KESSLER FOUNDATION Podcast Transcript

"Managing Your Memory" by Sarah A. Raskin, PhD
2022 Kessler Foundation Summer BrainStorm Virtual Presentation

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ANNOUNCER 00:09

[music] The Northern New Jersey Traumatic Brain Injury System proudly presents the 2022 Summer Brainstorm Virtual Series with special guest Dr. Sarah A. Raskin, professor of psychology and Neuroscience at Trinity College, Hartford, Connecticut. She will be presenting managing your memory. There are dozens of techniques people with brain injuries can apply in their daily lives to help them learn and retain memories. Listen as Dr. Raskin details various approaches to improve cognitive functioning after brain injury. This series is supported by Kessler Foundation, the Northern New Jersey Traumatic Brain Injury System, and by a grant from the National Institute on Disability, Independent Living and Rehabilitation Research. Grant number 90DPTB0003. This event aired on August 1st, 2022. Listen in as Dr. Jean Lengenfelder from Kessler Foundation introduces Dr Raskin. [music]

JEAN LENGENFELDER 01:11

It is now my pleasure to introduce Dr. Sarah Raskin. Dr. Raskin is a professor of Psychology and Neuroscience at Trinity College in Hartford, Connecticut, since 1994, where she teaches courses, mentors students, and conducts research on improving perspective memory or the remembering to remember. Dr. Raskin received her bachelor's degree in behavioral biology from Johns Hopkins University and her PhD in neuropsychology from the City University of New York Graduate Center. She worked in the rehabilitation medicine department at Mount Sinai Medical Center in New York and in the rehabilitation medicine department-- oh, I'm sorry, and then at Good Samaritan Hospital in Washington. She is board certified by the American Board of Professional Psychological Society in Clinical Neuropsychology and a fellow of the American Psychological Association, both divisions 22 and 40, as well as the National Academy of Neuropsychology. Dr. Raskin also serves as chair of the Board of Directors of the Brain Injury Alliance of Connecticut and is on the boards of Connecticut Against Gun Violence and The Gifts of Music. Thank you, Dr. Raskin, for being here with us today.

SARAH RASKIN 02:38

Thank you for that introduction. It's always a lot hearing all that. So I'm really thrilled to have been invited here today. I encourage questions at the end. I'll try to go relatively slowly. I have a habit of speaking quickly, so I'll try not to do that. I'm going to share some slides with you right now, and hopefully I am-- they were just here, and noow they're gone. And then we can have time at the end to talk. So they've asked me to speak to you here today on managing your memory. If you are interested or have questions later, my email address is here, sarah.raskin. Very, very happy to answer any emails or any questions that you might have after the talk. So I'm going to start just with a quick definition of what I mean by memory before we talk about how to manage it. And memory is typically divided into two parts, declarative memory and non-declarative. Declarative memory is something that you can declare and now I know it. So for example, you can tell me the capital of the United States, and now I'll know it. And that's a fact, or what we call a semantic memory. Or you could tell me

that you graduated high school in the year 2000, and now I know it. That's an event from your life or an episodic memory. So knowing that eggs are a common breakfast food in the US is a fact or a semantic memory. Knowing that you had eggs for breakfast this morning is an event or an episodic memory.

RASKIN 04:33

And we separate these two because you might find in your daily life that you have more trouble with the episodes, the events from your life, than you do remembering general knowledge, facts. And so much of what I'm going to focus on today is going to be remembering events. Now over here are non-declarative memories and these are things that you can't just tell me and now I know it, like how to ride a bike or how to play a musical instrument. You can't just say to me, "Sarah, here's how you ride a bike." And now I can ride a bike. I have to practice it. And the same for things like being scared of snakes. You can't say to me, "Be scared of snakes." It's something that I learned through my experience. So again, where I'm going to focus this talk is going to be mostly right here on these events. So now that we have a sense of what I mean by memory, what do I mean by learning? So learning is the process by which you change your brain. Learning is the process by which you change your nervous system because of your experiences. And we call those changes memories. And the experiences that you have aren't stored. You don't have a grandmother cell, like people used to think, or in the press awhile ago was the idea of a Jennifer Aniston's cell. You have some cell in your brain that knows everything about Jennifer Aniston. That's not true. Rather, we change the way that we react in a situation because of past experiences that we've had. And these changes are physical. They are changing the structure of your nervous system. So I'll give you a quick example. You all may have heard of Pavlov's experiment with the dogs. So this is a similar experiment. So if I blow on a rabbit's eye, it's going to blink.

RASKIN 06:27

If I ring a little bell, the rabbit might blink, but it's not going to blink every time the way it is if I blow on its eye. But if I always blow on its eye at the same time that I ring the bell, it's going to learn. It's going to put down a memory that the puff of air and the bell go together. And so it's going to make the connection to blinking the eye stronger. And that's what we mean by learning, making those connections stronger so that now when the rabbit hears the bell, it blinks. I actually have a rabbit in this room with me, but I'm not going to blow on her eye. So how do we know that these changes change the brain? And I'm just going to give you a couple of brief examples. So the earliest finding was that when birds in the springtime have to learn new songs, the part of their brain responsible for learning songs actually gets bigger. And then it gets smaller in the winter when they don't have to use the songs anymore. Rats, in what we call an enriched environment get bigger cells, more connections, more chemicals. Everything about their brains seems to get better and they get better at learning and remembering. So what do I mean by enriched? Well, here's a standard cage and here's what we're calling an enriched cage. It has a wheel to run on, it has toys to play with, it has two different levels to climb up on. And you can see here the cells in the mouse's brain are much more complex and allow the cell to learn better than cells in the brain of a mouse that's in what we call a standard cage. Now we're still teasing out what this means for humans. So you can think for a second, what

would be an enriched environment for a human? Well, it would have social interaction, but that's true in the standard cage.

RASKIN 08:23

It would have a chance to exercise, it would have a chance to play, it would have a chance to have to think and problem solve. And so all those things you can think about within your own environment. So how do we know this actually happens in humans? Again, just a couple of examples. Sign language, of course, is a visual process that means moving your hands, but it's processed in the part of the brain that people who can hear use for speech. People who read Braille, even though they're using their fingers, are using the part of their brain that is normally visual, for their eyes. People who are deaf, when they're looking at a visual image, show better visual processing than people who are not deaf. And one of the greatest examples that I think recently is London taxi drivers. So it turns out London taxi drivers have to memorize the entire city of London. So if you say to them, "Drive me from Buckingham Palace to the Pig and Lamb pub." They have to be able to tell you from memory how to do that. And it's called the knowledge. And it turns out that the part of the brain that's really important for memory, which we call the hippocampus, is bigger in taxi drivers than it is in people who are not taxi drivers. So I know what you're thinking. You're thinking maybe people with a big hippocampus become taxi drivers and people with a small hippocampus wash out and can't be taxi drivers, and that's why taxi drivers have a bigger hippocampus.

RASKIN 10:15

But actually, they looked at number of months as a taxi driver and size of this part of the brain called the hippocampus and it got bigger the longer the person was a taxi driver. So it seems like-- we can't say for sure, but it seems like practicing using your memory actually makes your hippocampus bigger. All right. So let's go to some techniques that might actually help you with your memory. So we used to think about rehabilitation in this way. So we think about changing your environment. Then you don't have to do anything. Your environment has been changed. Your pills are right out where you're going to run into them. You don't have to remember them. Compensation is things like making yourself a shopping list. Now we used to say making yourself a shopping list is like using an ambulatory device. So using a quad cane might help you get where you're going, but it doesn't actually affect your mobility. Whereas directive interventions were supposed to actually make your memory better. But now we know that all these things interact and that writing things down on a list might actually change your brain as much as direct interventions. So I'm going to try to move away a little bit from this way of separating things out. And I'm going to start with talking about your ability to pay attention. Because, as you probably know, you can't learn something new if you didn't pay attention to it. If you never knew it happened, if you were looking the other way, there's no way for you to learn it. And so what are ways that you can maybe make your attention better? So you can work in a quiet room and limit distractions. And if you don't have a quiet room in your own home, you could try a community center or a library.

RASKIN 12:15

Distractions are difficult because there's really no such thing as multitasking. What we call multitasking is really moving your attention between things very quickly, and that

can make it much harder to put down a memory. So it's better to work in a space where you're not constantly distracted. Focus on one thing at a time. Again, multitasking isn't, there's no such thing. So it's better to just focus on one thing at a time. And that can mean turn off your cell phone if you're trying to work on something. Turn off notifications on your computer. Turn off background noises, anything that you can to allow you to just focus on one thing at a time. Crowds have all kinds of sensory distractors in them, sights and sounds and maybe smells. So if you need to focus on something, it's better to not be in a very crowded situation. And in general, for people with brain injury, crowds can be overwhelming for these reasons, because of all the sensory information, and can lead to increased symptoms. You can't always avoid crowds. And sometimes you might choose to be in a crowd, but just choose conscientiously about when it makes sense and when it doesn't. Fatigue is huge, of course, for people with brain injury, and your ability to learn and remember is going to be worse in situations in which there's fatigue. So it's important to learn to recognize what fatigue looks like for you. It might be feelings of tiredness, it might be increased irritability, it might be increased symptoms like headache. So if you feel any of those things, try to rest, maybe even take a nap. But certainly, it's not a good time to try to focus on something that requires a lot of attention and memory. Avoid interruptions again, which I've already talked about a little bit.

RASKIN 14:09

If you're in a theater or a classroom or a meeting - this is the beauty of Zoom, right? You don't have to worry about it - move really close to the person that is the focus of your attention or the information that's the focus of your attention so you're not having to look at the backs of other people's heads at the same time that you're looking at the person you're listening to. Use electronic organizers. There's all kinds of organizers for all kinds of purposes. Key finders, car finders. These are two lists of things to do that are free. I use Things 3 and I find it really helpful. They can set alarms or notifications for you. You can organize them by day or by hour. Remember the Milk is another good one that I know people with brain injury find helpful. It's pretty easy to use. Again, you need to have a device that allows you to use these, but if you do, they can be helpful. Spell checkers and grammar programs are great not just for what they do, but because spelling errors and grammar errors can be distracting. They can take your focus away from what you're trying to pay attention to. So it can be helpful to use them just to eliminate those distractors. You can tape record important information. You can use a real tape recorder if you have one, or again, if you happen to have a smart device. These are all different programs that allow you to record where you parked your car or what floor your doctor's office is on, that kind of thing. I always forget the key code to get into where the person who cuts my hair works. And so I have it recorded. You can use cueing devices and these can be to queue you to a specific event you need to remember. But also some people set them for every 10 minutes just to remind them to pay attention. I set my watch to just vibrate on my arm every hour just to remind me that an hour has gone by, not to let any more time go by before I do what I'm supposed to be doing.

RASKIN 16:09

And if you're in a classroom meeting, you can always get notes from someone else. Brain games actually can be really helpful. Don't pay money for the expensive ones. I

do not recommend that. But there's lots of sites for free ones. AARP has a bunch of free ones on their website, if you're interested in looking at those. And I will, throughout the talk, just sort of make the point that some of these things have good and solid empirical evidence. So this is a study that looked at attention training using computer programs and found that they really were effective in helping people get a better ability to pay attention. Oops. Okay, so New Jersey, The Arc also has some free brain games. Thank you for that. So now I'm going to move to memory specifically, rather than attention. And we know that memory errors, especially, as she said, remembering to do things in the future can have serious consequences in your daily life. So I'm going to use this model of memory. Don't worry too much about it. It's just a way for me to organize what I'm going to be talking about. So in this case, explicit means you consciously decide to use it. Implicit means it happens automatically. So explicit, you consciously decide to use it; implicit, it happens automatically. External it's outside of your body; internal it's just you and your brain and nothing else. So implicit external devices are what we would have called before environmental modifications. And this can be something as simple as color coding things that belong together. So you can even paint your walls so that you remember green means the kitchen and the dining room, orange means the bedroom. But you can also just color code files in your filing cabinet.

RASKIN 18:09

You can place things right in front of the door so you would literally have to trip over it, rather than leave without it, if it's something really important that you know you have to take the next morning. If you have a specific task that you have to do every single day, you can set aside an hour, "Every day at 11:00 is when I'm going to water the plants, or when I'm going to read my book, or when I'm going to do my homework." Put a calendar in a place you can't miss, like on the refrigerator door. Use sticky notes. Although, as this photo shows you, there's a limit to the number of sticky notes. So you're going to have to use them a little bit carefully. But for some things, a sticky note or two can be a really helpful reminder. Put your keys or other important items, like your wallet, in the exact same place every time. This key holder is actually also color coded, which is really helpful. Make a schedule that lists the exact times that you're going to complete tasks so that you don't have to just have it in your memory all day long, "I have to remember that. I have to remember that." You can use external devices. And I do want to talk for a minute about using external devices like notebooks, because I think it requires some thought. So you can have sections for your notebooks, like things I have to do, phone numbers and addresses, ideas, goals, what to do in an emergency. You can link your notebook to lunch so that whenever you have lunch, you remember, "Oh, I should update my notebook." But learning to use your notebook takes memory and requires practice. You might forget to use it, you might feel dependent on it, you might be afraid of losing it. All good reasons not to use this. There's pros and cons. You need to find what works for you.

RASKIN 20:01

The same with electronic notebooks. While they are really helpful and can send you alerts, and there's all kinds of great apps that you can connect to them, like a vehicle locator or a tape recorder, they can be costly. They can also make you feel dependent. Some people find it really stressful to get notifications all the time.

There's a risk of losing them. And so if it feels like too much, don't worry, you'll find something that works for you. This works for some people. It doesn't have to work for everybody. And so now I'm going to move to the next section of this, which is explicit internal. One example is mnemonic devices. Some people learned ROYGBIV, for the Rainbow, for example. I learned rinse out your gondola before inviting visitors. These kinds of mnemonics, like the method of Loci, I don't want to spend a lot of time on because they work for very discreet things. But in repeated studies, they have not been found to be particularly helpful for people who've had brain injury. The PQRST is a specific technique for reading comprehension. So scan the information you're reading first. Ask yourself questions, what do you think you're going to learn when you read it? Read it while looking for answers to your questions. Say out loud what you think you just learned, and then test yourself. The method of vanishing cues just means first you give yourself the whole answer, like string, and then you take it away and you give yourself a hint with one part missing. Then you take that away and you give yourself a hint with a little bit more missing. And little by little, you remove each part until you can just remember it with no hints at all. You can learn to make associations.

RASKIN 21:58

So let's say you have to measure out 87 inches on a piece of lumber. It's going to be hard to remember 87. But what if you're 87-years-old or you were born in 1987? Now you've made an association that makes it much easier to remember the number 87. And the story memory technique is one method for making these associations. So let's say you have a list of words to remember. Oops, I missed my list of words. Oh, well, the list of words was salmon, milk and broccoli. Maybe it's later. Sorry. Yeah, there it is. Milk, salmon and broccoli. So you might think the milky white stream is full of bright orange salmon swimming in a forest of underwater broccoli. And this will help you remember. And the more weird it is actually, sorry for doing this, the more you're likely to remember. Another technique is visual imagery. So if you have to buy milk, imagine buying the milk. So take a second and imagine if you were in the grocery store buying milk, what would you see? What would you hear? What's the temperature? Imagine it as much detail as possible, and that will help you remember to buy the milk when you're in the store. And visual imagery, again, has been shown to be helpful in people with brain injury. You can also imagine not yourself buying the milk, but the cue of the store. So as you're driving by, what does the store look like? What's next door to the store? What does the intersection look like? And these things also can help you remember to stop at the store and buy the milk. And then you all probably know that the group at Kessler has shown incredible findings using a modified story memory technique, which combines visual imagery with story memory.

RASKIN 23:54

And you can talk more to them about that since you're connected to Kessler. But it's very impressive findings using these techniques together. And then the final thing that I will say in this part of the chart is explicit internal. Repetition, repetition, repetition. So the way that your brain knows something is important to you is that you've repeated it. So the more times you repeat things, the more likely it is to get stored in your memory. So if something's important, repeat it, repeat it, repeat it. I

think I'm going to skip over that in the interest of time. And so then we can talk about internal implicit. And one example is implementation of intentions. And it turns out if you just say, "I'm going to work out more often," you're probably not going to work out more often. But if you say, "I'm going to work out from 6:15 to 7:00 on Monday," and you say that to yourself, "I am going to work out from 6:15 to 7:00 on Monday," you're very much more likely to remember to do it and to actually get it done. And then another example is space retrieval. So the bus I take to work is the number 72 on Fern Street. In order to remember that that's what the bus that I need, I might write it on a piece of paper and read it out loud, put the paper away and quiz myself. If I get it right, wait five minutes and quiz myself again. If I get it right, wait 15 minutes and quiz myself again. The important thing is to not make wrong guesses. If you're unsure, look at the paper, because wrong guesses can get encoded in your memory instead of the right guesses. And then you're stuck always remembering the wrong guess. And I'm sure this has happened. This happens to me with like, "I know this person's name is either Susan or Sally," and then forever, I'll never know which one because both Susan and Sally are associated with this person from now on.

RASKIN 25:54

All right. And so I just want to make sure that we are putting this into context. So we like to use what's called the biopsychosocial model. And that just means that your biological health, so any biological changes from the brain injury or any other aspects of your physical health that you brought with you to the brain injury, are going to interact with your psychological health, your beliefs, your attitudes, your coping skills. As well as your social circumstances, your friends, your family, work or volunteer, other social circumstances, your culture that you come from. So these all interact to determine your health. And in the case of brain injury, this section includes emotional changes from brain injury like depression, anxiety, post traumatic stress or irritability. And so when we think about quality of life or meaning of life post brain injury, we need to think about physical, cognitive and emotional changes, but also social changes, work or volunteer experiences, financial status, recreational things that you participate in, and again, culture. And so what do I recommend for keeping your brain healthy so that all of these memory techniques can work? Physical activity, social interaction, mental stimulation, diet, reduction of stress, and good amounts of sleep, lots of sleep. So physical activity enhances memory and learning, as well as mood and might actually support new brain cells in that part of the brain I was talking about, the hippocampus. How much do I mean? 30 minutes of moderate activity about four days a week. This can be a walk. It can mean taking the stairs, pacing while you watch TV or on the phone, if you're able to walk.

RASKIN 27:53

It can mean doing upper body work, if you're not. Interact socially. Other people are really unpredictable and make our brains have to work hard. And social networks reduce the effects of stress and increase self-efficacy. This has been particularly hard during the pandemic, and I know a lot of people have felt very socially isolated, leading to mental health changes. So what can you do? Attend a talk like this one, or take a class, volunteer in your community, join a book club, keep in touch with friends or family, if you have them. If you work at home, maybe bring your work to the library or another public space for a little bit of time just so that you're out in public. Mental

stimulation is important. So we already said playing brain games is a really great thing to do, playing puzzles. And this leads to increased memory functioning overall, even after the training was finished. So what can you do? I don't know. Does anybody ever balance their checkbook anymore? Well, if you do, you can try to do it without a calculator. Learn a new hobby, learn a new language. Use your nondominant hand to eat or brush your teeth. Do crosswords, learn a new musical instrument or learn a new song to sing. Go to a nearby museum. A lot of places have free museums that you can go to. Again, free games from AARP or these teacher's tools or somebody else who put something in the chat. Diet is really important. Green leafy vegetables, fish like salmon and tuna, whole grains, things with antioxidants like blueberries and walnuts. Reduced stress. Meditation has been shown to improve memory and learning. Insight Timer is one free app, but there's loads and loads of free apps out there to help you with meditation and mindfulness.

RASKIN 29:53

Take deep breaths. Listen to calming music. Avoid caffeine. Sleep. It's actually during sleep that you store new memories, and for that and lots of other reasons, sleep is really important. Practice good sleep hygiene. That means go to sleep at the same time every day and wake up at the same time every day, if you can. Don't drink too many liquids right before bed. Try to get some exercise during the day. Avoid caffeine and nicotine, if you can. And avoid screens for about an hour before bedtime. Music is huge. It's so important. It involves all three domains, cognitive, motor and emotion. It involves language, if there's lyrics. Your motor parts of your body move to the rhythm of the beat. Music has been found to be incredibly therapeutic in many, many domains. I don't have time to go into a lot of detail on it, but listen to music. Music that you like, it doesn't really matter what kind of music it is. And of course, hopefully, the information that I've given you today is geared towards improving your quality of life rather than ending up like this poor guy with Post-It notes all over him, that's obviously not helpful. So I want to thank you all for listening. Thank the folks at Kessler for inviting me. And these are the students who work in my lab at Trinity. And I am very happy to take questions. Yes, in fact, anybody who wants a copy of the talk, you can either reach out to people at Kessler. I'm not sure who the best person is, Erica, or reach out to me.

ERICA WEBER 31:38

Yes. So thank you so much, Dr. Raskin, for your talk. So as she just mentioned, we would like to open things up for questions. And there's a couple of ways you can ask questions. So first, you can use the raise your hand feature to do this. Click on the participant section at the bottom of the Zoom page. When that opens, you'll see a raise your hand button that you can press. And I'll call on people one by one. Or second, if you like, you can type your question into the chat and I can ask Dr. Raskin the question. And yes, to answer your question, we have been recording this talk. So we will be able to send it out later on to the participants who registered. Okay, so I do see-- okay, we got a thank you from Rich. And why don't I kick off the questions? As you were talking about different memory strategies, one thing that I find that I rely upon is, I'll ask someone else to remember something for me. I'll say, "Oh, hey, can you remind me?" And I do this, unfortunately, to all of my research colleagues all the

time. So what are your thoughts on that, about asking someone else to help you remember?

RASKIN 32:58 That is such a great point. Thank you for that. Yes, I mean, it can be incredibly useful. I think the problem is sort of know your audience. So sometimes family members might be feeling stressed as it is or might have other caregiving duties, and it might feel like they'd rather not. And also, again, it's an external aid. So it's not going to help you practice making your memory better. But for sure, I believe in being cooperative and helping each other out anytime. I'm happy to ask people to remember things for me. If somebody asks me to remember for them, I will quickly say, "You don't want to do that. I have the worst memory in the world." And it is not lost on my research assistants that I study memory when I can not remember anything, so.

WEBER 33:47 Research is me search.

RASKIN 33:49 Yes. So not to minimize other people's memory challenges, but I would not be a reliable person to ask. But if you have a reliable person and they are comfortable with playing that role for you, then absolutely, super helpful. Yeah. And then you don't have to worry about losing the notebook, right?

WEBER 34:10 Yeah, but I think that was one of the biggest challenges that I've heard from patients, is that they do write things down, but then they'll lose their planner or they'll misplace their memory notebook or forget to check their planner. So I like that you were able to speak about different layers of, "Well, you can write the content down, but then link checking your memory notebook or your calendar to a specific activity so that you do remember to do that and it doesn't just stay locked in that planner."

RASKIN 34:44 Right. So right. And some people just leave it at home all the time and keep it next to their table where they eat lunch, and then whenever they eat lunch, they just update it. Now the great thing, if you're able to have an electronic device, is you can sync it to all your devices. So you can have one device at home, that you always keep at home, and then a smaller device that you bring out with you so that if you're out and you need to look at the list that you made at home, too, without losing the one that you left at home. But data has its own problems. I'm right now having issues where my computer doesn't read my calendar from my phone. So that'd be perfect. Yeah.

WEBER 35:23 A challenge. Okay, it looks like we might-- Arun, is there a question?

ARUN 35:30 Yeah.

ARUN'S MOM 35:31 Yes. I'm Arun's mom. He has a TBI. I wanted to know whether all these robotic exercises-- his left side is weak, from the-- right?

ARUN 35:42 Non functional.

ARUN'S MOM 35:43 Non functional, almost. So these robotic exercises like the-- what is it called? The Lokomat and the exoskeleton, is that the repetition help in any way? What is your opinion on it?

RASKIN 35:58

So you should probably talk to a physiatist or an occupational therapist because I would need to know more about what's causing the loss of function. There's different techniques that help for different [crosstalk]. Certainly, all these techniques are helpful to people, as is things like constraint-induced movement therapy. But again, you'd have to match the technique to specifically what's going on. And I'll open this up to Erica or anybody else who must have an input.

WEBER 36:32

Yeah, I agree. That definitely is a great question for your physiatrist to see if that's an opportunity and that they think it would be a good fit for Arun's profile. But I know it's something that is getting a lot of traction these days, that people are more and more interested in, and a lot of research still needs to be conducted. So I agree with Dr. Raskin there. All right, thanks for that question. All right, any other questions that Dr. Raskin can help answer? Oh, I see. Gina Marie.

GINA MARIE 37:07

Yes. Hi. Thank you to everybody at the Kessler to have this for us. I appreciate. I'm having concerns because I have different things in place, not just one way to try to remember to trigger me in a good way, to be able to routine and do things I need to function. But with that being said, at the same time, I'm having a hard time with the disconnect. I have to remember to remind Alexa to remind me of the things. I have to remember to this, to that. Since you're in the research field doing studies and stuff, are they working on filling that gap? Because it seems like the more gadgets they put out in the world, the more of a gap I feel with my function levels. And it just increased my frustrates. And the candyland method not work for me because if I can't figure it out and remember and read it properly at the word, putting it to a color and the word just wonkies me more. So I know that's a hard question. I want to know what they're doing with all the research and the money. Not just keep pushing us with gadgets, but to fill that gadget gap in function level of our life, because I can't be the only one that's in that in between. And I'll shut up now. I'm sorry.

RASKIN 38:52

No, excellent, excellent point. An excellent question. Really so important. And researchers are asking the exact same question. I mean, it's hugely important. And so that's why for me, I want to work on things that make it easier for you to remember on your own without having to use the gadget, rather than just more and more sort of gadgets layered on each other. Obviously, you already know this, but if it's something that you have to do every day, you can tell Alexa every day on Tuesday at 11:00, "Remind me," and it'll do that. But for things that don't happen every day, you do need to tell her to remind you. Now there are services. I don't know about New Jersey, maybe Dr. Weber does, where you can get somebody to put in reminders for you, for people with disabilities. But and again, like Dr. Webber said, sometimes if you have someone else in your life that you can get to sort of program your stuff for you and then use the gadgets, that can be helpful. But I think the better solution for your independence is trying to come up with some technique that doesn't rely on you having to remember. So like I said, if there's a way to have something right in front of the door or right in front of your-- I don't know what kinds of things you're trying to get it to remind you to do, or write on a Post-It on the dashboard of your car, or those kinds of things, if you can think creatively about it. But you are 100% right. There are

huge gaps here. And just saying, "Use a smartphone or use a notebook," as I tried to say, are not helpful, because those require training and practice and learning, and you have to have somebody help you put the time in to use them effectively.

GINA MARIE 40:41

I'm sorry to interrupt, Ms. Raskin, but then it's like something as simple as like updating an app or updating a website or updating-- my iPhone went to a new update, whatever thing, just those little tweaks, it puts me back to-- I got to start all over. But one of the things that drive me crazy, and I talked to the Amazon help people about, because I have more than one Alexa, is okay, if it prompts me-- because they have a motion sensor, which is a lot better because I never remember to have Alexa remember me. So I have the motions in my house. So when I go into the kitchen, it's like, "Okay, Gina Marie, take your medicines." But this may be something to research or connect, because you got the power people on your corner, not me, of like once it goes off, even with the sensor, how do I proper ask it to repeat or for it to repeat, like some kind of control word so it connects with the person using it to say, "Okay, yes, check off. It's done. Complete, save, I can move on." I'm still finding that's a huge gap.

RASKIN 42:02

I love that idea. And there are a group of people, I'm not one of them, but there are some great researchers who are working on creating specific devices for people with brain injury that take into account the specific issues that people who've had brain injury have that are different from other Alexa users who might have other issues. And so I just think what you're raising is so important and such a great point and just a huge area that, I agree with you, we just need a lot more research and a lot more people with good technical skills to create these devices. There were some apps created specifically for people with brain injury a few years back, but I don't think they've been updated. Dr. Weber might know more.

WEBER 42:46

I don't know. And to get to your point about if there's any state resources, I'm not sure of the top of my head, but I would encourage everyone, if you have questions about what resources there are for you in state of New Jersey, the Brain Injury Alliance of New Jersey is a fantastic organization. They do a whole lot and their website has a ton of stuff on it. So definitely give that a check to see if there's any resources that might be helpful for you or if they have any counselors who can help work through these problems. Because they live in our modern society and they know all of these new gadgets and tasks that we're all trying to remember, but they also really understand what it is to have a brain injury. So the BIANJ is a great organization to reach out to. Okay. I see a question from Janine. Go ahead, Janine.

JANINE 43:46

Hello. Thank you for having my question. Thank you for this whole presentation. It's so informative. I love it. So basically, with all the suggestions that were mentioned with us practicing our memory, remembering what the colors, numbers and making our associations that are personal to us to help us, I'm wondering if we follow through with that, will that eventually help us with our memory improve for sure?

RASKIN 44:14

So I can't say for sure because everybody's brain is different. Everybody's brain injury is different. I don't know how many hours you're going to put in, if it's going to be

enough, but research has shown that people who do that according to a particular recipe do show improved memory. And also groups like the Kessler group have shown changes in the brain where they can actually show that the brain is behaving differently, is behaving better. Part of what happens is that, remember how I showed you that first slide and I said there's things that like remembering your wedding or remembering facts about the world, and then there's things over here like learning to ride a bike or learning to play an instrument? The great thing about learning to ride a bike or play an instrument is they start off in the part of your brain up on the top, like your frontal lobes. And then they move down to what we call subcortical structure. So your frontal lobes don't need to pay attention anymore. You just do it automatically without thinking. When you practice things like the techniques that I gave you, it moves that information out of your frontal lobes and into those subcortical regions. And it's your frontal lobes that are overtaxed and your frontal lobes that probably got damaged in the brain injury. So if we can move information out of your stressed and overtaxed frontal lobes and into these subcortical structures, you're going to be able to do it much more automatically without thinking about it, without effort, without fatigue, without all of that. So that's one of the brain sort of ideas behind it, is to move it into other networks that are more efficient networks that don't take up quite as much energy as the networks that you're probably using right now.

JANINE 45:54 Exactly. That's so great. Thank you so much, Dr. Raskin. Yes, thank you.

RASKIN 46:01 And I don't know, Dr. Weber, if you want to say anything about what you found in terms of imaging findings.

WEBER 46:07 Yes. So as a whole, as Dr. Raskin mentioned, our group has looked at, when we do rehabilitation studies for memory techniques-- and any of you who have been in our research studies can attest that when we're doing an assessment to see how your brain and your cognition are changing before and after treatment, we throw a lot at you because we're really looking to see how much is changing in so many different ways. So one of the things that a lot of our participants do is go through an MRI scan before they go through a memory training and after. And what we're often looking to see is, is your brain approaching a memory tasks differently after training? And a lot of times, we do see that. So some of our older studies, Dr. Raskin mentioned in her talk about the modified story memory technique, where you're trying to visualize information and you're trying to put it as part of a story in context. And after people who go through that training, we actually see that the part of the brain that is responsible for vision and thinking things through in your mind's eye, that lights up, that's using a lot more resources after people go through that training. So in one sense, it tells us that they are using that technique internally, and secondly, it tells us that their brain is responding differently and then they perform better. So to go back to Janine's point, there are some really-- there's good evidence that using these techniques can actually help improve your memory long term. Sometimes it is, though, that it's just using the technique helps you remember things better because you then continue to use that technique.

WEBER 48:03 But I think as long as the outcome is resulting in your everyday life getting better, you remembering to do the things that you want so you can have a meaningful quality of life and engage and work better, remember your neighbor's birthday so you aren't socially embarrassed, that's really the important part.

RASKIN 48:26 And I'll tell you all some hot off the press data that we have. We did a study just over the last couple of years where we didn't do just one technique. Where we did whatever we thought the person needed, and we did fMRI pre and post, and we found really great evidence for them being able to not only remember better, but for on the fMRI scans that they've actually shifted where they're remembering to do things away from taking up huge amounts of the brain to being just in the areas where people who didn't have a brain injury remember to do things. So it didn't even have to be one specific task over and over again for each person. It could just be completely individualized. So we were really happy to see that. So there's a couple of things in the chat. I got TBI in 1996 and I'm tech challenged. I do want to always have written things down as the writing assists with memory. Yes, writing definitely assists with memory and also handwriting seems to help you remember better than typing. So if you still know how to write with a pencil, which I admit not everybody does, it does help get into your memory a little better. I have a pocket calendar. Great. There's somebody who asked me a direct message question. So I'm going to wait to read that out until I find out if it's okay to read that to everyone. And then NJCD have a great grant options. It helps with IT assist tech stuff. Oh, good to know.

WEBER 50:00 Oh, perfect. Thank you, Gina Marie.

RASKIN 50:02 Good to know. So Gina Marie also even put the link there so you can look it up.

WEBER 50:10 yeah. And a grant deadline coming up in about a month and a half in case you need any additional tech here. Okay, great. Okay, any other questions for Dr. Raskin before we begin to wrap up?

RASKIN 50:28 Okay. So the question in the chat was about irritability after head injury and the fact that communicating via text or other kind of communication devices can be really challenging compared to just talking to somebody. But nobody likes to talk on the phone anymore. People want you to text them or send them an email. And so she's asking if there's any techniques to help with that. I think it's a super big challenge for everybody having your emotion misread whether or not you have irritability as a problem using these domains. That's why I think emoticons have taken over our lives. And I noticed that my very stoic 26-year-old son puts exclamation points after everything so that I know it's a positive thing, not a negative.

WEBER 51:19 That's a good coping strategy.

RASKIN 51:21 Yeah. So I think it's a challenge for everyone. I think that the best thing to do is maybe avoid really, really long texts or really complicated or texts about really complicated things. Save texting for kind of quick things. And emails can be a little bit better for really long things. But if you know that it's a challenge for you, and I know that you do know that it's a challenge for you, then it's really important to find other strategies.

And I think one thing that I know that you do, the person who asked the question, which is great, is the tape record function in the text, where you can tape record yourself saying something and send that recording as a text.

WEBER 51:59 I'd really like to thank Dr. Raskin for her presentation today.

RASKIN 52:02 Thank you all so much for having me.

WEBER 52:04 Yeah. And thank you all for your great questions and for attending. So immediately after this presentation, when you close the Zoom link, there will be a survey for you to answer about today's presentation. We would really appreciate if you would take a few moments. We're looking for feedback so that we can continue to offer this programming and gear it toward what would be most helpful for everybody. And we'll also follow up with an email survey, if you're unable to complete that now. And be on the lookout for the new edition of our newsletter, which is TBI News and Views. That will be out soon, and that will have-- and then we'll also provide information about our next talk in this series. That will be our fall brainstorm. And then for those of you locally in the area, we also wanted to promote, Kessler Foundation has their annual Stroll and Roll event on Sunday, October 2nd, and that's in Verona Park. It's also hybrid, in case you want to join from home. And if you're interested in any more of our events or participating in research, much of which can be done remotely, especially for those with brain injury, check us out on the Kessler Foundation website.

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