

the child has experienced (Andrews, Ahern, & Lamb, 2017; Andrews & Lamb, 2018). It appears that the reliability of young children's reports has as much to do with the skills and motivation of the interviewer as with any natural limitations on young children's memory (Bruck & Ceci, 2012; Ceci, Hritz, & Royer, 2016).

Autobiographical Memory Another aspect of long-term memory that has been extensively studied in regard to children's development is autobiographical memory (Bauer, 2018; Bauer & others, 2017). *Autobiographical memory* involves memory of significant events and experiences in one's life. You are engaging in autobiographical memory when you answer questions such as these: Who was your first-grade teacher and what was s/he like? What is the most traumatic event that happened to you as a child?

During the preschool years, young children's memories increasingly take on more autobiographical characteristics (Bauer, 2018; Bauer & Larkina, 2016). In some areas, such as remembering a story, a movie, a song, or an interesting event or experience, young children have been shown to have reasonably good memories. From 3 to 5 years of age, they (1) increasingly remember events as occurring at a specific time and location, such as "on my birthday at Chuck E. Cheese's last year" and (2) include more elements that are rich in detail in their narratives (Bauer, 2013). In one study, children went from using 4 descriptive items per event at 3½ years of age to 12 such items at 6 years of age (Fivush & Haden, 1997).

Executive Function

Recently, increased interest has been directed toward the development of children's **executive function**, an umbrella-like concept that encompasses a number of higher-level cognitive processes linked to the development of the brain's prefrontal cortex (Knapp & Morton, 2017; Perone, Almy & Zelazo, 2017). Executive function involves managing one's thoughts to engage in goal-directed behavior and exercise self-control. Earlier in this chapter, we described the recent interest in *executive attention*, which comes under the umbrella of executive function.

In early childhood, executive function especially involves developmental advances in cognitive inhibition (such as inhibiting a strong tendency that is incorrect), cognitive flexibility (such as shifting attention to another item or topic), goal-setting (such as sharing a toy or mastering a skill like catching a ball), and delay of gratification (the ability to forego an immediate pleasure or reward for a more desirable one later) (McClelland & others, 2017; Muller & others, 2017). During early childhood, the relatively stimulus-driven toddler is transformed into a child capable of flexible, goal-directed problem solving that characterizes executive function (Zelazo & Muller, 2011).

Researchers have found that advances in executive function during the preschool years are linked with math skills, language development, and school readiness (Blair, 2017; Hoskyn, Iarocci, & Young, 2017; Liu & others, 2018; Muller & others, 2017). One study revealed that executive function skills predicted mathematical gains in kindergarten (Fuhs & others, 2014). Another study of young children also revealed that executive function was associated with emergent literacy and vocabulary development (Becker & others, 2014). And a recent study found that young children who showed delayed development of executive function had a lower level of school readiness (Willoughby & others, 2016).

Walter Mischel and his colleagues (Berman & others, 2013; Mischel, 2014; Mischel, Cantor, & Feldman, 1996; Mischel & Moore, 1980; Mischel & others, 2011; Schlam & others, 2013) have conducted a number of studies of delay of gratification with young children. One way they assess delay of gratification is to place a young child alone in a room with an alluring marshmallow that is within their reach. The children are told that they either can ring a bell at any time and eat the marshmallow or they can wait until the experimenter returns and then receive two marshmallows. For the young children who waited for the experimenter to return, what did they do to help them wait? They engaged in a number of strategies to distract their attention from the marshmallow, including singing songs, picking their noses—anything to keep from looking at the marshmallow. Mischel and his colleagues labeled these strategies "cool thoughts" (that is, doing non-marshmallow-related thoughts and activities), whereas they said the

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