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Is thinking about the future related to theory of mind and executive function? Not in preschoolers



Laura K. Hanson, Cristina M. Atance*, Sarah W. Paluck

School of Psychology, University of Ottawa, Ottawa, Ontario K1N 6N5, Canada

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ABSTRACT

The capacity to mentally project the self into the future, or what has been termed “episodic foresight” (EpF), is becoming a popular topic of study in developmental psychology. Several theories propose that EpF is related to theory of mind (ToM) and executive function (EF). However, these links have not been tested using standard behavioral tasks in young children. Accordingly, we administered a battery of EpF, ToM, and EF tasks to 90 3-, 4-, and 5-year-olds. After controlling for age and language ability, the EpF tasks were not intercorrelated, nor were they individually related to EF or ToM. As such, this study challenges the claim that EpF, at least as currently assessed in young children, is related to their developing ToM and EF abilities.

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Introduction

Thinking about the future is an integral aspect of human cognition that underlies our abilities to anticipate possibilities, plan ahead, and control aspects of our environment and our relationships with others (Suddendorf & Corballis, 2007). Adults think about the future and engage in future-oriented behaviors on a daily basis, and these capacities are argued to distinguish humans from other species (e.g., Suddendorf & Corballis, 2007; Tulving, 2005; but see also Raby, Alexis, Dickinson, & Clayton, 2007). Whether young children also think and behave in a future-oriented manner is less clear but has recently become a topic of study among developmental psychologists (Hudson, Mayhew, &

* Corresponding author.

E-mail address: atance@uottawa.ca (C.M. Atance).

Prabhakar, 2011; Suddendorf & Moore, 2011). Of particular interest is children's capacity to mentally project the self into the future or what has been termed "mental time travel" (Suddendorf & Corballis, 1997, 2007), "episodic future thinking" (Atance & O'Neill, 2001; Szpunar, 2010), "prospection" (Gilbert & Wilson, 2007), "episodic simulation of future events" (Schacter, Addis, & Buckner, 2007), and (most recently) "episodic foresight" (EpF) (Suddendorf & Moore, 2011). EpF is broadly defined as the capacity to "imagine future scenarios and use such imagination to guide current action" (Suddendorf & Moore, 2011, p. 296).

Measuring EpF in young children

Although the study of EpF is still in its infancy, when we began our data collection there existed a handful of methods to measure it, with most studies showing important development in this ability between 3 and 5 years of age (e.g., Atance & Meltzoff, 2005; Busby Grant & Suddendorf, 2009; Busby & Suddendorf, 2005). A relatively straightforward approach has been to simply ask children to provide verbal accounts or plans for the future. For example, Hudson, Shapiro, and Sosa (1995) asked a group of 3-, 4-, and 5-year-olds to provide plans for familiar events, including going grocery shopping and going to the beach. They found that older preschoolers' verbal plans for familiar events included more information and specific planning activities than those of younger preschoolers. Interestingly, a separate group of children was also asked to provide "scripts" of these same events. In contrast to the "plan" condition in which children were asked, for example, "Can you tell me a plan for going to the beach?," the "script" condition placed less emphasis on preparatory activities, asking children instead, "Can you tell me what happens when you go to the beach?" Results indicated that although the adequacy of children's plans increased significantly with age, the adequacy of their scripts did not (i.e., 3-year-olds were already quite proficient at providing scripts for familiar events). Because plans are more future oriented than scripts, Atance (2008) argued that the capacity to provide a plan for going to the beach, for example, draws more heavily on the episodic system than does providing a script for this same event. Children have also been asked to report events that will happen "tomorrow," with this approach yielding similar findings. That is, 4- and 5-year-olds' (but not 3-year-olds') accounts are relatively coherent and accurate (e.g., Busby & Suddendorf, 2005).

Researchers have also examined whether children plan/act in anticipation of future needs. For example, Atance and Meltzoff (2005) developed a Picture Book task designed to assess whether children can anticipate physiological states of the self, such as hunger and thirst, that might occur in the context of relatively novel situations such as walking up a mountain and walking along a desert path. Children were presented with stories and pictorial scenes of such destinations, asked to imagine themselves in these scenarios, and then asked to choose one item from a set of three items to bring with them. One of these items could be used to address a future state of the self. Developmental differences among 3-, 4-, and 5-year-olds were observed for correct item choices and the ability to explain these choices using future-oriented justifications (e.g., "I might get thirsty"). More recent tasks that emerged after we began our data collection have been developed to assess children's capacity to plan for future needs (e.g., Russell, Alexis, & Clayton, 2010; Suddendorf, Nielsen, & von Gehlen, 2011), with an improvement in performance also shown between 3 and 5 years of age.

Another type of task that potentially requires EpF (McColgan & McCormack, 2008; Suddendorf & Corballis, 2007) tests children's ability to conceptualize temporal event sequences for both the immediate future and longer term future. For example, McColgan and McCormack (2008) investigated children's ability to reason and plan for an immediate future event according to temporal order information. They found that 3- and 4-year-olds were unable to consistently apply a temporal order rule (position a camera in a model zoo so that it could be used to take a picture of a particular animal that appeared later in the sequence), whereas 5-year-olds succeeded. Similarly, when Busby Grant and Suddendorf (2009) asked 3-, 4-, and 5-year-olds to place pictures of various longer term future events (e.g., playing at the park, getting married) along a timeline, only 5-year-olds were able to differentiate daily events involving the self from those that were more remote.

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