

Development of a Manualized Intervention to Support Episodic Memory in Autistic Children: Elaborative Reminiscing Is Key

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ABSTRACT

Episodic memory (EM) is memory for past personal experiences. EM and social development are inextricably linked, and both are impacted in autistic persons. Parents of autistic children can be taught to engage in a unique conversational style (i.e., elaborative reminiscing) to support a child's memory and social development. This article discusses the importance of EM in autism and describes a new manualized caregiver training to support EM in autistic children. An uncontrolled pre-post study design was employed to test proof of concept. Results affirmed the potential of this intervention for increasing caregivers' elaborateness and improving children's EM in a family-centered, naturalistic way. Results suggest that further treatment development and examination of effectiveness are needed. We argue that these kinds of intervention are important: not only is EM theoretically potent for social cognitive development, it is essential for a sense of self-determination, social connection, and psychological well-being.

KEYWORDS: elaborative reminiscing, episodic memory, parent training, autism, autobiographical memory

Learning Outcomes: As a result of this activity, the reader will be able to (1) describe episodic memory and how it is impacted in persons with autism; (2) identify key features of elaborative reminiscing; (3) explain how to scaffold elaborative reminiscing to support episodic memory in autistic children.

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It is only through sharing our stories with others that we come to own our experiences as uniquely ours and different from others. Memories may not be true to the world, but they are true to the self; through language we share our memories with others and through sharing our memories with others we come to understand that our memories are our own subjective perspective on our personal past.¹

Sharing stories with others is a universal but uniquely human activity.² Humans share stories for a variety of purposes. We tell stories to inform, teach, persuade, problem-solve, and entertain others and to establish and maintain social relationships.^{3,4} Stories serve a wide variety of purposes and take many shapes, including elaborated cultural narratives passed down from generation to generation, life stories or autobiographies, and parables and fairytales. Fictional narratives are made-up stories that include previously heard or read stories,⁵ and mastery of these types of stories appears to be important for literacy development and overall academic success.^{6,7} Personal narratives, on the other hand, are stories about one's own experiences and include personal event narratives as well as integrated life stories which integrate an accumulation of events and experiences across a person's life.⁷ Both types of personal narratives play an important role in social development, psychological well-being, and academic achievement.^{7,8} Moreover, sharing past experiences through personal narratives is foundational to successful social relationships⁹ and broader social-emotional development.⁷ As such, fostering personal narrative discourse skills from a young age has consequences for healthy social and cognitive development.¹⁰ As a composite skill, personal narrative production requires mastery of several subskills. These include the ability to organize and understand one's own and others' thoughts, feelings, and perspectives; explain causal relationships; identify relevant information; adapt the content and delivery of the story based on the context and the audience; and organize this information into a coherent story.^{8,11} Although these skills are foundational to successful narrative production, the sharing of past personal experiences

also relies on and requires another cognitive ability: episodic memory (EM).

EPISODIC MEMORY

Although personal narrative discourse involves the *sharing* of past personal experiences, EM is the *memory* of past personal experiences. During episodic recall, an individual mentally travels back in time and re-experiences an event from their subjective, first-person perspective. Information pertaining to the *when*, *where*, *who*, *what*, and *why* of the event is typically recalled,¹² as are sensory details (e.g., sights, sounds, smells, tastes) and mental states (e.g., thoughts and feelings) of oneself and others.¹³

EM and personal narrative discourse are inextricably linked, and it is difficult to imagine personal narrative discourse skills without EM. In fact, it is well-established that EM is central to the ability to construct and communicate personal narratives and to reminisce about past experiences.¹⁴ Moreover, sharing past personal experiences (i.e., personal narrative discourse) requires one to reflect on and integrate EMs while maintaining narrative coherence.⁷ In turn, personal narrative discourse provides an "organizational and evaluative structure around which EMs can be recalled"¹⁵: as children become more practiced in recalling past experiences, they become more skilled at organizing their past experiences, which leads to a better understanding of their place in the broader societal and cultural context.¹⁶

EM in autism. Although there is great heterogeneity in the EM abilities of autistic individuals (see Hutchins et al¹⁷), it is well documented that the EMs of autistic and neurotypical individuals also differ in consequential ways.^{18–20} Specifically, research suggests that individuals with autism (regardless of language ability) report fewer EMs, and when they do recall EMs, they tend to be less detailed and less elaborate.^{19–25} Moreover, the EMs of autistic persons may be fragmented, overly general and lacking specificity, and contain relatively few subjective details (e.g., reference to thoughts/feelings^{26–29}), and, thus, manifest in "a significantly reduced sense of presence."³⁰ Personal narrative development is similarly impacted in autism. Compared with

neurotypical individuals, the personal narratives of autistic persons tend to be shorter³¹ and less specific,^{24,32} reference fewer person and resolution elements, and are less coherent and contain fewer mental state references.^{27,31–33}

ELABORATIVE REMINISCING

Reminiscing is a ubiquitous activity that occurs spontaneously in day-to-day life.^{34,35} In fact, it is estimated that people share their past experiences in the form of personal narratives “as frequently as every five minutes in everyday conversation.”³⁶ As noted previously, personal narratives can take a variety of forms. A specific type of caregiver reminiscing that facilitates children’s recall of past personal experiences is called *elaborative reminiscing*³⁷ (for a review, see Fivush et al³⁶). During elaborative reminiscing, caregivers and children talk about past experiences, and the adult structures the conversation in a way that supports children’s ability to recollect and take meaning from the experience.

A central feature of elaborative reminiscing involves the adult’s ability to elicit and expand upon a child’s recollections by asking open-ended questions and providing details about the event that confirm, recast, or draw out the

child’s recollections with higher degrees of elaboration or accuracy.^{38–41} Elaborative reminiscing also incorporates a high degree of mental state talk (e.g., talk related to thoughts and feelings), which has been found to contribute positively to children’s social cognitive and narrative discourse development.^{42,43} This style of reminiscing is referred to as “high” elaborative reminiscing, which can be contrasted with a “low” elaborative reminiscing style in which the caregiver rarely expands on the child’s recollections and instead asks more repetitive (often redundant or “interview” style) questions.¹⁰ Table 1 provides an example of both high and low elaborative reminiscing styles.

During elaborative reminiscing, the child and adult recount a past event with specific, subjective details so that it can be *re-experienced, mutually understood, and socially shared by the discussants*. In this way, elaborative reminiscing echoes the experience of joint attention and the forging of a “common ground”⁴⁴ in which two (or more) people have shared contents of mind.^{15,17} When employed optimally, a family’s coordinated storytelling about past personal experiences “provide[s] a safe and comfortable environment for children to tell

Table 1 High Versus Low Elaborative Reminiscing

High elaborative reminiscing	Low elaborative reminiscing
Mother: Remember when we went to see grandma and grandpa? And aunt Dani was there? Remember what she had with her? It was a small animal.	Mother: What kind of animal did aunt Dani have?
Child: Cat!	Child: Candy
Mother: Nooo! She didn’t have a cat. Her animal kept barking! (pause) A dog! Remember what her dog did?	Mother: Candy isn’t an animal, is it? What kind of animals did she have?
Child: I don’t know	Child: Dog.
Mother: You don’t remember?	Mother: She had a dog. And what did the dog do?
Child: No	Child: Ruff Ruff!
Mother: Remember the dog ran right through the mud puddle?	Mother: No, what did the dog do?
Child: Yeah	Child: Ruff!
Mother: He got so dirty! You were watching him run through the puddle and were laughing, huh?	Mother: No. What did the dog run through?
Child: Yeah!	Child: [silence]
	Mother: Why was the dog all muddy?

their perspectives, thus creating interconnectedness as a whole family and recognizing the individual value of the child. Because children's perspectives are validated and integrated, their self-esteem is [also] high."⁴⁵

The use of elaborative reminiscing with neurotypical children is associated with positive changes in children's ability to recall and report their past personal experiences. Children demonstrate better EMs, such that their memories are more accurate and more detailed than children whose caregivers do not use a high elaborative reminiscing style.^{14,37} Not only do these children demonstrate gains in EM abilities, they demonstrate advanced social cognitive abilities; they have a better understanding of their own and others' thoughts and feelings, which is believed to contribute to the development of a stable, continuous sense of self.^{14,37} Advances in EM appear to be causal and persistent over long periods of time.^{41,46} This is important because caregiver reminiscing style is malleable; caregivers can be taught to adopt a highly elaborative reminiscing style to advance their children's social and cognitive development.^{46,47}

Caregiver's talk in autism. Crucially, parents of autistic children appear to be *less elaborative and more directive* during reminiscence compared with parents of neurotypical children.⁴⁸ They tend to ask more yes/no questions, engage in repetitive questioning, and produce more off-topic utterances.^{48,49} Questions may frequently call for rote memorized, objective, factual information that is not central to the memory or the unfolding narrative (e.g., "What month did we go?") and discourse may incorporate fewer subjective, mental state references.⁴² Although it is likely that parents of autistic children adopt a low style of elaborative reminiscing and make other adjustments in their language input to support their child's development in certain ways (e.g., to maintain engagement or repair children's off-topic turns^{48,50}), these features of parent conversational discourse do not predict advancement in autistic children's linguistic or social cognitive development. Indeed, when parents of autistic children use high elaborative reminiscing, their children initiate and contribute more to conversation,⁵¹ respond more elabo-

ately themselves,²⁶ and demonstrate better EM.⁴⁹ Clearly, the quality of the language-learning environment influences how both neurotypical and autistic children develop language and social communication skills.^{42,52} Similar to their neurotypical counterparts, autistic children's memory and discourse appear to benefit from a rich language environment as opposed to a simplified or telegraphic one.⁵²

Of importance, a substantial body of research has demonstrated that EM is facilitated in autism when informational support is provided. Specifically, the Task Support Hypothesis⁵³⁻⁵⁵ postulates that recall is facilitated in autism when more information about the event is made available (e.g., visual stimuli,⁵⁶ question prompts²⁸). For example, in autism, questions that rely on cued recall such as "*What did the woman say when she dropped the camera*" facilitate episodic remembering to a greater extent than do free recall questions (e.g., "Tell me everything that happened"²⁸). This is likely because cued recall questions *add information* about the event. For example, when asking "What did the woman say when she dropped the camera," information is given about the event: a woman dropped the camera and she said something when she dropped it.

Because an essential feature of high elaborative reminiscing is that the adult provides additional information about a past experience to support children's recollections, it can be thought of as a powerful form of *task support*.⁵⁷ This task support can take various forms, including commenting (to add information, detail) and cued questioning, but task support can also include certain kinds of closed-ended questions, which is a device typically associated with a low elaborative reminiscing style. The following is a sample conversation in which the adult first asks an open-ended question. When the child does not respond, the adult then asks a closed-ended, forced choice question. When the child still has difficulty responding, the adult continues the conversation by offering the information. Asking closed-ended questions (while not the ultimate goal of elaborative reminiscing) may be necessary in the short run to provide enough information and task support to help

the individual with autism recall the event and contribute to the conversation.

Adult: "Tell me what happened at the race-track last week." [open-ended]

Child: [no response]

Adult: "What did we do?" [open-ended].

Adult: "Where did we go?" [open-ended]

Child: "I don't know"

Adult: "We watched a really exciting horse race."

Child: "The horses raced"

Adult: "The horses did race. Who won the race: the brown horse or the gray horse?" [closed-ended]

Child: "The gray horse"

Adult: "The gray horse did win. Did it win by a lot or a little?" [closed-ended]

Child: "Like a mile!"

Adult: "I'll say! Yes, that's right. It won by a lot."

Adult: "I was very happy because I won \$20.00 and used it to buy us all popcorn"

Adult: "How were you feeling?" [open-ended]

Child: "It was ok. The popcorn stuck in my teeth. I liked the hotdogs better"

ELABORATIVE REMINISCING PARENT TRAINING

The vast majority of research on elaborative reminiscing has involved parents and their neurotypical children,^{41,46} and although theoretically potent and rich with implications, relatively little is known about whether elaborative reminiscing works as a support for autistic children's social and cognitive development. To address this gap in the literature, we developed an elaborative reminiscing caregiver training that was aligned with the research on EM, autism, and the Task Support Hypothesis while incorporating strategies from the elaborative reminiscing literature,^{41,46} existing caregiver training studies,^{41,58-61} and well-established, manualized training programs targeting social communication skills in autistic children.⁶² The parent training was piloted on one mother and her neurotypical child to refine the intervention and data collection procedures. The resulting program was composed of three sessions, with an additional booster session. The three-session

protocol is provided in the Appendix. The comprehensive training package, including the standard operating procedure and materials, is available in Hutchins et al.¹⁷

Training procedures. Our caregiver training in elaborative reminiscing was manualized according to a standard operating procedure that was developed as part of the first author's doctoral dissertation. The training consists of three sessions occurring on 3 separate days over the course of 1 week. Each session ranged from 30 minutes to 2 hours (with the entire training lasting ~3 hours). The entire training can be completed remotely via online video meeting platforms (e.g., Zoom, Microsoft Teams) or in-person. Whether the training is completed in-person or online, caregivers are provided with the training materials ahead of time so that they can follow along with the appropriate materials throughout the training.

During the training, caregivers are taught strategies to support EM (i.e., elaborative reminiscing and task support) that are paired with best practice principles for supporting social cognition in children with autism. Best practices include using visual supports as appropriate, scaffolding the child's memory contributions by providing more information about the memory, allowing the child to take the lead in the conversation, providing the child choices, and using supportive repetition. The training can be delivered to caregivers by professionals (e.g., speech-language pathologist [SLP], special educator, and psychologist) with a good understanding of EM and elaborative reminiscing, and who have experience working with children with autism and their families. Before delivering this training, professionals should study EM and how it is impacted, assessed, and supported in persons with autism (see Hutchins et al¹⁷).

METHOD

Design, participants, and outcomes. The data reported here were collected as part of a larger study designed to evaluate the newly manualized intervention. An uncontrolled pre-post designed was used to test proof of concept and the intervention's potential for therapeutic outcomes. Participants were 27 caregivers and

their children (20 males; 7 females; aged 6–15 years; $M = 9.93$) with a formal diagnosis of autism. Parents received training in elaborative reminiscing and implemented the intervention techniques for 8 weeks (5 minutes a day/5 times a week). Here, we report intervention outcomes for proximal goals (i.e., caregivers' degree of conversational elaborateness and their subjective, qualitative impressions of intervention) and children's EM outcomes. Data for measures tapping distal outcomes related to children's social cognitive development and personal narrative discourse abilities are reported elsewhere.⁶³

RESULTS

Caregiver's elaborateness. A first step in evaluating the potential of a parent training program to support children's development typically involves examinations of the proximal intervention targets and mechanisms—in this case, the degree of caregiver's elaborative reminiscing. All parent–child dyads participated in the training which is described in the Appendix, and their reminiscing discourse characteristics were evaluated reliably at pre- and post-intervention.

To code parental elaborative reminiscing, raters were trained on a random sample of six transcripts (i.e., 11.1%). Reliability between the primary investigator and her research team was established on a random sample of 15 of the

remaining transcripts (i.e., 26.3%). Transcripts and measures from both the pre- and post-assessment visits were used for training and reliability. Cohen's kappa,⁶⁴ a chance-correcting measure of agreement, was used as the index of overall reliability yielding excellent agreement (overall unweighted kappa = 0.89). Due to the large number of mutually exclusive categories in our coding scheme (i.e., 12 in the larger study from which this brief report is drawn), kappa was not calculated for individual codes; rather simple agreement was calculated as an estimate of interrater reliability (see Table 2). Using simple agreement, most coding categories achieved at least 80 or 90% agreement which is considered good to excellent. Simple agreement for the codes *Corrections* and *Evaluative Statements* were lower; however, these were relatively infrequently occurring codes that independent raters agreed upon 10/13 or 77% and 10/15 or 67% of the time, respectively. Because estimates of simple agreement for codes with a high number of mutually exclusive categories (12 in this case) result in low chance agreement (i.e., 8%), and in light of their theoretical importance, reliability for these codes was deemed adequate and they were included in subsequent analyses.

Six of the twelve codes were taken as indicators of parental elaborateness: open-ended non-rote questions (i.e., questions or statements calling for the child to provide new memory information about the event; e.g.,

Table 2 Caregiver's Elaborateness and Task Support at Pre- and Post-intervention

	Pre M (SD)	Post M (SD)	t(26)	p	d	Simple agreement
Elaborateness						
Open-ended non-rote questions	5.67 (4.31)	9.41 (5.05)	3.43	< 0.01 ^a	0.66	91%
Statement elaborations	21.52 (21.77)	26.93 (14.48)	1.43	0.16	0.28	91%
Confirmations	7.19 (5.43)	10.81 (6.26)	3.22	< 0.01 ^a	0.62	82%
Follow-ins	4.52 (4.30)	10.00 (5.36)	5.93	< 0.01 ^a	1.14	76%
Evaluative statements	0.11 (0.32)	4.00 (4.32)	4.80	< 0.01 ^a	0.92	63%
Total number of words	562.56 (255.98)	834.78 (343.40)	4.21	< 0.01 ^a	0.81	
Task support						
Closed-ended questions	14.78 (8.30)	21.78 (14.63)	2.89	0.01 ^a	0.56	77%
Statement elaborations	21.52 (21.77)	26.93 (14.48)	1.43	0.16	0.28	91%

^ap < 0.05.

“tell me about this day”), statement elaborations (i.e., statements that provide information about the event but do not require a response; e.g., “Sheldon tried to catch the ducks!”), confirmations (i.e., utterances that confirm a child’s previous utterance; e.g., “we did eat cake!”), follow-ins (i.e., a confirmation followed by the adult’s own statement or question that elaborates on and is semantically contingent to the child’s utterance; e.g., “Yeah we did give them cupcakes. They were chocolate cupcakes with sprinkles.”), evaluative statements (i.e., statement that evaluates or summarizes the memory experience toward the end of the reminiscing discussion; e.g., “that was so fun. I can’t wait to go back again next year.”), and total number of words. For five out of the six indicators of conversational elaborateness, caregivers demonstrated more elaborative reminiscing after the training. Specifically, parents talked more to their children, asked more open-ended non-rote questions, confirmed their children’s memory contributions, offered utterances that were semantically contingent to the child’s responses, and concluded the discussions by offering an evaluation of the experience or commenting on what they would do in a similar experience in the future.⁶³

Additionally, because autistic children show better EM recall when more information about the event is provided, caregivers were taught when to provide task support (i.e., when children experienced memory failures or difficulty responding). Two codes were taken as indicators of task support: closed-ended questions (i.e., including yes/no, forced choice, clarifying, and fill in the blank questions; e.g., “did you feel happy?” and “was this at the beginning of our trip or the end of our trip?”) and statement elaborations. Statement elaborations were considered as an index of both elaborateness and task support because their function is inherently elaborative *and* supportive. In alignment with training, caregivers increased their use of task-support by asking more closed-ended questions from pre- to post-intervention. Caregivers did not increase in their use of statement elaborations at post-intervention; however, the means for statement elaborations for pre- and post-intervention did move in the expected directions, and this effect would

likely be significant with greater statistical power. In addition to indices of elaborateness and task support, other codes were developed and coded as “other” and are not applicable to these data. Therefore, these data are not analyzed here. Finally, caregivers used more mental state terms in their talk with their children after training (see Table 2 for caregiver data pre- and post-training).

Data for caregiver elaborateness and task support were analyzed inferentially to explore pre-post effects using a series of paired samples *t*-tests. Bonferroni tests to correct for family-wise error were not conducted to protect against the likelihood of multiple Type II errors (due to the large number of comparisons^{65,66}). All inferential statistics were accompanied by effect size analyses (i.e., Cohen’s *d*).

Children’s EM. Children’s EM was formally assessed using two methodologies. One popular EM assessment paradigm (i.e., the Remember/Know Task) employed with adults (but that we attempted to modify for young children) did not prove useful and was dropped from analysis (i.e., it evidenced floor effects and we concluded that the instructions were too complex and not understood by the majority of young autistic children in our sample). However, another popular procedure known as the cueing procedure that has been used successfully with children and adolescents did yield interpretable results. The cueing task is intended as a measure of EM specificity. Degree of recall specificity involves the question of whether memory is general or specific. General memories refer to memories for routine or habitual past events (e.g., “We used to always play ‘eye-spy’ on road trips to Utah”), whereas specific memories are located at a particular (specific) point in time (e.g., “One time we played ‘eye-spy’ and the answer was the white lines in the middle of the road”). In this task the examiner presents the child with a series of positive and negative cue words and asks the child to recall a specific memory that is associated with that cue word (e.g., “tell me a specific memory you have that goes with the word ‘happy’”). Results of this assessment revealed that children’s EM specificity increased from pre- to post-intervention ($p = 0.01$). Said another way, children included more information about *when* an event

happened, which is a characteristic feature of EM.¹²

Parent's perceptions of intervention. To gather information on the quality and therapeutic potential of the training processes and procedures, we conducted an interview at post-treatment to ask parents about the intervention. Qualitative data were collected through the administration of a carefully constructed semistructured interview.⁶³ Responses were transcribed and examined for shared patterns, but we were also interested in the heterogeneity and range of experience in response to questions about the elaborative reminiscing parent training. The general conclusions resulting from this process are described below.

In response to a question about their general impressions of the elaborative reminiscing intervention, one mother shared the following sentiment: “[elaborative reminiscing] doesn't take a lot of time. There are lots of emotional rewards and I am motivated to do it. The level of enjoyment for me is high because this is our lives. For the amount of time it takes, the bang for your buck is worth gold.” Another parent noted that after engaging in elaborative reminiscing with her son for several weeks, he independently started sharing memories of events that happened at school. This mother noted, “this was the first time he was able to provide me with this kind of information about an event that I had not experienced with him. It's a great example of how he is starting to generalize the strategies from elaborative reminiscing with me to telling me about events I wasn't present for in a logical way.”

When asked whether or not the intervention helped support the child's memory or communication, some parents were uncertain and felt more time was needed to observe the child, but most responded affirmatively and offered specific examples to justify their positive evaluations. For example, one parent shared that after she began using elaborative reminiscing with her son, her son's school said that “he was being more expressive with feelings and why he was upset.” Another mother shared, “I see definite positive changes in [my son]. I feel very fortunate to participate in [this training]. I know the new way of having conversations with my son will make a difference. Thank you for

giving us this chance and thorough training.”

This same mother reported that prior to the training, her son rarely used the word “remember” in his conversational exchanges. After the training, he began initiating reminiscing discussions by saying “Do you remember when ...?”, at which point an elaborative discussion could unfold. Several parents echoed this sentiment that their children were verbally expressing more and initiating discussions with others. For example, one parent said, “[elaborative reminiscing] provides a framework that makes the anxiety of interacting with others decrease. [My daughter] started approaching others and asking questions.” One child in particular started asking his mother to take photos of events they were doing so that they could reminisce about them later. Parents described that engaging in elaborative reminiscing was “very effective as a way to explore communication and memories.”

When asked about the most important things learned from the training, many caregivers reported insights involving the quality of parent-child communication. For instance, one parent replied: “I saw some strengths that he had that he wasn't showing before.” Another cited improvement in conversation, stating that her son can talk about past events and that he can also now remember some details. Still another parent reflected: “I was never truly talking to my daughter. Elaborative reminiscing created a closer relationship for us.”

We also asked parents whether anything proved difficult and if they had any suggestions for improving the intervention. In response, a few parents told us that they found it difficult to reminisce for 5 minutes for 5 days/week (which was our minimum recommended “dosage”) and that shorter reminiscing durations would feel more feasible and natural. Some parents also communicated that they sometimes had a hard time identifying a reminiscing topic for each day during the intervention period (which was our recommended treatment intensity). In such cases, caregivers also reported that in the future they planned to continue their use of elaborative reminiscing with their child but would do so in more spontaneous ways, an outcome of training that we indeed hoped would occur and that provides preliminary evidence for the social

validity of the implemented treatment procedures.

In summary, and in general, caregivers' testimonials were positive and encouraging for training parents of autistic children to use elaborative reminiscing to support autistic children's EM. The training provided families with a way to talk about the past in ways that were meaningful and enjoyable and that were frequently incorporated into family routines in easy and natural settings.

Cultural considerations. Although elaborative reminiscing has been shown to causally impact EM and personal narrative development,^{14,41,46,67} most research on this topic has been performed in Western societies. This notion gains importance in light of cultural differences in language socialization, including those that unfold during reminiscing. For example, many Western cultures place high value on independence and personal achievement.⁶⁸ Ross and Wang² noted that "by helping individuals to distinguish themselves from others, memories of personal experiences contribute to an autonomous self-construal." By contrast, more collectivist cultures may increasingly value interconnectedness and social cooperation,⁶⁸ and therefore the self is featured more peripherally in people's memories and discourse surrounding past personal experiences.

These cultural differences can be observed in other aspects of reminiscing. People raised in collective cultures often report differences with respect to the goals and content of elaborative reminiscing.^{68,69} For instance, although persons from individualistic cultures tend to focus on descriptive details about experiences where the self is the center of the reminiscing, caregivers from collectivist cultures tend to be less elaborative and focus less on the child and more on others who shared in the experience.^{15,68} Because of the impacts that culture has on what and how people remember,² clinicians must adopt a family-centered practice and consider the family's culture, values, and goals when determining the appropriateness of any intervention or training. Adaptations to the elaborative reminiscing training detailed below may be necessary depending on the family and their cultural beliefs, values, and discourse practices.⁷⁰

ELABORATIVE REMINISCING THROUGH THE NEURODIVERSITY FRAMEWORK

Sharing stories with others through reminiscence is a pervasive human activity that positively impacts children's social cognitive development and the development of one's sense of self. Elaborative reminiscing provides a structured platform around which caregivers and children can recount their shared experiences in a natural and family-centered way. At the same time, recalling and sharing past personal stories are challenges for autistic individuals.

Elaborative reminiscing has been shown to support the development of EM in neurotypical and neurodivergent populations, which has strong implications for one's self-concept and identity. Who we are is shaped by our experiences and our subsequent *recollections of those experiences*. Elaborative reminiscing, as a means to lay down a record of one's experiences, structure events into coherent narratives that can be shared with others, and shape one's life story, is a powerful tool that fits naturally into a family-centered approach, while drawing on the autistic person's strengths and supporting their recollections for meaningful events.

Training caregivers to use elaborative reminiscing with their autistic children is not intended to "normalize behavior or ... disassemble autistic habits of cognition but to support communication by improving access to socially relevant information and increasing the flexibility of representations of experience."¹⁷ As such, our training is aligned with the neurodiversity movement⁷¹ insofar as the neurodiversity movement is in favor of interventions to support functional skills, including language and flexibility.⁷¹ As Carol Greenburg, an autistic self-advocate, and Shannon Des Roches Rosa,⁷² a parent of an autistic child, argued, "everyone should have stable, level ground from which we can launch authentic discussions about what we owe and what we deserve." By supporting memories for past personal experiences in neurodivergent children, parents empower children to take ownership of their experiences, which can lead to meaningful integration of their experiences in the world.

CLINICAL IMPLICATIONS

Sharing past personal experiences is a pervasive, human-specific activity that is associated with the development of one's sense of self and overall psychological well-being and is often impacted in individuals with autism. Our uncontrolled pre-post intervention pilot study suggests that caregivers of children with autism can be explicitly taught to support their children's EM by talking about past personal experiences through the use of elaborative reminiscing and task support. We believe that the integration of task support into elaborative reminiscing is key to fostering autistic children's memories for past personal experiences, but future research is needed to disentangle effects and elucidate active ingredients of treatment.

SLPs have considerable experience supporting children's narrative discourse skills and are also skilled at integrating families into their intervention services. SLPs are well situated to teach caregivers about elaborative reminiscing and how to incorporate it into their daily lives. Including elaborative reminiscing in treatment plans for children with autism is promising for facilitating the development of EM, which is, in turn, theoretically potent for supporting children's personal narrative skills, self-concept, identity, and sense of belonging in the broader sociocultural context.

While elaborative reminiscing is not the only way to support EM, it is a potentially powerful way for clinicians and caregivers to strengthen EM in children. Clinicians are encouraged to incorporate elaborative reminiscing into their interactions with their clients through engaging in elaborative reminiscing discussions or by selecting intervention strategies that inherently include features of elaborative reminiscing. A variety of resources have recently become available¹⁷ to elevate the importance of reminiscing and enhance its quality and frequency in ways that are responsive to the strengths and interests of the individuals and that can be employed in a variety of settings (e.g., home, school, community). The resources differ in format in that some are more child-centered and some are more clinician-directed. What they have in common is that all are intended to support EM by integrating the principles of elaborative reminiscing, task sup-

port, and best practices for supporting social learning in autistic persons.

APPENDIX: ELABORATIVE REMINISCING TRAINING

Training Guidelines and Format

This caregiver training consists of three sessions which occur on three separate days over the course of a week. Each session ranges from 30 minutes to 2 hours, resulting in the entire training lasting ~3 hours. An important and exciting feature of this training is that it can be completed entirely remotely via online video meeting platforms (e.g., Zoom, Microsoft Teams) or in-person. Whether the training is completed in-person or online, caregivers are provided with the training materials ahead of time¹⁷ so that they can follow along with the appropriate materials throughout the training.

Session 1: Introduction to EM and Elaborative Reminiscing

Clinician and child interaction. Prior to beginning the training with the parent(s), the clinician completes an interactive activity with the child (adapted from McCrory et al²⁸). For this activity, the clinician constructs something with the child that is sensory-rich and can engage a variety of senses, thoughts, and feelings (e.g., building a science experiment volcano).^a Throughout the activity, it is important that the clinician and the child talk about the event as it is happening, including talk of each of their thoughts and feelings. Talk of the event while it is happening is associated with increased episodic memory (EM) in children.⁷³ During the interaction, the clinician should take multiple photos of the activity so that they can be used as visual supports for facilitating recall in Session 2. Caregivers are asked to observe the clinician-child activity, as it will serve as the basis for an elaborative reminiscing

^a *If completing this activity remotely, the child will be unable to physically manipulate the materials, and the clinician must ensure that the activity is as interactive as possible by describing sounds, smells, and textures and asking children about their experiences with those sensations.*

discussion between the clinician and the child in Session 2 of the training that will be modeled for the parent.

Episodic memory: what it is and why it's important. Once the clinician–child activity is completed, the child can leave the training, and the caregiver portion of the training begins. To start, the clinician and caregiver review the child's memory strengths and challenges (as indicated by the parent), so that this specific child's memory abilities can be referred to throughout the training. Then, the foundational concepts of EM are discussed. The clinician teaches parents about EM: what it is, why it is important, how it is associated with other developmental constructs (e.g., personal narrative skills, self-concept), and how it is disrupted in children with autism. To apply this information to their own lives, caregivers are then asked to think about their own EMs and practice recalling and sharing a few examples of their own memorable past experiences.

Elaborative reminiscing: what it is and how to do it. After learning about EM, caregivers are taught about elaborative reminiscing and how they can use it to support EM in their child. Caregivers watch and listen to video and audio clips of low and high elaborative reminiscing parent–child interactions. They discuss their impressions of the two different types of interaction styles, highlighting the features that make the high-elaborative conversation more successful. It is here that the clinician teaches

caregivers about the features present in elaborative reminiscing, including steps and tips for this type of conversational exchange (adapted from McCabe et al⁶⁰). Elaborative reminiscing steps and tips are provided in Figs. 1 and 2. Included in the review of elaborative reminiscing tips is a discussion of mental state terms. Mental state terms are a key feature in elaborative reminiscing, and so parents are taught how to scaffold the use of mental state terms depending on the child's development. Using visual supports with elaborative reminiscing is also discussed, and parents are introduced to the Remember Web (Fig. 3) and provided with examples of how to use it to support their child's memory for past experiences. As can be seen from the figure, the Remember Web is used to first locate the memory in time (by drawing a general timestamp in the When box) and space (by drawing the location in the Where box). From there, the images in the Remember Web are used to guide the conversation to include details about physiological (e.g., sights, sounds, smells) and psychological (i.e., thoughts and feelings) aspects of the memory. The Remember Web is a versatile tool as it can be used as a visual support for both the children and the adult interlocutors.

Elaborative reminiscing: what to talk about.

Although there is no limit to what we can reminisce about (and in fact the overarching goal of elaborative reminiscing is to talk

Elaborative Reminiscing Steps

- 1) Select a topic
- 2) Introduce the activity in a way that is natural for you (e.g., "Remember last summer when we went to California?")
- 3) Engage in an elaborative reminiscing
- 4) Conclude the activity
 - a. Summarize the conversation if that feels natural for you (e.g., "We just talked about our trip to California and the things we enjoyed doing the most.")
 - b. Identify any 'take home' messages (e.g., "That was fun. We should go there again"; "I'll got so burnt on the trip. Next time I'll definitely remember to wear sunscreen"; "Visiting Grandma was nice. She is such a sweet soul.")

Figure 1 Elaborative reminiscing steps.

- When choosing a **first** topic to reminisce about, choose something:
 - Positive or neutral (please avoid reminiscing about traumatic events)
 - Where both you and your child were present
 - Distinctive, unusual, novel
 - Avoid talk of regularly occurring events like birthday parties
- Begin the reminiscing by talking about when and where the event took place (e.g., “Do you remember that time we went apple picking last year?”)
- Use open-ended *wh*-questions to expand upon the topic and fewer yes/no questions
- Let the child take the lead (talk about something that is interesting to the child, but avoid topics involving their focused interests)
- Incorporate many mental state terms
- Encourage the child to recall details about the who, what, when, where, how, why
- Offer positive feedback to the child and encourage their elaboration
- Use responses like “I see” and “really?”, as well as repeating what the child has said to encourage them to elaborate
- Give gentle corrections if their recollection is inaccurate
- Use supports like pictures or the Remember Web to make connections if you think it would be helpful
- Don’t worry about correcting the child’s grammar or word pronunciation
- Keep it fun!!!

Figure 2 Elaborative reminiscing tips.

about the child’s past experiences for which the caregiver was not present [e.g., “Hey honey, what happened at school today?”]), a few considerations about early reminiscing are provided. To begin elaborative reminiscing discussions with their child, conversations should consist of events for which both the child and the adult were present, so that the adult can be sure to provide appropriate details to the recollection. We also encourage caregivers to talk about events that are unique, novel, and/or memorable to the child, so that the child is more motivated to participate in the conversation. During this part of the training, we encourage caregivers to avoid discussing certain topics, including traumatic events, events for which

the caregiver was not present, general events (e.g., events happening every summer), scripted events (e.g., birthday parties), and topics involving the child’s restricted interests. Each of these topics presents a challenge for reminiscing, especially when caregivers and children are first learning to engage in this style of communication.

Session 2: Elaborative Reminiscing Modeled

Clinician and child interaction. During the second training session, the clinician engages in an elaborative reminiscing discussion with the child about the interactive activity from Session 1 while the caregiver observes. The clinician follows the steps and

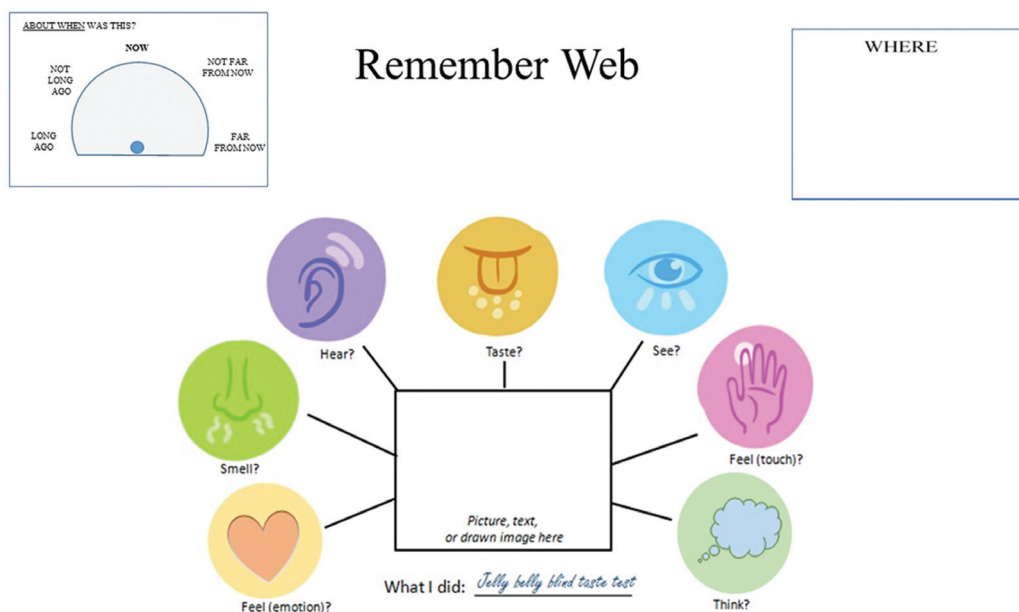


Figure 3 Remember Web.

tips for elaborative reminiscing and uses the appropriate techniques to scaffold the child's recollection. It is important to note that each child may require different supports; clinicians must be skilled in adapting their reminiscing style based on the specific child's memory responses. Here, the clinician can also use the photographs that were taken in Session 1 as a visual support for the recollection. It is important that the caregiver observe this clinician–child elaborative reminiscing discussion so that they can better understand how to reminisce with *their* specific child (as opposed to the example child in the videos in Session 1). Once the clinician–child elaborative reminiscing is completed, the child is no longer needed for the remainder of the training.

Parent practice. After the clinician–child elaborative reminiscing discussion, the caregiver and the clinician complete a reflection activity that includes what went well during the reminiscing discussion, what challenges occurred, and what the caregiver could do if these challenges occur in the future (reflection activity adapted from Sussman⁶²). At this point, the caregiver begins to think about elaborative reminiscing discussions with their child. Fig. 4 provides a way for

caregivers to map out a future elaborative reminiscing discussion with their child.

Finally, caregivers are asked to complete a home activity to practice what they have learned in Session 2. For this activity, they are encouraged to use the outline that they completed during the session and engage in an elaborative reminiscing discussion with their child. They are asked to video record this discussion with their child and bring the video recording to Session 3.

Session 3: Practicing Elaborative Reminiscing

Parent practice. For the final training session, the caregiver and clinician review the video of the caregiver–child elaborative reminiscing discussion (home activity from Session 2). The clinician then guides the caregiver in completing a reflection form similar to the one used in Session 2, indicating what went well during the interaction, what challenges occurred, and what the caregiver can do if these challenges occur in the future. For example, parents can reflect on their use of elaborative reminiscing in real time and how their child responded to the conversation, and they can troubleshoot any unforeseen challenges that occurred (e.g., if the child kept changing the topic).

**Practicing
Elaborative Reminiscing**

Think about an experience you have had with your child in the past. Now think about using elaborative reminiscing with your child to talk about that experience.

A topic I can reminisce about is: _____

I picked this topic because it was relatively novel and I can use it to (e.g., teach, share, just for fun): _____

An open-ended question that I could ask to begin the reminiscing discussion is: _____

Some details about the event that I can add to the discussion are:

- 1) _____
- 2) _____
- 3) _____

Some ways to reference mental state terms include:

- 1) _____
- 2) _____
- 3) _____

One way to sum up the conversation is: _____

Note: It is good if you can try to get in the habit of being aware in the moment as you are having experiences with your child to think about how you are making memories in the present. Tuck these away because you can always reach back to them in the following days to use as a reminiscing event.

Figure 4 Practicing elaborative reminiscing.

CONFLICT OF INTEREST
None declared.

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