15| Interventional Neuropsychology: Compensatory Cognitive Training – With Dr. Beth Twamley

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NEUROPSYCHOLOGY

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Speakers: Beth Twamley, John Bellone, Ryan Van Patten

🔊 **Intro Music** 00:00

John Bellone 00:17
Welcome, everyone, to Navigating Neuropsychology: A voyage into the depths of the brain and behavior. I'm John Bellone...

Ryan Van Patten 00:23

...and I'm Ryan Van Patten. In today's episode, we have a conversation with Dr. Elizabeth Twamley about compensatory cognitive training in a variety of clinical disorders. Dr. Twamley is a neuropsychologist and a Professor of Psychiatry at the University of California San Diego. She's also the Director of the clinical research unit for the Center of Excellence for Stress and Mental Health at the San Diego VA. And in addition to all of this, I'll also disclose that Beth is my scientific mentor. So I'm currently a postdoctoral fellow in neuropsychology at UCSD and I've been working with Beth since this past summer. All I'll say is that I've wanted nothing more than to have her on NavNeuro since we started working together and I am absolutely ecstatic that she was kind enough to speak to us. I'm happy to know that our listeners will have the chance to benefit from her wisdom as I do on a daily basis.

John Bellone 01:19

As neuropsychologists, we spend a large proportion of our time learning and talking about assessment. This is rightfully so, we do this part of our job really well. We do a lot of good in people's lives by helping them figure out what struggles they're experiencing and getting them connected with available resources. But neuropsychologists don't need to confine themselves exclusively to assessment. As you'll see in our conversation with Beth, there is very strong empirical support for certain cognitive training techniques that help improve symptoms for people with schizophrenia, TBI, and lots of other disorders. We think that the content of this episode will be very helpful both to trainees and to seasoned neuropsychologists. I know that sitting down and talking to Beth for an hour or so convinced me to add more compensatory cognitive training in my own clinical practice. I had used it on postdoc but hadn't really incorporated it yet into my current position, so I'm definitely going to be looking for more ways to do that. I hope you benefit as much as I did. So without further ado, we give you Beth Twamley.

🔊 **Transition Music** 02:28

John Bellone 02:39

Well, Beth, welcome to NavNeuro. We're really glad to have you.

Beth Twamley 02:42

Thanks so much for having me.

John Bellone 02:43

Why don't we launch it off. If you wouldn't mind just telling us, what is compensatory cognitive training? I guess we'll just refer to it as CCT from here on out for brevity. What is it? How does it work? How do you find your way into this field?

Beth Twamley 03:00

Yeah, I'm glad you asked that. CCT is something that I've been working on for about the last 15 to 18 years. This is an intervention to improve cognition in people who have cognitive impairments. It's compensatory, meaning that we teach people strategies to address and bypass some of their cognitive impairments. It's focused on improving functioning in the real world. Goal setting is very much a part of the intervention and linking all of the strategies that we teach to a participant's specific goals is really central. This is a low tech treatment manual. It's literally a notebook. It doesn't involve computers, as many of the newer cognitive training approaches do. It can be delivered in a group or individual format. Usually takes 10 to 12 weeks, depending on which manual you use. It's available for free. I should say that most of the manuals are up on my website, which is cogsmart.com, and all of the content is available for free. We've also made a web based app that people can register for on the website, and that is also free.

John Bellone 04:13

That's great. We'll link to all those in the show notes. It's really great that you made this open source. I think that's really cool.

Ryan Van Patten 04:19

Right. Helpful for the clinicians out there who are interested in trying it. CCT relies primarily, or at least to some extent, on neostriatal habit learning, the implicit memory system, as opposed to relying on declarative memory systems, the medial temporal lobe, hippocampus, etc. Will you talk about why this is important, why this is a key to the efficacy of the approach?

Beth Twamley 04:44

Sure. Memory is pretty central to the way that we function and a lot of people have concerns about their memory. If they do have any kind of memory deficit that's linked to the hippocampal system, they're going to have more of a problem with remembering how to use some of these strategies and even remembering that they've been taught. So by using more, I think of it as the muscle memory of the brain - so using more implicit learning and memory systems, you can actually train people how to develop new habits that they can then implement without really

thinking about it. The habits become more automatic. If you go back in the literature, it's really interesting, like even HM, who had no hippocampi could benefit from implicit training. He was able to learn motor routines and all kinds of things.

Ryan Van Patten 05:38
Yeah, that mirror drawing task that's really famous. Brenda Milner did with him. That's really interesting.

John Bellone 05:43
So using that logic, could CCT maybe not be used in diseases that impact the implicit memory system? Like I'm thinking of Huntington's disease, as an example?

Beth Twamley 05:54
It's an interesting question. I think not necessarily. I don't think that it would be contraindicated. I think you'd want to use different ways to establish some of the new behaviors. So, for example, calendars are one thing that we teach a lot of. Calendars would be just as useful to someone who had a deficit like that. You might use different support strategies to teach them ways to remember to check their calendar. So, for example, instead of linking it to something else that they do, you might just have signs in the environment reminding them to do it.

John Bellone 06:33
So it's not contraindicated, but then maybe you'd have to adapt it to that person.

Beth Twamley 06:38
I think you would.

John Bellone 06:39
Most CCT, you're reacting to that individual. Right? So it's pretty common?

Beth Twamley 06:43
Yeah.

Ryan Van Patten 06:44
Right. It's compensatory in that if the declarative memory system is impaired, you can use the implicit memory system and vice versa. Whatever is still there is what you capitalize on.

Beth Twamley 06:53

Right. Yeah. So if the declarative memory system is intact, then the learning just occurs I think in a different, probably more verbally mediated sort of way.

John Bellone 07:05

Great.

Ryan Van Patten 07:05

Makes sense. So the primary cognitive domains that are a focus of CCT interventions are prospective memory, attention and vigilance, learning and memory, more typically, and executive functioning. So I'm curious why you decided to focus on these cognitive skills in particular, and maybe if you could briefly throw out a few examples of how you use compensatory strategies for each of these abilities.

Beth Twamley 07:32

Sure. I initially started working in the field of psychosis. I was really driven by a desire to help people improve their functioning. You know that people with psychosis tend to have cognitive impairments in lots of different domains. This really affects their ability to succeed in work and school, to succeed in social relationships, and even to live independently. My initial choice of these domains was based on their linkage to those functional outcomes. The second criteria was that there had to be some indication in the literature that these domains were modifiable. So, for example, processing speed is almost universally impaired in people with schizophrenia. But there wasn't a lot of evidence to suggest that we could do anything about it. So that was not included.

You asked for some examples of strategies that we teach in each domain. So for prospective memory, we really focus on this because it's so important for remembering to do things in daily life. It's a really important daily skill. So we rely pretty heavily on calendars. A lot of people, of course, use calendars already, but we really focus on making them calendar masters. So really improving their calendar use. Even if they use calendars, we want to make sure that they're using them consistently. We want to make sure that they have them all the time with them, and we want to make sure that they actually check the calendar. So calendars are not very useful if you don't check them.

Ryan Van Patten 07:52

[laughs]

Beth Twamley 08:17

We teach a bunch of support strategies that will help people use calendars. For attention and vigilance, we focus on a couple different things. There's an acronym in the manual called LEAP, which is used for conversational attention. The letters stand for listen actively, eliminate distractions, ask questions, and paraphrase. These are techniques that help people pay attention in conversations. Then for paying attention during tasks, self-talk is probably the biggest strategy that we use. Just talking to yourself out loud as you're doing the task. Talking about what you're doing, and following the steps.

For learning and memory, we include a bunch of different strategies, they're mostly focused on learning. Once the information is encoded, it usually is remembered fairly well by most people with cognitive impairments. We focus mainly on learning, and there are two general approaches. One is to make sure that you're only committing to memory what actually needs to be remembered. If something is simpler to just write it down somewhere, then that is obviously an easier course of action. Then the other general strategy is to make the information more personally meaningful, to get it encoded more strongly. An example of that would be using a visualization. If you wanted to remember something, you could make it into a picture in your mind or even a movie, you could even act it out. That would make the memory that much stronger.

Then for executive functioning, I think the planning aspect of this is particularly important and also links back to calendar use. We teach people to plan for goals and deadlines by starting with the goal and then working backwards to see what steps need to be executed to reach that goal by a certain time. Then we also teach a 6-step problem solving method that is very common in a bunch of different psychotherapies. We have an acronym for it, but it's basically the same as every other 6-step problem solving method that you've heard of.

Ryan Van Patten 11:32

Great, that's helpful. You had mentioned that CCT, CogSMART, tend to be 10 or 12 week long interventions. I'm wondering about dosage effects, specifically for clinicians who may not always have 10 or 12 weeks with patients. Are there any data or do we have a sense as to how useful CCT can be if it's done for three weeks? Five weeks? Six?

Beth Twamley 11:59

Yeah, and I think, clinically, that is how it works. So, for example, in our VA, we have a TBI cognitive rehabilitation clinic that's directed by Amy Jack. In her clinic, the average participant is actually receiving only about five to six sessions of cognitive training. I think what happens is, that's about how long people want to participate for. Not everybody has every cognitive impairment. When you're doing research, of course, you have to make it the same for everybody and so you have to deliver the whole intervention. But if you're seeing someone clinically, you can really pick and choose what's relevant to them and have them be a part of the process too.

Ryan Van Patten 12:47

Right. That flexibility helps a lot.

Beth Twamley 12:48

Yeah.

John Bellone 12:49

Can you talk about the importance of psychoeducation? I know that's a big part of CogSMART and some of the other cognitive training systems. I'm thinking about, like telling people about the typical recovery from mild traumatic brain injury, concussion, explaining basic neuroplasticity to them, effects of poor sleep and mood problems on cognitive abilities. How much of that do you incorporate usually?

Beth Twamley 13:14

Yeah, so far for the CogSMART and CCT manuals that are focused on TBI, we do provide quite a bit of psychoeducation about TBI. We really want to educate people about the symptoms that they should expect and the symptoms that they shouldn't expect or shouldn't attribute to the TBI. We have this problem, particularly in mild TBI, that many patients tend to attribute some of their symptoms that are really nonspecific to the TBI and sometimes that can be a mistake and it actually ends up perpetuating the post concussive symptoms. So we teach people about that. We teach people some very basic stress control strategies, a little bit on sleep hygiene to improve sleep, and a little bit on headaches. Those are the topics that we cover.

In the other formats of CCT, for example for psychosis or some of the other disorders that it's been adapted for, we don't do as much psychoeducation. I don't tend to use words like neuroplasticity, it's a little bit too high level for a lot of service users. I try not to make things too technical. We talk about things in very lay

language. So, you know, "you have problems with remembering to do things." That's an example. Not too much jargon. We do talk a lot about the effects of mood and sleep on cognition. Of course, everybody is going to feel more cognitively on top of their game if they've slept. When you have mood or really any prominent psychiatric symptoms, your brain is spending a lot of energy trying to keep the symptoms at bay and you just have less cognitive oomph to devote to the task at hand, right? So if you can get the psychiatric symptoms under control as best they can, then the person is going to have better cognitive efficiency just from that.

John Bellone 15:23
Yeah. I like how you limit the jargon. I think you're right, neuroplasticity is too big of a word. But I know that CogSMART talks about the construct of neuroplasticity - how we can, by some of our actions, physically change our brain. I think that's good for a lot of patients. That's one of the first things that in CogSMART, you know, that they learn about. I think that's great. Sometimes that's all people need, is that psychoeducation, especially for the concussion types of patients that you see sometimes. So that's awesome. There are some similar terms that come up in the literature a lot on interventions to improve cognitive status. I just want to maybe throw out a few of them and you can define them and delineate them however you see fit.

Beth Twamley 16:08
Can I ban some of them?

John Bellone 16:09
[laughs] Yes. Yes, you can. I think the two that maybe come up the most are cognitive rehabilitation and cognitive remediation, which people usually use synonymously. I'm curious about your take on those, but also cognitive restoration and enhancements, cognitive stimulation. These are all used sometimes. Just help us out here.

Beth Twamley 16:36
I'll try. [laughs]

John Bellone 16:36
[laughs]

Ryan Van Patten 16:36
[laughs]

Beth Twamley 16:38
Yeah, so it is very confusing. Different research groups tend to use the terms differently, and in different disorders too. So, for example, in the psychiatric field, cognitive remediation is really the dominant term. I would say I see that rarely in the TBI rehabilitation literature. So, yeah, let's just go over some of these words.

Cognitive remediation, to me, implies a repeated drill and practice sort of intervention. The goal of it is really to take away the impairment, so it's really intended to be a curative type of intervention.

Cognitive rehabilitation, if you look up the word rehabilitation, it really means to restore someone's functioning to a prior level. So if you are going through rehabilitation for a knee injury, for example, the idea is to get back to your former level of functioning.

Cognitive training, I think, is probably the most general of all the terms and I really prefer it because it doesn't make assumptions that we're fixing something - that we're getting someone exactly back to where they started. For many people, we don't really know where they started and so it's hard to know when we're done.

Cognitive restoration, I don't see that term very much. But I think it implies restoring function that may be really over promising on what's possible.

Cognitive enhancement, I think, is also more general. I see that a lot in the lay language and some of the commercially available products that promise to enhance your cognitive functioning. I think enhancement just means improvement, so it's okay. I just don't see too much in the scientific literature.

And then cognitive stimulation, I think, doesn't promise any benefit at all. But it is just about stimulating cognitive activity.

John Bellone 18:38
Okay. So really stick with cognitive training?

Beth Twamley 18:42

You know, I think if you're training someone how to do things, if you're teaching a skill, it certainly fits. Or if you're doing repeated drills and practice, I think it also fits. It is a more general term.

John Bellone 18:55

Yeah, like that, too. It seems like a lot of your work in CCT has been in serious mental illness and also traumatic brain injury. Can you summarize the evidence for CCT in these populations? Does it work? What improvements can we expect here? That kind of thing.

Beth Twamley 19:13

Yeah, so I'll start out with the literature on CCT in psychosis and severe mental illness because that's really where I started my career in this area. What we found over the years is that we're getting some positive effects and statistically significant effects on multiple domains of outcomes. Cognition is really central to cognitive training naturally, and so we measure cognition pretty extensively. And so far, in this population, we've found positive effects of CCT on attention, memory, working memory and also some more distal outcomes on functional capacity, quality of life, and some symptom outcomes too. In one study, we found a very large effect size, actually a 0.92 effect size for negative symptoms in schizophrenia.

John Bellone 20:11

Wow. Which are traditionally very difficult...

Beth Twamley 20:14

Which are difficult to treat. Yeah. Then in another study, we've found some positive significant effects on depressive symptoms. The effect sizes vary, of course, across the studies and depending on what control group you use, but those are the general domains that we think that we're moving the ball.

John Bellone 20:33

Can we talk about dealing with those negative effects of schizophrenia for a little bit? Like, were there any adaptations that were necessary to do that? Or is that just the typical CogSMART?

Beth Twamley 20:44

That was the first iteration of the manual. It was the CCT for psychosis manual. We tested that out in a small study many years ago and that was really an unexpected, very pleasant, but unexpected result.

John Bellone 21:02

What do you think's going on there?

Beth Twamley 21:03

A lot of people asked me this because, obviously, this is not an intervention that was designed to target negative symptoms. I think what's happening is that during treatment, people start to do more things. They start to feel a little bit more on top of their game cognitively, that may encourage them to try some things that they haven't tried in a while or try some things that they've never tried. And, slowly, I think there's a little bit of a snowball effect. They get a little bit of mastery, and then they are willing to try something else, and then they get a little bit more. So I think they're doing things by the end of treatment that they wouldn't necessarily have been doing before. In this study, where we had the negative symptom finding, it was also delivered in groups and so there was some group interaction and group cohesion that happened as well. So that could be a big part of it. I will note that that effect was not sustained over time. So, basically, that effect went away after the group went away. But there was something encouraging about it, at least during the time of the intervention.

John Bellone 22:17

That brings up another question, how often is this done in group versus individual?

Beth Twamley 22:23

I would say probably about half and half. Clinically, it can be done either way and the manuals are really exactly the same. You can teach these strategies in a group format, which has some advantages, actually, I think. You can call it a class, which really sort of de-stigmatizes the group therapy aspect of this. A lot of people have had a lot of group therapy, and they don't want it anymore. [laughs] So calling it a class can really be helpful. Of course, people teach each other things and support each other in their learning and so I think that can be really powerful. On the other hand, if you do it individually, you have the opportunity to really tailor it a lot more to the individual participant. Did you want to talk about some of the TBI results?

John Bellone 23:10
Sure, yeah.

Beth Twamley 23:10
Okay, I can summarize those too.

John Bellone 23:12
Just a broad overview.

Beth Twamley 23:12
Yeah. We've had some pretty encouraging results in TBI as well. I've studied mainly mild to moderate TBI, I'd say, in the VA population - almost all mild, a few people with moderate. We found some very significant, great effect sizes on post-concussive symptoms, about 1.0 effect size, significant results for prospective memory. Those two actually were sustained well after the intervention. This was nine months after the intervention, those effects were sustained. Quality of life also improved. We've also found effects on cognitive domains such as attention, learning and memory, and executive functioning. So that has been encouraging. We've also combined, I think we're going to talk about this later a little bit, but we've combined some of the CogSMART and CCT techniques into other treatments. We just finished a trial where veterans with a history of PTSD and TBI received cognitive processing therapy, one of the first line treatments for PTSD. We added some of the CogSMART content to that manual, so it's basically an augmented form of CPT. So we call it SMART-CPT. And what we found was that it performed really equivalently to CPT in terms of effects on PTSD symptoms. But the SMART-CPT was also associated with improvements in cognition and in attention, working memory, learning and memory, and executive functioning. So we're getting more bang for our buck so to speak by including the cognitive strategies in that intervention.

John Bellone 25:04
That was great. Just a couple of clarifications for our listeners who might not be aware. CPT is cognitive processing therapy, mainly for trauma. The other very common treatment is what's called PE, prolonged exposure. So just if people aren't aware. The other thing you mentioned was prospective memory, which maybe people aren't as aware of - the remembering to remember.

Beth Twamley 25:29

Remembering to remember, exactly. Prospective memory, yes, it's remembering to do things when you're supposed to or in connection with other things that you're supposed to do. For example, this can be a time based prospective memory task or an event based task. Either you have to do something at a certain time, or you have to do something when you're cued in another way. So, for example, you have to go to your class at 4 o'clock on Tuesdays, or you have to buy dog food on the way home - something like that would be an event based task.

John Bellone 26:03

Yeah. Great.

Ryan Van Patten 26:05

Beth, you had mentioned that the effects on negative symptoms in schizophrenia, thus far positive effects of CCT have not been shown to last pass the intervention. But, on the other hand, some of the positive effects we find do last and even continue to improve. What I mean is that, imagine a participant, a patient in a trial, they're experiencing CCT, they're getting better on whatever metric you want to think about. Of course, they're getting better during the intervention, intervention ends, there's a three months follow up. In that period of time between the end of the intervention and three month follow up, when they're not receiving more therapy, they continue to get better. That's obviously impressive and bodes very well for the therapy. I can imagine one way this may be happening is that people are learning these strategies and techniques in CCT in the group and then they go off into their daily lives and they start implementing them. They're using them on a daily basis and improving. Is that what you think is going on here? Is there anything else?

Beth Twamley 27:12

Yeah, that's my guess. I think the domains where we're seeing those long lasting effects, a year, even two years later, are in some of the more distal outcomes, like quality of life or functional capacity. So I think people are practicing some of the strategies, the ones that work for them, the ones that they really like, they're using those more. Hopefully, those are having knock on effects in their daily life. I'll also say that a lot of people that have gone through this intervention have taken the strategies and applied them in very interesting and unexpected ways that I never imagined they would. I'll give you a couple of examples that I think are really cool. We had one person with schizophrenia in one of our groups, who really glommed on to calendar use. We never told him to do this, but he started using his calendar to record all of his glucose monitoring results. He had diabetes and he had to

monitor his glucose. He said that before using calendars, he would do a finger stick every other day or so, he wouldn't write it down anywhere, and so it was really not that helpful. But once he started using the calendar, he would write down his glucose levels in his calendar every day, or multiple times a day. Then when he went to the doctor, his physician would have a month's worth of really good glucose control data to look at. So that was something that we didn't tell him to do, he just did that on his own. But I was really impressed at that sort of application. So, yeah, I think people are doing a bit of that. There are other examples of people using some of these strategies to help out in their social relationships, to remember people's names, for example. They've reported that they've had really great effects on their social life and have started socializing for the first time in many years.

Ryan Van Patten 29:15
Which can then lead to continued improvements over time.

Beth Twamley 29:19
Right.

John Bellone 29:19
I think one of the benefits of this kind of training is that it does generalize like that. You teach someone a calendar, it's not just in the session. It's...

Beth Twamley 29:26
Right. It's for life.

John Bellone 29:27
For life. Yeah.

Ryan Van Patten 29:29
That's great. I'm wondering, drilling down a little bit, we established that CCT has positive effects on a group level. But then we might ask what sorts of people benefit more than others - individual differences. One metric that has come to mind for me a number of times when thinking about this is, would someone's baseline or premorbid cognitive abilities, would someone who is high functioning tend to benefit more from CCT? So an argument there might be that this person maybe has subtle impairments, but has a lot of resources - they can follow along, they can understand and implement the CCT strategies much better. On the other hand, someone who is low functioning or has more severe cognitive impairments, has

more room for improvement, right? There's no ceiling effects. One of your papers in 2011, in Schizophrenia Bulletin, I think there was a negative correlation between cognition and improvement such that people with lower cognitive functioning coming in got better, improved more, do you think that's the answer? Or is it more complicated than that?

Beth Twamley 30:42
Yeah, certainly, I think people who start out lower, have more room to improve. I think we saw that, but the effects were subtle. Certainly there are people who start off doing pretty well who also find ways to improve in different domains. I don't think you need to limit the use of strategies like this to high performing people or low performing people. We've also found that comorbid psychiatric disturbance doesn't seem to affect people's ability to benefit. Age too. A lot of people ask, can older people benefit from this? We generally have not found any associations with cognitive change and age following these interventions. But we have noticed that when you look at the correlations, most of the correlations with cognitive change in age are positive. So older people tend to do a little bit better. They're mostly not significant, but they're in the positive direction.

Ryan Van Patten 31:40
Interesting. I might, if I was asked without you having said that, I would think "Oh, younger folks, more neuroplasticity, maybe they can learn more easily?" Why might older adults be benefiting more?

Beth Twamley 31:54
You know, I don't think we know. I've got a couple of guesses. A lot of older people - we found this in the schizophrenia trial, a lot of older people with schizophrenia are real survivors. They have learned how to deal with their illness. They tend to be pretty resilient. So I think they bring a lot of strengths to something like this. They've got some strengths that they can apply in their new learning.

Ryan Van Patten 32:22
Right. There's that selection bias we think of in older adults with schizophrenia, anyway - those that have survived are at a higher level.

Beth Twamley 32:28
Yeah, sure. Especially the people who are interested in participating in a randomized control trial of these interventions. These are people who generally

have insight that they may have some cognitive impairments and they want to do something about that. It's a pretty select Group to begin with.

Ryan Van Patten 32:45
I haven't seen literature on any other demographic factors playing a major role in outcome.

Beth Twamley 32:50
No, no.

Ryan Van Patten 32:51
Yeah. Okay.

John Bellone 32:52
Just to break it down a little further. It seems like it's a very multi-component intervention. There's lots of pieces involved in CogSMART or the other CCT. Have there been any dismantling studies of it yet? Do you have a guess about what components might be most effective? I guess it's maybe going to be specific to different individuals, I would imagine.

Beth Twamley 33:15
Yeah, there have been no dismantling studies and so we really don't know what components are the most effective. But your question is, what do I think is the most helpful, right? So if forced to choose, what would I prescribe? I think certainly calendar use is really important. If people are not using a calendar, there's just no way. All the strategies that we're teaching in these interventions, they're not high concepts, they're not high level. They're things that most successful people use every day, or every week in order to succeed. We're just helping people who aren't using those strategies currently to start adopting some of them that fit in their life. So calendar use, obviously, is very important. Writing things down - really great strategy for not having a memory problem. I think the conversational attention strategies, the listening and eliminating distractions, asking questions and paraphrasing, that seems to be something that's really helpful for a lot of people. They report back to us that they really like them. Just decreasing what you need to remember to lower the overall cognitive workload can be helpful. Then increasing the personal salience of what needs to be remembered.

John Bellone 34:33
If there's one takeaway, use a calendar. [laughs]

Beth Twamley 34:36
Write things down, preferably in a calendar. Yeah.

John Bellone 34:38
[laughs]

Ryan Van Patten 34:39
Good advice.

Beth Twamley 34:40
Yeah. Don't trust your memory, write it down.

Ryan Van Patten 34:43
I want to go back for a moment. You had gone through some terminology earlier, and I want to zero in on a few terms. The distinction is often made between restorative approaches and compensatory approaches. Of course, we're talking about compensatory cognitive training here. With regard to restorative approaches, some people call these "brain games" sometimes they're called "cognitive training", although I like how you use cognitive training as the umbrella term. We know some of these paradigms have even been monetized and marketed - Lumosity, Cogmed, and others. Unfortunately, to this point, that literature has not shown good evidence for far transfer, for good generalizability to untrained tasks. I'm curious, what are your thoughts regarding restorative training? Do you think they tend to work at all? Might it be helpful to add restorative training to compensatory training or is CCT all we really need?

Beth Twamley 35:39
I think it would be really helpful to add the two together. There are a few people who are doing that right now, so we'll see how those trials come out. But, you know, these are also called top-down and bottom-up sorts of interventions. So the restorative would be the bottom-up. You're really working on more basic cognitive processes, and then hoping that they build upon each other and then eventually generalize to improve functioning. Then with the compensatory approaches, you're really starting with functional goals, and trying to teach strategies that are going to directly address those functional goals. So the bridge to functioning is a little bit

shorter. I think combining the two might really hit the sweet spot, and provide some more benefits.

Ryan Van Patten 36:27

Yeah, that makes sense. It will be interesting to see how those trials turn out. As you mentioned at the beginning, a benefit of CCT is that it's low tech. We don't need to administer it on a computer. Setting that aside, if we're just looking at efficacy, do you have a sense as to what tends to work better for people, computerized training versus paper-pencil or low tech?

Beth Twamley 36:50

I think they can both work, and a lot of it is what the person is comfortable with. You know, what do they know? Are they computer savvy enough that this is not going to be a whole additional learning experience for them?

Ryan Van Patten 37:03

Yeah. We might think about how it will generalize to everyday life, right? If they're an older adult, who doesn't really use a computer very much, and we artificially sit them down, and they play some video game, and then go out in their daily life and never touch a computer, it's less likely to generalize.

Beth Twamley 37:17

Yeah, even though they might get really good at playing that video game.

John Bellone 37:21

Usually, when patients ask me if they should start playing some of those games, computer based games, I usually say that it probably doesn't hurt, right? If it's fun for you, if you can afford it, go for it. But some of the more general - staying social and doing new and difficult tasks, learning how to play a new instrument, or learning a new language - that's really where it seems like they're going to make the most gains. Not to just just rely on brain games. Would you agree?

Beth Twamley 37:52

I do agree. And time spent on screens is time spent away from people, generally. I think interacting with people is really important to help protect and preserve cognition.

John Bellone 38:03

It's a good point. You had mentioned CogSMART before and I want to talk a little bit more about it. Like you mentioned at the beginning, it's free, it can be used by any psychologist. How about other practitioners? Do they often use it as well?

Beth Twamley 38:19

Yeah. So, I mean, this is out in the world, it's free. Anyone can download the manual. So I think a lot of other types of practitioners are using it. Certainly, occupational therapists, speech and language pathologists have used it. Some nurses have used it. I think, really, any person who can teach a skill can probably do this fairly well. We've had social workers, marriage and family therapists, and so on also delivering this.

John Bellone 38:51

So even, I guess, individual patients could just download it and start doing it on their own.

Beth Twamley 38:55

They could. Yeah. Any patient could download the manual and look through and see all the strategies and see what applies to them. I think a better way, if an individual were interested in doing that, would be to register for the app and go through it in a more systematic way. The app includes some videos that really bring some of the strategies to life. That's what I would recommend.

John Bellone 39:17

So there's no real formal training that's needed, it sounds like.

Beth Twamley 39:20

I don't think so. A lot of people have asked me, how do I get trained to deliver this intervention? What I usually say is, why don't you download the manual, take a look at it, and if you have questions you let me know. And I don't generally hear from people. I think it is fairly straightforward. Once people see what it actually is, it's demystified a bit, and I think most people feel pretty confident that they can deliver it.

John Bellone 39:47

I know at the VA this isn't as much an issue for you where you have the luxury of just doing things and not caring about getting paid by insurance or other means.

How about getting reimbursed for it in more like a private practice setting or other settings?

Beth Twamley 40:03
My understanding is that it is covered. There's a CPT code, which is 97127 for those who are interested, which is cognitive intervention. Medicaid reimburses for that. Many private insurances do as well. If you're seeing a Medicare patient, there's a G code for this, which is G0515. It's reimbursable by Medicare as well.

John Bellone 40:29
It's awesome. So even if a neuropsychological evaluation had been done, then it seems like Medicare would still potentially cover some. Do you know how many sessions?

Beth Twamley 40:37
I don't know how many sessions are [covered]. I don't live in that world, [laughs] but my understanding is that it is covered.

John Bellone 40:45
The codes all changed with 2019, too. [laughs]

Beth Twamley 40:50
These came out in 2018, so I believe they're still current. Yeah.

John Bellone 40:53
Yeah, I'm not sure. You mentioned how sometimes you alter it for the individual if you need to make adjustments. Does anyone need special permission to make those alterations to a program or the manual for it to fit their setting?

Beth Twamley 41:09
They don't need special permission. To be honest, they could do anything that they wanted with it and I would never know anyways. [laughs] I think people probably are using it in the way that fits their setting.

John Bellone 41:21
Yeah. Okay. Sorry. I have so many questions. [laughs]

Beth Twamley 41:24
Sure.

John Bellone 41:26
Are there other commonly used CCT programs that are widely available?

Beth Twamley 41:32
Do you mean the ones that aren't on the website?

John Bellone 41:34
Sure. Yeah.

Beth Twamley 41:36
I think we have a few that are really considered more under development, where we haven't published initial results from a trial yet. Those generally, we're willing to share privately, but we haven't posted them on the website yet. Some examples of that would be there's a manual for mild cognitive impairment in older people. There's a manual combining some CCT with social skills strategies for adults with autism. There's a Parkinson's disease manual as well, but we're not distributing those widely yet.

John Bellone 42:13
Okay. In addition to the manual, do you give self report measures or do any cognitive testing that accompany the manual?

Beth Twamley 42:22
Oh, for sure. Yeah. We want to see if people are improving cognitively. We test cognition, of course, using standard neuropsychological tests. But we also want to know, from the patient's perspective, how do they think they're doing? So we have a number of questionnaires that we commonly use to assess their perceived cognitive difficulties, what strategies they're using versus not using and so on.

John Bellone 42:47
So you'd recommend that practitioners maybe do some brief testing before and after and during?

Beth Twamley 42:52

I think a little bit of both. Yeah. I think you want to know what your patients think of this intervention if you're deciding whether you want to keep using it.

John Bellone 43:01

Agreed.

Ryan Van Patten 43:02

We've talked a lot about CogSMART and CCT. For listeners who aren't aware, what's the easiest way people can differentiate CCT from CogSMART in their minds?

Beth Twamley 43:13

[laughs] It's so complicated. The first manual that was developed is the CCT for psychosis manual. When veterans started coming back from Iraq and Afghanistan with high prevalence of brain injuries, there really just wasn't any recognized treatment for them. So we retooled the CCT manual into CogSMART, which stands for Cognitive Symptom Management and Rehabilitation Therapy by the way, I don't think we've spelled that out. So that was CogSMART. Then, later on, I discovered that some colleagues in Portland, Marilyn Hopkins and Dan Storzbach, were doing some very similar sort of work with their patients. So we joined forces and created a new manual that was the best of what we were each doing. We ended up calling that CCT.

Ryan Van Patten 44:05

That's helpful. Moving forward now, we've talked a fair amount about psychosis and TBI but there's also some data on CCT and depression and bipolar disorder. I'm thinking that some people may believe these sorts of disorders are best treated pharmacologically and via psychotherapy. Let's focus on depression for a moment. We know depression has a negative impact on cognition, of course, but do you think that CCT adds incremental validity to psychotherapy for depression? Should CCT be more well integrated into standard treatments? Or no?

Beth Twamley 44:43

I'd really like to see more research in this area. We just don't know the answers to that right now. But I would like to see the cognitive impairments of psychiatric disorders get more recognition in the field and actually get addressed more in treatment. All of these disorders are brain disorders. So they do come with some

cognitive impairment. So if we ignore that, I think we're ignoring some low hanging fruit that we could potentially really address to help the clients function better.

Ryan Van Patten 45:18
Right. That's consistent with what we've been doing more recently, which is pairing CCT with CBT. For example, the trial CCT paired with CBSST, cognitive behavioral social skills training in psychosis, which is potentially hitting both sides, the emotional social side with CBT and the cognitive side.

Beth Twamley 45:41
Exactly.

Ryan Van Patten 45:41
So, potentially, in the future, that would be a standard clinical intervention.

Beth Twamley 45:45
Yeah, let's hope so. This was a trial with Eric Granholm who developed cognitive behavioral social skills training, CBSST. It's like an alphabet soup of acronyms. [laughs]

Ryan Van Patten 45:56
[laughs]

Beth Twamley 45:56
So we paired the cognitive strategies with the CBT approaches and the social skills training approaches in that manual. Hopefully we'll find some good results with that.

Ryan Van Patten 46:10
Yeah, that's great.

John Bellone 46:12
I've also seen a pretty interesting application of CCT as an adjunct to exposure therapy for people with hoarding disorder specifically. Can you tell us a little bit about that? Why does that work for that population?

Beth Twamley 46:23

Yes. So this is a collaboration with Catherine Ayers, who is my colleague here at the VA in San Diego. She's been doing a lot of work on some of the cognitive impairments that are common in older people with hoarding disorder, which is, by the way, a very underrecognized disorder - it's highly prevalent, about 5% of the older population. So it's a huge problem. These folks do tend to have some executive function problems. And so we wanted to address those in treatment and combine some of the CCT strategies with her standard approach, which is exposure therapy, addressing and discarding the valued items. We really use the CCT strategies as a lead into the rest of the treatment. It's about 7 weeks of cognitive training, followed by about 20 weeks of exposure therapy. This serves a couple functions. One is that it helps the client get ready and get cognitively prepared to take advantage of the rest of the treatment. They get organized, get their ducks in a row, and then by the time they get to exposure therapy, they're more cognitively able to approach that demanding task. The other nice thing about front loading the treatment with the cognitive strategies is that it provides a nice lead into something that's emotionally much more challenging for them. They get to really focus on more general strategies first before diving right into exposure therapy, which can be really hard.

Ryan Van Patten 48:03

That's a really cool application of CCT. CCT is clearly very flexible, right? Many different populations, we can apply it to. With that in mind, we've already covered psychosis, depression to some extent, TBI, hoarding disorder. Another set of diseases or disorders you referenced briefly earlier would be neurodegenerative disorders. You mentioned MCI. Here there's a particular challenge for any type of cognitive training or rehabilitation because, obviously, the person has a degenerative condition. They are declining across time as opposed to what may be more static in terms of TBI or SMI. I can think of a number of different challenges associated with this. Someone with Alzheimer's disease, for example, is very impaired in terms of their memory, so to what extent can new learning occur? With all that in mind, talk a little bit about what you think the efficacy of CCT may be in these groups? And maybe a little bit about our ongoing CCT and motivational enhancement for MCI?

Beth Twamley 49:10

Sure. I think for many years, people have been pretty pessimistic about what can be done in this population given that it is neurodegenerative in nature. And, rather than just giving up, I think we should ask what is possible, given the residual

capacities that they have left? Especially if you catch someone in the MCI phase or in early dementia, there is still some learning that they can do. Particularly the implicit habit learning is probably still going to be pretty intact. So I think that's the time when we really want to take advantage of their strengths and help them adopt some new strategies that could potentially help them be a little bit more independent a little bit longer. That's really the goal. Even if we can just teach people "don't trust your memory, write it down" while they still have some insight that they do have a memory problem, that could be very helpful. So I don't think we need to give up on this population at all. As you mentioned, we have a current trial on motivationally enhanced compensatory cognitive training for older veterans with mild cognitive impairment. This is with our colleague, Marilyn Huggins in Portland. We'll see by the end of the trial, it's a pretty big trial, and we'll see across the two sites if this approach is helpful compared to a robust control group.

Ryan Van Patten 50:41
Right.

John Bellone 50:41
Can you explain the motivational enhancement piece of it?

Beth Twamley 50:43
Yeah, thank you for asking. We know that to really protect and preserve brain function and to prevent dementia as long as possible, there are a bunch of lifestyle strategies that are really important to think about. So a healthy diet, physical activity, getting enough sleep, engaging with other people, and so on. All really important. So what we do is we focus not only on the cognitive strategies, but also on some of those lifestyle strategies as well. We really want people to adopt these and so we really hammer the importance of them. Then we ask them in a very motivational interviewing sort of style, "How important is this to you? How effective do you think you can be? How confident are you that you can make these changes?" That can start a conversation to produce change talk, which we just mentioned before has been very helpful. Hopefully, get people on the right track in terms of practicing some of these strategies.

John Bellone 51:46
We should definitely cover motivational interviewing in more depth on NavNeuro. I think it's such a good...

Beth Twamley 51:52
It's good for what ails you.

Ryan Van Patten 51:53
[laughs]

John Bellone 51:53
 Yeah, it really is. It's a good intervention.

Ryan Van Patten 51:57
A big picture piece of this that is important to mention is that ,even if we don't think we're reversing decline that has occurred in a degenerative condition or even halting it, that doesn't need to be our goal. Even if we slow the decline, if we flatten that curve…

Beth Twamley 52:14
Absolutely. Yeah.

Ryan Van Patten 52:15
…the slope of that curve a little bit, that is a win.

John Bellone 52:18
Or improve functional abilities through some of these compensatory strategies.

Ryan Van Patten 52:21
Right.

Beth Twamley 52:21
Sure, yeah. Long term institutional care for people with dementia is extraordinarily expensive. So even if you can keep someone out of institutionalization for even an extra day or two, the cost savings associated with that are huge. If you can keep people at home for even another month or two, that's very significant.

Ryan Van Patten 52:41
Their quality of life, as well, in addition to the financial benefit. You briefly touched on earlier, applying CCT to children with autism. That's the other end of the lifespan spectrum. Can you talk a little bit about that?

Beth Twamley 52:55

So it's actually not kids. That was a study done in young adults with autism who were in supported employment to grow up to regain employment or to get jobs for the first time for some of them. I think this is something that I'd really love to know - does this work in kids? We have a study going on right now with Kristin Cadenhead, in her care program here at UCSD, which is an early psychosis and clinical high risk program. In that study, we do have youth with prodromal psychosis probably, and we'll see if it's helpful in that population. We really haven't had to make too many adjustments. We've made some of the examples a little bit more relevant to school. But other than that, it's pretty much the same strategies.

Ryan Van Patten 53:48

This is speculative, but I wonder to what extent it can be helpful for kids with ADHD?

Beth Twamley 53:53

Yeah, a lot of people have asked that question. I think some of the strategies are just helpful for anyone who is not using them. [laughs]

Ryan Van Patten 53:59

Right. Yeah.

Beth Twamley 54:00

We know that ADHD comes with a lot of executive dysfunction, difficulties with planning, difficulties with prospective memory and organization. So all those strategies, I think, could be helpful in that population too.

John Bellone 54:14

Yeah, it seems ripe for research.

Beth Twamley 54:17

If there are any clinicians who are using it in those folks, I'd love to know how it's working.

John Bellone 54:21

I can think of a couple of patient characteristics or symptoms that might be a barrier to CCT success. It might help to talk about how we might work with these to improve the intervention. Anosognosia is one that comes to mind, the lack of

awareness or appreciation of one's own difficulties or deficits. If a patient doesn't have any insight into his cognitive impairments, he might not be as likely to be interested or motivated to do CCT. Is this just a non-starter or are there good strategies for implementing it in people within anosognosia?

Beth Twamley 55:00

So, I think we encountered this in our initial studies in psychosis. About half of that population is not aware that they have a mental illness, right? So this is a problem. I think there are a couple of things that I've noticed. One is that it's really helpful to start talking about goals and what the person wants to accomplish, rather than focusing on symptoms, which they may or may not agree that they have. Even if they can't name specific rehabilitation goals right away, most people can very easily tell you what they're not satisfied with in their life. So that's a way to start the conversation about what the goals might be, and then introduce the idea that improved cognition could be relevant to reaching some of those goals.

John Bellone 55:46

I really like that focus on goals, not symptoms. I really like that. How about people with defeatist beliefs, or people who have low self esteem, low self efficacy? They might express a lot of hopelessness. Clearly negative thoughts about someone's self worth and their own ability to complete goals can interfere, I'd imagine, with the CCT process.

Beth Twamley 56:12

It could, yeah, sure. If people aren't willing to try new things, that's going to make it more difficult for sure. I think then it becomes the therapist's job to really help the person divide these into bite sized chunks that they can handle. Starting with small steps that are really achievable, that are really likely to be successful. Then you set the person up for success, you provide all the scaffolding that they need to be successful. As they continue to have more success, you can then start fading some of those supports. So that's our approach for people who have defeatist beliefs. That was actually - defeatist beliefs is one of the main outcomes that we're studying in the CCT, CBSST study.

John Bellone 56:56

That's great. I'm curious, also just the clinician in me, what types of cognitive training recommendations do you give patients during a traditional neuropsych feedback? Not one that started out with CCT as the goal. If a clinician doesn't feel like they're well trained, or they don't want to do CCT, is it helpful to just provide a

list of compensatory strategies? I think that's what most clinicians probably do. You know, write in the recommendations [to] use a calendar and write things down, limit distractions, take extra time. I'm just wondering what the next best option is if there is no access to formal CCT?

Beth Twamley 57:43

I think that a number of clinicians can teach some of these strategies outside of a formal CCT intervention approach. So the clinician could just choose one or two to really focus on and see how that goes. But, yeah, I think providing a list of strategies, that's not cognitive rehabilitation and I don't expect that that would be particularly effective. You really have to start, again, with the goals. I know I've said this, but that's the way to get buy-in from the participant. If you really start by establishing their goals, and then linking all the strategies to those goals, that's how people get motivated to try these things out. If you just tell them to do something, because it's good for you, they won't do it.

John Bellone 58:28

Maybe even I'm thinking that could be, if you're not going to do formal CCT, that might be incorporated into a feedback session. Maybe picking a couple of goals that they have, and then and then doing a very mini session.

Beth Twamley 58:42

Yeah, it could be very mini. Or, you could have some, if there's truly no access to any sort of cognitive rehabilitation or psychotherapy that could incorporate cognitive rehabilitation into it, then maybe the CogSMART app might be a good choice. At least someone could do that in a very self directed way and see if there are any strategies that they find that could be helpful.

Ryan Van Patten 59:06

Right. I could see so many different ways that this could be used clinically. I'm thinking about when a neuropsychologist finishes the evaluation, and then you've got recommendations. Sometimes that's the point where we bow out as we provide recommendations, and then that's it. But having CCT available means that that's not necessarily the end. Maybe the ideal would be to finish the neuropsych eval, and then go through 10 to 12 weeks of CCT with that person, either yourself as the original clinician or referring to someone else. But then, like we've talked about, there's an infinite number of points in between there. You could conduct five or six, or at least you could have an extended feedback that includes a few of the strategies, booster sessions. It's nice that we have so many different options. Do

you think, Beth, that the ideal would be if we could set up a system where after a neuropsych eval, if it's warranted, then the patient goes through a full 10 or 12 weeks?

Beth Twamley 1:00:08
Yeah, I mean, I think most patients in a clinical setting would probably want to pick and choose domains that are of significance to them and maybe decide, along with their clinician, what to focus on.

Ryan Van Patten 1:00:19
Yeah. That makes sense.

John Bellone 1:00:22
I'm going to start incorporating this more into my practice.

Beth Twamley 1:00:25
Great.

Ryan Van Patten 1:00:27
Well, I feel like we've covered CCT quite well. This has been really helpful so far. I think we can pivot a bit and I'd like to ask you a few professional questions, Beth, if you don't mind. One thing that has probably been clear to our listeners that's unique about this conversation is just how much ground we've covered in terms of psychopathology and neurological disorders. Your professional life cuts across the DSM very well. I can imagine there being challenges and benefits to wearing so many hats to knowing the literature in TBI, SMI, depression, hoarding disorder. Can you talk about both the benefits and some of the challenges of that?

Beth Twamley 1:01:08
Yeah, there is a lot of literature to catch up with and try to stay current on so that's a challenge. I think it's hard to develop expertise across a number of different populations like this. And, certainly, I have some expertise in severe mental illness and TBI. I would not be recognized as any sort of expert in depression, hoarding, neurodegenerative diseases, and so on. I think having some experience in those areas is great, but if you really want to be an expert, I think limiting it to just one or two populations is probably the way to go. On the other hand, working in all these different populations is really interesting. It's never boring. I always get to learn about new populations and what their cognitive challenges are and what their

openness to these sorts of interventions is. And then we can go from there and design interesting studies.

Ryan Van Patten 1:02:04
Right. Another benefit to that is you're not confined to DSM categories. We know that depression and bipolar disorder and schizophrenia are not truly fully separate entities and yet, we treat them that way because that's how it's written up in a book. But your approach is more consistent with like the research domain criteria, more of a dimensional approach to how psychopathology really exists. It's nice.

John Bellone 1:02:28
You've also written several manuals to inform treatment. Can you give us and our listeners a brief overview of the process of writing a treatment manual? What goes into that?

Beth Twamley 1:02:40
Yeah, sure. I think it takes a long time to write these treatment manuals. I think you have to be prepared to really almost constantly try to improve them and update them. I think, in the beginning, you want to sketch out what kind of content you want to deliver, try to divide that content into some logical chunks that might eventually become sessions, and then maybe write the outlines of each session and write the text that you want to include. Then of course, you have to simplify it and make it more patient facing and make it pretty. That's a fun part of it for me. Then, you possibly want to make a therapist version to go along with the client version that you've developed. I really think that's important so that the therapist and the clients are literally on the same page in the manual at the same time, and they're all looking at the same content. I think the manuals are very transparent. There's nothing in there that is secret, or that we want the therapist to know but not want the patient to know, and so on. I think it's really important to get feedback from clients and clinicians all along the way, every step of the process. When you try it out, you want to get more feedback. Just keep iterating and revising, trying to make it better each time.

John Bellone 1:04:00
You didn't find publishers for these. This was self published.

Beth Twamley 1:04:06

The copyright is through the University of California because I was wearing my UCSD hat as I developed the first version. But this is not technically published. I guess it's published online. Anyone can use it, though. So there's no problem.

John Bellone 1:04:23

Yeah. The decision to make it open source, was that part of that decision?

Beth Twamley 1:04:30

That was very purposeful. First of all, I'm not really a business person. I don't really have an interest in developing that expertise or encountering those problems and challenges. [laughs] I wanted to give it away from the very beginning. I also thought that that was really important to do to get it in use. I really wanted to see, does this work? Do clinicians like it? Do patients like it? Do they find it helpful? If you charge money for it, that's just such an impediment to people using it. So that was not important to me.

John Bellone 1:05:08

That was very generous.

Ryan Van Patten 1:05:09

I'm so supportive of that. It's such a humanitarian decision. I mean, you could have made quite a bit of money from it, but then it would have been limited to those folks who can afford it and, you know, far fewer people could have benefited from it.

Beth Twamley 1:05:22

Right. It's the same thing that you guys are doing by giving NavNeuro away, right? You're giving this information away for free because you want people to hear it.

Ryan Van Patten 1:05:30

Yeah. agreed. One final professional development question. Most neuropsychologists are primarily assessors, evaluators, we're very skilled at determining and delineating what the problem is, and then making good recommendations to help that patient. But you're part of a subset of neuropsychologists, who is also an interventionist. I think this is incredibly helpful and important. Can you speak to the utility of having those intervention skills as well?

Beth Twamley 1:06:03

We all learn these skills in graduate school, right? We're all psychologists before we become neuropsychologists, and so we should have some basic intervention skills under our belts. As neuropsychologists, I think we really have to decide, are we going to be primarily in the assessment world? Or do we want to straddle both? Or do we want to be primarily interventionists? Certainly, people are drawn to different aspects of neuropsychology practice, and that's just fine.

John Bellone 1:06:31

So that would be where most interviews would end. We have a couple of bonus questions for you, though, that we ask everybody. These don't have to be specific to CCT. The first question is, if you could improve one thing about neuropsychology as a field, what would it be?

Beth Twamley 1:06:46

I'm going to cheat and give you three.

John Bellone 1:06:49

[laughs]

Ryan Van Patten 1:06:49

[laughs]

Beth Twamley 1:06:49

But they're related. So, alluding to our last question about being an interventionist, I think neuropsychologists need a lot more training in intervention work. To me, assessment is really only about half the story. Once you have some results for someone, you've got to decide what to do about their impairments. So I think more training in interventions is important. More research to establish the evidence base about what works in terms of neuropsychological interventions, and more funding to support that research.

John Bellone 1:07:24

Emphasis on the funding. [laughs]

Beth Twamley 1:07:27

Yeah. [laughs]

Ryan Van Patten 1:07:27

There you go. What's one bit of advice that you wish someone had told you while you're in training, or that someone did tell you that really made a big difference? So what we're looking for is an actionable step that trainees can take that they may not have thought of which can improve their training and performance.

Beth Twamley 1:07:42

I was thinking about this last night. And, again, I couldn't confine myself to just one response.

Ryan Van Patten 1:07:48

Is it three? I know you like three. [laughs]

Beth Twamley 1:07:51

I have three. [laughs]

Ryan Van Patten 1:07:51

[laughs]

Beth Twamley 1:07:51

So, yeah, I've got three. The first one is something that Mark Bondi told me when I was trying to consider what type of postdoctoral fellowship to pursue. He said, it's very easy, if you decide that you don't like research, it's very easy to become a clinician because you're going to be licensed and then you can just go be a clinician. But if you really focus on clinical work first, it's very hard to then try to get back into research if you've left research for a while. So I really took that to heart. I liked clinical work and research and didn't know, frankly, which direction I wanted to pursue. He convinced me to give research a try first, which has turned out to be a really good fit. So thank you Mark Bondi. Number two. This was Mr. Nakano, who was my high school math teacher.

Ryan Van Patten 1:08:38

Nice.

Beth Twamley 1:08:38

[laughs] I think I've said this to you, Ryan, before, [he said] "Slide into the low A. Don't kill yourself to get the high A, because an A is an A." What we have to do is not let our own perfectionism get in the way of progress. I think over time in your

career, you learn what needs to be done well and what just needs to get done. Learning that as soon as possible will save you a lot of time.

John Bellone 1:09:06
I like that a lot.

Ryan Van Patten 1:09:07
Yeah, prioritizing. I know from being a trainee, it's easy to really perseverate on details. I know, in the past, I may have spent 20 or 30 minutes before sending an email, reading it and rereading it - that perfectionism. But then that limits my overall productivity.

Beth Twamley 1:09:24
It's related to another quote that I've heard repeated a lot, which is that "a good dissertation is a done dissertation".

Ryan Van Patten 1:09:31
[laughs]

John Bellone 1:09:31
Yes.

Beth Twamley 1:09:31
Right. You could spend four hours on a graph or a table or formatting a certain section of your dissertation. But, really, what you need to do is write it and just get it done.

John Bellone 1:09:42
Of course, there's a balance, right? Like, you know, in an email, you don't want typos. So read it a couple times, but don't perseverate to the nth degree on it. Yeah. It's a balance.

Beth Twamley 1:09:52
Then the third one, this was - actually, I don't know who to attribute this to. It was something that we talked about a lot in graduate school. The idea was that competent people land on their feet. If you've earned a doctoral degree in psychology, you're a competent enough person, right? That you're going to be able

to land on your feet. I think, if you believe in your own basic competence, if misfortune strikes, you are going to be able to rally and pivot and do something different and adapt and find new ways to succeed. I think people need to believe in themselves enough to do that. We're lucky to have a career where we have a trade associated with it. We have a lot of different directions that we can go in - we can do clinical work, we can teach, we can do research, we can do consultation. Lots of different options for jobs. Not all career paths are so flexible. I think we really need to believe in ourselves, and then take advantage of that flexibility.

Ryan Van Patten 1:10:48

That's great advice, Beth. Thanks. So now that we've covered good advice for trainees, we want to finish up asking for advice for early career professionals. Once we hit that point of getting licensed, becoming a faculty member, then moving forward from there. Specifically, I'm thinking about how the healthcare landscape is changing rapidly and we want neuropsychology to remain relevant and useful, of course. Once we are established as neuropsychologists, what steps can we take to ensure that we're continuing to provide cutting edge scientific and clinical services for the next 10, 20, 30 years?

Beth Twamley 1:11:22

I think we can't ignore the role of technology and how that's already changing our field. A lot of assessment will become automated. A lot of assessment will become self directed. I think people will be logging on to websites and assessing their own cognition and then going to their doctors and saying, "What do I do about this?" We need to be prepared to deal with that sort of question. Again, that leads more into interventions, right? So if people are doing their own assessment, or if machines are doing the assessment for them, then we really need to be able to pivot toward interventions.

Ryan Van Patten 1:11:57

Right. That reminds me of our discussion about direct to consumer testing. People are becoming more powerful, having more autonomy with our own health information overall. This is another example. Like you said, people [might] be able to log in online and take a quick computer test then, like today, they're already bringing their 23andme results into their PCPs office or to us sometimes. [laughs] But they could also bring us cognitive results and ask us what they mean and what to do about them.

John Bellone 1:12:28
Yeah. Agreed. Ryan kind of snuck in that third question in there. I think we're going to do that from now on, because I think it's a really good question, how to remain relevant as a field going forward. I'll expand it from now on.

Ryan Van Patten 1:12:43
Yeah, for sure. Well, that's all we have. Thanks so much, Beth. This has been wonderful.

Beth Twamley 1:12:48
Thanks for asking me to do it.

Ryan Van Patten 1:12:50
Yeah, of course.

John Bellone 1:12:51
Thanks so much.

Ryan Van Patten 1:12:55
Well, that does it for our conversation with Beth. If you found today's episode interesting and engaging, feel free to share your thoughts and/or questions on our website at navneuro.com. And join us next time as we continue to navigate the brain and behavior.

🔊 **Exit Music** 1:13:12

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