encounter in the classroom, then you would include the written form of that word. So again, teaching constellation, you would say it, use it in a sentence and get the meaning of the word, but you'd also want to write it down and have that written form present. You may not even have to draw a ton of attention to the written word, but you want to have it present while they're learning the spoken production of that word, constellation.

Jessica Hamman: This could be an important tip for teachers, especially teachers of students who struggle with reading difficulties because they may not think to include the written word because written words often give them so much trouble. So this would be kind of a push not to

back away from using that. In fact, maybe do use it and it may help the facilitation of their word learning.

Tiffany Hogan: That's absolutely right, Jessica. Absolutely.

Jessica Hamman: Excellent. Before we go, I'd love to hear what you guys are working on next and what you're excited about, what kind of research you're excited about right now.

Tiffany Hogan: Well, this is as tough question, because I'm actually excited about several research things going on so I'll limit it to a few. This work was done as part of a larger project in which we looked at working memory and word learning, and that work continues on with a new National Institutes of Health grant. That work is completed with Shelley Gray at Arizona State University and Mary Alt at the University of Arizona and Nelson Cowan at the University of Missouri. So we're continuing to look at working memory in children as they progress from kindergarten to 6th grade and we're examining the working memory in children with dyslexia with and without language difficulties.

Tiffany Hogan: I also have another project, another National Institutes of Health grant, in which we are following children with developmental language disorders in kindergarten and then we try to predict based on how well they remember spoken and written words, like in this study. We use that information to predict who will have dyslexia in 2nd grade and who will not, from those children who have developmental language disorders. This work is being done in collaboration with Suzanne Adlof at the University of South Carolina, Julia Wolter at Montana, Jessie Ricketts at Royal Holloway in London, Annie Fox here at MJS Institute, and Yaacov Petscher from Florida State University.

Tiffany Hogan: Because we have this interdisciplinary, multi-site team, we have a nice representation of children in the U.S. from the south, east, and west and from rural and urban schools. We're very excited about learning more about these children as they develop over time. I'm very passionate about translating research findings into practice and in doing so, started the podcast that I mentioned and also I have been working on a project with Karla McGregor at Boys Town National Hospital, and a website to help inform the public more about developmental language disorders. That website's dldandme.org. That's been exciting too, to work on translating findings into practice.

Jessica Hamman: Lauren, how about you?

Lauren Baron: Some of the things I'm really excited about build off of what Tiffany talked about. She mentioned a new project to study children in kindergarten through 2nd grade. Here at South Carolina we're working on a project that starts in 2nd grade and follows children longitudinally to 4th grade, both children with reading and language impairments. We'll be testing kind of theory-driven factors that might explain differences in word learning tasks, just like the one we talked about today, and changing things like number of exposures, whether that instruction is explicit or more incidental, and trying to get at how those things might influence learning and reading behaviors in these children with language and literacy impairments. I'm part of that same team that she mentioned, and really excited to just be learning from people in so many different places doing great things and moving the field forward.

Jessica Hamman: Excellent. I can't thank you two enough for joining us today on our first podcast. I'll look forward to talking to you again soon. Thanks for coming.

Lauren Baron: Thanks, Jessica.

Tiffany Hogan: Thank you, Jessica.

Jessica Hamman: To learn more about upcoming research from Lauren Baron out of the University of South Carolina, you can follow her on researchgate.net/profiles/Lauren_Baron. To learn more about Tiffany Hogan's work, check out her new podcast at seehearspeakpodcast.com.

Jessica Hamman: Thanks for listening to Glean's Research to Practice podcast. If you're interested in learning more, head over to gleaneducation.com to listen to more episodes, access teacher resources, and join the movement to make in-service teacher education more dynamic and accessible. Bye for now.