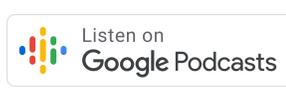


104| D/deaf and Hard of Hearing Neuropsychological Evaluations in Children – With Dr. Jennifer Reesman

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This is an audio transcription of an episode on the Navigating Neuropsychology podcast. Visit www.NavNeuro.com for the show notes or to listen to the audio. It is also available on the following platforms:



Speakers: Jennifer Reesman, 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, brought to you by INS. I'm John Bellone...

Ryan Van Patten 00:26



...and I'm Ryan Van Patten. Today we speak with Dr. Jennifer Reesman about neuropsychological evaluations in children in the deaf and hard of hearing community. Jen is board certified in clinical neuropsychology and pediatric neuropsychology through ABPP and works at the Chesapeake Center in Maryland. She provides services in English and in American Sign Language, and has extensive experience with this community so we were lucky to have her join us.

John Bellone 00:56



We understand that this is an audio only podcast, which may seem limiting for the very people who we are talking about in this episode, but we now offer transcripts for all of our episodes, including this one, with the idea of making our content as accessible as possible. We think that this topic is extremely important for neuropsychologists, both those who are hearing and those from the DHH community. So, with that, we give you our conversation with Dr. Jennifer Reesman.



Transition Music 01:22



John Bellone 01:31

Jen, welcome to NavNeuro. We're really excited to have you on the show.



Jennifer Reesman 01:34

Thanks, it's a pleasure to be here talking about a topic near and dear to my heart.

John Bellone 01:38



Let's start off by clarifying some terminology. So capital D, Deaf, from my understanding, refers to people in the Deaf community who share a language, such as American Sign Language, and also a culture. Whereas lowercase d, deaf, typically refers to the medical or audiological condition of having lost the ability to hear. I'm curious to hear from you, if you wouldn't mind, talking about these terms as well as the terms hard of hearing or hearing impaired or affected by hearing loss or any other terminology that you think we should know.

Jennifer Reesman 02:12



So when we talk about deafness and hearing loss, typically an abbreviation that you might see commonly is DHH for deaf and hard of hearing. There's been a lot of terms used over time as well. A generation ago, folks might have referred to little kids as being hearing impaired and they might have abbreviated it HI. The National

Association for the Deaf in the United States has a lovely website that has a good primer on terminology. That's a good resource that I point folks to. That is where they clarify that, yes, the Deaf community in the United States - and I should clarify, I'm a hearing person. So I'm talking about this from a hearing person perspective, sharing the perspective of what the National Association of the Deaf says that they would like to be called in the United States, and that they prefer the terms DHH, or deaf and hard of hearing, to refer to themselves as a community and that, oftentimes, when you see it written, you might see a capital D used to refer to a cultural and linguistic community of the Deaf community and that sometimes, in writing, you might see a lowercase d, as you said, referring to the medical condition that is hearing loss or deafness.

Ryan Van Patten 03:18



We should highlight right up front that there's a lot of diversity and heterogeneity in the DHH community. I'm sure we'll talk about this throughout the conversation. For now, can you give us some basic information about the culture of the capital D, Deaf community? Just enough to set the stage for our discussion.

Jennifer Reesman 03:35



One thing I like to do in a lot of my talks whenever I'm talking about this as a professional or talking with colleagues, talking with students and trainees, is say that, in the Deaf community, when we're talking about the cultural aspects of the Deaf community, it's pretty typical to give a nice warm introduction that includes a lot of connections to the community. So, how are you related? If I were to introduce myself in line with that, I'd say, "I'm Jen Reesman. I'm a neuropsychologist. I got my PhD from Gallaudet University. Gallaudet is one of the universities that at the undergraduate level is specifically for deaf and hard of hearing students. At the graduate level, they do allow hearing students in. It is a bilingual university so the language of instruction they use there is American Sign Language." So that's one of the things in Deaf culture. You talk a lot about your connections to the community, as well as just a little bit about yourself. So that would be my Deaf culture community introduction here.

Ryan Van Patten 04:30



Great, thank you. Tell us a little bit about hearing loss in children. My understanding is that only a minority of deaf children are born to two deaf parents, something like roughly 5% or so. This will be important as we continue our conversation, but roughly how common are hearing loss and deafness in children and what are some common causes?

Jennifer Reesman 04:51



When we talk about children who are born deaf or hard of hearing, or identified as deaf or hard of hearing shortly after birth, certainly we notice one thing about the incidence of hearing loss and deafness itself is that none of our senses, and particularly hearing, remains unscathed as we age, right? So the incidence of hearing loss increases as we get older, particularly high frequency hearing loss. But when we're talking about children who are born deaf or hard of hearing, we do know that there are not as many deaf children born to deaf parents. That is a relatively smaller minority. The figure that's put around is about 90% of deaf children are born to hearing parents. So, for many parents, that does mean that the first deaf person that they've met is their child with hearing loss or is their child who is deaf or hard of hearing themselves. This is also where things have changed over time because of the advent of universal newborn hearing screening programs, both in the United States as well as globally, have really spread and have been pretty much the law of the land since the late 90s to early 2000s. We have a lot more children who are identified as being deaf or hard of hearing from birth, as opposed to a generation ago where you might not have seen these children identified as having hearing loss until they weren't talking, until people started to get concerned about their milestones, until after about 2 years old. The advent of universal newborn hearing screening has really helped us to make sure that families, that parents, that children receive more timely early intervention services to help make progress on their language development because it is something that you can't really see. Although with different forms of hearing loss, certainly there are syndromic forms of hearing loss that go along with other physical features or characteristics and there are other types of genetic forms of hearing loss, where you might see a physical feature going on with the hearing loss as well.



John Bellone 06:48

Regarding some of those potential etiologies, could you tell us what is sensorineural hearing loss?



Jennifer Reesman 06:53

Yeah.



John Bellone 06:54

How it differs from conductive and mixed hearing loss?



Jennifer Reesman 06:57

So you've got your two different main categories or buckets of hearing loss when audiologists are describing what hearing loss looks like. When we think about

conductive hearing loss, we think about sound waves traveling to the ear and something gets in the way of that sound conduction getting to the middle ear. The main common causes that we can think about related to that include ear infections, otherwise known as otitis media, temporary blockages of the middle ear - anybody listening who has little children knows that they like to stick beans in their ear, that can cause some temporary conductive hearing loss.



Ryan Van Patten 07:34

[laughs]

Jennifer Reesman 07:34

Beans, Legos, Q-tips - all the stuff that shouldn't go in your ear that can. We also know that early and chronic conductive hearing loss in the form of, say, early or chronic infections that were left untreated can actually lead to permanent hearing loss and change in hearing status. So when we think about conductive hearing loss, that can be either acquired or congenital present from birth.



Then your second bucket of hearing loss when audiologists try to characterize it really talks about sensorineural, and that can be a disruption in the cochlea itself or within cranial nerve eight (CN VIII). A lot of times when we think about that it's due to poor hair cell function, and that can also be congenital or acquired.

Then you can have mixed hearing loss where some folks have an abnormality of their cochlea itself that might cause a sensorineural hearing loss with a conductive component. Say, for example, if your cochlea doesn't have the same number of bones and if you have some malformation of the middle or external parts of the ear, that can cause some mixed hearing loss type of situation.

Ryan Van Patten 08:43



You mentioned the hair cells. Those are the cells in the cochlea that transduce sound waves. They change sound waves to neural impulses, like action potentials, so that our brain understands what that information is, right?

Jennifer Reesman 08:56



They're so cool and they're so underrated. Whenever I'm giving a presentation and talking about the hair cells, there's a lovely dancing hair cell [video] that I recommend anybody go look for on YouTube where they've put in the electrode into the hair cell and then looked at what happens to these hair cells in response to stimulation. And they move! They actually grow. There's a lovely one of a hair cell doing "Rock Around the Clock" and it moves in response to the music. So, yes,

they're pretty cool. They do wave. They can also get damaged really easily. The CDC has a lovely campaign about protecting your hearing and "How loud is too loud?" because those hair cells are really sensitive to damage, which is also why the incidence of hearing loss increases as we get older. So it's something we need to be sensitive to across the lifespan of our patients, really.



John Bellone 09:47

We'll link to your dancing hair cell and all the other resources...



Jennifer Reesman 09:50

Oh, yeah.



John Bellone 09:51

...in our show notes.



Ryan Van Patten 09:52

[laughs]



Jennifer Reesman 09:52

That's fantastic. Everybody can enjoy a good dancing hair cell video. It helps bring neuropsychology to life.



Ryan Van Patten 09:58

Awesome. Tell us about genetic nonsyndromic hearing loss.

Jennifer Reesman 10:04

So, genetics. We used to think about different forms of hearing loss and different etiologies of hearing loss. There's genetic hearing loss. There's spontaneous hearing loss, that happens. We also know that the most common form or etiology of hearing loss is unknown. But when we think about genetic causes of hearing loss, there's some that just purely affect hair cells and purely affect some of the sensorineural basis of hearing. One of the big ones that people should know about, neuropsychologists especially, and it's commonly tested for in some of the genetic workups of children with hearing loss is connexin-26, also known as GJB2, or gap junction beta 2 protein. That's one of the more common genetic forms of hearing loss which is not associated with any kind of negative cognitive impact. It really only impacts hearing. It's recessive, so many folks walking around that are hearing folks, like myself, may be carriers for that and simply don't know it.



Ryan Van Patten 11:06

Got it. A little later we'll ask you about psychiatric and emotional conditions that are relevant to the DHH community, but, for now, I'd like to hear you talk about common medical and neurodevelopmental risk factors and co-occurring conditions. There's the TORCH acronym and mnemonic for the medical etiologies of hearing loss in children.



Jennifer Reesman 11:26

Yeah.



Ryan Van Patten 11:26

So T and O for toxoplasmosis and other infections, R for rubella, C for cytomegalovirus, and H for herpes. What would you like us to know about this?



Jennifer Reesman 11:38

Can we get back to the C of the TORCH? Cytomegalovirus. Here we are recording this in the time of another C, in the time of COVID, when COVID gets a lot of attention and CMV does not get as much attention. This is a lesson for everybody to be thinking about cytomegalovirus as one of those common viruses that is out there. It is one of those viruses that can cross the placenta and can impact the developing child. That is typically only an issue if mom acquires a CMV infection while she is pregnant and mom is CMV negative. Lots of people walking around already have antibodies to CMV; however, it's not something that is routinely tested for in pregnancy so many pregnant women are not aware of if they're CMV positive or CMV negative. It's really unfortunate that it doesn't get a little bit more attention in some of our media coverage in terms of talking about prenatal infections and things that are important to know about because the common way to prevent it is washing your hands and that just doesn't garner media coverage. But CMV infection is a pretty common cause of deafness. That is important for neuropsychologists to know about because we do know that it's also associated with other neurodevelopmental conditions such as autism, such as intellectual disability. So it is something that may come to neuropsychologist's attention a little bit more frequently than other causes of hearing loss, which is why it's important for us to know about. All of those TORCH infections are really important for us as neuropsychologists to be aware of and know about, but also how they can affect our senses in other ways. Another common one that it's important to know about but may not always be documented well in medical records or medical conditions is alcohol. Alcohol during pregnancy can also be associated with hearing loss after birth as well.

Ryan Van Patten 13:34



Many people who are deaf from an early age communicate using sign language. In the US, we often use American Sign Language, or ASL, although there are a few 100 different varieties of sign language all around the world. Even though the word language is in the name, it can be easy for hearing folks to forget that this is truly a language because we tend to associate language primarily with the spoken word. Sign language is not the same as gesture or pantomiming. In sign language, meaning doesn't just come by looking at the signs as if they were pictures. There's a linguistic structure, syntax, semantics, and other language dimensions. What else do you want to add or what else should we know about ASL or sign language in general?

Jennifer Reesman 14:18



You hit on some of the big things - that sign language is not universal and that sign language actually has a really rich history. When we think about the historical roots, and there are fantastic sign language linguists out there that can articulate this a lot better than me, but American Sign Language is actually heavily related to French Sign Language and is also very different from other English speaking countries and their sign language. So, for example, Irish Sign Language and British Sign Language are very different from American Sign Language. Even though our spoken languages share a common English, our sign languages are different. So, it's very good to be aware that there are international differences. This comes up particularly in practice across the globe when we have deaf individuals in refugee situations fleeing. I know in my clinic, we've seen some deaf individuals coming to the United States at school age, and really struggling to ensure that they were provided good access when they might have had exposure to a completely different sign language that nobody in the US or in their immediate environment had strong access to. So putting another demand on the child in terms of learning the language of a new environment.



John Bellone 15:32

I'm also curious how ASL differs from so-called Cued Speech.

Jennifer Reesman 15:37



Cued Speech is something that you use your hands to do. Cued Speech represents the phonemes of the language - the spoken phonemes, the sounds that you make - and uses your hand and positioning around the face, as well as some movements, to make that visual. You can cue any language. You can cue Spanish, you can cue French, you can cue English. It simply takes the phonemes of that and uses that in combination. You can also cue with either hand. I once went to a cue camp where I

attempted to learn cued American English. I will say it's very challenging, but it can be done. There are resources for individuals to learn Cued Speech. Cued Speech was actually invented and developed by some folks at Gallaudet University. So [when] we think about Gallaudet, we think about American Sign Language. Cued Speech is not one of the main languages used on campus, but there are people that use it. And there are thriving cueing communities where people teach each other Cued Speech and might use that. It is another adjunct, but it really is not its own language. You are cueing, you are making visible the sounds of your spoken language.



John Bellone 16:53

So these are people who speak English for the most part?



Jennifer Reesman 16:58

For the most part. There are a lot of deaf and hard of hearing individuals who might use cochlear implants or hearing aids and use Cued Speech as a way of having visual access to disambiguate some of the sounds. Because if you're looking at somebody's mouth - and if you've ever done the little lip reading test of "olive juice" and "I love you", you know that if you're listening to the podcast, or reading the transcript, they sound very different. But if you're looking at somebody's lips, without the sound coming out, or with grainy feedback or something, it can be hard to disambiguate and know, "Were they asking for olive juice? Or did they tell me that they loved me?"



Ryan Van Patten 17:39

[laughs]



Jennifer Reesman 17:40

But when you use Cued Speech, it disambiguates it and it looks different. I wish I could demonstrate cueing, the difference between the two. I obviously need to go back to cue camp for a refresher to be able to do that.



John Bellone 17:54

Yeah, it's obviously very important to distinguish between "olive juice" and "I love you". You can get into trouble if you can't. [laughs]



Ryan Van Patten 18:00

[laughs]



Jennifer Reesman 18:01

It's all about good communication.

John Bellone 18:03



[laughs] As we had mentioned earlier, most children who are deaf or hard of hearing are not born to two deaf parents and hearing issues sometimes go unrecognized in children which, from my understanding, can lead to a language deprivation syndrome where the child doesn't hear well enough to learn language through auditory means and they haven't yet started learning sign language. This is related to the idea of critical or sensitive periods of language development, where a child is not receiving the sensory input necessary for expected language-based brain development. How big of a problem is this syndrome from your perspective?

Jennifer Reesman 18:43



I'm so glad we get a chance to talk about it because it's one of the biggest things that I see people overlook. I think it's an area where we, as a field of neuropsychology, can actually do a lot of good to recognize the importance of the brain of our patients, but also the importance of the environment, their stimulation, and their access to the things in their environment. You touched on a number of important topics that I feel like we should dive into a little bit more, right?



John Bellone 19:15

Sure.

Jennifer Reesman 19:15



Because you have this child, or this baby, and their brain is primed for language. It starts from the minute you're born that children are ready to acquire the language that is around them. That's one thing that I want to make sure that we lay out as a baseline. All deaf infants that are born have the capability to acquire a language. One of the things that we see that's really unfortunate is that not all deaf children have the opportunity to acquire an accessible language to them. That really gets to [the question], if there is not a language that's around you that you have access to, how can you acquire it? That's a pretty silly expectation for us to expect somebody to become successful in reading Braille if they were never taught how to read Braille. So when we have no access to language going on for a child who is deaf or hard of hearing, and we are only providing them with a modality of input that may not be accessible to them - which is one of the reasons why newborn hearing screening programs are so incredibly important and follow up for them. I will say they're not perfect. Newborn hearing screening programs will miss some deaf children. There are forms of hearing loss that we know that can impact children

after birth. We know that there's acquired forms of hearing loss - there's accidents, there's traumas. There's all sorts of reasons why hearing can be impacted later in life. But particularly for children who are born deaf, having access to a language from birth, from infancy, is really crucial. All of these children and infants have the capability for acquiring language if they're provided with that accessible language. For most deaf children, that's going to be sign language in terms of the access that they would have.

A major push behind newborn hearing screening programs also has to do with access to technology like hearing aids or cochlear implants in order to provide that auditory access. But, again, this is where I think, as neuropsychologists, we also know that our brains are complex. One of the most important things I hope your listeners walk away with is knowing that our ears are connected to our brains. So even if we stick hearing aids on a child, or if they have access to a cochlear implant, we, as neuropsychologists, know that that's just part of it. That's just one baby step towards full language access and understanding. As neuropsychologists, we're very aware that you can have perfectly intact hearing, but have a whole host of conditions that impact your ability to understand language, to produce language, and to be able to understand the language that's going on around you.

Let me stop there and just say we've taken one baby step there, but when we see that children don't have access to language, it can cause a whole host of related downstream negative impacts and effects. There's other folks who've done a lot of work to indicate that when we look at the prevalence of things like hearing loss and learning disabilities within individuals who are in prison or individuals who are in psychiatric institutions that many times when you go back in the history there may be diagnosis that gets thrown on to an individual, but a lot of times what you're dealing with is at the root of it is some language deprivation. Dr. Gulati up at Boston Children's and up at Harvard has been a big proponent. He is a Deaf psychiatrist who talks a lot about the importance of recognizing and naming language deprivation syndrome when it happens.

John Bellone 23:04



Great. We'll definitely get to some of those downstream effects in a minute or two. I'm curious if you have a sense for deaf children who learn to sign as their first language. When do they typically begin learning to read English?

Jennifer Reesman 23:20



Oh, great question. Just one quick point of clarification: So, in terms of language development progression, if we're talking about sign language development, there's some research out there that's very compelling that indicates that you might see

emergence of first signs before you see emergence of first spoken words in infants. That is really compelling because we know that the motor coordination required to produce words with the mouth is a little bit more sophisticated and takes a little bit more developmental time than it does to move your hands into your first sign as a baby sign. We do see a difference of a couple of months and we know that there's a big push for lots of folks to use baby signs and things like that. But your question was...

John Bellone 24:05



Sorry, before we go into my question, because what you just commented on was really interesting, too. So you're saying not just for deaf children but all children have that capacity to learn signs first?

Jennifer Reesman 24:16



Yeah. I think anyone who has a new baby at home probably recognizes or thinks about or all of a sudden finds that their social media feed is full of advertisements for baby signs, right?

John Bellone 24:29



[laughs] That's true.

Jennifer Reesman 24:30



That's been really popular. If you read any of the backs of those advertisements, they usually say things like, "Take advantage of your child's brain and their ability to communicate through sign earlier than they can through spoken language", which is entirely true.

John Bellone 24:47



My baby sign language was pretty strong when my daughter was a few months old. Now I kind of forgot most of it. [laughs]

Jennifer Reesman 24:54



[laughs] Baby signs are great for everybody.

John Bellone 24:56



Yeah. But in terms of the acquisition of English, I'm very curious about that.

Jennifer Reesman 25:03

So in terms of the acquisition of English and in terms of the process [of learning] to read, that's where we also need to talk about - so are we talking about a deaf individual who has a solid base in their, what we'd call L1, their first language of ASL? We know from a lot of research that children who have a stronger foundation in American Sign Language do go on to become more fluent and better English readers at typically the same pace. I think that that's an important thing to know and recognize because one of the things that gets thrown around as an oft cited statistic is that deaf individuals don't end up reading at the same rate as hearing individuals. When we unpack, "Well, why is that?", well, one, that's something that comes from educational research of deaf and hard of hearing children that was done before there was strong newborn hearing screening. So I just want to point that out. It's one of the things that is a pet peeve of mine when people go and talk about, "Well, I read this study that said that deaf people do this, that, and the other." Oftentimes, when you go and you unpack that study and you say, "Well, how old are these people that they were studying? And when were they born? Were they even born at a time where they had access to things like universal newborn hearing screening to identify folks who are deaf and hard of hearing prior to age 2?" Sometimes they didn't. So we know that educational outcomes for deaf and hard of hearing used around the world and in the United States need work. That is one of the biggest areas of need - to ensure that deaf and hard of hearing children have strong access to language, particularly literacy and reading. One of the best ways to improve that is by ensuring that deaf or hard of hearing children have access to a strong foundation in language, typically that's through sign language, or ensuring that there is access to auditory information.



Then it gets to, "Well, how are we teaching them to read?" And that's where the educational programs and services and supports for deaf and hard of hearing children really vary around the United States. When I say that they vary, it means that there's different philosophies of education, and then there's different ways of funding it and accessing it. So, in my state, in Maryland, for example, parents can choose what type of a classroom or school placement they would like their child who's deaf or hard of hearing placed into. Every child who is deaf or hard of hearing in the state of Maryland, their parents can choose to send them to the State School for the Deaf, which is the Maryland School for the Deaf. It's a state run public education. There's no tuition, it's not a private school that parents have to pay for anything like that. Or they can go to their local public school. Local public school programs around the state differ. Sometimes parents are asked to decide when their child is in preschool or kindergarten, "Would you like your child who's deaf or hard of hearing placed into a spoken language classroom? Or into what they call a SimCom class? Or would you like them placed into a Cued Speech classroom?"

When we talk about reading and deaf children, we also have to recognize what their educational experience has been. Across the United States, it's hard to say that all deaf children receive this type of educational experience because they don't. It can vary greatly and sometimes the criteria for who is allowed into what placement varies dramatically. Whereas in the state of Maryland, any parent who has a child who's deaf or hard of hearing can send them to the State School for the Deaf and the language of instruction there is bilingual, they use ASL as well as English for instruction versus at some local public school programs you might have a child who's in a spoken language only classroom so that child is not learning ASL alongside of their English. If they do not have good auditory access to information, it might be a lot more challenging for them to crack the code of the phonics of reading, which is how we are teaching reading. That's where you'll see a lot of different things going on. There's the auditory access to phonics and phonetic decoding of English. There's also programs called Visual Phonics, which again, as we were talking about that disambiguation, or making visual some of the phonetic differences, that's a way of teaching English reading. There's also a lot of emphasis in some programs on sight words, and on the memorization of what it is that an individual is reading in English.

Ryan Van Patten 29:46

Great information there. Yeah. Thank you. I wanted to go back to - you mentioned L1 and the importance of the first language that a child learns. We've been talking about how sign language is truly language and there are language mechanisms in our brains that are related to these critical or sensitive periods of development. So if a child misses a critical period and does not acquire any language, which can happen in deaf and hard of hearing children, then that makes them vulnerable to language problems later in life, right? We want deaf and hard of hearing children to have exposure to one or the other. It could be sign language, it could be English or another spoken language if they can hear well enough to receive it. But my understanding is that what happens to those children is that many of them are born to hearing parents who don't sign and the child doesn't get the spoken language so well because they have hearing problems of some kind, so their language mechanisms in their brain have not developed in the way we would like. The L1 isn't there, and then that leads to developmental issues. Is that all about right?



Jennifer Reesman 31:02

Yeah, that is all about right. I think that there are a couple of misconceptions where I feel like neuropsychologists are well-positioned to provide psychoeducation, education to families, as well as to teams who might be grappling with this if this is a question that comes up. I think it also comes up and I know you've had



conversations with folks in neuropsychology talking about doing assessments of individuals who use multiple languages. When we think about it, particularly children with neurodevelopmental concerns or differences, sometimes there's this old-fashioned advice out there of don't expose the child to more than one language. It will "confuse" the child and their brain, right? As neuropsychologists, I feel like we all look at that and go, I don't think I've ever seen a brain that gets confused by multiple languages. There's no brain injury that happens when you grow up in a household that speaks multiple languages. Many countries across the world expect their children to become fluent in multiple languages and their brains aren't much different than brains of children in the United States. It's simply our educational philosophy in terms of how we approach teaching multiple languages to children. We know that earlier is better. One thing I like to explain to families who are grappling with this when they say, "Well, should I just sign or should I just do this? And should I limit...?" Particularly families with deaf or hard of hearing children who may have extended family members, grandparents, that speak another language. They say, "Should they tell them not to speak Spanish around my deaf child who uses hearing aids or uses a cochlear implant?" What I'll often remind them is that they're not going to get away with not being exposed to spoken language. Spoken language is all around us. The deaf child may not have as much auditory access to that language, but it's not going away. It's really hard to avoid it, even when you go to Gallaudet. I can say that as a hearing person who went to Gallaudet University. There was still spoken language around me, a ton of it, and in the world and on TV and everywhere else. But what we need to support is the access to the accessible language or the sign language for the deaf or hard of hearing child in order to make sure that they can get access to that first language.

John Bellone 33:23



Can you talk a bit more about cochlear implants, which is the intervention for improving hearing that involves an electronic device that stimulates the auditory nerve? Tell us about indications and contraindications for the implants. How well do they work? Anything else you might know. I'm curious if there's a stigma in the deaf community, you know, watching the Sound of Metal, I'm sure a lot of people saw that movie.



Jennifer Reesman 33:45

Yeah.



John Bellone 33:46

Just your thoughts in general.

Jennifer Reesman 33:48

Yeah. It's also where technology has changed so much. So when I think back to my days when I was first learning sign language in college, full disclosure back in the 90s, the movie that was out was Sound and Fury, and it was a little bit about the cochlear implant debate at that point in time. Cochlear implants have a pretty brief history, where the first cochlear implants trials were done in adults, and then they were approved, and then there were trials by the FDA in children in the 80s. So when we think about it, it's not all that old and that the technology has evolved a long way.

But cochlear implants, in terms of some of your questions, who is it indicated for? Cochlear implants are indicated for individuals who would not have access to spoken language with just hearing aids alone. In the US that is typically for infants that are 12 months and up. Just pausing for a beat right there. Cochlear implants are not given to 3 month olds, so there is a significant amount of time when children, even if they do qualify for a cochlear implant, are not going to get it until they're at least a year old. This is also a good time to point out and say that, as a neuropsychologist, I still remain extremely concerned about all of the delayed care that we saw during the pandemic. I know I worked with families where their cochlear implant surgery was put off almost indefinitely for a period of time in 2020. I'm very curious to see what those outcomes are going to look like, curious and also saddened. I can say that because we know that along with a lot of those canceled surgeries that were put off for a significant period of time, there also wasn't the typical hearing screening going on in hospitals, early intervention programs weren't happening. So there's a lot of downstream effects that I think we'll be confronting for a long time. But we know that children at [age] 12 months might be getting access to a cochlear implant, and then getting it activated, and then really learning how to hear through that device.



When we think about criteria for cochlear implantation, that's changed over time. It does require audiological evaluation to meet certain audiological thresholds in terms of the severity of hearing loss being such that less invasive maneuvers, like hearing aids, wouldn't be helpful. It is for sensorineural hearing loss. So for individuals who have conductive hearing loss, cochlear implants are not for them. Cochlear implants also are ear-specific. So you can have your right ear implanted or your left ear implanted. The number of electrodes have dramatically increased, so the number of channels and the number of electrodes are implanted into the cochlea.

One of the things that does happen, that is a risk - or sorry, not a risk, but a side effect of cochlear implant surgery in individuals is that the hair cells are then

destroyed. So any residual hearing that that individual had access to is gone. Certainly over time, there's been surgical techniques that have been done to try to preserve as much residual hearing as possible, but it does mean that if an individual does not have access to their cochlear implant - there's an internal portion and there's also an external portion or a processor that goes along with a cochlear implant. So if an individual loses their processor and, as we know, children like to lose things - I've definitely talked with families where they've said, "I've gone through my warranty, and I've gotten the one replacement processor, and they can't find the other one out on the playground." Darn it, that does mean that the child doesn't have access to sound then at that point in time. So there are a lot of considerations with cochlear implants.

It also used to be just a few years ago that you'd only get approval for one ear at a time. So the big debate in terms of cochlear implantation that was in front of children and their families and their doctors was, "Do we implant one ear? Do we implant both ears? Do we do them simultaneously if we're doing both ears? Do we do them sequentially to see how a child adjusts to one ear?" Or another idea that was often bandied around and families that I heard of is, "Do we save one ear for science?" Because things are improving rapidly, technology changes and improves. Then, if so, which ear do we choose to implant if all else is equal? So there's a lot of decision making that goes into that. Typically, as part of getting a cochlear implant, children are going through meeting with an audiologist, meeting with an ENT who's going to do the surgery, and then the best standard of care is they're also meeting with a psychologist or neuropsychologist to identify if there's any other additional neurocognitive concerns or impacts that need to be thought of in terms of post-implant recovery and ensuring that the child and family are really in a best position to make the best use of a cochlear implant because it is a significant surgery.

John Bellone 39:08



Excellent. Well, armed with all of this background information, why don't we start talking a little more about the neuropsych assessment process? I want to get into some issues related to testing and norms, but maybe we can start more broadly. As we already discussed, the timing of diagnosing hearing loss can be critical for a child's language development. So if a child can't hear spoken language well enough to communicate fully then sign language can provide the linguistic input that they need during that sensitive period of language development. How do you go about assessing the degree of hearing and language deprivation in the record review and in your clinical interviews?

Jennifer Reesman 39:46



You said the number one thing: record review. One of the big reasons behind that is ensuring that, as a neuropsychologist, if you're working with a child or an individual who is deaf or hard of hearing, it is important to both talk with the individual and the family and find out what their experience is day to day. Do they have hearing aids and do they use them? Those are sometimes two different answers, right? We all know the folks who come in and say, "Yeah, I have glasses. No, they're not with me. And no, I don't need them." Right? Same thing can happen when we have folks coming in. Different people walk around with different understanding of how their sensory needs impact them on a day to day basis. So getting the individual's understanding is important. Taking a look at what the objective data say and what their audiogram looks like. Audiograms - I will say that audiologists are a neuropsychologist's friend because they will often be really helpful in terms of answering questions. Reviewing an individual's audiogram can let you know what their hearing looks like in terms of how the individual is accessing sounds in their environment. They can also give you information on how well that individual can hear if they, say, for example, use hearing aids or a cochlear implant, with or without those devices. So aided testing is something that is often really helpful to look at so that you know, "Okay, how is this individual doing if they come into my office with their hearing aids or their cochlear implant on? What's their access to the sound look like?" That's number one. That is a fantastic thing to be doing in your record review before that patient comes in.

Ryan Van Patten 41:28



Generally speaking, what level of sign language proficiency should a clinician have in order to conduct a neuropsych eval via ASL or whatever sign language they would be using? Versus when should the clinician refer out? And when should they consider an interpreter?

Jennifer Reesman 41:44



So fluency in sign language is extremely important. Unfortunately, there is a small number of clinicians around the country that are both neuropsychologists or psychologists and fluent in ASL. That number is definitely growing and I will say a lot thanks to Gallaudet University's clinical psychology program in terms of training and providing both Deaf and hearing psychologists to be prepared to serve the needs of a wide variety of deaf and hard of hearing patients. So that is one program that's doing a fantastic job. There are certainly other programs out there that are providing sign language training and expertise.

It is really important as if we're talking about providing an assessment to any other population where the individual coming into your office does not speak the same

language that you have. I would say that your couple of courses of sign language in college is probably not going to cut it to provide a whole assessment in another language. One of the things that I see in doing a lot of record reviews of individuals who had assessments in the whole variety of areas is really well-meaning individuals who just want to communicate with their patients. But I think it's important, again, and I know everybody listening is practicing within the bounds of their competence and doing their best to provide top notch excellent clinical service in an ethical way. We all have bounds. We all have limitations to that. I think it's important for us to recognize, especially as neuropsychologists in assessment situations, that whatever our language skills are, that's going to be the limit for our patient. How are we ever going to know and say, "Oh, wow, this person who came in is the next ASL poet extraordinaire." We're not going to know that unless we also have strong ASL skills.

I think that's a situation [where] if you are an individual who's listening and you've taken a couple of sign language courses but you're not fluent and it's not something that you have the opportunity to use on a regular basis, you're probably going to be best served by consulting with a colleague who might be or in working with a certified interpreter. And I say certified interpreter because I think you don't have to go very far to Google to see examples where very famous people, people in emergency situations, have called who they thought was an interpreter and they got put on TV, and they weren't actually very competent in the language. So that's why I think it is important if you are working with an interpreter to ensure that that individual has some type of certification. In the US, the biggest certification is RID, or the Registry of Interpreters of the Deaf certification. If you happen to be practicing in some states in the US, actually, interpreters are licensed. So, for example, in Illinois, interpreters are licensed. Interpreter licensure has not passed in my state, in Maryland, yet but that does happen in a few states where there's actually a requirement for licensure or certification.

John Bellone 44:37



You talked about lip reading a little bit earlier. I am curious how common lip reading is and whether it could ever be sufficient to avoid needing an interpreter. I think I can...

Ryan Van Patten 44:49



[laughs] You know the answer to that.

John Bellone 44:50



...inuit your answer there. But just to talk through a little bit about that.

Jennifer Reesman 44:53



Well, one thing I want to say about lip reading, though, actually, and I feel like we can all recognize this and it's almost one of these things that now it can be said after a lot of masked interactions since 2020, is that now I hope we all realize that we all actually do use lip reading. Hearing people walking around everywhere use a heck of a lot of lip reading. Most people probably didn't realize it until they put on a mask and they realized. I don't know if anyone else, if you two had this experience where you felt all of a sudden, "Is my hearing going? Is there something wrong with me?" And then you realize, "Oh, no, wait. It's just that I had less access to visual information and my brain was using that good visual information along with auditory information to help me understand what was going on in my environment." Am I the only one?

John Bellone 45:44



No, yeah. It's not just understanding the phonemes and what they're saying, but also their emotion and reading it on people's faces has been diminished by the use of masks for sure.

Jennifer Reesman 45:56



Yeah. So I guess in some ways that helps answer your question. We all do use lip reading, whether we like it or not. It's just more visual information to help us get information about the tone of someone's voice, the emotional valence of what they're communicating. But it is also woefully inadequate because without access to the auditory information, we know that we're likely to misinterpret. Our example that we talked about before, the "olive juice" or the "I love you" - that it gives you a tiny bit of information. Without context or without the auditory information, lip reading is really not enough. I think some examples that I've been putting clinically when I'm working with an individual who might have more adulthood-onset hearing loss, so they didn't grow up with sign language or they didn't grow up with that and maybe they're in the process of getting hearing aids or a cochlear implant but they are relying on a lot of visual information and residual hearing. In those situations, I can tell you, I've sat in on a clinical interview where I've had somebody across from me and when this patient looked down to take some notes or write down something that I was saying, if I kept on talking, she totally missed it. So I had to very much control my behavior to pause to allow her to take notes on what she wanted to take notes on before I resumed talking. That wasn't a situation where me signing would have done her any good because she didn't know any sign language prior to losing her hearing as an adult.



Ryan Van Patten 47:35

Let's talk about common referral questions and symptoms to think about, starting with language-based and learning disorders. Language deprivation, as we talked about earlier, can be tough to disentangle from learning disorders but the distinction is really important. This issue can come up in evaluations of hearing patients such as when there are questions about a reading LD in a hearing child who never attended school or if the quality of education was very low. Clearly not being taught how to read is not the same as a reading LD in any child, but the differential diagnosis is especially complicated in DHH children. Can you talk through how to think about this topic?



Jennifer Reesman 48:17

One thing that's important is to avoid diagnostic overshadowing. If a child who has been born deaf or hard of hearing had accessible language from an early age and had adequate instruction - now, I will say, I want to put a pin in that "adequate instruction" because that varied so dramatically since 2020 for many children and was made worse for children with disabilities such as those who are deaf and hard of hearing. That's another bucket of conversation for another day. But, assuming those things happened, we should definitely be making sure that we look at the possibility of learning disability diagnosis because we should not preclude that. Certainly, that's where DSM and neuropsychology principles can conflict a little bit because if you were to just look at a DSM-based definition, they very much exclude sensory disorders as part of that. I think, from thinking through what we know, there is absolutely no reason not to consider those diagnoses if you have all of the other criteria met in terms of access to language and access to adequate instruction. I've certainly seen learning disabilities, I've certainly diagnosed them, both math and reading-based disabilities, in children who are deaf or hard of hearing as well as broader language-based learning disabilities.

When we think about individuals who are struggling with acquisition of sign language, despite access to it and despite absence of other cognitive symptoms or cognitive concerns and other reasons for it, I think those are broader principles that we need to think about. Certainly they can occur. We shouldn't ignore them, but sometimes we need to do a really good job in our history taking to make sure that we have a good understanding of what that individual's access to language and instruction looked like at an early age.



Ryan Van Patten 50:12

Right. So specific learning disorders are possible in DHH children, very important to say. We want to be very careful about ruling out language deprivation in those

children because, as we talked about earlier, they are at risk, through no fault of their own, for language deprivation in early life.



Jennifer Reesman 50:29

Yeah.



John Bellone 50:31

Roughly speaking, how common are cognitive and mental health symptoms in DHH children?



Jennifer Reesman 50:37

They're certainly more common. One of the pet peeves of a lot of researchers and folks working with kids who are deaf and hard of hearing is that just because they are more common doesn't mean that they are necessarily causally linked to being deaf or hard of hearing themselves. I think this is where I really appreciate this conversation and you all getting involved in some of these things and talking about other things that can be associated such as language deprivation where being deaf or hard of hearing doesn't cause language deprivation, but language deprivation itself can be associated with higher risk of mental health, substance use or abuse concerns, criminality, all sorts of other concerns. But, yes, at a base rate level, children who are deaf and hard of hearing are over-represented in terms of mental health disorders, learning disorders, or cognitive disorders, and do come to the attention of professionals at higher rates. Personally, it's one of the things where I feel really strongly about making sure that we are not over-diagnosing those children who come to clinical attention and instead really giving pretty careful clinical consideration before, you know, assigning a diagnosis of autism. Especially when we know that a lot of the screening measures for autism rely on things that assume intact access to sound such as responding to [their] name. When we think about some of the things that pediatricians do - if you check off enough of those boxes, that's going to get you referred to a psychologist or neuropsychologist for assessment. But is it just that this child has hearing loss and that's why they're coming to attention? Those are some important things to me. Same thing with ADHD.



Ryan Van Patten 52:19

Yeah, we want to think really critically about all these things. On the cognitive side, my understanding is that sometimes an infection or another process that causes hearing loss can also cause cognitive impairment because, as you say, the ears are very connected to the brain. So an infection, for example, could cause brain impairment and cognitive symptoms. Roughly how often does that happen?

Jennifer Reesman 52:46



So, as we know, CMV, or when we think about hearing loss related to fetal alcohol effects or alcohol related neurodevelopmental disorder. Any of those types of things are going to have a higher risk of hearing loss as well as then be associated with neurocognitive effects. So it really depends on what the etiology at play that we're talking about. And do we know the etiology at play? Because many times we don't. We just know that the individual in front of us is deaf or hard of hearing or has some form of hearing loss. Etiology is not always known at the time that an individual is coming in for an assessment. But when we have some of those parts of the history together, it is also another time when an individual can say, "You know what? Maybe it's good to go and talk to genetics or talk to a neurodevelopmental pediatrician about whether or not that type of assessment makes sense at this point in time." Would that gain anything that might contribute to that individual's treatment?

Ryan Van Patten 53:42



The semicircular canals that form the basis of the vestibular system are also located in the inner ear. We haven't touched on this yet, but along with the cochlea, they sit in that same area. So if there's some pathology that affects the inner ear, it could also affect the semicircular canals. So, then, I'm wondering how common balance and gait issues are in children from the DHH community?

Jennifer Reesman 54:06



Depending on the etiology of deafness, it can be very common. We also know - I'm so happy you brought up the semicircular canals because they are also really underrated. This is also why, as a neuropsychologist, performing a really good motor exam is really important. Because we want to look at balance, right? We want to look at how an individual's balance changes when we take away that visual information. We ask them to close their eyes with their arms outstretched, how are they doing? We do know that there's also certain forms of hearing loss that can be involved with vestibular aqueduct abnormalities and so EVAS is one of those conditions to be looking for in records, enlarged vestibular aqueduct syndrome. That is a syndrome that can be associated with hearing loss but also with balance and coordination difficulties. Those are things where you can see them linked at times. In many forms of hearing loss, if it only affects the hair cells and doesn't impact the vestibular aqueducts, then we're not going to be expecting any type of balance abnormalities or anything like that. But if you have an individual coming into your office and they have hearing loss and they have EVAS, or enlarged vestibular aqueduct syndrome, certainly balance difficulties are something you want to be looking out for.



Ryan Van Patten 55:24

Great. So we've put it off for a while, but let's talk about cognition and cognitive testing in these children now. We can start with IQ tests - verbal and nonverbal intelligence. I know you know a lot about this. You first-authored a really nice review paper about tests of intelligence in children from the DHH community. This is in 2014, in Rehabilitation Psychology.



Jennifer Reesman 55:45

Gosh, that's a long time ago now.



Ryan Van Patten 55:47

[laughs]



Jennifer Reesman 55:48

Let's just say that it was back in the 2010s.



Ryan Van Patten 55:50

[laughs] Fair enough. As you outline very well in the paper, there's a lot of issues to think about in this space. For example, I find it really interesting to think about signing as a visual spatial language modality instead of an oral or auditory modality - totally different. So this can change the very nature of test instructions and the constructs measured by a test themselves. There's also the issue of whether to adapt traditional tests like the WISC or to use items designed specifically for the DHH population. There are many tests available - the Leiter international Performance Scale, Differential Ability Scales, the adapted WISC, the CTONI, Comprehensive Test of Nonverbal Intelligence. Just this caveat one more time, there's a great deal of heterogeneity in the DHH community, which complicates test selection. I could ask you 100 questions about this, but can you talk through some of the test batteries that you frequently use for verbal and nonverbal intelligence and why?



Jennifer Reesman 56:54

So, first of all, this is the only time I'll actually say that this is where I love to get back to, like, all of us in our graduate studies took Tests and Measurements or Biological Bases of Assessment and all of these things, right? We have to get back to, "Do our tests measure what we think that they measure?", and to also make sure that we get away from, "Just because a test publisher labels something as this scale, does that necessarily mean that that scale label is what we're looking at?" Right? What's the construct validity here that we're talking about?

In my reports and in my practice, I often try to make sure that I'm focusing on language-based reasoning skills and visual reasoning skills. There's a few reasons for that. One is because a lot of times the thing that drives me batty in IQ testing is seeing things called verbal comprehension stuff. Well, is it verbal if I've translated that into American Sign Language and my patient sitting across from me is giving me a response in American Sign Language and then I'm writing down their response in English? No. There's been nothing "verbal" going on about that. There's nothing magical about that verbal comprehension being verbal. We could think about how that could be written as well. Everybody recognizes that our written language is still language, but it gets us back to thinking about what's the modality of language? So I like to make sure that I talk about what language modality I am using. Am I using sign language? Is my patient using sign language or are they using spoken language or are they using both of them? Thinking about visual versus language-based reasoning skills, I think, is important to break apart.

One of the things it's important to think about all of our tests is that sometimes we have this bad habit of calling things "nonverbal" if it doesn't require language to administer or to respond. That's one of the things I think is good to remember. That just because you might have a measure that does not require you to use language, where you're able to use gesture and pointing to have your patient indicate to you which response they're pointing to, that doesn't mean that they're not using a language-based mediation cognitively to come up with the answer, to solve a pattern task, for example. But it just means that we're not using language or we're not using spoken language to administer that. I think that's also important. What's the construct that I'm measuring? And getting away from calling it just what's the method of administration of a task. Sometimes those things are different because sometimes you can present somebody with a language-based task with no verbal input involved. If an individual requires me to write down [or] if instead of presenting them with a signed list, I'm going to show them and ask, "What does this word mean that I've written down?" That's still using language. We're just not using the spoken form of language to get at it. Same thing if someone is reading the transcript of this podcast and listening to me prattle or reading me prattle on. They're using language. They're not using spoken language per se, when they're understanding it. So that's one thing.

Do we want to talk about specific tests?



Ryan Van Patten 1:00:20

Yeah, sure. Thanks.



John Bellone 1:00:21

Sure.



Ryan Van Patten 1:00:22

Yeah.



John Bellone 1:00:23

Wax poetic about any of these topics that you can [laughs].

Jennifer Reesman 1:00:26

I think one of the things that's important to think about is that people don't exactly fit the molds nicely. We know that our patients may not be well represented in normative samples, right? So we have to figure out how we are going to practice. What sense of information are we going to make with that? It's just important to know. Then, do we modify our assessments? Or are assessments ready to go and work well with the patient population that we're at? And then what are the questions we're trying to answer?



There are some things that test publishers and test creators do that I think are really fantastic. I'll use the example of the DAS-II, the Differential Ability Scales, the second edition of that. One of the things that if anyone has ordered that or gotten a new kit, there's a DVD along with it. Now it's probably on a USB stick, but when it first came out, it was on a DVD. If you played that DVD, put it into your computer, or you plug the USB stick in, you see a fantastic psychologist, Poorna Kushalnagar from Gallaudet University, and you see her signing the instructions of the DAS-II. The behind the scenes part of that was that when they came up with all of the English-based instructions for the DAS-II, they did a translation into ASL and then they did a back translation process of that. They filmed the agreement from the translation and back translation process into a DVD that could be distributed so that I, as somebody fluent in ASL, could watch that and then essentially have the signed equivalent of the instructions in front of me so that I could be certain that I was delivering the instructions faithfully as the author's intended. So that I was giving that in the same way as we would when we're reading the instructions in the tests. Now, I just want to also clarify, some people say, "Oh, so that means that you just show the DVD to the person that you're testing?" No, no no. It's not like that. But it's giving me how they are signing it and how they are presenting it so I know that it's a faithfully translated and then back translated process. So that's an example of one really nice cognitive assessment tool and the process involved with making sure that somebody who is fluent in ASL, or if you have an interpreter, you can make

sure that they watch that video and are able to then utilize those instructions faithfully in test administration to an individual who's deaf or hard of hearing.

There's also been special group studies. So, say for the WISC, there's been a group at Gallaudet that worked on the WISC-V and did some special group studies and they looked specifically at children who are deaf or hard of hearing and who used spoken language and assistive technology. Those white papers have been published by some of the test publishers. So those are available, those are known. They talk a little bit about what are the important considerations that one should have, but they also provide some match control groups as well as children with hearing differences so that the published data is available and is a really useful tool for any individual who's testing folks on these cognitive scales or using them to make decisions in terms of school eligibility criteria or criteria for intellectual disability, for example.

Ryan Van Patten 1:03:59



I'd love to hear you talk for a few minutes about intellectual disability evaluations in these children. One might think that the thing to do is simply to measure "nonverbal intelligence" and to use that as the measure of IQ to diagnose ID. But, first off, you've already mentioned some of the issues with calling something nonverbal when verbal skills are relevant. But then even when we think about, like, matrix reasoning, Raven's Progressive Matrices, skills that are more spatial, more fluid reasoning-based, those aren't the only skills that matter to children in their lives. So just generally, how do you approach ID evals?

Jennifer Reesman 1:04:41



One thing that I think is really important, when we think about the adaptive assessment being extremely important, I think, again, making sure that we're really aware of our tools and what are the potential weaknesses in use of that specific tool with the individual in front of me. So when we're thinking about some checklists-based rating skills or adaptive rating forms where I'm just handing it over to somebody and they're circling along, ensuring that I've explained to an individual that my perspective as a neuropsychologist is looking at language. And that even if the question is worded and says, "answers the telephone", that, for me, it's okay if they're answering the videophone or if they're using language but it's a signed language or if they're using Cued Speech that counts. I don't want to discount an individual's skills simply because the questionnaire that I have in front of me doesn't nicely capture the modality that that individual is using on a day to day basis. The other thing, when I think about ratings is seeing, "Do I have anybody who can reliably communicate with this individual providing me with ratings?" Especially if we're talking about pediatric evaluations because if I'm getting ratings only from a

teacher that is frustrated with this child and can't communicate with them very well, I'm going to be at high risk of mischaracterizing or misclassifying this individual based on likely communication differences or communication conflicts or just lack of accessible communication for the individual. So I think that's a big risk that you have.

I do also think it's really, really important to consider the access that an individual has to both language as well as education. So when we think about some of the criteria in making an intellectual disability diagnosis, one of the things we want to make sure, as we just talked about in learning disability diagnosis, the consideration for, "Did the individual have access to language? And did they have age appropriate access to instruction?" Those are two criteria that for most of our patients that come in, we don't really have to give a second thought to those because if you grow up in the United States, you can go to school and the stuff going on around you is accessible. But if you're a deaf or hard of hearing child in the United States, those two things are not necessarily a given. They should be, but they're not always. So they do require more careful consideration. Sometimes you might see a really strong case made for saying, "You know, what? This child's hearing loss wasn't identified until maybe age 5 or 6 and now they're coming to you at age 7, would it be appropriate to diagnose intellectual disability at that point in time?" Probably not. Probably good to make sure that they get some access, whether that be hearing aids if they're getting access to spoken language that way. Do they qualify for a cochlear implant? Do they perhaps need more accessible instruction in ASL? Do we need to give them a period of time to see how they do at that point in time?

On the flip side of that, I can tell you that when I see individuals coming in who are 18, 19 years old, 20 years old, and ID or intellectual disability has been danced around and hasn't quite been declared as an issue. You have an individual who is clearly not able to access and be independent in the ways that we would expect, but everyone said, "Oh, it's just because of the hearing loss." It can also be a situation where I think, again, making sure that we're not doing diagnostic overshadowing but that we're also not shutting any doors to an individual in obtaining the supports that they need to be healthy and independent. I think there's a fine line in considering the history, not making any premature diagnoses or jumping to conclusions, and being really good advocates for our patients to make sure that they're able to get those services so that we're not saying, "You know, what? I can't make that diagnosis because this individual hasn't had appropriate instruction."



John Bellone 1:09:09

Yeah, it's always a fine line between balancing sensitivity and specificity in any of our evals but especially in these.



Jennifer Reesman 1:09:16

Yes.



John Bellone 1:09:17

You touched upon this, but I wanted to talk a little bit more about what are some difficulties in interpreting from written English to ASL. So for clinicians who are using a certified ASL interpreter for their evals, how well do traditional test instructions translate to ASL? Would you ever give a so-called verbal word list or verbal stories and would that be translated? Talk us through the mechanics of working with an interpreter and how that eval might go.



Jennifer Reesman 1:09:47

I would say that one of the things is that there's a lot of tests that you realize, if you're working with an interpreter, that just don't translate well. Where you say this was a test created for English speakers and is most useful for that. Tests like verbal fluency are tasks where we go, "Yeah, that's not the greatest. That doesn't really translate well." However, when we think about the construct of it, there are some folks who've developed tasks that instead of looking at letter-based prompts for verbal fluency or category-based prompts, use handshape-based prompts. There are some folks at Gallaudet I know who've done dissertations and published a little bit on this in terms of giving the prompt of, "Tell me as many words/signs that you can think of that use this handshape." Again, when we think about that generativity and organization, there's a way that you can get at that task. Not saying that fluency tasks can't be done. They can be done, you have to do them a little bit differently. So those are some useful things.

When we think about some of the list-based memory tasks, again, folks have come up with some different ASL differences and ways of doing that. When we think about some of our structured examinations, especially as we get a little bit older, so folks who are doing a MoCA or different mental status examinations, where some of the instructions don't exactly translate really well. So it's important to think about, "Should I have that written out? Is that an easier way to do it?" Or if you're doing a motor examination, when we think about, "Are we looking at the individual's ability to copy a motor task?" If I say, "Okay, do what I do", and I start finger tapping my index finger against my thumb, that's different than if I'm wanting to see if an

individual comprehends a one-step motor instruction, for example. So I think just being really flexible about how we're doing that.

I also think that one of the number one things somebody can do when they want to be successful in working with an interpreter is to realize that most interpreters have no clue as to what we do. So any preparation that we can do if we're working with an interpreter is going to pay off so that they understand what we are looking for. Because in certain interpreting situations, the expectation might be, "Okay, I need to explain more so that this patient understands." Whereas if we're looking and saying, "No, don't explain any more. Don't give any additional words. I just want to know this word. Can they point to the thing that shows this word? That's all. Don't give them any other similar words." Because, otherwise, that changes the nature of the task.



John Bellone 1:12:41

Right. They could give information in the ASL that answers the question potentially.



Jennifer Reesman 1:12:47

Yes.



John Bellone 1:12:48

I've heard of that happening, too.



Jennifer Reesman 1:12:49

Yes. So it's really important to do some good preparation if you're working with an interpreter so that you can make sure that you're actually getting the information back from your patient that you're working with that helps you to answer your question that you have at hand.



John Bellone 1:13:14

There's some controversy or disagreement about when and whether to use population-specific norms or traditional hearing-based norms. I'm curious about your thoughts about the normative topic.



Jennifer Reesman 1:13:26

Well, that's just like the hot topic in neuropsychology lately, isn't it?



John Bellone 1:13:29

[laughs]



Jennifer Reesman 1:13:29

Let's talk all about norms. What kind of norms are we using? That's, like, phew, way to get into the hot topic there.



John Bellone 1:13:29

[laughs]

Jennifer Reesman 1:13:36

I think one thing that you said right at the top of this podcast that's really important is that the Deaf community is heterogeneous. We have a ton of diversity within the Deaf community. So even if I had my magic wish of a set of norms that was useful for Deaf folks, they probably wouldn't match the folks that come into my office. That just gets to a point of saying, "Wow, my clinical tools are somewhat limited. I need to make sure that I'm doing a really good job of interpreting them within the constraints that I have because I may not have norms that perfectly match the patient coming in." Whenever I've brought it up then people say, "Well then, who would you have in a Deaf normative group? Would you have only people who were born deaf, who had exposure to ASL from birth, and who didn't use hearing aids or cochlear implants?" Well, no. That's not typically who's coming on into my office for evaluation, nor does it represent the greater deaf and hard of hearing community at large. So there is a lot of diversity. I think one of the best things that I could say in terms of not fueling fire on either side of a controversy of should we have population-specific norms or should we use general norms, is that the most important thing is for us to be aware of who's in our normative sample and does our patient that's coming in to see us look anything like anyone who's in that normative sample? But also, does that patient look anything like their community? Who is their community? And who are they being compared to? I think that's one of the important things when we think about, "Well, I'm expecting this deaf child to exist in a family that may be hearing, that may speak Spanish, that may do a lot of different things." They may not look like their family and all of their characteristics, but it's important to understand how they are functioning within that broader, larger context. So if I can make sure that I understand how similar or different they look, with respect to the rest of the normative sample, it's probably the single most important thing I can do.





John Bellone 1:15:56

Yeah. Clearly there's not an easy answer to any of the normative topics that we touch on in neuropsychology, but that is good advice.



Jennifer Reesman 1:16:04

The one thing I will say about norms that I'm most worried about, and I feel like you all could probably do another whole podcast episode on it is, what are we going to do about children who were in education in 2020, 2021, even 2022, who didn't go to school in person, who were learning behind a computer screen? Because we know that that was not well-represented in any of our normative samples where we're looking at educational achievement or we're looking at cognitive skills or working memory skills or anything like that. That just wasn't a typical experience of children. Children in many parts of the country have had experiences that are outside of the norm. I think that that's been true for Deaf kids for a long time, but now it's something that I feel like we're confronting on a larger basis.



John Bellone 1:16:54

That's a good point. Do you have any pearls of wisdom related to recommendations and feedback sessions with these families?



Jennifer Reesman 1:17:03

One of the biggest things that I like to think about is ensuring that we help parents walk away with a greater understanding of how the ears are connected to the brain, and looking at a child - and I realize we've been talking [for] a long time about children, but it also goes well for adults - looking at people as a whole. There's this sign that I was introduced to that really communicates so much more than a sign when I came to Gallaudet. And it's this. This sign is literally putting up your hands and making a little box around your ears. It's the experience that a lot of Deaf individuals and deaf and hard of hearing people have. It's that there's this obsession with the ear. How well can you hear? Let's send you to an audiologist. Let's measure how well you can hear. Let's put hearing aids on you and let's see how well you can hear with these hearing aids. Let's put a cochlear implant in you and let's see how well you can do with this. So some of the pearls of wisdom relate to ensuring that we are respecting the individual as a whole. One of the cochlear implant surgeons I worked with at Children's National in DC always talked to families and reminded them, "I am working with a perfectly healthy child", which was really important because a lot of these families came to see their child as not healthy and that was not healthy for them.

So I think, neuropsychologists, when we come at our work from a very strengths-based perspective can be really empowering to families when we step back and we remember, "Yep, this person may be struggling in these areas, they may have these disabilities, but where are the strengths?" What else am I doing and how can I make sure that I don't fall victim to just focusing on the ear? If I have a patient walking in that I know that is deaf or hard of hearing, how can I look at them as a whole person? That doesn't mean that I should ignore the ear, right? It's part of them. It's part of any of us. Just like if we have a child who needs glasses, if they walk in with or without their glasses, I should know how that's going to impact them on their testing or on a day to day basis. Same thing if a child walks in and uses hearing aids. I should know how that's going to impact them or not impact them on their testing. But being able to make sure that we're looking at our test results and considering the whole child, considering the whole person, and also the stuff that's between the ears. That's something where I feel like a lot of families when I talk to them, a lot of experiences of families of deaf and hard of hearing children is just focused on the ear, just focused on that. Sometimes these families are really worried, you know, "Is my kid going to be able to learn to read? Is my kid going to be able to live independently?" None of the other professionals that they've talked with are focused on that. So when you do really good neuropsych assessment work, you can help them to answer these questions and say, "No, I don't have concerns about that. Your child is doing really excellent in all these areas. The sky's the limit. Let's put them in more challenging classes." Or, you know, "They do have ADHD. Let's make sure that we treat this so that they can be successful in that."

The other important thing that I think in terms of pearls of wisdom that I try to pass along to families is to ensure that they're aware of the rich community of Deaf adults. Especially when we're talking to hearing parents who are working with Deaf kids who may not know a lot of other Deaf adults, that there is a whole community of Deaf adults who've been there, done that, got the t-shirt, went through school, who can help provide some reassurance, validation. But quite literally one of the things that I've really pleased that I've had the chance to do in my work is supervise future psychologists who are deaf or hard of hearing themselves. Having them in the room, in feedback with families, changes the dynamic completely. It's one thing to talk about "representation matters" and it's important. It's a whole other thing when you've got a family in the room who says, "Wait a second, you're Deaf? Or you're hard of hearing yourself?" Not me, but to one of my trainees who is. Because the way they hang on every word and recommendation that that person is giving changes so dramatically. That's just - I will never have that when I walk in the room with a family who's working with their deaf or hard of hearing child, but when there's

the deaf or hard of hearing professional psychologist or neuropsychologist giving some of those recommendations, that kind of stuff is pretty life changing.



Ryan Van Patten 1:21:42

Yeah. Being able to identify so closely with the professional makes a big difference. I'm wondering if you have recommendations you can give for pediatric neuropsychologists who want to become more proficient in assessing DHH individuals short of attending Gallaudet for grad school? What can people do?



Jennifer Reesman 1:22:00

Well, I guess we shouldn't turn this into an ad for Gallaudet grad school, but it's really cool. I'll say that.



Ryan Van Patten 1:22:06

[laughs]



Jennifer Reesman 1:22:06

It's in DC. It's a fantastic program. I highly recommend it. But I do think that there's a couple of things that I can plug: One, continuing to learn. There's also some fabulous texts and we can put this in the show notes. Auditory Neuroscience, the text about that. There's entire fields of study, of folks who do a really good job of explaining the neuroscience of sound. There's also special interest groups within APA and Division 22 for Rehabilitation Psychology. The Association of Medical Professionals with Hearing Loss is a fantastic group for individuals who are studying to be psychologists or neuropsychologists who have hearing loss themselves. I think there's a lot of resources out there, whether they be list-based, whether they be continuing education-based, but there are resources out there. There is really a growing number of folks. I'm very pleased and proud that when I used to present and say, "Yeah, there's only a handful of us around the country that are out there doing this work," now those handfuls are growing to two handfuls and they will continue to grow and and kids will be able to better access services overall.



John Bellone 1:23:18

Along those lines, I've heard of several neuropsychologists who have either graduated from Gallaudet or are affiliated with Gallaudet in some way. So I'm sure that there are lots of people in our community who we can reach out to for guidance and mentorship in this area in addition to yourself, of course, although we don't want to flood your email [laughs].

Jennifer Reesman 1:23:41



These questions are always fun. I will say case consultations are probably one of the most fun things that I get to do with folks across the country because the questions are different across the country depending on what your resources are in your community.

Ryan Van Patten 1:23:53



Tell us how you became involved in this corner of the neuropsychology world. Tell us your story.

Jennifer Reesman 1:23:59



So this corner of the neuropsychology world, for me, goes back to my undergraduate days. I am forever grateful that where I went to school required me to take a foreign language as an undergraduate in college. I was at the point in my undergrad studies where I knew I wanted to go into clinical psychology. I didn't quite know about neuropsychology at that point in time yet. You know we have work in the PR side in neuropsychology to get that message right down to undergraduates a little bit more.

Ryan Van Patten 1:24:30



[laughs] So true.

Jennifer Reesman 1:24:30



That's our own fault, whatever. But, so I took a sign language class really on a whim because I didn't want to take French or Spanish. I wasn't very good at either of them. So I took a sign language class and I also was at a small all women's college in Milwaukee, Wisconsin. Because it was small, by the time you got to your second or third level of class, the teacher there said, "You gotta get out into the community and start using your language skills." So she would assign us to a site and I went to the Milwaukee Sign Language School, which is a bilingual, bicultural education public school where they had Deaf and hearing teachers, they had Deaf and hearing kids all learning together. At that point in time, my sign language skills were at the point of like, I could tell you that there was a red apple in the corner and that I wanted a sandwich for breakfast. Like, you know, I had kindergarten level sign language skills. So I worked with a gym teacher. It was a ton of fun. While I was there, the principal was, I don't know if he felt sorry for me? He just took a special interest and was like, "Here. You should go and shadow some people and talk to the school psychologist." And I did. Then people there were like, "Oh, you're applying to clinical psychology programs? You should really look at Gallaudet." I had heard of it in my sign language classes, but I wasn't aware that they had a

clinical psychology program. So I went to the computer lab because, in those days, you didn't have a smartphone where you could call up all of the knowledge of the world in your pocket. So I actually had to go to someplace and sit down and research this information. I sent out an application somewhat on a whim. And being like a lot of people who are entering graduate school, you have super ambitious goals and ideas. The program there sounded so incredibly cool to me and amazing. They did a very good job when I interviewed of letting me know, "You're going to have to learn a new language." And, you know, being in my 20s, I was like, "That sounds great! There's no better place to learn it than at Gallaudet where I would be surrounded and immersed in it." And so I did. Looking back, it's only now I can realize, "Well, that was... Who were you to think that you could earn your doctorate and learn a new language at the same time? Were you nuts?" Yeah. I was. I was in my 20s. Like, my brain was not fully developed. We know this now.



Ryan Van Patten 1:27:01

[laughs] Still myelinating at the time.



Jennifer Reesman 1:27:03

I was still myelinated, right? I should be forgiven for this.



Ryan Van Patten 1:27:07

[laughs]



Jennifer Reesman 1:27:07

But it was the best experience and best decision I ever made. I think also for me as a hearing person and as a white woman in neuropsychology, I got the experience of being able to be the linguistic minority in a campus that was Deaf. I had to do a lot of work to fit in and to do things like that. So I'm really grateful for that experience. It really changed my professional career and trajectory. At some point along the way when I was at Gallaudet, somebody told me about neuropsychology and so we can blame them for me going into the field of neuropsychology. I got hooked because neuropsychology is cool. You're endlessly solving puzzles and figuring out things and learning and, really, being in individual things. So that's kind of how I got to what I'm doing.



John Bellone 1:27:58

Excellent. Well, as somebody only speaks a little bit of baby sign language, I can see that the YouTube videos of you signing are super impressive. So... [laughs]



Jennifer Reesman 1:28:07

I progressed along the way. We can thank Gallaudet and sign language instructors and Deaf mentors and people who took me under their wing to really help me come along in that.



John Bellone 1:28:17

Yeah. Excellent. Is there anything else you wanted to say before we move to a couple of bonus questions?



Jennifer Reesman 1:28:22

I think that maybe the only other thing I want to say is that there's a lot of fantastic Deaf researchers out there whose work I really admire. I mentioned Poorna Kushalnagar. She works with the Deaf Health Equity Program at Gallaudet University, and is a fantastic resource as well. But there's a lot of really wonderful things going on at Gallaudet, up at the Rochester Institute of Technology, and other places. But there's also a lot of really cool things that we can credit, learning about the brain and sign language and how our brain's process information that we can owe to research with deaf and hard of hearing individuals and individuals who use sign language. So I think there's always endlessly fascinating things that we can be learning.



John Bellone 1:28:36

Excellent. So we have two bonus questions for you and these are general questions. They can be about whatever we've been talking about today, but they don't have to be. So number one is: If you could improve one thing about the field of neuropsychology, what would that be?



Jennifer Reesman 1:29:22

I think one thing that I wish we could improve is our PR campaign, right? I didn't know about neuropsychology until I got to graduate school and until I was really well into graduate school. It wasn't available as a specialty program within my program, I went to a small program. So I think we need to do a little bit better about that just as a field in general. When I explain what I do to family members or friends who don't know what neuropsychology is, I say, "Yeah, nobody knows what I do, but let me tell you what I do." So I do think we need a little bit better of a PR campaign as a field.



Ryan Van Patten 1:30:02

What is one bit of advice that you wish someone told you when you were training or someone did tell you that really made a difference? We're looking for an actionable

step that trainees could take that they might not have thought of to improve their training.

Jennifer Reesman 1:30:16



It'd be, "Take the challenge." If there's something that when you are in training that you think, "This could be really hard, but it could be really worth it in the long run," go for it. Do it. You're never going to regret it. But you'll probably look on later if you're in grad school, like I was, in your 20s and you'll look on later when you have a little bit more myelin to say, "Well, that was really formidable. And you took that on?" Yeah. Do it.

Ryan Van Patten 1:30:42



Well, this has been an awesome conversation, Jen. Thank you for all the info. NavNeuro has been around for a while and we haven't touched on this topic yet, but you've given us a lot to think about. Thank you so much.

Jennifer Reesman 1:30:54



Thank you. Pleasure. I just want to say, I've listened to NavNeuro and I've recommended it to trainees and other folks, but now having worked on this end of it with both of you, it's really clear how much care and consideration goes into this. It doesn't happen without a ton of effort. Can I ask how you guys got into wanting to do a neuropsych podcast?

John Bellone 1:31:16



[laughs]

Ryan Van Patten 1:31:16



[laughs] Yeah, well, thank you for saying that. That means a lot. John, you're welcome to go ahead.

John Bellone 1:31:23



Yeah. Ryan and I both love listening to podcasts and we have been listening for a long time. We were both at the same place at the same time, I was doing my postdoc where Ryan was doing his internship, and we were at a meeting one day and we were listening to a podcast on some other topic, like a neurology podcast. Ryan made a comment, like, "Why doesn't neuropsychology have a podcast? We really should." I had been thinking about that, actually, too. And we were going to go out and have a beer, just by coincidence that night or the next night or

something like that, and I brought it up to him and said, "Well, why don't we do it?"
[laughs]



Jennifer Reesman 1:32:01
Excellent!



John Bellone 1:32:01
[laughs] So that was the inception.



Ryan Van Patten 1:32:03
Very serendipitous. Yeah. I thought about it and talked to friends for a few years.,
but I hadn't met a friend in neuropsych where I was confident that it would be 50/50
[laughs] in terms of the workload. I knew it was a big commitment. Actually, we
didn't know each other that well when we decided to do it. So, there was a little bit
of trepidation... [laughs]



Jennifer Reesman 1:32:23
Yeah.



Ryan Van Patten 1:32:23
But it's been great.



John Bellone 1:32:26
[laughs] Now he knows a lot more and he regrets his decision.



Ryan Van Patten 1:32:28
Yeah. Yeah.



Jennifer Reesman 1:32:29
[laughs]



Ryan Van Patten 1:32:30
But I don't have the excuse...



Jennifer Reesman 1:32:31
Now you're just overcommitted.



Ryan Van Patten 1:32:32

Yeah.



Jennifer Reesman 1:32:32

You can't get out now.



Ryan Van Patten 1:32:33

I wasn't in my 20s, so I don't have the excuse that you have.



John Bellone 1:32:36

[laughs]



Ryan Van Patten 1:32:36

I made that decision. [laughs] I was fully myelinated and I still... [laughs]



John Bellone 1:32:41

[laughs] There was some neuropathology...



Jennifer Reesman 1:32:44

There's some research though. I feel like as I get older, I'm able to be like, "Well... But, wait. This is still developing in a positive way into your 30s." Now I'm like, [groans].



Ryan Van Patten 1:32:58

[laughs]



John Bellone 1:32:58

[laughs]



Ryan Van Patten 1:32:58

Thanks for asking. Yeah, it's been great. I really enjoy working with John. We have a really good system where it's really truly 50/50 in terms of the workload. And it's a lot of fun. Like, we're really lucky guests like you are really, really gracious with your time.



Jennifer Reesman 1:33:14

People love to talk about their special areas of interest.



Ryan Van Patten 1:33:17

They do.



Jennifer Reesman 1:33:17

We're like, "What? You want to talk with me about what I'm super interested in? Of course. Let's do it."



John Bellone 1:33:22

[laughs] Your kind words are really appreciated about NavNeuro and us. We really thank you.



Jennifer Reesman 1:33:28

No, I mean, I can't tell you how many - you probably don't hear it, but people that I've talked to and especially, especially - and I have felt so much for trainees during pandemic times when a lot of our in-person opportunities for didactics and connection [were unavailable]. And, just, seeing and hearing trainees be like, "Well, I listened to this episode of NavNeuro," and I'm like, "That's great!" Like, that's fantastic because then at least I know that they're listening to somebody talking and it's not nonsense. Because I've definitely had trainees come to me like, "Well, I heard this on a podcast..." and I'm like [groans].



Ryan Van Patten 1:34:04

[laughs] Yeah.



John Bellone 1:34:06

All right, Jen. Well, thanks again.



Jennifer Reesman 1:34:08

All right, absolute pleasure. Have a wonderful weekend. Thank you guys.



Ryan Van Patten 1:34:12

Thanks, Jen.



John Bellone 1:34:12

Bye.



Jennifer Reesman 1:34:12

Bye.



Transition Music 1:34:12

Ryan Van Patten 1:34:17



Well, that does it for our conversation with Jen. If you'd like to support what we're doing here, please leave us a rating on whatever podcast app you're listening to this on. And, as always, thanks so much for listening, and join us next time as we continue to navigate the brain and behavior.



Exit Music 1:34:34

John Bellone 1:34:58



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Ryan Van Patten 1:35:09



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