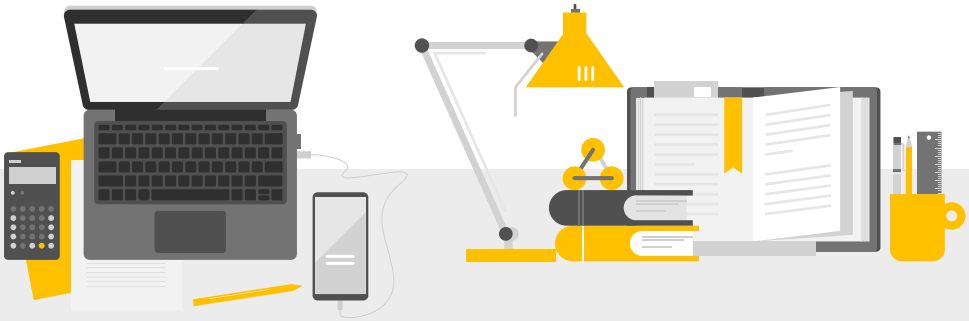
Bauer Memory at Emory Lab

Newsletter 2022

We at the Bauer Memory Lab are excited to share with you all of our accomplishments and discoveries from this past year! Within this newsletter, you will find descriptions of our new and ongoing projects, as well as updates on the projects detailed in previous newsletters. Likewise, this newsletter includes updates regarding our lab members and their achievements.

Although the lab spent the last year conducting study sessions remotely, our graduate students and staff members have thankfully been able to work in person in Emory's psychology building and collaborate more than ever. Our experimenters have loved the opportunity to connect with participants through Zoom and online surveys, and we are also excited to hopefully welcome participants back in person this fall! The ability to conduct research face-to-face will also allow us to reintroduce some really cool research methods such as eye-tracking (more on this later in the Newsletter).

None of this research would be possible without you though! We are so thankful for your continued support of our endeavors. It is your participation and interest that allows us to make exciting discoveries such as those covered herein!



INSIDE THIS ISSUE

For more information about projects, findings, or ways to get involved, call us at (404) 712-8330, visit our website, or email memory2@emory.edu

WHAT WE DO IN THE BAUER LAB

Much of the research performed in the Bauer Lab focuses on memory and learning, often through a developmental lens.

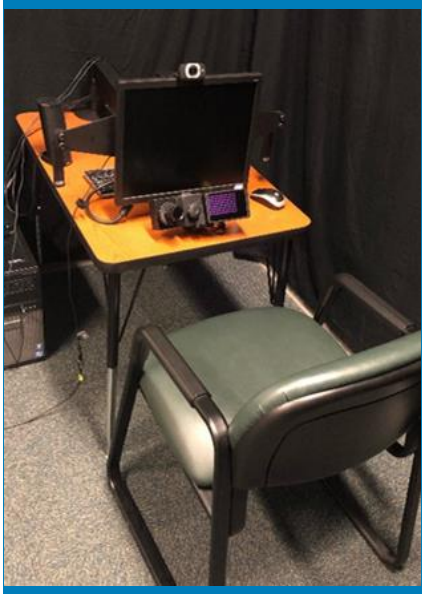
In the Bauer Lab, we are curious how people go about learning and remembering the knowledge that they obtain throughout their lifetime. We are also interested in how people come to generate their own knowledge based on separate instances of learning. These types of questions are important for broadening our understanding of how individuals come to generate a full knowledge base, from childhood into adulthood.

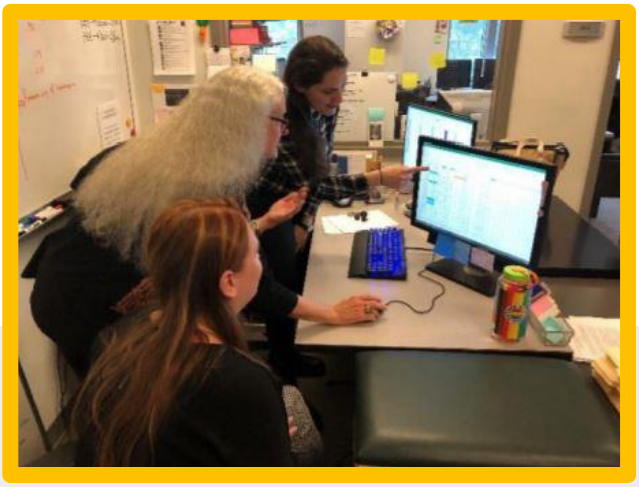
In order to study these types of questions, the Bauer Lab utilizes many different research methods and tools, from eye-tracking and behavioral tasks to book reading and museum walkthroughs!

In the past couple of years, many of our studies have had to shift to hybrid or fully online formats, but we haven't let that hinder our curiosity and passion for research! Our experimenters have adapted to conducting much of our behavioral research through Zoom sessions with participants or through the use of online survey platforms. Even virtually, we're able to administer many of the tasks we would do in person with participants, such as fact learning and memory tasks.

We are excited for the next year of studies and have you to thank for your participation!

One of the eye-trackers used in our lab





FORMING A KNOWLEDGE BASE

As was mentioned on our first page, we are interested in the development of memory, especially as it pertains to adding new information to our knowledge base. Much of the research in the lab investigates the different skills and processes that affect how children learn, remember, and use new information—skills that are especially important in a school setting.

In particular, we at the Bauer Lab are interested in how children combine information learned at different times and in different contexts and then generate new understandings, a skill that is critical to building this knowledge base across one's lifespan. Our lab calls this process *knowledge integration*. One of the goals of this research is to better understand how this skill develops over the school-age years, as well as to investigate the ways in which we can promote and facilitate its development.

This line of work began in 2009, and since then, we have gained a great deal of information about how children combine new facts through pictures, stories, single sentence facts, and games.

Knowledge Integration Example:

Children come into the lab (or participate online) and meet with a researcher who presents the child with a series of facts (either learned from a PowerPoint or learned from reading a story).

For example, a child might learn that a corolla is the name for the bunch of flower petals on a flower. Then, after a short break, the child might learn that flower petals are used to make perfume. At the end of the session, we ask the child a series of questions (i.e., What is the corolla used for?). In order to answer these "integration" questions, one must put the two related facts together to create (or self-derive) a third, "new" fact (i.e., the corolla is used to make perfume).

GENERATIVE PROCESSING

What allows us to remember, apply, and organize new information? One learning process that supports these knowledge outcomes is generative processing. Generative processing is the creation of new information beyond what someone has been directly taught. In this project, we examined generative processing in college students (age 18-22 years old) with neuroscience classroom material. We compared generative processing to an active learning control, where students were asked to rephrase directly-taught information rather than generate their own information. We then measured students' memory for directly-taught information, generated/rephrased information, and their ability to organize and apply this information.

Julia

Melanie

Alissa

Katie

We found that when students in the generative processing condition successfully generated their own information, it helped them remember learned information better than students who were in the rephrase condition. Successful generation also permitted high levels of application of information and influenced organization of concepts in memory. These findings are important for understanding how students learn best in classrooms and how we build knowledge bases.

In a related project, we compared generative processing to a rephrase control condition in terms of revision of educationally-relevant misconceptions. Everyone holds some misconceptions—and it is important for learning and education that we know how to revise them. Working with 18- to 22-year-old college students, we tested whether generating information that contradicts a misconception, or being directly taught and rephrasing this contradictory information, led to higher misconception revision. Data from this project are currently being analyzed.

LEARNING THROUGH BOOKS

How do children learn to combine information across separate pages of a book? For instance, a child may learn about animals' nicknames and learn that "Hippos' nickname is river horse." Then in another section of the book, they learn that "River horses talk by honking." If the child combines information learned across pages, they will learn that "Hippos talk by honking." In this study, we have parents read a book to their children about animals. Within the book, children can combine facts learned across sections. We then test children on their combination of information learned across the sections. For example, we may ask children "How do hippos talk?" We are interested in the extent to which the conversations surrounding book reading between parents and children help children to combine the information and learn novel facts. We are still in the process of collecting data for this study, but we hope that it will generate new information on how children learn factual information from books.

Hilary

Melanie

Cori

LEARNING IN THE "WILD"

Lucy

We are curious about how children learn from informal educational settings, like museums, aquariums, and zoos! This year, we continued our partnership with the Carlos Museum on Emory's campus to learn more about how children build their knowledge base outside the classroom. We asked caregivers to visit two different virtual museum exhibits with their children. We then asked children questions about what they learned from each exhibit. We were curious about what information children recalled directly from their experience (e.g., factual recall). We also asked more challenging questions to see the different types of inferences children were able to make from the information they learned (e.g., memory integration and inferential reasoning). This study helped us to learn a lot about how and to what extent children learn from informal educational experiences.

TWO-YEAR MEMORY STUDY

Last year, the Bauer Lab started recruiting for a longitudinal project about acquiring knowledge in childhood. This research is funded by the NIH and takes place over the course of two years, giving us an opportunity to see individual growth amongst participants! Last year, 8-12-year-old children met with researchers twice over Zoom, and we are meeting with the same children this year to see what has changed over the course of a year. Children in this study learn engaging facts ranging across topics they may learn in school, and experimenters test to see how well these facts are remembered and used to self-derive new knowledge. Then, children answer questions about various academic topics such as math, reading comprehension, science, and social studies. Some activities include puzzles or number games and will provide insight into what skills are acquired in different grade levels, and how these skills develop over time. Importantly, we are interested to see if any of these academic skills are related to the ability to self-derive new knowledge. We started looking at the data from last year, and we are excited to see how everything from this year turns out! Almost the entire lab has participated in meeting with participants in this important study!



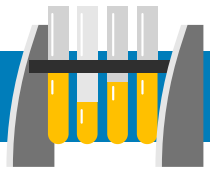
SCIENCE LEARNING & PRE-TESTING

How does early learning relate to later learning? In 2018-2019, we conducted a study with 4-year-olds to test how they learn science information from reading books with their parents. We followed up this study 3 years later in 2021 to see whether early science learning from books related to later learning. We had 6- to 7-year-old children from the original study participate in standardized tests of language and science knowledge. We found that children's learning from the science books at 4 years of age related to both their language and science knowledge at 6- to 7 years of age. We interpret these findings as suggesting that reading science books with preschool-aged children can help them learn science information and grow their vocabulary into elementary school.

Lucy

Hilary

Melanie



In this study, we were also interested in understanding 6- to 7-year-old children's learning strategies. What types of learning strategies can help children remember information? For this aspect of the project, we focused on *pre-testing*, or asking a test question before teaching the children any information. We know that pre-testing works well for adults because it helps show what information might be especially important to pay attention to during learning. We were curious to see if it helped children in the same way. In addition to their participation in the language and science tests, we tested the 6- to 7-year-old children on pretesting. We first had the children answer some questions and then taught them fun facts (some of which had the answers to the pre-testing questions). We found that pre-testing helped some of the 6- to 7-year-old children remember information! In the next year, we will continue this research to further investigate what sorts of strategies help children learn.

LAB MEMBER UPDATES

Our graduate students in the lab, Lucy (left) and Julia (right) have both made a lot of progress in their PhD programs! Lucy recently passed her qualifying exams and will begin data collection for her dissertation in the coming fall. Julia just finished data collection for her dissertation and is looking forward to continuing data analysis and writing!

One of the post-docs in the lab, Jessica, will be starting as a Visiting Assistant Professor at Emory in the fall! Over the summer, she taught a cognition course, and in the fall, she will be teaching an introductory psychology course and a research methods course. We are very proud of her and know that she will be an amazing professor to her students!

We also have a new lab member, Greer! Greer graduated from Emory College in May and joined the lab as a lab coordinator over the summer.

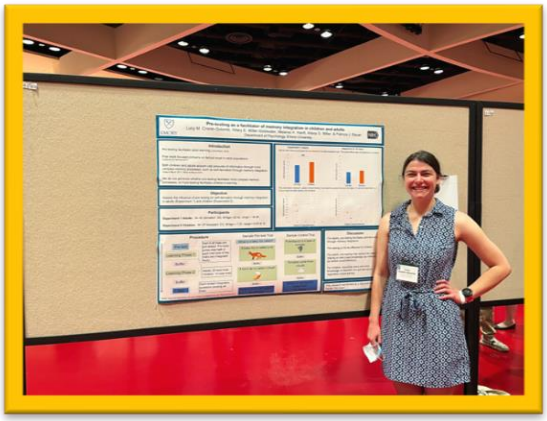
Katie is continuing her work on her master's in public health, and she is also beginning an epidemiology internship in Emory's School of Medicine studying the spread of diseases like covid-19.

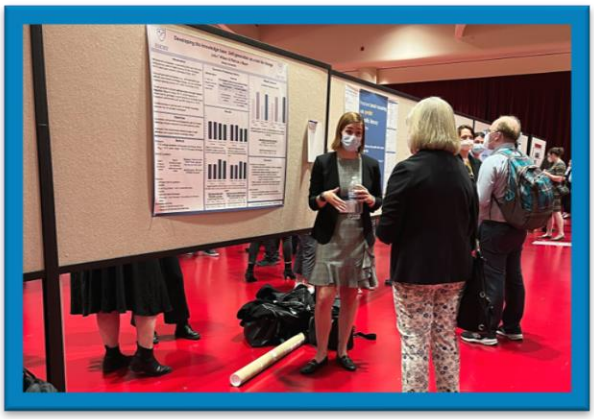
Two of our lab coordinators, Melanie (left) and Alissa (right) are headed to new positions. Melanie is now working as a Lead Specialist on a project within Emory School of Medicine focusing on maternal and child health. Alissa will be traveling in the fall to work as a teaching assistant in the U.S. cohort of the Teaching Assistant Program in France. We will miss them both very much!

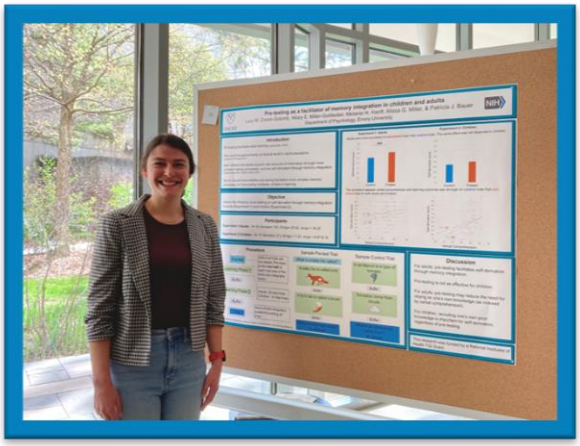
PRESENTING OUR FINDINGS

Hilary gave a talk at the Cognitive Development Society (CDS) conference about how reading high-quality science books can serve as an avenue for early science learning in children.

Lucy, Julia, and Jessica all presented posters at CDS! They presented on ways of promoting memory integration and self-generation as tools for developing the knowledge base.







Lucy and Julia also presented their posters from CDS at the Mechanisms of Learning conference. This conference was part of a seminar course they both participated in at Emory that focused on writing skills and professional development.

Thanking our Undergraduate Research Assistants

Many wonderful undergraduates have worked in our lab the past year. They provided support to all aspects of our research, from entering data to running sessions with participants! We are very grateful for them, and we could not have done all this research without them.

Britney Del Solar	Dawn Nguyen
Cori Reyes	Mengzhe (Emily) Wei
María Grosso Zelaya	Lillie Lanphier
Luisa Taverna	Bethany Williams

Again, thank YOU for participating in our research! Our efforts would not be possible without such willing and enthusiastic participation. We would love to have you back for another study!

REFERRAL PROGRAM

We are actively recruiting participants for two ongoing studies, and we are beginning a referral program! If you give our email (memory2@emory.edu) to someone who qualifies for one of the studies detailed below and they mention your name, we will send you a $5 Target e-gift card (per referral) as a thank you for helping us recruit more participants!

Eye-tracking study:

- 8 to 12-year-olds
- In person
- 2 sessions
    - One week apart
    - Each an hour
- Target e-gift card compensation
- Weekday or weekend availability

Book-reading study:

- 5 and 6-year-olds
- Zoom
- 1 session
    - 45-60 minutes
- Target e-gift card compensation
- Weekday or weekend availability

EMORY UNIVERSITY
child study center

EMORY UNIVERSITY

Do you know any other families who might be interested in participating in child development studies at the Emory Child Study Center? Please call 404-727-7432, email childstudies@emory.edu, or visit http://psychology.emory.edu/child-study-center/index.html