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**We Are Our Memories: Supporting Autobiographical
Memory and Personal Narratives in Children
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- [Amy] Once again, welcome to Day Four of our Virtual Conference from speechpathology.com, and the American Board of Child Language and Language Disorders. Today's event is "We Are Our Memories: Supporting Autobiographical Memory and Personal Narratives in Children". And I just wanted to thank our guest editor this week, Doctor Trisha Self. She's gonna be introducing our presenters today. Trisha is an associate professor and Chair in the Communication Sciences and Disorders Department, and she's also the Coordinator of the Autism Interdisciplinary Diagnostic and Treatment Team Lab at Wichita State University. And she's also the CE co-chair for ABCLLD, our partner for this event. So Trisha, I will hand over the mic to you.

- [Trisha] Thank you, Amy. As Amy mentioned, this Continuing Education event is in partnership with the American Board of Child Language and Language Disorders, also known as ABCLLD. I'm on the board of ABCLLD, and just want to mention to today's attendees, that if you think you have advanced knowledge, skills and leadership in child language, and are interested in becoming a certified child language specialist, you'll find resources at our website that describes the process. The web address is www.childlanguagespecialists.org.

Those of us who are specialists have found many benefits to being certified as an expert in child language, one being that we're all dedicated to ensuring that children receive high quality services. So I invite you to become a specialist. I'd like to thank all of you for joining us today. We're fortunate to have Doctor Tiffany Hutchins and Ashley Brien with us, who will discuss "Supporting Autobiographical Memory and Personal Narratives in Children". Now, it's my pleasure to introduce our speakers. Doctor Tiffany Hutchins has researched the relationships from parent-child interaction strategies to child language and social cognitive development. She has developed and validated

new measures of theory of mind that are widely used in research and practice. Doctor Hutchin has investigated the efficacy of story-based interventions to teach social communication skills, as well as the nature, development, and treatment of social cognition deficits in four populations, ADHD, ASD, hearing loss, and childhood trauma. Doctor Hutchins teaches courses in the development of spoken language, psycholinguistics measurements, in communication sciences, and language disorders. Ashley Brien is currently pursuing her PhD in interprofessional health sciences at the University of Vermont under the mentorship of Doctor Tiffany Hutchins. She has published and presented nationally on theory of mind, episodic and autobiographical memory and the visual attention of children with autism spectrum disorder. Her research focuses on episodic memory and its relationship to theory of mind and personal narrative discourse. She is currently designing interventions and treatment materials to support episodic memory, social cognition, and personal narrative discourse in children with ASD. Welcome Tiffany and Ashley, we're looking forward to your presentation today. And Ashley, I'll hand the microphone over to you first.

- [Ashley] Thank you, Trisha. Before we begin, I just want to say what an honor it is to be presenting alongside some of our most esteemed colleagues in the field on these topics. Tiffany and I are so honored and grateful for this opportunity, and so thank you all of us for joining us today. Okay, so today we're going, oh, here's some disclosures, here are our learning outcomes. Okay, so today we're going to be talking about memory, and we know that there are many different types of memory, there's longterm, short-term, procedural, declarative, and the list can go on. But despite the various types of memory, we often think of memory as a simple unitary construct. So my husband has a bad memory while my grandpa, he has a great memory, but we rarely think of how memory informs our daily lives, about how we use it to tie our shoes, go grocery shopping, cook dinner, navigate an airport, comprehend language, and share our stories. And the type of memory we're focusing on today is autobiographical memory, which is a special type of longterm memory specifically for information about

the self. And these memories contribute to our understanding of ourselves as well as to the development of our personal narrative. And this is important because research suggests that personal narratives emerge as frequently as every five minutes in everyday conversation. And so sharing our personal narratives and our life stories with others, it's human-specific, and it's important to healthy social development. An autobiographical memory is comprised of two related, but distinctly different types of memory, semantic and episodic memory. Semantic memory is knowledge of facts about oneself, so I was born in February, I went to North Country Union High School, my brother's name is Josh. And I don't know how I know these things, I just know them.

And that's because the defining feature of semantic memory is source amnesia, which is the inability to identify the source of your knowledge. In this space, semantic memory can be referred to as the knowing system and it very fact-based and contextual. And if semantic memory is the knowing system, then episodic memory is the remembering system, and it's your memory for past personal experiences. When recalling episodic memories, we mentally travel back in time and reexperience an event from a subjective first-person perspective. We recall who was there, what happened, when it happened, where it happened, and we might remember more specific details, including maybe how we felt, what we were thinking, maybe a specific smell.

And then in this sense, episodic memories tends to be sensory-rich and include information about physical sensations like sights and sounds, and affective and psychological states, like your thoughts and feelings. And unlike semantic memory, there's no source amnesia in episodic memory because these memories are grounded in space and time, and the event, again, is reexperienced through subjective first-person perspective. This also gives them a particular experiential flavor where semantic memories feel objective and factual, episodic memories feel more subjective and personal. And as a class of autobiographical memories, episodic memories are

perhaps the most important and the most vulnerable memories. Given their sheer number, we forget more episodic memories than any other form of knowledge, and they're typically the most effective form of autobiographical memory in cases of neurological injury, like an anterograde and retrograde amnesia and functionally as a whole, they give us a sense of continuity in space and time while individually, like I said, they can guide us in innumerable ways. For example, they may help us remember how to change a flat tire or find our way back on a mountain trail. So here are some example questions that could be asked to elicit the different types of memories.

On the left, we have semantic, and on the right, episodic. So an example of a semantic memory could be who is one of your friends, what is their name, that's very fact-based. Versus a question designed to elicit an episodic memory about that same topic could be, "Do you remember something you and that particular friend played at recess?" So in healthy development, the contents of semantic and episodic memory tends to be functionally integrated in autobiographical memory. And that's to say that a memory of a past personal event often include semantic autobiographical facts. So I can episodically reexperience a walk on the beach while I semantically can recall the name of the beach.

And episodic memories are also massively priming such that they can activate other episodic memories. And this is an important aspect of episodic, their ability to activate one another. For example, when one recalls a past episode, like going to a museum, this memory may prompt the recall of an additional episodic memory that's conceptually related, maybe another museum experience. And this property of episodic memory increases their potential functional nature, and it likely gives rise to what we refer to as general event concept, category knowledge, or even scripts and schemata, for both physical and psychosocial domains. So what are museums, what are they for, why do we go to them, what do we expect when we visit one? And as we'll illustrate in examining autobiographical memory deficits in a variety of clinical

conditions, episodic and semantic abilities can also diverge and they can fail to adaptively integrate in autobiographical memory, so their distinction is crucial. When autobiographical memory is disrupted cognitive compensations are often observed that have deleterious effects and wide range of human specific intellectual achievements in psychological and social domains that we'll talk about a little bit later on. So episodic memory is an important component to the development and the maintenance of our life story and our self-concept. It's considered the basis for imagination, the ability to reason about counterfactual events, like what if the soup I had spilled had been hot, and the ability to adaptively plan for the future. So maybe I'm going on a long car ride tomorrow, I need to remember what happened last time I went on a long car ride, so what should I pack this time?

Also, episodic memories are essential to our ability to integrate and make sense of socio-cultural information, solve social problems, and tell a coherent personal narrative. And personal narrative development is particularly important, but it's often overlooked because traditionally, for school-aged kids, the focus has been on fictional narrative construction because of the ties to academic standards, but this isn't necessarily ecologically valid. Personal narratives are the stories that we tell in real life, and that's how we socially connect with others.

And our ability to share our stories with others, connecting on that personal and social level, is linked to nothing less than our sense of purpose and meaning, and our general psychological wellbeing. Okay, so the development of episodic memory, there are a number of precursors to episodic memory that develop early on in infancy, like the encoding of associations through operant conditioning, for example, but the most significant advancements develop in the preschool years between the ages of three and four. However, it's not that once a child turns four her episodic memory, it's completely solidified, no, it continues to develop and becomes more elaborate in middle childhood, and likely doesn't mature until late childhood, or even early

adolescence. And this protracted development makes sense in light of the fact that advancements in episodic memory are strongly associated with, and likely foundational and integral to the development of theory of mind, personal narrative skills, and executive functions. So here are some examples of typically developing children's episodic memories. So take a second to read those, but generally, what we wanna show here is that episodic memories appear very early in the form of personal narratives that are elaborated upon, and that become more complex and sophisticated over a few decades. So it turns out it's possible to foster healthy episodic memory development. And there's one type of caregiver communication style that does this, it's called elaborative reminiscing.

And it's a conversational style that facilitates the recall of personal narratives and episodic memories in rich details. And the central feature of this reminiscing style is that it draws on the adult's ability to illicit and expand upon their child's recollections through the use of open-ended questions, elaborative statements, and hear the adults provide rich details about an event and either confirms, or recasts the child's memory contribution. And the primary goal of elaborative reminiscing is to recount a personally experienced events so that it can be reexperienced, mutually understood, and socially shared.

And in this way, elaborative reminiscing echoes the experience of joint attention and the forging of a common ground in which two or more people have shared contents of the mind. And when used effectively, coordinated storytelling about past personal experiences provides a safe and comfortable environment for children to tell their own perspectives. And there's a rich and impressive body of research documenting the length from maternal reminiscing style to children's socio-emotional, cognitive, and language and literacy developmental outcomes. One important dimension that distinguishes caregivers on the basis of how they engage children and talk about past events, concerns their degree of elaboration. Compared to caregivers who are

characterized as low in elaborate elaborative reminiscing, which we can see here on the right of this table, caregivers who are high on this dimension column on the left are reminiscent of their children in more detailed, evaluative, and coherent ways. And more specifically, parents who are more highly elaborative ask many open-ended questions, invite children to participate in conversations, and integrate children's recollections into a collaboratively constructive narrative. So now that we've touched upon elaborative reminiscing, we should note that most of the literature is based on Western-educated industrialized societies, but reminiscing does appear to foster development of episodic memory across cultures, albeit in different ways. In individualistic cultures, the goal is individuation. So when reminiscing, caregivers provide children with specific descriptive information about experiences, they emphasize the chronological structure, they encourage children to focus on themselves and their feelings, compared to collective cultures where the goal is social connection. And this caregiver reminiscing style is typically less elaborative, caregivers de-emphasize chronological structure, the reminiscing is less centered on the child, and more attention is devoted to others who have shared in the experience. And now I'm gonna pass it on to Tiffany.

- [Tiffany] Hello, thank you, Ashley. So I'm gonna use the acronym EM for Episodic Memory, and I hope that's acceptable for everyone. So EM personal narrative discourse skills, theory of mind, and executive functions, are developmentally and functionally intertwined. Personal narrative discourse provides an organizational and evaluative structure around which EMs can be recalled. And as children become more fluid in recalling past experiences, they become more adept at using narratives to think about and organize their past experiences. The same kind of transactional relationship is seen between EM and theory of mind. Within EM, we encode social information relevant to theory of mind, and our theory of mind is shaped by the content of our episodic memories. To complicate matters, all of these developmental processes are informed by their sociocultural context and the processes of language socialization. All of these also draw upon, and co-develop, and correlate with executive functions

across the life span. And then finally, at the epicenter of all of these cognitive processes is where we imagine our self-concept and our identity are situated. And so what all this means is that each component in this model is cognitively complex. The components are developmentally functionally intertwined, and massively interactive, and this complexity makes these highly vulnerable to insult. And it also creates the potential for multiple pathways to dysfunction. And finally, these specific pathways to dysfunction shape the nature of the EM challenges and the cognitive compensations that result.

And we're gonna examine the nature of EM challenges in autism, ADHD, hearing loss, and childhood trauma. We chose those conditions because of their prevalence and therefore relevance for SLPs, but also because they illustrate the similarities and differences that we see in EM due to their differing etiologies, and we will begin with autism spectrum disorder. These testimonials come from a study we recently conducted where we asked autistic adults, and remember, we're supposed to use I identity and person first language more interchangeably now, so yes, we asked autistic adults to reflect on their EM challenges, and we were surprised by both the heterogeneity of responses in terms of specific symptom presentation, but also our respondents' remarkable degree of insight and the overwhelming number of reports of severe deficits in this area.

When we asked specifically about EM, we heard things like, "I don't have any personal memories. I just remember everything semantically. I have next to no memory at all. I have only a few memories, which I can recollect well, most other things I forget or become a blur. I remember very intricate sensory details, particularly visual and tactile details. I remember things I saw or heard, but not what I did. And if it's the same temperature weather outside on a certain day, I might remember something that happened to me, but usually only when the same exact conditions are present." So ASD is rarely conceptualized as a disorder in which memory is impaired. And this is

likely it has a lot to do with the fact that semantic memory, right, their memory for facts can be good, and we see this depicted and reinforced in film and popular media quite a bit, but semantic memory for autobiographical facts can also be intact or superior. So being able to remember people's names or the names of places one has been. But this can obscure the fact that when it comes to this very special type of memory, episodic memory, studies have consistently shown severe deficits in this area. Several studies have found that the persons with autism report fewer EMs, and that they require more prompts to elicit them. We also find that EMs are less specific. Persons with autism rarely offer specific time, place, event references. And this is true for both older and younger children and for both recent and remote memories, and this suggests that this is a lifelong issue.

Accounts of EMs are also relatively brief and less elaborated. And this appears to be the case independent of verbal IQ and language ability. EM is less coherent, importantly, the narratives of individuals with autism often lack resolution or meaning-making, which likely hinders their ability to learn lessons about the self from past personal experiences. And although the data are equivocal, there are a few reports suggesting that persons with autism those who have relatively good emotion understanding and good emotion vocabulary, for them, emotion processing can be a scaffold for episodic memory.

And the same is true for sensory and perceptual experiences, which likely represent an alternative compensatory strategy to episodic memory encoding. As such, emotional, perceptual, sensory features, may serve as a stronger organizing schema for episodic memory in ASD than they do in neuro-typical development. And crucially, finally, a series of studies by Dermot Bowler and his colleagues, has shown that recall in autism is better when more information about the recalled event is available. So you think back to that quote, where that gentleman was saying, "I can recall, but only when the same exact conditions are present." Now, this is true in neuro-typical development as

well, but it appears to be more important in autism, it tends to be a bigger effect. Because in autism, EM may be disorganized and fragmented, and so, any additional supports to structure EM can be facilitative. So this is clear implications for intervention, providing more information should facilitate episodic memory it can mean a variety of things. It could mean the use of artifacts to help EM, maybe if you wanna talk and reminisce about a day at the beach, it would be facilitative to have the seashells on hand that you got when you were there, if you wanna ask a child about an incident on the playground at school, it's probably gonna be facilitative to have that conversation on the playground itself. So we also see what has been referred to as a reduced sense of presence in the EMs of persons with autism.

And this is associated with disruptions in self-concept and identity, that are often concomitantly observed. It also involves a tendency to adopt an observer view as opposed to a first-person perspective. My friend, Doctor Carol Westby, talked about this when introducing the notion that cultural variation exists along this dimension, but we also see it vary with some clinical conditions, and autism is one of them. We tried to illustrate this here, let's imagine this is you, you're the man in the blue shirt, and if we reflect on how we experience the world, most of us would probably report that we take a first person, very importantly, subjective perspective, and we're trying to show that in the left image.

So we place ourselves in the center of an experience and we organize the experience from the egocentric cognitive landscape so we can integrate and make sense of the information and the stimuli all around us. So it is the self that is actually organizes the record of our personal experiences. By contrast, in autism, there appears to be a tendency toward the adoption of an observer view, one that places the self as an object in this scene. And now this is a very different way to experience the world, and it suggests that episodic memory will be organized and coded very differently, and in the ways that will make it difficult to learn from the social environment and to recall, reflect

on, and analyze one's own subjective paths. In a related vein, research has demonstrated that episodic memory is better in neuro-typical individuals when they are actively participating in a task. So our EM tends to be superior when we build a sand castle, as opposed to watching somebody else build a sand castle, but people with autism, interestingly, tend to show the opposite pattern. EM and ASD has been shown to be superior for events that are observed, compared to events that are actually experienced. And this suggests that people with autism may have special difficulties with memories for past events that are tied to the self, as opposed to past events in general.

So when it comes to practice recommendations, I have to begin by saying that there are zero studies that have been conducted to examine the efficacy of EM interventions in autism. So we are working on that right now, it's the topic of Ashley's dissertation. And so these are tentative recommendations, but they flow from the literature, and what we know about best practices for working with persons with autism spectrum disorders.

And the strategy that we will discuss here that I'll describe, can also be found in an upcoming book that we are offering on the topic. I also just wanna say, I'll be talking about a few strategies for each clinical population, but we don't mean for you to interpret that as these being mutually exclusive, they're not. I'm gonna highlight certain strategies here because they involve explicit teaching, which we know can benefit children with autism. So first, when it comes to EM encoding, involving others in the activity is promising. And this is in response to the data on the no-self enactment effect that I just talked about. And it is also consistent with the evidence-based strategies to capitalize on peer play. We also recommend using multimodal experiences following the research that shows that this can facilitate recall. We recommend using language to help lay down a record of what is being experienced during encoding, talk before the activity, what are you doing and why, and talk during the activity, we call this parallel

talk, but it's basically a form of narration where the adult describes what the individual is doing, but also importantly, what they may be experiencing subjectively. And then very crucially, talk right after an event. Research shows that talk immediately following the event is the most facilitative for episodic memory. We recommend the use of elaborative reminiscing while talking about thoughts, emotions, and sensory experiences, the use of artifacts and prompts, and visual supports is needed. So in an article in 2018 I published with my colleague, Patricia Prelock, we described how you could use social stories, how you could adapt them in ways that would be more therapeutically potent for supporting episodic memory. And we actually think, in large part, that's why social stories are effective.

Many researchers and theoreticians who have commented on the matter have proposed that social stories are effective because they support theory of mind, sure, executive functions, I have no problem with that, maybe even central coherence, but we're adding another one to the list that people haven't really thought about before. These social stories are personal narratives, they're written from a first-person perspective, and we think they're effective in large part because they recruit and support episodic memory.

You could say the same thing about Carol Gray's sister intervention, "Comic Strip Conversations", and in that article that I referenced, we give specific guidelines in that tutorial about how to adapt these well-known very promising interventions. Here's an example of a visual organizer that we can also use to facilitate a conversation about a past personal event. The adult asks questions that probe the child's experience, including what they felt, or thought, or smelled, or heard, or tasted, or saw. And in the center of this, we put some physical support, like an artifact or a visual support, like a picture, or a text, or a drawing. And this example shows a blind jelly belly taste test. And this is designed to engage all the senses, but also thoughts. So maybe you were surprised at the flavor, maybe feelings, like did you like or dislike that flavor? And we've

proposed this as a controlled memory encoding procedure, which is advantageous when trying to assess memory specificity and accuracy because the clinician has control over and knows exactly what was experienced, and should therefore be encoded in memory. Another fun procedure that we've proposed is the Memory Box Scavenger hunt. And so here, what you do is you talk with the child ahead of time, you try to think about different objects that would stimulate different senses, and where you could locate those around the house, or around school. While you're on the scavenger hunt, you talk about the experience, you bathe in language, and also your thoughts, and feelings, and sensations, evaluating that experience.

And then again, right after, because that's so important, reinforce the experience and the encoding of those experiences by asking the child to maybe draw a picture of the object. And then on the back of the card, we write a memory that we associated with it, and we could put all the cards in the memory box, and that's a metaphor for our brains, and we can pull them out later for a subsequent reminiscing session.

Storyboards also can be used to good effect.

This is image that I borrowed from, again, thank you, my good friend, Doctor Carol Westby, this is her image of going for pizza, I think there was a pizza party here. But the idea here is to identify an event and document it, bring artifacts from the event into the discussion, and to keep a storyboard where children can see or refer to it so they can use it to support the organizational structure for the telling of a personal narrative during a reminiscing session. So here's a quote from a mother of a son with ADHD. "I have no idea why my Vance is failing in school. He has the best memory of anyone in our family. We might go to a restaurant where we haven't been for several years, he remembers where we parked, and can even recall what he ate, and where the men's room was. But that kid can't ever remember his vocabulary, or spelling words from last night." ADHD involves significant disruption to the executive function system, which underlies our ability for self-organization, goal-directed behavior, and self-regulation.

And when it comes to memory, persons with ADHD have difficulties with both working memory and semantic memory, that's why Vance is having trouble with his vocabulary lessons. Yet, surprisingly, a few studies have shown that episodic memory can be superior in some persons with ADHD, and indeed people with ADHD often report EMs, more episodic memories as well as more detailed and more specific episodic memories. And only a handful of studies have been conducted on EM and ADHD, and this combined with the great heterogeneity in ADHD, makes it difficult to characterize EM in this population. And there's also some indication that EM will vary greatly depending on ADHD type, severity, and co-morbidity, okay?

But that said, nevertheless, the quality of EM likely reflects high emotional impulsivity. Individuals with ADHD are less able to moderate or suppress the emotional reactions they experience, and consequently, they are likely to show more impulsive and more extreme emotional reactions in response to events. And this emotion dysregulation has been considered a characteristic feature of ADHD, and many have argued that it should be a diagnostic criterion. And it fits with the well-established finding that emotional saliency in ADHD, well, for all of us, emotional saliency is associated with robust memory encoding and retrieval.

Where were you on 9/11? If you were old enough to remember this event, I'm betting you could tell me where you were that day and what you were doing, thinking, feeling. And this is in large part because it was so highly emotional. So those memories get robustly and inscribed in memory. And it's no different for the person with ADHD, it's just that so much more of their experiences are accompanied by big emotions. Unlike ASD, the first-person perspective appears to be intact in ADHD, but EM appears less well-organized compared to typically developing individuals, and this likely reflects the quality of attention at encoding, although disruption and retrieval processes also may operate. But at encoding, due to lowered inhibition and heightened impulsivity, people with ADHD may not attend to or find salient the same things that typically developing

people do. They may not make the same causal connection that others do, they may not encode the same information that neuro-typical brains might find irrelevant. And so, although EM detail and specificity are intact and may even be superior in ADHD, the content of EM appears to be disorganized, or it is organized differently, and in a way that lacks a unifying structure. And finally, we should also consider the effects of behavioral dis-inhibition on episodic memory in ADHD. Another defining characteristic of ADHD is impairment in the ability to inhibit or delay a behavioral response. But what happens when we delay a response, it's very important. If we can delay a response, we have the ability to form a mental representation while acting on some data to solve some problem.

And this is what allows a person to prepare and execute a response that once activated can be stored in longterm memory. Okay, once in longterm memory, that information can later be pulled back into working memory to solve new problems. But you can't sequence recurring patterns and themes and predict what's going to happen next if you are enacting behavior before you've had a chance to make sense of the situation, and its relationship to the behavior. So this process allows the individual to create an anticipatory schema and to develop forethought, or a sense of future-thinking.

In other words, the experiences of persons with ADHD is different from neuro-typical persons, in that the antecedent behavior consequence sequences are turned on their head. And so even though they may maintain rich and highly detailed EM, they may nevertheless lack the mental models that are deployed in adaptive information processing and problem-solving. Practice recommendations for supporting EM and ADHD include working on general semantic memory, working on those vocabulary items that Lance was having trouble with, but doing it in an active experiential way to recruit the episodic memory system, because this is a strength. And we can also use narrative therapy to support EM memory organization. So the quality of personal

narratives likely reflects the quality of episodic memory in ADHD. And what we know about narrative discourse in persons with ADHD is that even as adults, many of them tend to tell personal narratives that are poorly organized, or redundant, or that can be overly descriptive, and that there's too many details, or some embellishments. And so strategies that SLPs we'll be very familiar with to support narrative cohesion may be profitable when applied to the construction of personal narratives in ADHD. So this could, of all things that you will be very familiar with, focused on story grammars, a focus on gists, or high points, or a clear temporal sequence of events. This is a quote, again, from Carol Westby, she has shared with us so generously, I'm grateful to her, and she referenced this individual on her talk on Monday.

This is the testimony of a woman who was born with no outer or middle ears. "Every once in a while, there's like a splinter of a memory that comes in. It just pops out of nowhere. I didn't know it was there. I remember remembering, but the memories are not connected, they're like floating, unattached. How do you capture a memory that doesn't have a time or place to attach to it? It's just free-floating." So when having this discussion, I've noticed that Carol and I are both very careful to make the following point, it's very important to recognize and appreciate the fact that a child with hearing loss is not like a hearing child minus hearing.

So with children with hearing loss, there are a whole host of factors that lead to learning differences, what Carol Westby describes as global neurocognitive differences. Children with hearing loss may process visual and auditory stimulation differently from hearing children because they're exerting an effort to listen, particularly in noisy environments, or when interacting with several people at a time. Stress and fatigue that arise from increased listening efforts also likely reduce the capacity to process the multiple environmental cues that are essential for effective social interaction. And so, as a consequence, children with hearing loss experience reduced incidental learning. And I have a good example of that here. The, oh, there it is, there we have it. So, for

many parents, sadness lay in their own appreciation of what the deaf young person is missing in terms of incidental conversations and asides, or overheard conversations. And this is a quote from mother of Bobby, who is 20 years old. "You can't carry on a normal conversation. It's giving that instant comment. You can't catch the moment. By the time you have got his attention, the situation might've passed. He doesn't say he misses anything, but he wouldn't know if he missed anything." I really love this comment about the difficulties with catching the moment and it's worthwhile to recognize just how quickly so much of the social interplay around us takes place. A look or glance paired with an utterance, and a gesture, and a conversational turn-passing device, or a point to some object of reference, these things are coordinated so quickly.

And when you've missed the moment, it's gone, and it can't be recovered, at least not in its original form. And many parents describe efforts in trying to slow down, go back and recreate the experience through explanation, but that's a very different experience, right, being able to observe how people exchange social communications in real time is completely different than having somebody sit down and explain it to you. So this leads to challenges in theory of mind. I'm having trouble advancing the slide. Okay, there we go. Thank you for your patience. So theory of mind challenges are not universal, but they are common in children with hearing loss, and they are sometimes severe.

And although children with hearing loss show the typical developmental sequence, it's also not at all uncommon to observe severe developmental lags. And the degree of impairment is highly variable in linked in complex ways to aspects of the child's social and hearing history. Here's the general trend, beginning in infancy, and even early childhood, theory of mind can look good, it can look intact, but that as development continues, difficulties in social cognition and social pragmatics become more pronounced because of two joint problems. First, the theory of mind problems the child

is expected to master as she grows older, increase dramatically in complexity, and then second, recall that this child is missing the moment. And so the gap in theory of mind knowledge is ever increasing relative to hearing peers. So right at the time when the social concepts become extremely complex is when the biggest gaps in social knowledge are accrued. And so, yes, we often think we see a toddler or preschool-aged child with strong theory of mind, or language skills, or social skills, and then we're surprised because in the school years, or in adolescence, we see severe challenges in social cognition and social pragmatics. When it comes to narrative, these skills are often delayed, and this includes both comprehension and production, narratives tend to be less detailed, and we often see problems with micro structure, and in a related vein, and as we'd expect, we often see that they have fewer, less-detailed autobiographical memories.

So, we used to think that if you just train up the language, the social cognition and the social skills would follow. This is not the case for most children with hearing loss who need extra support to develop theory of mind. And so we have advocated for the need for a broader view. If we're trying to understand the episodic memory and personal narrative deficits of deaf children, language structure is absolutely important, but it also tends to upstage the many other processes that are involved. A somewhat inchoate structure in episodic memory and narrative discourse also reflects conceptual deficits in theory of mind.

To construct and interpret narratives, we need to understand the differing viewpoints of characters. So a promising approach for supporting autobiographical memory in children with hearing loss is to focus on EM, as well as theory of mind in the context of narratives. And one specific approach is the use of joint book reading that is rich in mental state talk. So during joint book reading, the adult and the child, they read a book while also having a conversation about the content. The conversation focuses on mental states and social reasoning. What Doctor Westerveldt talked about yesterday,

as Bruner's landscape of consciousness, and I've included several of those aspects here. But these conversations that focus on mental states encourage children to reflect on the inner workings of mind, and it helps them make implicit knowledge explicit, and it helps them focus attention on different points of view. We can also use the fictional narratives themselves to support EM theory of mind and personal narratives. As Doctor Westby related in her talk, there's a correlation between fictional and personal narrative discourse skills. If you're good at one, you tend to be good at the other. And this makes sense because fictional narratives provide information about the potential structure and content of personal narratives. But, of course, it's important to also think about what theory of mind concepts you want to work on. You want to make text choices that are hopefully not only interesting and motivating, but also developmentally appropriate, not just in language level, but also with regard to the theory of mind content.

And we use a norm reference and standardized broadband assessment of theory of mind known as the Theory of Mind Inventory, for which I am the lead developer, so disclosure there. But we use this tool to identify patterns of strengths and challenges, and then to make decisions about treatment targets. And now once we know what we want to target, we can make more appropriate text choices. And in a related vein, Beazley and Shelton recently analyzed several children's texts for theory of mind content.

And they recommended books for children with hearing loss, the targeted range of theory of mind domains. All of the books in their study included a depth and variety of theory of mind concepts, and a few of them are highlighted here. But again, the important point is to be targeted, not only in the language level, but in the theory of mind content and to consider which theory of mind domains are developmentally appropriate to work on. We can also support episodic memory and theory of mind and personal narrative development through elaborative reminiscing. And the really

encouraging news is that effects are often immediate and clinically significant. Also, research shows that parents can be trained to adopt an elaborative reminiscing conversational style in a short period of time. So we can train clinicians and parents in the use of elaborative reminiscing, but if you're looking for a manualized approach, there's something called Tender Shoots developed by Elaine Reese and Elizabeth Schaughency. And this is a book reading intervention, they do a book reading with a conversation approach. But the reason I bring it up here is that it includes a module called Rich Reading and Reminiscing, or RRR. It's a six-week module that focuses on story understanding, emotions, and episodic memory, through the use of elaborative reminiscing.

And the data are impressive, the data has shown that RRR helps children develop narrative skills, self-regulation, emotion understanding, and better problem solving. Now, that was with autism, we can also use modified social stories to teach social concepts. And studies have shown that this intervention can improve story comprehension skills in deaf children, and that the effects of intervention generalized to spontaneous conversations about emotion, as well as better emotion recognition. And finally, the most natural approach is to ensure that the child is exposed to rich and varied social interactions.

And that means different physical and psychosocial context, variety of interlocutors who vary in age and their relationship to the child. And crucially, these need to be accessible interactions. So it's important to think about talking within the listening bubble, or using whatever modalities are necessary. This is a testimony of a woman with a severe trauma history, reflecting on the quality of her memory. "My memory was quite sparse. All of a sudden, I'm like, 'I do remember,' and there's this moment of, 'where did that come from?' It's almost like being slapped in the face and you're not expecting it. It made it very difficult for me in interpersonal relationships, because I just didn't know who I was supposed to be. What are we, if not our life experiences?"

When understanding autobiographical memory and trauma, we need to distinguish between traumatic memories and non-traumatic memories. Traumatic memories tend to be maladaptively intrusive, they pop up when they're not helpful, and this is the slap in the face that we just heard in that quote. They also tend to be sensory-rich and to feel like they are occurring in the here and now. Persons with traumatic histories often recount episodes of panic and use motor movements that mirror the behaviors experienced during the actual traumatic event. So maybe rapid breathing, or flaming of hands while recalling a near-drowning incident. But non-traumatic memories are differently disrupted in almost every way. These tend to be over-generalized. They are nonspecific, details are conspicuously absent.

A phenomenon some have argued as a psychological defense mechanism, something called functional avoidance. And the idea here is that cognitive system shuts down memory search to avoid encountering an unpleasant or traumatic experience. And finally, persons with traumatic histories tend to also have more negative self-representation. So childhood trauma is also associated with a wide range of theory of mind challenges that vary in their complexity and their developmental onsets. Emotion recognition is disrupted, they tend to over-assign anger, they see threat where there isn't any, false belief understanding is disrupted, as is empathy, and pretense, and fantasy in the early years.

And we also see dysfunctional appraisals and maladaptive coping, as well as broad low-level biases in memory, attention, and judgment that support disturbed thoughts and reinforce them. And all of these appear to be causally implicated in the development and maintenance of psychiatric conditions like PTSD. So the narratives of persons with trauma tend to be less coherent, temporal markers are blurred, and their narratives, as they tend to be in their psychologies, and the distinction between then and now is often collapsed. They're less dissociated, and by that, I mean not narrated from the distanced perspective of the present, more disorganized, chronological and

event sequence get disrupted, they're more repetitive, and they also tend to lack agency and authorship. So trauma profoundly disrupts the capacity connected back with the past and make a validly usable experience applicable to the present. Although we see a lot of heterogeneity in this as well, not all trauma narratives are so fragmented. And so I'll show you an example, and just contrast the testimony of two women. This is Iris who is talking about going back to a house where she used to live with her abusive husband, who has since died. "I left the house at Beresford Road and vowed never to go back. I had to leave him in the end, and it was just like, you know, great expectations and nothing had changed. And when he died, I had to go up to the house, and nothing had changed.

There were no cleaning or anything, or anything done, nothing, nothing, it was just nothing had changed. I said to my girls, 'I'm never going back up to that house. There's too many bad memories,' by God, there were. I said, 'I'm never going back up.' But then he died and I had to go back up, clear it out. I never ask help, but said, 'I've got to have help time. I can't do it.' Oh, and it was awful, it brought it all back. I wished the bugger would go, but it won't. Nothing had changed, it was as if I'd just gone that day, it was absolutely filthy. Where was social services and all his care workers? So I saw that, I was in a flat, I had to move out of the flat because they put the druggies up there on top.

So I had to go to the lodge with this chap, very kind of him, ad I got this, and that was it. It needs a lot of work, but it's mine." So Iris' account deploys some discursive features that suggest only a partially assimilated recollection. The narrative is disjointed and there's a lack of a logically progressive or chronological sequence, with the narrative jumping around between episodes kind of without warning or explanation. Her sentences are not fully formed, and in some instances go unfinished, and this makes their meaning elusive. And further, her fragmented recollection may be evidence of a disruption in her ability to narrativize herself. There also appears to be a lack of

agency that may be reflected in what Doctor Lyons talked about the other day, for instance, you see many compulsion verbs here, I have to, I got to, and these kinds of discursive features give the narrative the appearance that the primary order is a passive agent. Finally, you also see quite a deal of repetition in here as well, which is characteristic. But the narratives of trauma need not be disjointed. And we can observe several healthily integrated, resolved trauma narratives. This is a reflection of Fiona speaking about the loss of a young child. "Do you visit those memories of Victoria often?" "Very rarely. It's not necessary at all.

It was very sad, but I don't have any regrets about it. It was a very steep learning curve, it was a very valuable experience. I was devastated at the time, but I went on to have two happy healthy children, and it would be much more tragic if I hadn't. When you have two healthy children, you don't have time to consider one that died. It was a very important experience in my life. The only time I could possibly think about them now, if I think how old Georgina is, it occasionally pops in my head, or if I knew someone who was going through a similar experience, I would, I hope, be brave enough to share if they needed to talk to somebody about it, but I don't need to do it myself. It was a ghastly experience in a lot of ways, I won't go into detail because it would be hard for you."

So, in contrast to Iris' collapse of temporal boundaries, Fiona discursively constructs temporal limits around this emotional event. She also distances herself in the event. So this is displaced in time, "I was devastated at the time," she says. She marks the boundaries between the past and the present and firmly locates herself and the meanings that are constructed in the present. And despite the painful subject matter of Fiona's account, it is characteristic of an integrated recollected experience rather than one with continuing traumatic features. The chronological structure of the account, the detailed explanation, interpretation of the experience in retrospect, suggests that the experience has been successfully assimilated into later periods of her life. The

experience of losing her first daughter is no longer configured as a tragedy because of her subsequent successful mothering experiences. And in contrast to Iris, Fiona finds a framework of meaning, such as that of motherhood. She's also able to construct the devastating loss in a conventional and meaningful narrative form. And by positioning the event in the wider context of her life's story and turning death into a learning experience, it suggests the event has been successfully controlled and integrated into a successful conception of self. So Doctor Westby gave us a really nice description and overview of the theoretical and empirical basis of KIDNET in her talk on Monday. This is a form of narrative exposure therapy that focuses on the reconstruction of one's autobiographical chronology.

So I will not repeat her lessons here, but I just want to remind the audience about this approach for treating autobiographical memory challenges in children with trauma history. And so mental health professionals are typically the ones who are gonna be conducting Narrative Exposure Therapy, or NET, so what is the SLP's role in supporting episodic memory and wellbeing in children with traumatic histories? First, SLPs can recognize the fragmented narrative and characteristic disruptions in theory of mind, and they can also partner with mental healthcare professionals who are doing that.

Mental health professionals are often gonna recognize that trauma narratives are incoherent, but they rarely understand the language factors involved. And meanwhile, telling a coherent narrative, even for younger children, is required for success with narrative exposure therapy. So SLPs can build foundation skills by targeting narrative cohesion and completeness through the use of elaborative reminiscing of positive events for which the clinician was present. This is important, because remember Ashley talked about how episodic memory is massively priming. And so you would want to identify a specific positive event that you were present for and could discuss in elaborative detail. And indeed Doctor Westby reports in her clinical experiences that SLPs are often surprised by what they will trigger when talking about what they expect

to be a positive past experience. "So tell me about what you did for your birthday last year," or, right, it seems benign, very positive, but in practice, all kinds of things can get triggered because EM is so massively priming. They can also help build on those foundational skills that successful narratives require, things like self-regulation. SLPs kinda assist with emotion coaching and the ability to label emotions, and perceptions, and behaviors. All of these are required for successful communicating a personal narrative, which, again, is the core component of an intervention like KIDNET. So I've learned so much over the last few years of my research on theory of mind has taken me into research on autobiographical memory, and it's important for adaptive functioning, but also psychological wellbeing.

And one quote that summarizes this for me is, "The ability to remember personal events is at the heart of what defines an individual as a person with obligations, roles, and commitments in a given society. It enables us to draw lessons from our past and plan for our personal future. It helps us orient and participate in complex social communities. Autobiographical memory is therefore crucial for a sense of identity, continuity, and direction in life." Now, I'll end with a summary of our conclusions and what these mean for our lives, I mean practice. Autobiographical memory, especially episodic memory, is crucial to identity and social cultural learning, and the linkages between autobiographical memory and the wide range of human specific cognitive achievements are complicated.

Remember, these are functionally and developmentally intertwined, and theory of mind and personal narrative development, executive functions, they're all knotted up together. And this means that there are multiple pathways to autobiographical memory dysfunction. And for different clinical conditions, autobiographical memory appears to have different origins. And so it has different qualities, and it has different features. And so there's gonna be different implications for assessment and treatment planning. And in the end, we want to challenge SLPs, and related professionals, to develop

awareness of, and to think critically about autobiographical memory. And we believe this should be a priority for graduate training going forward. And with that, I will end this presentation. I wanna respect the time, and I'm happy to open this up for any questions you might have.

- [Amy] Thank you so much, Tiffany and Ashley. This is Amy. I wanted to let our participants know if you need to go now, you can, but if you have a few minutes to stick around for Q&A, please do. I welcome any questions in the Q&A pod. In the meantime, I wanted to our audience know that if you were not able to attend the live events earlier this week on Monday, Tuesday, Wednesday, those are currently available already in our library, in the recorded format, and the same will happen with tomorrow's event. If you're not able to make the live event tomorrow, we'll offer it probably at the beginning of next week, in it's video form. And I see something here, and this is a comment, not a question, but Elizabeth said, "Tiffany, you are a dynamic speaker, fascinating information that you are passionate about, thank you." I would echo that for sure.

- [Tiffany] Thank you.

- [Amy] Let's see, I'm gonna give it another minute or so here, but I really, really enjoyed this information. Memory has always been a particular interest of me, and so to see it, how it intertwines with language and to think about perhaps us looking at this more closely in our graduate programs is a wonderful step forward, I think, for our profession.

- [Tiffany] Yes, thank you for saying that. I think we have a lot of work to do. And so we've been trying to incorporate it increasingly into our own graduate program, but just really trying to get the word out about it's important 'cause it's so core to so much of

what so many speech language pathologists are working on. I think we just give it a different name sometimes.

- [Amy] Absolutely. And there's a question here that says, "Could you explain what sourced amnesia is in semantic memory?"

- Yeah, sure. I mean, I'd be happy to take that. Ashley, if you wanna jump in, that's fine too. So source amnesia, that means you don't know how you know something. So if I asked you, "What is your wedding date?" if you're married, or, "what's your wedding anniversary?" you probably be able to tell me that. But if I asked you, "How do you know that?" Some people get confused and they say, "Well, I know it because I was there." Well, no, because you probably, you were also there when you met your spouse, right, can you remember the day that you met your spouse? Most people can't bring that up unless there's something really like special about that day, because that's semantic memory, you've memorized that date. But that's different than the experience of your wedding.

And so if I say, "Well, tell me about your wedding." You could say, "Well, I remember walking down the aisles and I remember the faces of the people who were looking at me, and I remember feeling scared and I thought I was gonna faint, but I was so happy. But I couldn't wait for it to get over. And then we had the food, and then we had the dance, and then after that, we..." right, you could tell me all of these rich details. And I could say, "How do you know that?" And you just look at me funny, right, because you'd say, "Well, I knew that because I remember it, I remember it because I was there." So there's like this reliving of an experience, and semantic memory is just completely different. It's just that they're so knotted up together, and so they're hard to distinguish in practice, but they are very different psychological animals.

- [Amy] And we're gonna do one more super-quick question here, and then we'll wrap up. One of our audience members says, "I work with a high school student with autism. Are there specific ways you have targeted episodic memory for high school students who are perhaps preparing job interviews, preparing to go to work, trying to learn about expected behaviors during various social situations?"

- [Tiffany] Yes, so there's a distinction there, right, there's the work on the episodic memory, which is situated at the cognitive level, and then how to successfully navigate a job interview, that's something on the behavioral level. So we can, I mean, ultimately the goal is to use advances in episodic memory to support all of those other things. And if we do support episodic memory, the idea is, is that you would get more natural and functionally adaptive kinds of behaviors. But look, my first knee-jerk response to that is this must be an individual with good language and high intellectual abilities.

And so my instinct is a comic strip conversation, and we've adopted those. So that's a conversation with somebody about how to engage in something, or it could be a past event, but they're past events for thinking about the future. And so you could have a conversation and then you could talk about, "Well, here's what I would do differently," or not, or, "that was a very successful encounter," or those kinds of things. We also know that there could be role modeling, and those kinds of things, and so. This is not something that we would do exclusively either, focus on episodic memory is nice because it can overlap with all kinds of other approaches, and it doesn't need to be an either-or. Video modeling jumps to mind, you know?

- [Amy] Yes, definitely. Thank you so much. All right, well, I'm gonna go ahead and wrap it up here. I don't wanna take up extra time for our audience, but thanks Ashley and Tiffany for being here today, this was a wonderful segment of this conference. And

Trisha, I wanted to thank you again for being guest editor this week and helping us with these events. Did you need to say anything in conclusion?

- [Trisha] No, I don't. I would just think Tiffany and Ashley for a fantastic presentation, and for taking part in this, and we all certainly learned an awful lot from you, so thank you.

- [Tiffany] Okay, great. Thank you so much for having us, absolute pleasure and an honor, and I'm just grateful for the opportunity.

- [Amy] Wonderful, thanks again, guys. Thanks to our audience for being here today, we appreciate it, and hopefully we'll see you all tomorrow for Day Five.

- Thank you.

- Have a great day, everybody.

- Thank you.

- Thanks.