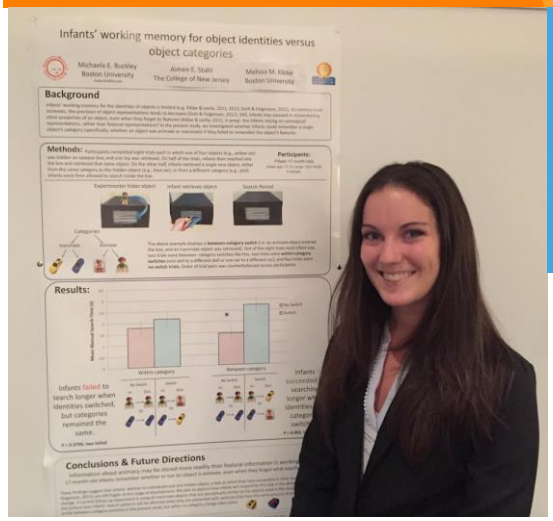
Fall 2015 Newsletter

Inside:

What has the BU Developing Minds Lab been up to?

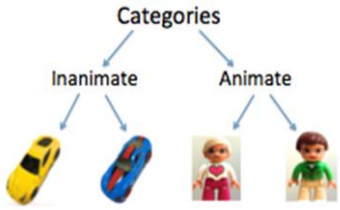
We have had a busy semester! With your help, we have continued to explore how infants and children think and behave, and have discovered some pretty interesting findings. Take a look inside and see what we have learned. We couldn't have done it without you!

Cognitive Development Society (CDS) 2015 Conference



What do 17-month-olds remember about the features of objects and the categories of objects?

In our lab, we played a hide-and-seek game with 17-month-olds in which infants saw one toy go into a box, and then reached in and grabbed one toy out of the box. Sometimes, the toy switched identities. The toys belonged to two categories: animate toy dolls, and inanimate toy cars. We measured how long infants searched in the box for any "missing" objects.

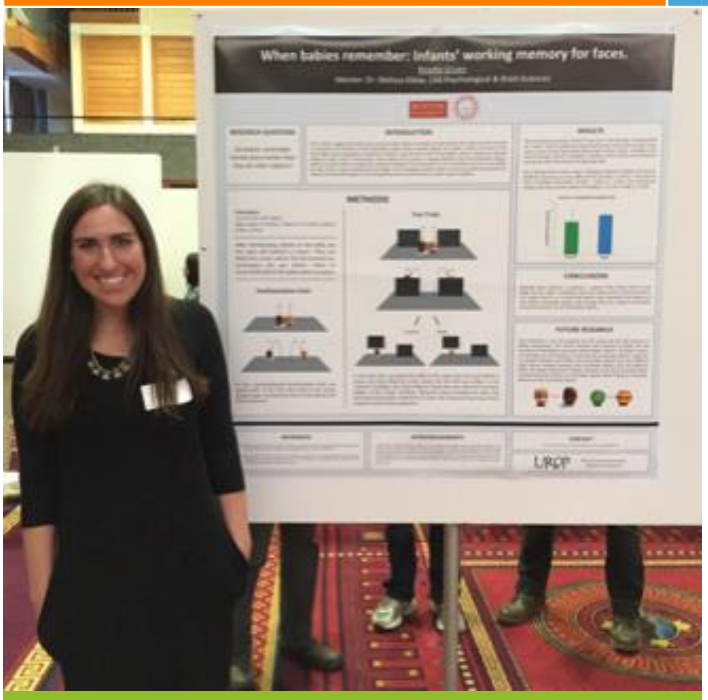


We found that infants noticed if the toy changed to another toy from a *different* category, but that they did not notice if it changed to a toy from the *same* category. This finding suggests that even when infants forget what exactly an object looks like, they still remember what *kind* of object it is (in this case, whether or not the object is animate). Lab Manager Michaela Buckley presented a poster explaining these findings at the Biennial CDS Conference in Columbus, Ohio (shown above).

How can social factors improve babies' memories?

Babies have a lot to learn while exploring a world full of people and objects. In our lab, we study the interactions between how babies learn about people and how they learn about objects. Developing Minds Lab Primary Investigator Dr. Melissa Kibbe gave a talk about some of our recent findings at the CDS conference this fall (shown below).

One of the studies in our lab that helped us learn more about these interactions involved a video for 5- to 7-month-old infants. In this video, a person was presented with two different shapes, and always chose to reach for one of the shapes. These shapes were then hidden behind screens and then revealed to have either changed or stayed the same. Previous research has shown that when two objects are hidden from view, babies are pretty good at remembering the last hidden object, but have a harder time remembering the first hidden object. We were curious if this person's preference for one shape would help babies remember it better. Using eye-tracking technology, we measured babies' abilities to anticipate the location of this "preferred" shape. We found that babies are pretty good at remembering where this object should be, which suggests that social cues can help improve young infants' memories!



Undergraduate Research Opportunity Program Symposium

The BU UROP Symposium allows undergraduate researchers the opportunity to present their work. Rinatte Gruen (pictured above) presented our lab's findings about infants' memory abilities for faces and objects.

Past work has shown that infants have trouble remembering the features of two inanimate objects, so here we asked if babies can more easily remember the features of humanlike faces. In our lab, we showed 5- to 7-month-olds a puppet show in which different doll faces were hidden from view. Sometimes, they changed identities. If babies remembered the face that was originally hidden, then we expected them to be surprised when the face changes. We measure babies' surprise by tracking how long they look at the puppet stage. We found that babies generally look longer when the faces switch, which suggests that they can remember the features of human faces more easily than they can remember the features of other objects.

Can children distinguish between different types of fiction?

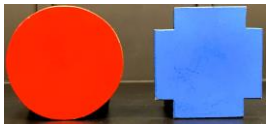
Children love being read to, but how exactly do they interpret the different stories that they hear? This study explores children's abilities to distinguish between different types of fiction. With the help of over 90 lab visitors, we learned about four- to six-year-olds' understanding of fantasy, science fiction, and realistic stories. Past studies have shown that children tend to have a "reality bias," meaning that even when stories contain fantastical events, children still generally expect stories to end in a realistic way. In our study, we tried to create stories that were very consistent to their genres, to see if this would lessen this reality bias. We read children a story from one of these genres, and then asked them to pick a matching ending. Children were always given the choice of either a genre-matched ending, or another ending from a different genre. We found that children are very good at distinguishing between fantasy and science fiction, but that distinctions become a bit more difficult when a realistic ending is thrown into the mix. Children show a very strong reality bias when read a fantasy story (i.e. most children choose the realistic ending). Children also seem to choose endings at random when read a science fiction story and given the choice of a matching or realistic ending. Predictably, when children are read a realistic story, they almost always choose the realistic ending.

Are infants able to group objects together to remember more?

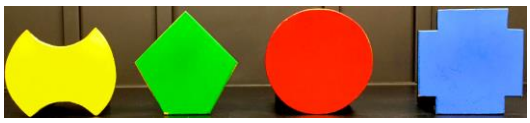
Adults, infants, and children all have limits to their short-term memories. Infants can generally only keep track of about three objects at a time, but are able to group objects together to remember more than they usually can (the same way you might remember a phone number by sorting it into groups of three and four numbers). In our lab, we explored 13-month-olds' abilities to remember up to four objects at a time by remembering two groups of two objects. We created these two groups by repeatedly placing two objects next to each other. We found that these simple groups did indeed help infants keep track of all four objects.

In other words, when infants repeatedly saw this:

And then this:



They were able to remember all of this:



These findings resulted in a publication, currently in press in the journal *Cognition*.

DML at the Museum of Science!

Children generally are not taught about algebra until middle school, but current research shows that children may develop these abilities much earlier! Through the Living Laboratory at the Museum of Science in Boston (shown left), we are exploring 4- to 6-year-olds' abilities to "solve for x" when problems don't have numbers and letters, but instead are presented as fun games with groups of objects and a "magic cup" that acts as the x variable. This year, we asked the following questions:

1. **Can children solve for hidden variables?** When problems are presented with objects and magic cups instead of numbers and letters, children can!
2. **Can children distinguish between multiple variables?** We have found that children estimate values of hidden quantities so successfully, that they are able to distinguish between multiple variables of different values.
3. **Can children apply these variables to more complex computations?** We have found that children successfully understand the principles of addition and subtraction with two variables, but find multiplication more difficult.

To summarize, young children have an aptitude for algebra before they learn algebra in school! Feel free to visit us at the Museum of Science to see us in action. You can also visit the Living Lab's website for more information: legacy.mos.org/discoverycenter/livinglab

Thank You!

We are so grateful to all of the families who participated in our research throughout the year. You have helped us learn so much, and we hope you had fun along the way!

We always love meeting new families, and are thankful to anyone who helps. You can learn more about our lab and our research at our website: bu.edu/cdl/developing-minds-lab

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