

Transcript of Cerebrum Podcast— Brain Training for Kids, Adding a Human Touch

Guest: **Kathryn Hirsh-Pasek**, Ph.D., is the Stanley and Debra Lefkowitz Faculty Fellow in the Department of Psychology at Temple University and a Senior Fellow at the Brookings Institution. With her long-term collaborator, Roberta Golinkoff, she is author of 14 books and hundreds of publications and a fellow of the Cognitive Science Society. She is the recipient of the AERA Outstanding Public Communication for Education Research Award, the American Psychological Association's Bronfenbrenner Award, the American Psychological Association's Award for Distinguished Service to Psychological Science, the Association for Psychological Science James McKeen Cattell Award, the Society for Research in Child Development, Distinguished Scientific Contributions to Child Development Award and the APA Distinguished Lecturer Award. She is the president of the International Society for Infant Studies and served as the Associate Editor of *Child Development*. Her book, *Einstein never used Flashcards: How children really learn and why they need to play more and memorize less*, (Rodale Books) won the Books for Better Life Award book in 2003. Her 2016 book, *Becoming Brilliant: What the science tells us about raising successful children*, was on the *New York Times* Best Seller List in Education and Parenting. Kathy received her bachelor's degree from the University of Pittsburgh and her Ph.D. from the University of Pennsylvania.

Host: **Bill Glovin** serves as editor of *Cerebrum* and as executive editor of the Dana Foundation. He was formerly senior editor of *Rutgers Magazine*, managing editor of *New Jersey Success*, editor of *New Jersey Business* magazine, and a staff writer at *The Record* newspaper in Hackensack, NJ. Glovin has won 20 writing awards from the Society of Professional Journalists of New Jersey and the Council for Advancement and Support of Education. He has a B.A. in Journalism from George Washington University.

Bill Glovin: \$7.5 billion. That's the projected market next year for brain training apps, games, puzzles, and blocks for kids. About \$2 billion more than Trump wants for his wall.

Bill Glovin: But do these brain game products actually work? Do they make kids smarter, or just isolate them into a world of smart phones and tablets? Is there even enough definitive research to provide the answers?

Welcome to the *Cerebrum* pod. To help us with some of the answers to those questions is Kathy Hirsh-Pasek, who is on the phone with us from Temple University, where she's a professor in the department of psychology, and director of Temple's Infant Language Laboratory.

Kathy is also a senior fellow at the Brookings Institution, and the author of two very notable books: *Einstein Never Used Flashcards, How Children Really Learn and Why They Play More and Memorize Less*, which won the prestigious Books for a Better Life award and was named best psychology book in 2003. And her

2016 book: *Becoming Brilliant, What Science Tells Us About Raising Successful Children*, which was on the New York Times Best Seller list in both education and parenting.

And if you're at all interested in this topic, you may want to check out our latest Cerebrum article: "[Brain Training for Kids, Adding a Human Touch,](#)" which is available at dana.org, and which Kathy co-wrote with Brenna Hassinger-Das.

You might also want to check out Kathy's website which has lots of great information.

I should also point out before we begin that brain training for seniors, another multi-billion-dollar industry fueled by such companies as Lumosity, is thought to be ineffective by most brain researchers. The reason? They claim that the apps make you better at the games or exercises but have little to do with improving memory, focus, multi-tasking, or learning.

So, with that said, welcome Kathy to the *Cerebrum* pod. Thanks for being on the phone with us.

Let's begin with why the interest in kids, and infants in particular?

Kathy Hirsh-Pasek: Well I think we all want to understand more about the human condition. And one really good place to start is with little babies, and ask what do they have when they're born? And what do they get from the experiences that they have? And how do those intermix to create a you.

Bill Glovin: What distinguishes brain training from sitting in a classroom?

Hirsh-Pasek: Well I think brain training has kind of become an industry that's a form of a kind of edutainment these days, which is a term that's used in the entertainment field. It was actually first introduced in 1954 by Walt Disney.

But the idea more recently was to see if we can come up with gadgets and gizmos and apps that will actually exercise our brains in the same way that going to the gym exercises our muscles.

Bill Glovin: So, I've been playing Scrabble my whole life, and I believe I've expanded my vocabulary from it.

Hirsh-Pasek: Yeah.

Bill Glovin: And I've got to admit that now that there's an app I can play my attorney cousin, Jeff, in northern California every day.

Hirsh-Pasek: Yeah.

Bill Glovin: I bring this up because it has only made me play Scrabble more often and more conveniently. Can I classify that as brain training?

Hirsh-Pasek: You know, I think you can. In fact, there's been a bit of research, not a lot, on games like Scrabble and Boggle. And what we find is when people are using their brains, which of course we're always using even when we're breathing, to make new words and rearrange words, to bring words out of our memory that haven't used those letters in a long time, for sure.

It's testing our speed of processing and it's testing our word dictionary. So, it sure is brain training. But what I think what people classify more as brain training are those that are targeting more like the speed of processing, the memory, and spatial and math skills. And if you just play these particular neurological games somehow you are going to have better brains and think more quickly, remember a little better, and be a better mathematician.

Bill Glovin: Getting back to the Scrabble app metaphor, if I'm a kid having a lot of fun with an app teaching me something, isn't that better than having a boring human being lecturing to me, even if I'm six years old?

Hirsh-Pasek: Well I think the real question is not about boring or non-boring. It's about active versus passive. And I think what we have learned over the past decades is that human brains learn best when they're in active mode, not when they're in passive mode. When they're doing rather than when they're watching.

And you will notice even in college campuses now everybody talks about the flipped classroom. And the flipped classroom is read at home, do while you're in the classroom. Let's do the homework here. And the reason for that is because we want to teach in a way that's more consistent with how the brain operates, active not passive.

Bill Glovin: You say in the article that social interaction is better than solo learning? Why is that?

Hirsh-Pasek: Well for the youngest kids I think that's absolutely true. Because people say, in fact Pat Kuhl from the University of Washington in Seattle has suggested that we have a socially gated brain. Now let me unpack that for you.

We are attracted to human beings from the get-go. And one of my colleagues, Mike Thomicello says we are the ultra-social species. There are many things that apes can do even better than we can do them. But what they're not as good at is in reading another's intent and in being social and in reading social cues.

And it may just be that that's one of the reasons we're primed to learn from others, even as young babies. We are in a state where we couldn't do much on our own. We're not like the fawn who's born and then struggles to stand up and immediately starts to run. We have to rely on other social beings.

So, from early on we use that social blanket so to speak that we're in to help us learn more and more. And the brain seems to be primed for just that kind of social interaction.

Bill Glovin: The internet and apps in general seem to have an addictive quality.

Hirsh-Pasek: Uh huh.

Bill Glovin: Do they help kids learn better let's say than a block, or a puzzle, or a game?

Hirsh-Pasek: Well that's a great question. Apps open up a world for us that many of us could never see without the apps. They take us out of our bedroom and out of our playroom to worlds that we might have not explored otherwise. And they can do wonderful things as long as they're not just copying what we could do if we were just reading a book. Or copying what we could do if we were just playing with some sort of a toy.

So, I think there's absolutely a market for apps to do cool things and take us to those wonderful places. And there are apps out there by the way that are jumping the screen and allowing us to play with 3D right before our eyes. And then to put our creations back on the screen and to build whole worlds.

So, I'm actually a fan of digital media. And I think if used well it can teach us tremendous things and give us awesome opportunities.

Now, whether it's as good as some of what we have already, and how you would even compare that, I don't know. Let me give you a few examples. If we're talking about learning our shapes, the shape sorter apps that are digital, or not apps really, the toys that have a chip in them. They actually make a lot of noise, give a lot of instructions, and they don't seem to be as educational as the real shape sorters.

Playing with blocks, still up for grabs. There may be something to the manual dexterity that you get when you're playing with blocks and building the tallest tower and then having the opportunity to knock it down, which isn't quite the same as if you just have a finger swipe.

So, I think there are more things that are going to be more suited to a 3D world. And there are probably many things that will be better suited to having the experience of app world. The trick is that whatever apps we build, I think they have to be built in a way that maximizes the way human beings learn. They should be active as opposed to passive. It's not just that you should tap the right answer and not be minds on.

So active versus passive. They should be engaging rather than distracting. That is if they take you off focus in the middle of the story, we don't learn as well as if the story line is clean and clear.

They should be meaningful rather than disjointed, something that matters to the child. And where they can be, it'd be wonderful to have more apps that actually brought in a partner so that you were playing together as a team. Active, engaged, meaningful, socially interactive. Then if you plop on a learning goal you probably have an equation for a very strong app.

And if you make those so they have that learning goal, I think they're educational. But they can still just be fun.

Bill Glovin: How about apps or games for kids with let's say reading disabilities or dyslexia? Have studies shown that they're effective?

Hirsh-Pasek: I don't actually know of any studies that have done that. We're really just starting to publish on the apps that have come from the iPad. It's hard to believe that we're only a decade into the iPad, not even. It was introduced in 2010.

So, I think we're at a point right now where we're designing apps and material and books that take advantage of the power of the internet and the power of digital.

The first wave was really just putting the books we had already on a screen. And it was not any place where you could turn pages or dive into the book. And many of them had many distracting elements. So, as we go to if you will, wave two and wave three of app development, I think we're going to master that active, engage, meaningful, and socially interactive with a learning goal, and I think we'll be able to tailor make these kind of reading apps for children who have disabilities.

Bill Glovin: Well before I came to Dana I was an editor at *Rutgers Magazine*. And I did a cover story at one point on a professor named Paula Tallal.

Hirsh-Pasek: Oh, I know of her, yeah.

Bill Glovin: She teamed up with Mike Merzenich at UCSF and they created something called Fast ForWord, which was an app for kids with learning disabilities. And this was in early 2000's. So, these kinds of things have been out there for a long time and making a lot of money. And a lot of schools bought them and utilized them. And do you feel like maybe the schools jumped the gun on this before the research was in?

Hirsh-Pasek: Well I would say there are places where they did and places where they didn't jump the gun. So, in the case of Paula's work, I've seen some of the research that's come out of it. And it's really quite interesting. Now it's not reading per say. So, it didn't bear on the question of how we, have we created books for children with disabilities. It was really more to get you to better hear the small,

teeny sounds that actually can get lifted off of words so that they map to the letters. We call letters sound correspondence.

And sometimes it's really hard for kids to make the kinds of discrimination that they need to in the sound system to solve that alphabetic principle.

So, some work supported it. Some work I understand did not. I don't know. The jury seems to me to still be out, so I don't know if there's any conclusive data on that at this point.

But in the rush to get to schools, there were a lot of programs that were called brain training programs. And I would have to say there the schools really did jump the gun. Because we really don't know exactly how if you use one particular app it changes some connection point in the brain. There's not a lot of work out there.

I would say the Shaywitz's out of Yale are probably the best in the business. But what we don't have are brain training curricula. So, if you bought that, unfortunately you probably did jump the gun. And some of the things that promise more than they can preach, so to speak, the Your Baby Can Read and other products like that, well there's actually research to suggest no, your baby can't read.

Reading actually requires certain brain changes that allow you to then connect the language system and the visual system, and the sound system.

So, we're beginning to understand that. A wonderful researcher, Stan Dehaene, who's out of Paris, has done a terrific job of really figuring out how those connections work and we're moving. But we're not quite there yet.

So those apps, premature.

Bill Glovin: Well, coincidentally, the Shaywitz's are writing an article on dyslexia for us, so that should publish in a few months. And Stan Dehaene has already written for us an article he called the Letter Box, which was how the brain forms language.

Hirsh-Pasek: See, then you have the best in the business out there.

Bill Glovin: Yeah, he is also right now appointed by a French minister to actually look into neuroscience education and kind of lead that.

But getting back to this topic. Besides what you and Brenna are saying in the article, this fellow, Mike Milham, director of The Center for the Developing Brain at the Child Mind Institute put it this way, "There is some research saying brain training has some value, and other research saying that it doesn't. No one has shown a particularly impressive, effective side."

You know, with brain training for kids expected to be a \$7.5 billion-dollar market by next year, why aren't there more definitive answers?

Hirsh-Pasek:

Well partly because the technology is changing a little bit faster than research can keep up. We're kind of on different time scales. Technology's job is to bring things to market. Scientist's job is to see whether it works. And unlike in medicine it's not as if we have clinical trial before people have to bring things to market.

So, I think that's one of the reasons. Now I actually think that we do know a fair amount about the brain training apps that are out there. There was a beautiful review last year by a person named Simon, professor Simon, and I'm going to say it was current directions of psychology, but I may be wrong.

And essentially this review suggested that what we know to date, 2018, is that if you have an app that has you practice particular outcomes you will get better at those outcomes.

Alright, now I know that sounds trite but bear with me for a moment. If your goal is to get faster, have better speed of processing, I can give you well designed apps to help you be better at speed of processing.

If your goal is to get better at memory, there are apps that can help you with memory.

And in the kid domain there are actually some apps that people have looked at, for example, Tetris, that helps you with spatial discrimination. And some argue that it's called Mind Games is helping kids in problem solving.

So, I think there are lots of examples out there of very promising direction. But right now, what we have not seen is transfer from the particular to the general. It's not as if your whole brain gets better because you did a speed of processing task. It doesn't transfer to your attention or to your memory. And Tetris doesn't help you remember better, it just helps you with some of your spatial reasoning.

Bill Glovin:

So, are you sort of saying that brain training doesn't translate to real life skills?

Hirsh-Pasek:

No, it can translate to real life skills if the real-life skills happen to be in the same domain that you've trained your brain. It's just like driving. You can practice on a simulator for a little while and you'll get better at noticing things that dart across the front of your path and your windshield. And that's going to transfer to how you are as a driver. But don't ask me if it's going to make me a better tennis player because it won't.

Bill Glovin:

If brain training works, why has the Federal Trade Commission cracked down on brain training companies like Lumosity and Learning RX for making unwarranted claims not backed by scientific evidence?

Hirsh-Pasek: Well that's because most of these like I think it was the LumiKids that was introduced in 2015, that was owned by Lumosity, it really did promise more than it could deliver. There was really no evidence first of all in the kid literature to support a lot of the games. And secondly, what you're not doing is global brain training. And that's a really, really important point.

If I just go to the gym and I exercise my right arm but not my left arm, then I can't promise that I'm giving you better body building. I have to have a real bodybuilding routine that does the legs, the right arm, the left arm, and hopefully the core, right?

Bill Glovin: Mm-hmm (affirmative).

Hirsh-Pasek: What the brain training products don't do right now is build the core. They only build the right arm, or the left arm, or whatever product you happen to choose. But they promise a lot more than they deliver.

Bill Glovin: Have you been approached to endorse any of these products?

Hirsh-Pasek: Oh sure, I think everyone in my field has been. But the best way to go about that is not to endorse anything.

Bill Glovin: So our most recent *Cerebrum* article before yours was titled, "[Why Do We Love Music,](#)" and the author, Robert Zatorre, a pioneer in the music research field pointed out in the article, and in our last [podcast](#), that music has the ability to actually change the brain. So, in effect you could introduce some musical software for kids and sell it as brain training. Is that ethical?

Hirsh-Pasek: Well you could sell anything as brain training right because I don't think any of us would get very far if we didn't have a brain. So, I think we just have to be careful about what people are promising and to really look carefully at the kind of research that's out there to support it.

Reading a book is brain training. Playing with blocks is brain training. Doing puzzles is brain training. And we can actually show cognitive outcomes that come from these kinds of training.

So, anything can be brain training. And it's okay if you just say hey, want better Spanish skills? Well buy this app and it'll help you with Spanish. It's not okay to say if you buy this app that teaches Spanish, your brain is somehow going to be better all around. Just not true.

Bill Glovin: So, this is a topic I think we could talk about for hours.

Hirsh-Pasek: Oh my gosh, yes.

Bill Glovin:

Yeah, but let's wrap it up here. I want to thank you again so much for your fascinating article, "[Brain Training For Kids, Adding a Human Touch,](#)" which is available at [dana.org](#). And thanks for all your important research in an area that is vital to the future of our children.

Here at the Dana Foundation we wish you luck in all of your future endeavors. And I want to thank the listeners and we hope you enjoyed our *Cerebrum* podcast with Kathy Hirsh-Pasek.