



April 2021

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### Recommended Citation

Koldas, Kardelen (2021) "A New Window Into Children's Memory: Professor of Psychology Martha Arterberry's new study comes with implications for eyewitness testimonies," *Colby Magazine*: Vol. 107 : Iss. 3 , Article 12.

Available at: <https://digitalcommons.colby.edu/colbymagazine/vol107/iss3/12>

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# A New Window Into Children's Memory

Professor of Psychology Martha Arterberry's new study comes with implications for eyewitness testimonies

By Kardelen Koldas '15



When children are eyewitnesses—to an incident, an accident, or a crime—does age matter? Are older kids more precise in recounting an event than the younger ones?

Not necessarily, says Professor of Psychology Martha Arterberry, who together with her research assistant, Eliana Albright, published a new study, “Children’s Memory for Temporal Information: The Roles of Temporal Language and Executive Function,” in the *Journal of Genetic Psychology: Research and Theory on Human Development* in its special issue on temporal cognition March 18.

“What we found is that there are some kids, regardless of age, who are really good at this, and there are other kids, regardless of age, who are very bad,” said Arterberry, whose research largely focuses on children and their so-called event memory. This is a contrast to what’s typically seen in memory studies. “We think it’s a type of maturity that’s happening independent of their chronological age.”

In the study, Arterberry and Albright examined how 40 children between the ages of three and six ordered events in a children’s book, *Miss Malarkey’s Field Trip* by Judy Finchler and illustrated by Kevin O’Malley.

Why that story?

“The book presents an arbitrary order of events. In the story, characters make a trip to a science center, visiting the electricity room, the dinosaur room, and the astronomy room, among others. “All these things are happening in an order that doesn’t have a logical connection, so that way it tests their [children’s] ability to remember the order of events without relying on some internal script.”

Unlike previous research that often investigated how children remember things from their own life, this research explored children’s ability to order events that didn’t directly happen to them—like they are bystanders.

Immediately after hearing the story, children were asked to chronologically order events, corresponding to different scenes in the plot, on an empty timeline. They were asked yes or no questions about the plotline as well as given other tests to measure their understanding of “before” versus “after” executive functions, and attentiveness when listening to the story.

“What we found out is that the children generally do understand ‘before’ and ‘after,’ and that ability doesn’t predict their temporal memory. Instead, we found it was the executive function of cognitive shifting,” said Arterberry.

Cognitive shifting, or cognitive flexibility, she explained, is the ability to switch among rules and then be able to remember the new rule and act accordingly—a skill that develops independently of age. “The kids who had greater cognitive flexibility were the ones better at remembering the ordering of the events.”





Arterberry also stressed that it's quite hard for children to remember the order of events. "They can report on facts like what happened, but the placement of those events in a time frame is difficult," she said, adding that this limitation doesn't mean that their input should be discounted.

"A big question in the legal field is at what age can children be accurate eyewitnesses, and the answer is nobody, no matter what their age, is an accurate eyewitness," said Arterberry. "But it's still a question that people really want to know better or understand because there are some crimes when kids are the only witnesses."

## Onward with the Research

Last summer Arterberry and Albright began testing the recall of adults 60 or older, with Erica Chung '22, a psychology: neuroscience major, on the team.

Over the summer Chung tested the adults using the same storybook combined with a different series of tests. Since January, she has been inputting the data for analysis. "What I'm learning in the classroom is a lot different than applying this knowledge to real data with real participants for a real study," Chung said. "And I think it was really interesting to be able to work with that kind of field data."

In a preliminary analysis, Arterberry and Chung found interesting results. "The older adult results are not showing the same pattern as the children," said Arterberry, "suggesting that the processes that predict temporal memory in children—as it is developing—are not the same processes that predict temporal memory in older adults—once it is established and well-practiced."