

# Supporting Social Learning in Autism



An Autobiographical  
Memory Program to  
Promote Communication  
& Connection



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by

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# About the Authors

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## **Tiffany L. Hutchins, Ph.D.**

Dr. Hutchins has researched the relationships of parent–child interaction strategies and child language and social development. She has examined the construct of social learning, including its nature and scope, and has developed and validated new measures of theory of mind that are widely used in research and practice. Dr. Hutchins has also investigated the efficacy of social-pragmatic interventions to support social communication as well as the nature, development, and treatment of social cognition and autobiographical memory challenges in various populations.

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Dr. Brien’s research focuses on the development, implementation, and social validity of family-centered interventions to support social learning and episodic memory in individuals with autism. She has also designed intervention materials to support social cognition and communication in a variety of populations with social learning challenges.

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Dr. Prelock is Provost and Senior Vice President at the University of Vermont. Formerly, she was the dean of the College of Nursing and Health Sciences at the University of Vermont for 10 years. She is also a professor of communication sciences and disorders and professor of pediatrics in the College of Medicine at the University of Vermont. Dr. Prelock has been awarded more than \$12.4 million in university, state, and federal funding as a principal investigator (PI) or co-PI to develop innovations in interdisciplinary training supporting children and youth with neurodevelopmental disabilities and their families, facilitate training in speech-language pathology, and support her intervention work in autism. She has more than 205 publications and 575 peer-reviewed and invited presentations/keynotes in the areas of autism and other neurodevelopmental disabilities, collaboration, interprofessional education, leadership, and language learning disabilities.

In 2019, she was named associate editor for the *Journal of Autism and Developmental Disorders*. Dr. Prelock received the University of Vermont’s Kroepsch-Maurice Excellence in Teaching Award in 2000 and was named an ASHA Fellow in 2000 and a University of Vermont Scholar in 2003. In 2011, she was named the Cecil & Ida Green Honors Professor Visiting Scholar at Texas Christian University, and in 2015, Dr. Prelock was named a Distinguished Alumna of the University of Pittsburgh. In 2016, she received the ASHA Honors of the association, and in 2017, she was named a Distinguished Alumna of Cardinal Mooney High School. Dr. Prelock also received the 2018 Jackie M. Gribbons Leadership Award from Vermont Women in Higher Education. Dr. Prelock is a board-certified specialist in child language and was named a fellow in the National Academies of Practice in speech-language pathology in 2018. She was the 2013 president for the American Speech-Language-Hearing Association.



# Preface

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The impetus for this book was grounded in two critical observations. First, decades of rigorous scientific research had demonstrated particular kinds of memory challenges in autism. At the same time, application of that knowledge to the teaching and conduct of clinical practice was woefully lacking. In this book, we pulled what science has revealed about memory in autism to guide the development of social learning and social communication and for the sharing of stories that structure our social realities. We seek to accomplish this in ways that elevate the autistic person's voice and experience through a sense of agency, authenticity, and autonomy. In so doing, we advance the importance of language and memory as the most fundamental general functions that lead to all areas of psychological growth. This includes the higher order cognitive processes involved in socio-cultural learning and the ability to participate in the concerns of a wider community.

Some contemporary approaches to teach social communication (and social skills) to autistic individuals are driven by assumptions that social rules can be accurately articulated or that their truth or content can be distilled and made useably accessible through explicit teaching. We believe these assumptions are unwarranted and largely unhelpful. Other popular approaches target social learning directly. Usually, the aim is to teach social learning principles with the expectation that it leads to more natural, flexible, or "appropriate" behaviors. But the focus on social learning as a mechanism for behavior change carries risk for prioritizing "appropriate behavior" as the indicator of treatment success. Furthermore, a focus on teaching discrete social learning principles obscures the true importance of more general learning mechanisms (language, memory), of which the acquisition of social learning is but one achievement. As we argue throughout this book, the ability to develop a stable and continuous self-concept, construct a cultural identity, reason about one's own and others' minds, and convey coherent narratives implies the ability to flexibly recruit and combine memories for past personal experiences in a contextual manner. All of this, in turn, is essentially the stuff of stories.

# For the Reader

---

## A NOTE ABOUT HOW WE USE LANGUAGE RELATED TO AUTISM

Autism is both a medical condition that gives rise to disability and a neurobiological and cognitive difference. Autism spectrum disorder and autism spectrum condition are referred to here as *autism*. In this book, we use the term “autistic” in reference to adolescents and adults on the autism spectrum to reflect their identity-first language, which is, at present, the preferred terminology for many self-advocates. Person-first language (e.g., individuals with autism) is also employed, usually in reference to children. The mixing of these terms is intentional and designed to respect the diversity in language preferences that exists in the broad community of stakeholders. In addition, “atypical” represents “neurodivergent” as a comparative term. “Atypical” does not represent “incorrect,” just as “neurotypical” does not represent “correct.”

Of course, clinicians are encouraged to engage in conversations with the individual client or family to determine their preferences about whether and how to refer to autism. Some will reject the autism label and prefer alternate descriptors (or none at all). Others who embrace the term may differ in their preference for identity-first (autistic, autistic person) or person-first (person with autism) language. This is no trivial question of semantics: Variable language choices can signal honest differences in the meaning people attach to autism as well as the nature and experience of autism. Consequently, early conversations about preferred language can demonstrate the clinician’s care and sensitivity to this matter while also emphasizing the value and worth of the person.

*This book is dedicated to storytellers.*





I

# Foundations of Social Learning and Autobiographical Memory in Autism





# 1

## Supporting Social Learning in Autism

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### CHAPTER GOALS

After reading this chapter, you will be able to

- Define autobiographical memory and its importance to social learning.
  - Differentiate between social learning and social communication.
  - Describe the importance of using assessments and interventions that are adaptable across settings and populations.
- 

Cooper is a talkative and sociable 11-year-old boy with autism who loves history and can't seem to get enough of it. When Cooper gets home from school, he sits down in the kitchen and his dad makes him a snack. Dad usually asks something such as, "Hey pal, what did you do at school today?" Cooper usually replies, "I don't know," and continues with his snack. Other days, Cooper doesn't really answer the question but instead initiates a monologue about something new he learned about a historical event in which he is interested. Sometimes his dad reframes the question so that Cooper only has to give simple, short answers. Dad might ask, "Well, did you sit with Laura at lunchtime?" or "Did you have regular milk or chocolate milk?" Even though Cooper answers when his dad does this, his dad feels like his questioning is laborious and he gets so little information from Cooper in return. Cooper's dad is confused. He wants to know what Cooper did today. Why can't Cooper tell him?

As a professional working with individuals with autism, what do you think might be happening with Cooper? Several interpretations are possible. Perhaps Cooper is tired when he comes home. Maybe he has a lot on his mind and just does not feel like talking (unless perhaps it involves the topic of history). Perhaps, owing to pragmatic and **social communication** challenges, Cooper does not understand what kinds of answers his dad is trying to solicit. In our experience, these are common interpretations between family members and professionals, but there is another likely—yet traditionally overlooked—explanation. That explanation involves the quality of Cooper's **autobiographical memory** (ABM) and difficulty encoding or recalling memory from past personal experiences—even recent memories from a day at school.

Memory is fundamental to a healthy life, and although we often take memory for granted, we may nevertheless have a general sense of the quality of our own and others' memory. For example, some people pride themselves on having a great memory, but their memories can be good in different ways. Some might have a good memory for historical facts, some might have an uncanny ability

to recall dates and details with perfect accuracy, and others might have a particularly good memory for names or faces. People also tend to notice the critical importance of memory when it fails, as in the case of brain injury (e.g., amnesia), progressive memory loss (e.g., dementia), and even healthy forgetting, which happens all the time (e.g., “Where on earth did I put my keys?”).

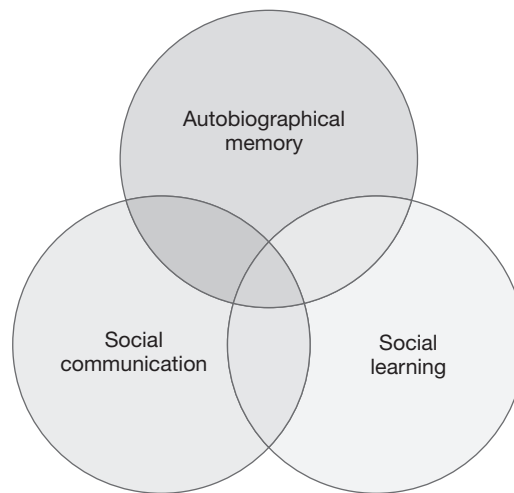
The fact that people have different memory strengths and challenges demonstrates that there are different kinds of memory. Consider just a few types of memory that have been examined by psychologists over the last few decades: short-term memory, long-term memory, procedural memory, event memory, working memory, declarative memory, **semantic memory** (SM), **episodic memory** (EM), flashbulb memory, echoic memory, sensory memory, and the list goes on!

In this book, we are interested in ABM, which is a special type of long-term memory that is crucial for social learning and social communication. ABM is memory for information about the self and includes memory for one’s own past personal experiences. Now, imagine a mental life where this is disrupted! Without the ability to reliably record, recall, and organize what the self has personally experienced, it would be difficult to relate disparate aspects of one’s experience in an adaptive way, track one’s experiences over time to develop a continuous self-concept, or apply lessons from the past to problem-solve in the present and plan for the future.

ABM is key for social learning and social communication, which are defined in the following sections. Although ABM, social learning, and social communication are separate concepts, they overlap in content and are highly interactive and functionally related; what happens in one area affects the other areas. Figure 1.1 represents this relationship, although the model is intentionally simplified here. Subsequent sections of this book elaborate on the interconnectedness of these concepts. For now, it is important simply to acknowledge the interrelationships and overlap among these three functions as we explore each concept.

## WHAT IS SOCIAL LEARNING?

Before getting into the specifics of ABM and how it affects autistic individuals, we must first examine the concept of **social learning**. One challenge in defining the concept of social learning is that it has been referred to differently by different groups of people (e.g., scientists, educators, practitioners in various fields). Most notably, it has been (and is still) referred to as *social cognition* or *mentalizing*, or *theory of mind*. The meaning of social learning and related terms has also shifted over time (usually becoming broader in scope). To complicate matters, sometimes these terms are used interchangeably and other times to refer to subtly different things.



**Figure 1.1.** The interactive relationship of autobiographical memory (ABM), social learning, and social communication.



In this book, we use the term “social learning” very broadly and in a way that subsumes alternative, related terms. Here, *social learning* refers to all forms of social reasoning about oneself and others: It is how people take from and make sense of the social world. We also use the term “mental state” to refer to a wide variety of inner mental states (e.g., thoughts/emotions, knowledge/beliefs/values, wants/desires, orientations/attitudes/assumptions). Consequently, the content domain of social learning is immense and includes (but is certainly not limited to)

- The understanding that someone can have a false belief (i.e., a belief that contradicts reality; some readers may recognize this as the earliest definition of theory of mind)
- The understanding that others can have different mental states that may differ from one’s own (i.e., perspective-taking)
- The understanding of the mind as an active interpreter; an appreciation that the mind itself influences the way the world is experienced
- The ability to make inferences about one’s own and others’ mental states based on a wide variety of informational/contextual cues (e.g., facial expressions; tone of voice; body language; information in the physical, social, or situational setting)
- Reasoning about the nature, causes, and consequences of inner mental states and their relation to outward, observable behaviors
- The understanding of embedded mental representations (e.g., what Asad thinks about what Sue thinks about what Andy thinks)
- Empathizing, meaning to not only identify other people’s feelings but to also affectively mirror and experience those feelings in the self
- Acquiring a common sense or shared culturally specific notion about what people generally know or assume
- The understanding of social and linguistic conventions for communication (i.e., pragmatic knowledge)
- Knowledge of how language varies as a function of sociological variables, including sex, gender, age, race, and social class (sociolinguistic knowledge)

## Social Communication

Whereas social learning encompasses all forms of social reasoning, including having the knowledge of social rules and understanding how to deploy these in real-world settings, social communication is the actual use of language and other forms of communication in social contexts. Social communication is a skill: the ability to apply knowledge (including social learning) to perform a communicative act. Most important, social communication skills are required for most, if not all, communicative interactions; “even if only one person is talking and the other is listening, there is always a degree of social coordination in their mutual recognition and adjustment of their cognition and action” (Kashima & Lan, 2013, p. 733). Therefore, communication involves a recognition of another person’s mind as distinct from one’s own (a part of social learning), which contributes to the social communication skills required in these interactions. Social communication encompasses social interaction (e.g., initiating interactions, maintaining conversations) and can be verbal or nonverbal. As a skill, social communication is practiced, develops over time, and is critical to the development and maintenance of meaningful relationships (Laurent et al., 2021).

Consider the following examples that illustrate the variety of concepts included under the terms “social learning” and “social communication.” Keep in mind that social learning occupies the cognitive level of function (it is about knowledge and understanding; indicated in parentheses),

whereas social communication is situated at the behavioral level of function (it is about communicative skill; what we actually do or say; indicated in brackets).

- Susan sees her son Jamal reach for a cookie that he cannot quite grasp and concludes that Jamal wants a cookie. Susan has a concept of the mental state “want” (social learning); she makes an inference from Jamal’s reaching behavior to detect his state of wanting (social learning). She knows that, as a social principle, people are usually happy when they get what they want (social learning). She predicts that Jamal will be happy if he gets the cookie (social learning). Jamal looks up at Susan. She hands him the cookie and says, “Here you go” [social communication].
- Jackie is standing in a long line at the bank. Ahead of her, a young man is looking down on his phone and seemingly not paying attention to the movement of the line in front of him. Meanwhile, the line behind them is getting so long that the people are running out of room to stand in the bank lobby. Jackie lightly taps the young man on the shoulder [social communication]. He turns to look at her and she gestures to him by looking and pointing to the empty space in front of him [social communication]. He turns and moves ahead in the line. Here, Jackie has social cultural knowledge about pragmatic conventions (social learning)—in this case, the amount of personal space we expect in this specific situation (social learning). Because she is paying attention to the line and the young man is looking at his phone, she infers differences in their mental/knowledge states (social learning); she is aware that the line should move forward, but he is not.
- Sam and Ryan are high school buddies. Sometimes, they brag and bicker about who is better at hoops. To find out, they have a free-throw contest, and Sam edges out Ryan in a slim victory. When they are walking off the court, Sam makes his triumph explicit. He lifts his head proudly and in a self-congratulatory tone says, “Who’s the winner now?” [social communication]. Ryan retorts with verbal irony, “It must be you, the guy with all the humility” [social communication]. They both (genuinely) chuckle and smile [social communication].

Here, Sam and Ryan appear to understand several behavioral norms and values promulgated in social-cultural narratives (social learning). Perhaps in this case, these involve the Western values of independence, competition, and success and notions about how these are achieved (social learning). The two young men appear to understand the permissible content and structure of social routines (social learning) for navigating competition while maintaining—even strengthening—an amiable relationship (indeed, gentle ribbing and friendly sparring can heighten interpersonal trust and feelings of closeness in many groups). This example demonstrates the role of multiple embedding of mental states (social learning): Sam and Ryan are both aware that Sam outperformed Ryan, and they both know that the other one knows it. Furthermore, they can each presumably infer and attach different affective states to the self and other (e.g., mild pride, embarrassment) and can empathize with the other’s thoughts and feelings about the situation (social learning). Finally, Sam understands the communicative intent in his friend’s use of verbal irony (social learning). Sam understands that when Ryan says “the guy with all the humility” (social communication), Ryan means to communicate “you lack humility.” Sam further understands Ryan’s pragmatic intent (social learning) and interprets the exchange as a form of friendly jousting (as opposed to a genuine attack). Sam also understands and expects that Ryan understands that he (Sam) understands the spirit in which the utterance is offered (and there is some very complex social learning indeed).

## A NOVEL APPROACH TO SUPPORTING AUTOBIOGRAPHICAL MEMORY IN AUTISM

Social learning and social communication are affected in autism, and most service providers working with autistic individuals are well aware of the traditional ways to address these challenges. This book represents the first formalized approach for supporting ABM in individuals with autism. The chapters that follow describe ABM, explain how it is central to social learning and social communication, and how it is affected in autism. The later chapters provide methods to assess and support ABM for social learning and social communication. Our assessments and treatments are adaptable

for a wide range of intervention settings (home, school, community) and make use of a variety of approaches, including

- *Clinician-directed strategies*: Some of our activities are high structure to clarify interaction process and goals and encourage reminiscing in group and one-to-one interactions.
- *Child-centered strategies*: Activities and discussion follow the child's lead, interests, and focus of attention without prescribing or adhering to specific procedures but providing the most natural contexts for learning and exploration.
- *Caregiver training (train-the-trainer) strategies*: These strategies teach caregivers how to support social learning through conversational techniques that are potent for developmental outcomes and can be implemented over time and across settings.

The materials, recommendations, and procedures presented in this book are informed and shaped by the existing literature on how to support ABM. The book does so through the use of established conversational techniques that have been shown to support social learning and social communication (especially personal narrative development) in individuals with autism. The goal of support is not to subvert autistic habits of cognition but to support mutual understanding and communication by improving access to socially significant information and increasing the flexibility of representations of experience. Our treatments do not teach socially appropriate/inappropriate behaviors. There are no scripts, rules, or principles to be memorized or followed. After all, as we shall see, there is no one way to reminisce. Instead, we describe how to create discourse around context and talk about the “there” and “then” in personally relevant, meaningful, and authentic ways. The activities described in this book are designed to facilitate both neurotypical and neurodivergent people's engagement in reminiscing in socially and emotionally safe ways, which requires an openness—indeed an embrace—of the interactional proclivities of one another. The goal of supporting ABM is to ultimately facilitate reminiscence using strategies that leverage natural tendencies and fit gently and healthily into one's life.

Our interventions also employ a number of evidence-based practices (National Autism Center, 2015) by incorporating the principles and procedures characteristic of

- Narrative therapy strategies (Cashin et al., 2013)
- Story-based interventions (Gray, 1994, 1998, 2010; Gray & Garand, 1993)
- Peer-play intervention (Wong et al., 2014)

Moreover, we use a blend of widely accepted best practice principles, including child choice, supportive repetition, visual and sensory supports, and a focus on the development of mental state terms and concepts. Crucially, we also adopt the tenets of—and encourage the use of—family-centered care to the fullest degree possible (Beatson, 2008; Crais et al., 2006; Fivush, 2012; Hutchins et al., 2017; Prelock & Hutchins, 2008; Wilkinson, 2017; Wong et al., 2014). When considering which strategies to employ, special consideration should be given to the individual's interests and abilities (what they find motivating), and which (if any) of these interventions have been used successfully with the individual in the past.

The treatment activities in this book have been put into practice by clinicians who have students or clients with autism with ABM challenges. Understanding how memory can be different in children with autism has offered a new way for clinicians to think about the core characteristics of autism. After using the activities in this book, clinicians have noted that their clients are increasingly engaged in therapy activities and can remember their experiences weeks later. One clinician recounted the following about her client:

“I remember being impressed with how quickly she improved in her orientation of the time of events using this support, and we were able to incorporate that detail into her narrative development goals . . . I've worked with children with autism in the past but had never worked on memory. After learning about it, I see how important it is to target . . . because telling our personal narratives

and past experiences is embedded in our communication with others. The client I worked with was struggling with interacting and forming connections and relationships with her peers at school, and I believe that a big part of that was due to her challenges in sharing personal narratives and experiences with others.” (Gwyn, speech-language pathologist)

Another clinician reported on the benefits of intervention related to communication with and involvement of parents:

“Please keep working this! It is so important. I’ve noticed only after 1 week of practice that this little girl is improving in answering ‘wh’ questions. To me it’s fascinating that just having a conversation (elaborative reminiscing) makes such a difference.”

“What a thrill to see parents involved! It is very rare in the school setting. I have heard parents of kids with autism say previously, and I see it here again with this child, that when they ask their child ‘how school went,’ they usually get no answer or a generic answer. Helping parents have a way to discuss the day with their child . . . really makes the parents feel good. And, of course, for us, gives the child more chances to keep working on EM skills.” (Guy, speech-language pathologist)

We have also heard from the parents and caregivers who have reported new insight into their children’s social communication strengths and challenges: seeing them in a new light and with different origins. For example, one mother shared that understanding the nature and importance of ABM was a real “aha” moment. She realized that although her son could often answer social questions that depended on rote memory learning (e.g., “Can you tell me the name of your best friend?”), this was not true for questions that required his memory of personally experienced events (e.g., “Can you tell me what you did at Brad’s house last time you went there?”). By this mother’s testimony, this revelation “completely changed how I think about [my son’s] challenges.”

Another mother of an autistic boy who participated in one of our ABM interventions (see Chapter 9 on elaborative reminiscing and Appendix 9.1 and 9.2) said that she noticed a breakthrough for her son and described how she learned to talk with him about past experiences in ways that improved his memory and the quality of their sharing: “I thought he didn’t remember anything. I feel as if a new door in his past memories has been opened. My son has improved describing overall his school day or any events . . . It is life changing and so crucial for him and all of us . . . Caregivers, who raise children with autism, need more naturalistic programs . . . 5 minutes a day [spent] reminiscing can make a difference.”

## FOR WHOM IS THIS BOOK WRITTEN?

This book is for professionals (e.g., speech-language pathologists [SLPs], special educators, psychologists, paraprofessionals, teachers) working with individuals with autism in a wide range of settings (e.g., home, school, community). Most treatment approaches described in this book were designed for school-age children who can demonstrate a minimum verbal age of approximately 7 years. Although ABM continues to develop through adolescence, this is the age at which ABM stabilizes, becomes adult-like (Gathercole, 1998), and needs to be recruited to solve increasingly complex cognitive and linguistic tasks. Other strategies were designed to support ABM in autistic adolescents and adults with higher language and intellectual abilities. Because individuals with autism vary greatly in their unique strengths and challenges, clinicians should ask a series of questions to decide if targeting ABM is an intervention priority for a student or client. Does the client

- Have challenges recalling the recent past (e.g., especially when answering an open-ended question such as “What did you do at school/work today?”)
- Able to recount facts about specific topics (e.g., history, science, video game characters, job requirements) but have difficulty reporting on their own past personal experiences (e.g., telling you what they did on their last vacation)
- Have trouble predicting how they may feel in the immediate future (e.g., “I’m taking a long car ride, and I bet I’m going to be really bored”)

- Have trouble planning for the future (e.g., packing the appropriate/necessary items for an upcoming trip)
- Have trouble reasoning about hypothetical events (e.g., “What would have happened if the soup I spilled were hot?”)

For clinicians who answered “yes” to many of these questions, this book can provide guidance for addressing the underlying ABM deficits characteristic of autism. This book specifically provides a foundation for understanding the nature and importance of ABM in autism and provides assessment methods, treatment materials, and data collection forms for treatment progress monitoring. The assessments and interventions are varied and designed for use in diverse settings for autistic people with a range of language and intellectual abilities.

## A Note About How We Use Language Related to Autism

Autism is both a medical condition that gives rise to disability and a neurobiological and cognitive difference. Autism spectrum disorder (ASD) and autism spectrum condition (ASC) are referred to here as *autism*. In this book, we use the term “autistic” in reference to adolescents and adults on the autism spectrum to reflect their identity-first language, which is, at present, the preferred terminology for many self-advocates. Person-first language (e.g., individuals with autism) is also employed, usually in reference to children. The mixing of these terms is intentional and designed to respect the diversity in language preferences that exists in the broad community of stakeholders. In addition, “atypical” represents “neurodivergent” as a comparative term. “Atypical” does not represent “incorrect,” just as “neurotypical” does not represent “correct.”

Of course, clinicians are encouraged to engage in conversations with the individual client or family to determine their preferences about whether and how to refer to autism. Some will reject the label autism and prefer alternate descriptors (or none at all). Others who embrace the term may differ in their preference for identity-first (autistic, autistic person) or person-first (person with autism) language. This is no trivial question of semantics: Variable language choices can signal honest differences in the meaning people attach to autism as well as the nature and experience of autism. Consequently, early conversations about preferred language can demonstrate the clinician’s care and sensitivity to this matter while also emphasizing the value and worth of the person.

## SUMMARY

*Autobiographical memory (ABM)* refers to an individual’s memory of themselves and their past experiences. Most important, there are notable social implications when such memories are disrupted. For example, without ABM, it is difficult to understand and express aspects of an experience, develop a continuous self-concept, and apply what has been learned to address a social problem not only in the present but also when planning for the future. The elements of ABM are part of one’s *social learning*, which broadly refers to social cognition or theory of mind and are foundational to social reasoning not only about oneself but also of others.

This book was designed to provide readers with a variety of methods to assess and support ABM to facilitate social learning and social communication. The assessments and interventions described throughout the chapters are adaptable across settings and highlight ways to engage clinicians, children, and caregivers in their implementation. These evidence-based practices are designed for school-age children with a minimum verbal age of 7 years, while recognizing that ABM continues to develop through adolescence. In addition, this text provides strategies appropriate for supporting ABM in autistic adolescents and adults with higher cognitive and linguistic abilities.





# 2

## Understanding Autobiographical Memory

### CHAPTER GOALS

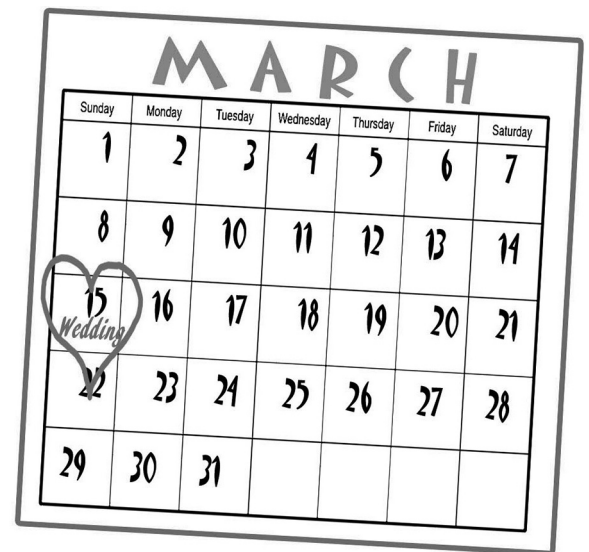
After reading this chapter, you will be able to

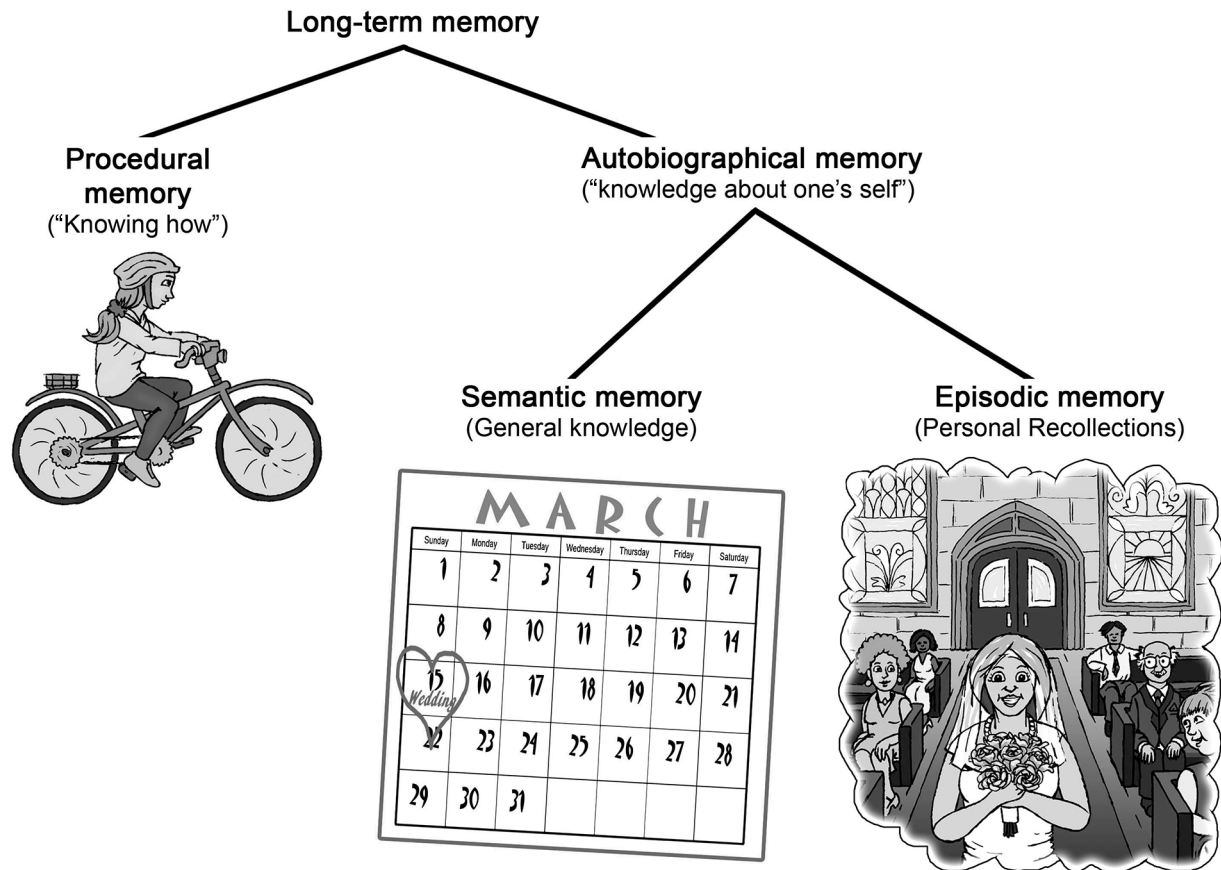
- Differentiate between autobiographical semantic memory and autobiographical episodic memory.
- Describe the key characteristics of semantic and episodic memory.
- Identify those questions that will best elicit semantic versus episodic memory.
- Explain the types of thinking frequently associated with autobiographical episodic memory.

Autobiographical memory (ABM) is a special kind of long-term memory that refers to memory for information about oneself. ABM can be broken down into two memory subtypes: semantic memory (SM) and episodic memory (EM). Autobiographical SM is memory for facts or knowledge about oneself. Autobiographical EM, however, is memory for personally experienced events (see Figure 2.1). SM and EM are two memory subsystems in neurotypical development that are highly integrated within ABM. ABM is a key challenge in autism, but that challenge appears to be primarily rooted in the EM aspect of memory (see Chapter 3). Hence, the strategies in this book ultimately focus on supporting social learning and social communication by strengthening autobiographical EM.

### EPISODIC MEMORY AND SEMANTIC MEMORY

EM can be distinguished from SM in a number of ways. For example, if you were to ask a friend when she got married, she could tell you that she was married on March 15. It is a fact about herself that she knows, although she is not sure how she knows it. Indeed, if she were asked, “How do you know you were married on that day?” she would not be able to answer. This is something scientists refer to as **source amnesia**, and it occurs because a person’s recall of information like a wedding date draws on SM: It is a known fact that is inscribed in memory through rote memorization.





**Figure 2.1.** Autobiographical Memory (ABM) System: Its subcomponents and relations to other types of memory.

By contrast, consider the question "Can you tell me about your wedding day?" This is a question that draws on EM. During EM, your friend in this scenario travels back in time and grounds herself in space (the location or physical setting). Then, she reconstructs the scene by linking herself to all that she remembers (who was there, what she wore, what she thought and felt, what happened first, second, third, and so forth). Crucially, she also has an awareness that this is a recollection, something referred to as **autonoetic consciousness**. With autonoetic consciousness, your friend knows that she is remembering (as opposed to daydreaming or planning for the future), but this awareness goes beyond simple recollection of a specific past experience to create a sense of self that extends through time (Nelson & Fivush, 2020). Your friend understands that she is situated in the present, reflecting on her wedding day in the past, and can extend a sense of personal continuity through time—from past, to present, and into the future.



Unlike SM, a person can tell you how it is that they know something during episodic recall. Your friend from this scenario knows that she was married in a church because she remembers it. She remembers being there, what it looked like, the stained-glass windows, and how happy and nervous she



felt as she looked at the faces in the pews. This is an EM: the remembering and reliving of a past personal experience.

SM and EM are different in many ways. The key characteristic features of SM include the following (Brien et al., 2020):

- *Acontextual*: no time or space and no information about where or when the memory was encoded
- *Feels objective, fact-based, impersonal*
- Associated with *source amnesia*: you may know when and where you were born but do not remember how you learned that information

The key characteristics of EM include the following:

- Grounded in time and space
- Requires mental time travel: during EM we mentally travel back in time to relive an experience
- It feels subjective and personal
- Autonoetic consciousness: awareness that one is remembering (or a feeling of “I was there, I did that”) that creates a sense of self that is extended through time
- Accompanied by some degree of detail (e.g., information about thoughts, feelings, perceptions, sensations, or details about events, locations, and time)
- Tends to reflect a temporal order of events (i.e., what happened first, second, next, later) (Aronowitz, 2018)
- Is a form of causal reasoning: it connects causal events in memory (e.g., I missed the bus because my alarm clock did not go off) (Keven, 2018)
- Is teleological in that it usually encodes information about our goals (e.g., the talk I was giving was important, and I really wanted to do a good job)

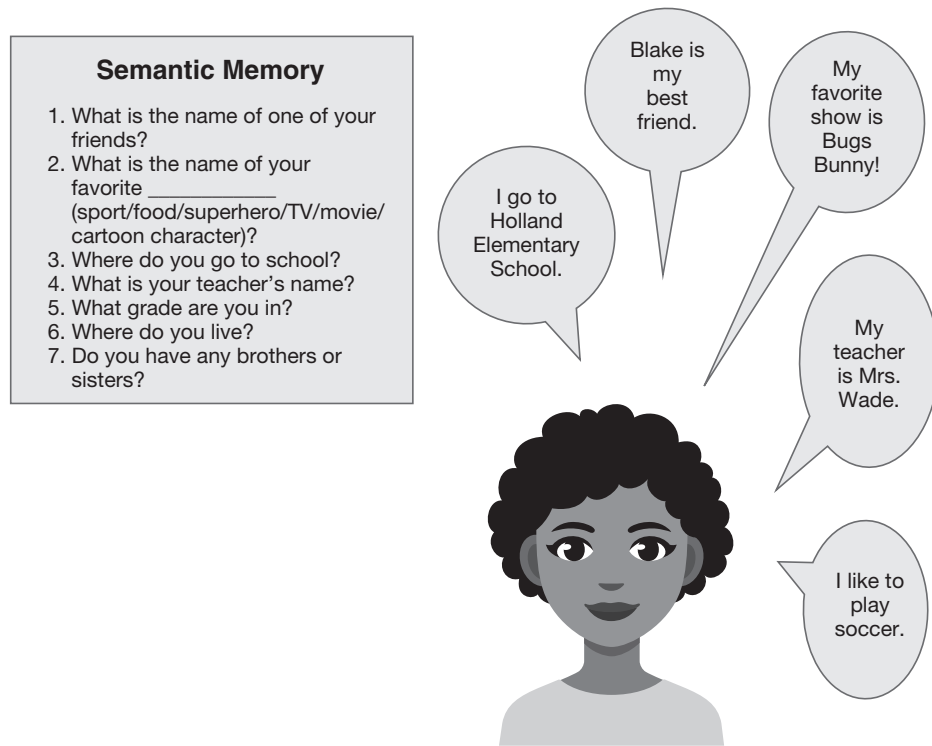
To illustrate these aspects of EM, consider the following narrative of one of our students who also studies memory processes (Knox, in press).

“I can tell you about the day I learned how to surf. It was when I was back in college [time] studying abroad in Byron Bay, Australia [place], and my parents were visiting. My dad woke me up early in the morning so we could catch the best waves [teleological/causal reasoning], and I remember following him down a narrow sand-covered path [detail] and carrying a surfboard above my head [temporal sequence of events]. I remember paddling out in the cold water [physiological detail], waiting anxiously for the next set of waves to roll in [affective detail], and falling down many times [what happened]. Then, I can recall feeling the sensation of a wave lift me from under my feet and hearing my dad cheer me on [sensory details] as the waves pushed me in toward the shore [what happened]. As I remember learning how to surf, I am aware that I am reexperiencing a previous experience in memory via mental time travel [autonoetic consciousness]. I can subjectively reexperience the unfolding of events in my mind and can remember [again, in temporal order] what I did, who I was with, what I was thinking, and how I was feeling.”

In neurotypical development, EM and SM are highly integrated in ABM. That is, a memory of a past personal event (EM) often includes semantic autobiographical facts (SM). For example, one can episodically recall an experience (learning how to surf) while also recalling the name of the location (Byron Bay). EM and SM can be difficult to distinguish because they are functionally intertwined.

## Examples of Semantic Memory and Episodic Memory

Figures 2.2 and 2.3 provide examples of SM and EM (Piolino et al., 2007). As you read the questions in Figure 2.3, reflect on how it feels to remember something semantically versus episodically. What you will likely realize is that SM and EM feel different. Although you will likely have no trouble answering the SM questions, you will not be able to say how you know the answers because of



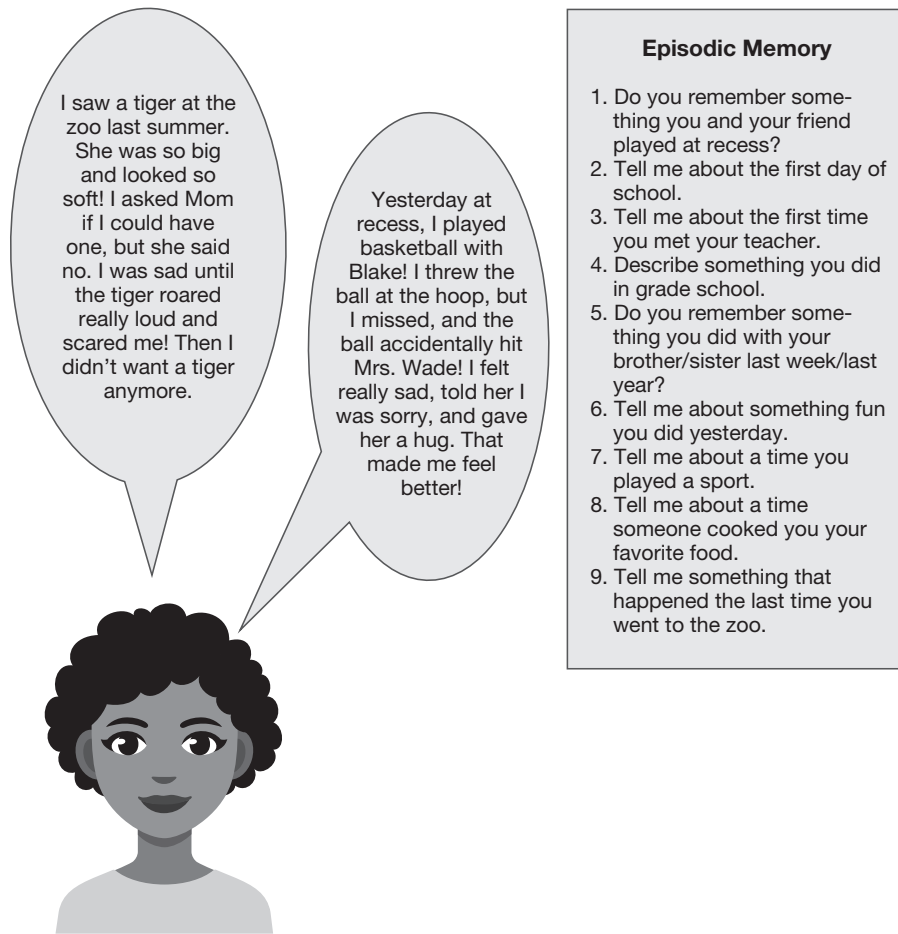
**Figure 2.2.** Questions that elicit semantic memory (SM).

source amnesia (“I just know it!”). Contrast this with how it feels to engage in episodic recall, which should feel very different (“I remember it because I was there”). There is no source amnesia in EM, and you will be able to recall subjective, personal information with some degree of detail (e.g., when, where, who, what happened).

## FACTORS INFLUENCING HOW MEMORIES ARE ENCODED

Three main processes are involved in memory: encoding, storage, and retrieval. During these phases 1) information is acquired and begins to consolidate (encoding), 2) rehearsal of the information facilitates transfer into long-term memory (storage), and 3) information is available to be accessed and reactivated (retrieval). Most important, not all (or even close to all) episodic events are encoded in ABM. Whether an event is encoded in memory sometimes depends on its personal significance in one's life and on the degree of emotion associated with the event. Although our day-to-day lives are filled with personally relevant experiences, we cannot and do not episodically encode all of them. Other EMs either drop out or are transformed into SM (i.e., they are reduced, reorganized, and remembered as *knowledge about* as opposed to an *experience of*) (Tessler & Nelson, 1994). For example, take last year's Thanksgiving dinner at my in-laws' house. I know I was there, and I am assuming we ate turkey and stuffing, but beyond that, I have no specific recollection despite my knowing that this was a personally experienced event.

On the other end of the continuum, ask me “Where were you on 9/11?” and I will tell you where I was and what I did on that day. My memory for 9/11 (and for most of us who are old enough to have lived it) is robustly encoded in EM because of the magnitude, emotionality, and impact of that event. This particular kind of example of ABM is referred to as **flashbulb memory**, which is a highly detailed, exceptionally vivid snapshot of the moment and circumstances in which a piece of surprising and emotionally arousing news is discovered. Depending on one's age, other examples of news events that may evoke a flashbulb memory include the United States beating the Soviet Union in ice hockey in the Olympics (1980), the space shuttle *Challenger* disaster (1986), the death of Princess Diana (1997), and the COVID-19 shutdown (2021).



**Figure 2.3.** Questions that elicit episodic memory (EM).

Yet, vivid autobiographical recall requires neither surprise nor an outside informant (e.g., news sources) as long as the experience is personally consequential and emotionally arousing (Eaton & Anderson, 2018). These can be individually or communally shared (opposed to societally shared) experiences and can include rites of passage (social, religious, educational), both positive and negative, and surprising or highly anticipated events. Examples include

- The day you got your braces off
- The day a family member died
- Your wedding day
- The day an adopted child came home for the first time

Like flashbulb memories, such events are vividly, episodically encoded. Interestingly, however, although people tend to report high confidence in these memories, researchers have not proven these memories to be more accurate than low-confidence memories (Talarico & Rubin, 2007). In summary, the important points here are

- Not all EMs are encoded or retained with the same degree of detail or specificity.
- Both visceral emotionality and the personal significance of an event enhance confidence in—and the vividness of—EM (but not necessarily the accuracy of EM).
- What is encoded in EM may not be wholly accurate and will be different for different people.

Now, identify two events: one that was impactful for you and one that was unemotional and relatively inconsequential (e.g., the last time you went shoe shopping at the mall or took your car in for an oil change). You will ask yourself questions about your memory of each event in the following activity.

### Activity: Contrast Two Kinds of Episodic Memories

#### EPISODIC MEMORY: Impactful, emotional, or personally consequential event

Event: \_\_\_\_\_ Where: \_\_\_\_\_ When: \_\_\_\_\_  
 Where was I? \_\_\_\_\_  
 What was I feeling and thinking? \_\_\_\_\_  
 What did I do first, second, next? \_\_\_\_\_  
 Who else was there? \_\_\_\_\_  
 What happened? \_\_\_\_\_  
 How confident am I in this memory (accuracy, details, completeness)? \_\_\_\_\_

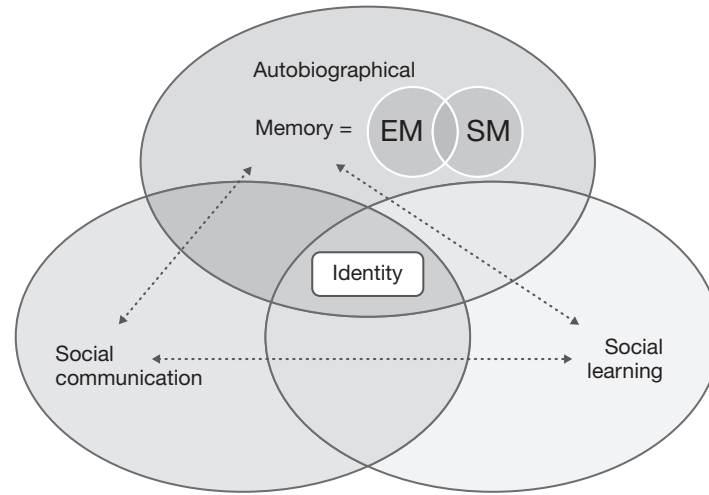
#### EPISODIC MEMORY: Unimpactful, unemotional, or personally inconsequential event

Event: \_\_\_\_\_ Where: \_\_\_\_\_ When: \_\_\_\_\_  
 Where was I? \_\_\_\_\_  
 What was I feeling and thinking? \_\_\_\_\_  
 What did I do first, second, next? \_\_\_\_\_  
 Who else was there? \_\_\_\_\_  
 What happened? \_\_\_\_\_  
 How confident am I in this memory (accuracy, details, completeness)? \_\_\_\_\_

In answering questions about the first, more significant event, you are likely relying on robust and vivid EM. You should notice that recall seems effortless, vivid, and detailed (and you are probably quite confident in the accuracy of your reporting). Now contrast that with the EM for the second, insignificant event. How were you at answering questions about this experience? You should notice that recall was less detailed and required more effort, and you may have more uncertainty about the specifics. Yet, these are also EMs, and the integration of vivid, impactful memories with memories for mundane, routine past experiences is foundational for our understanding of ourselves and our unique personal past.

### AUTOBIOGRAPHICAL MEMORY AND THE STUFF OF SELF

ABM is important for the same reason that all memory is important: It is central to learning and cognitive development. But ABM (and EM in particular) is a very special kind of memory. It is a human-specific capacity (Nelson, 2003) that has been credited with a wide range of (similarly) human-specific cognitive achievements. In fact, EM is considered the basis of nothing less than our ability to achieve an identity, a stable and continuous self-concept (McAdams, 2013; Nelson & Fivush, 2004), introspection, and conscious awareness itself (Bohanek et al., 2006). In short, ABM is special in that “it constitutes a major crossroads in human cognition where considerations relating to self, emotion, goals, and personal meanings all intersect” (Conway & Rubin, 1993, p. 103). As such, ABM is the “stuff of self.” It is the tome of our life history as recalled from the unique perspective of oneself in relation to others. It is cosmically important for various intellectual achievements as well as social learning, social communication, and social success (Nelson & Fivush, 2004).



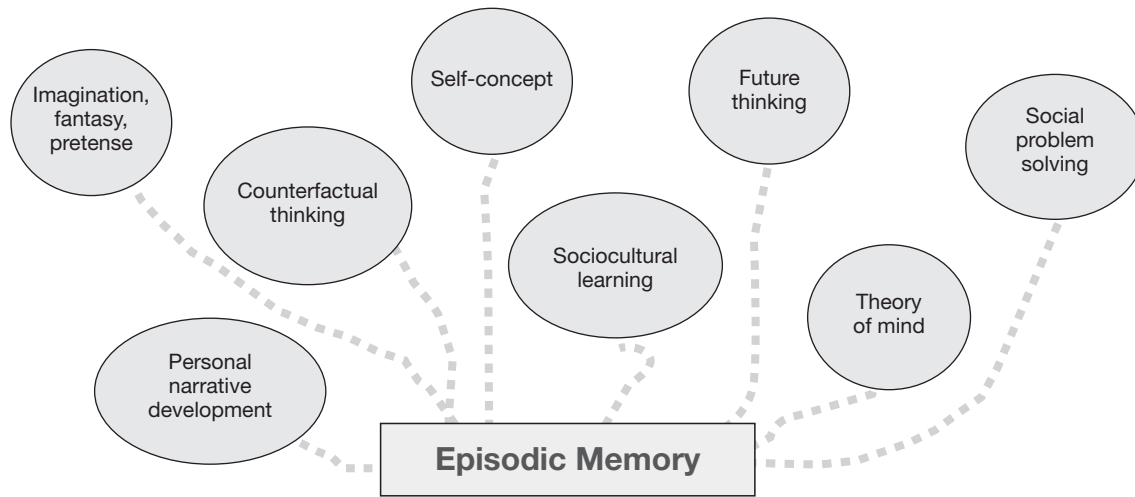
**Figure 2.4.** A visual representation of the bidirectional relationships among autobiographical memory (ABM), which comprises autobiographical episodic memory (EM) and autobiographical semantic memory (SM), social learning, and social communication. Identity is construed as occupying the intersection of these processes.

In Chapter 1, we began to sketch the relationships among ABM, social learning, and social communication, which are related operations that inform and shape each other over the course of development. We can refine these ideas now by 1) elaborating on the concept of ABM as comprised of two related subsystems: the EM and SM systems and 2) incorporating the aspect of self-concept or identity, which is situated at the intersection of the primary functions (see Figure 2.4).

### Types of Thinking Linked With Autobiographical Episodic Memory

The relationships between autobiographical EM and the conceptual self (identity) have far-reaching implications. Autobiographical EM is foundational to specific types of thinking humans do that help us construct our identity and self-concept, including **future thinking**, **counterfactual thinking**, and the more general development of social learning and social communication for social problem solving. For example, autobiographical EM is strongly linked to future thinking, which is the ability to imagine a future self, event, or circumstance (Lind & Bowler, 2010). As it turns out, time travel works in two directions, and EM and future thinking are highly correlated (Lind & Bowler, 2010). In short, the better we are at mental time travel to the past for episodic recall, the better we are at projecting forward in time to imagine our future self. This makes sense because “evolution does not provide memory for the purpose of simply thinking about the past but to solve problems in the present, in particular to anticipate the next moves that are required by a situation” (Nelson, 2013, p. 14). Not surprisingly, autobiographical EM is also related to counterfactual thinking (Guajardo & Cartwright, 2016; Lind & Bowler, 2010; Lind & Williams, 2012), which is the ability to reason about hypothetical (counter to fact) events or states (e.g., The coffee I spilled on Brian was not hot, but what if it had been?). People employ counterfactual reasoning to learn from their mistakes, “make sense of the past, plan courses of action, make emotional and social judgments, and guide adaptive behavior” (Van Hoesek et al., 2015).

**Personal narrative** discourse is an important aspect of social communication. As the core of the conceptual self, ABM is central to the ability to tell a coherent personal narrative. Personal narratives connect ABM with the language system and provide an organizational structure around which EMs can be recalled (see Figure 2.5). Then, as children become more fluid in recalling past experiences, they become more adept at using narratives to think about and organize their past experiences (Nelson & Fivush, 2004). The ability to tell personal narratives is, in turn, linked to



**Figure 2.5.** Episodic memory (EM) is core to several human-specific intellectual achievements.

our sense of purpose and meaning surrounding a narrated event and our psychological well-being more generally (Waters & Fivush, 2015).

This same kind of reciprocal relationship is seen between autobiographical EM and social learning. As described in Chapter 1, we use the term “social learning” (which has sometimes been referred to as *social cognition* or *theory of mind*) to refer to all forms of social reasoning about one-self and others. Autobiographical EM and social learning are so intertwined that they are practically impossible to disentangle. EM can be thought of as the accumulation of our past personal experiences; it is the record of our subjective social, emotional, cognitive, and behavioral experiences. This record both reflects and informs social learning. As such, it is difficult to imagine one without the other; within EM, we encode social information relevant to social learning, and our social learning is shaped by the content of EM.

Ultimately, EM is central to the development of flexible social problem-solving skills (Nelson, 2013). We encode social information within the EM system to help predict others’ behavior, develop scripts and schemata for situations and events, and adapt to new social situations. EM is also a primary mechanism through which we construct our social selves and integrate and make sense of sociocultural information (McAdams, 2013; Nelson & Fivush, 2004). Our culture influences what we remember and affects the way that we draw on our EM in daily life (Ross & Wang, 2010). Through EM

Individuals gain a sense of who they are in relation to others, both locally within their family and community and more globally within their culture. They also attain a shared perspective on how to interpret and evaluate experience, which leads to a shared moral perspective. In a very real sense, the achievement of an autobiographical memory system sets the stage for the intergenerational transmission of family and cultural history, which is the bedrock of human culture. (Fivush & Nelson, 2004, p. 577)

## Scene Construction

The nature of EM (and the cognitive achievements that accompany EM development) have led many researchers to conclude that **scene construction** is a common ability underlying EM (Hassabis et al., 2007; Hassabis & Maguire, 2007). *Scene construction* refers to the integration of relevant information and details encoded during an experience that is grounded in space and can later be mentally reassembled, manipulated, and visualized (Hassabis & Maguire, 2007). One can conjure mental images both real and imaginary through the process of scene construction (e.g., visualize your bedroom and the objects within it; imagine a meadow at twilight with scattered weeping willows and pockets of fireflies).



In short, EM (and its connections with scene construction and future thinking) allows us to mentally construct (and reconstruct) a scene, imagine real and hypothetical worlds, recall past personal experiences, and plan and execute the most adaptive behavior (Hassabis & Maguire, 2007; Schacter et al., 2007). Consider the following example in which EM is recruited to adapt behavior and avoid an undesirable outcome.

You are at home loading the dishwasher and notice an unfamiliar plate in the sink. Thinking nothing of it, you put it in the dishwasher and begin the cycle. Later that evening, your spouse is unloading the dishwasher. You hear your spouse exclaim, “Oh no! My great-great-grandmother’s china!” You turn to see your spouse close to tears, cradling the broken plate. Because you put the china in the dishwasher (of course not knowing that it was not dishwasher safe), the dish broke and your spouse got upset. Months later, you are visiting relatives for dinner. Like a good guest, you offer to help with the dishes after the meal. Your offer is accepted, and as you reach for a ceramic plate to load in the dishwasher, you remember the incident with the great-great-grandmother’s china. You imagine a possible future situation in which you repeat this mistake and damage your host’s dinnerware. You decide to check with your host and inquire as to whether these dishes should be hand washed.

Now think back to young Cooper, who we met at the beginning of Chapter 1. Cooper had trouble telling his dad about his day at school, presumably due to EM challenges, and that makes it difficult for father and son to connect in the moment. But EM codevelops with a range of social and cognitive functions so that, over time, Cooper’s EM challenges may affect his ability to

- Imagine a future self, event, or circumstance (e.g., “What colleges should I apply to? I want to study history, so I should look at schools that offer that major. I also think I would be happiest at a smaller school where it is easier to get to know people, not a big school where you can feel lost in the crowd.”)
- Reason about counterfactual events (e.g., “I didn’t study for that test, and I did poorly. What if I had studied? Perhaps I could have done better!” or “I’m glad I had a helmet on when I fell off my bike; otherwise, it could have been a lot worse!”)
- Form rich, coherent personal narratives (e.g., stories about childhood, a favorite vacation, or what just happened at the gas station; a life story)
- Develop a range of social learning and social communication competencies
- Develop flexible social problem-solving skills because EM is a contextual record and accumulation of one’s past personal history (e.g., what worked and did not work in some situations)

## SUMMARY

Autobiographical memory (ABM) includes both SM, or memory for facts or knowledge about one-self, and episodic memory (EM), or memory for personally experienced events. Key characteristics differentiate these two aspects of ABM. For example, SM usually specifies information about where or when a memory was encoded and is fact based and objective. In contrast, EM is grounded in time and space and requires one to relive an experience from their point of view. Thus, it feels more subjective and relies on what someone is remembering. In neurotypical development, SM and EM are highly integrated in ABM such that a past personal event (EM) often includes autobiographical facts (SM), making them difficult to distinguish.

Three primary processes explain how memory works. First, information is acquired and begins to synthesize—a process typically referred to as *encoding*. Second, there is information rehearsal that facilitates long-term memory or what is often described as *storage*. Third, this information can be accessed and reactivated in a process of retrieval. It is important to understand that not all episodes are encoded into ABM as personally significant in one’s life, and the degree of emotion associated with the event will affect all three processes.

Because ABM is central to learning and cognitive development, it is important to understand its specific elements and, in particular, the role EM has in supporting social cognitive connections. EM helps us to recognize our identity and develop a stable self-concept. It is the “stuff of self” that is key to achieving ABM, which, in turn, facilitates social success.





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