Bauer Memory At Emory Lab Newsletter

It is a tradition in the Bauer lab to send families who have participated in our studies this brief update about our work, accomplishments, and lab transitions. We also use this Newsletter to express our gratitude to the families for their support of our work – we could not have done it without all of you! THANK YOU from Dr. Bauer – the director of Memory at Emory lab and all lab members: Adna, Alena, Allison, Amanda, Anaïs, Aoxiang, Jessica, Marina, Monique, Natalie, Nicole, Rebekah, and Ruth.

Our lab has had a very productive year: we completed data collection on several studies and started a few new projects. In our newsletter, you will find summaries of the studies that explore new knowledge construction during preschool and early school years, as well as of the projects that focus on how older children and adolescents process and remember emotional pictures or events.

To share our research with the scientific community, the lab members presented their findings at several national and international conferences, see pictures from the conferences on p. 6. We have also published our work in top-rated journals- see them among others on the lab website.

There are going to be a few transitions among the lab members this summer. A new lab coordinator, Ruth, joined our lab in July. Ruth graduated from North Carolina State University, where she majored in Psychology and Spanish. We are excited to welcome her to our team! At the same time, our current lab coordinator, Amanda will be moving this summer to pursue a PhD in Counseling Psychology at the University of Houston. We wish her the best in her new grad school adventures!

For more information about our projects, findings, or ways to contribute to our research, you can visit our website, call us at 404-712-8330, or e-mail us at memoryatemory@emory.edu!

Inside this issue:

How Do Children Combine Information To Make New Knowledge?

A major focus for our lab is how children learn and remember new information – a skill that's especially important in a school setting. We began this line of research in 2009 using picture books to teach children new facts. For example, in one story children may learn a fact about flowers (e.g., a corolla is a bunch of flower petals). Then, after a short break, we read them a story that includes a second fact about flowers (e.g., flower petals are used to make perfume). At the end of the session, we then ask them to put the two facts together to create a third, "new" fact (e.g., the corolla is used to make perfume).

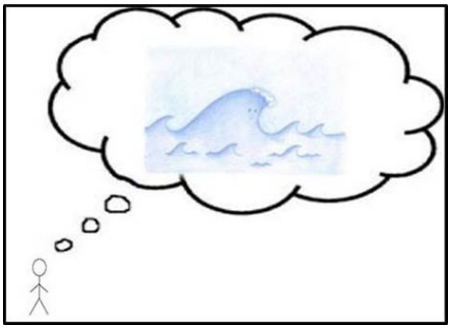
Children and adults alike are often required to combine their knowledge in order to form new understandings, a fundamental skill for building a knowledge base. As such, one of the goals of this research is to better understand how this skill develops over the school-age years, as well as how to promote its development.

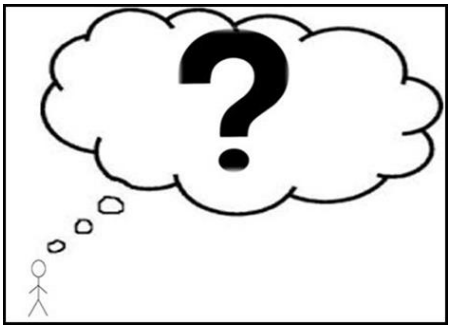
In the first several studies using this design, we found that children as young as 4 years old can combine these learned facts. Since then, we have looked at different ways of presenting information to children and the factors that may increase or decrease children's ability to combine these learned facts. Below are descriptions of several current studies in our lab that are looking at various aspects of this knowledge integration process.

Where Did I Learn That?

Remembering the source of your knowledge is sometimes as important as the knowledge itself. For example, remembering that your 3rd grade teacher taught you about butterflies may help you remember other details about that topic. In order to test children's memory for the source of their knowledge, 8-year-olds came into the lab for two sessions. In the first session, we read them stories and asked them to generate new knowledge from the facts they had read.

When children came back one week later, we asked them questions about the knowledge they had generated. Most importantly, we asked them, "How do you know that?" and presented them with pictures representing each of the stories they had heard the previous visit as answer choices. We think that if children know where their knowledge comes from, it may suggest that they will remember it better. Data collection for this study is currently ongoing.





Generating Our Own Knowledge vs. Being Taught

A great deal of research shows that when information is familiar, self-generated answers to questions are better remembered than answers that were explicitly taught. However, our study is the first to directly examine the self-generation of information that is *unfamiliar* to the person learning it.

This study sought to examine this by using a story reading task with 5 year old children. In one example scenario, a child would come to our lab and in a story he/she hears that "a corolla is a bunch of flower petals" and in another story, he/she would be explicitly taught that "corollas are used to make perfume." In a different scenario, a child may learn that same fact, not directly, but by combining two related facts (eg. "a corolla is a bunch of flower petals" and "flower petals are used to make perfume.") By combining the information in these two facts him/herself, the child should now know that "corollas are used to make perfume." The children in each of these scenarios learned the same fact, but through different means.

To test memory of the learned facts, children come back a week later and were asked about the previously learned information. Interestingly, we found no differences in children's memory for self-generated unfamiliar information as compared to explicitly taught information. More research is needed to understand our findings. By investigating which types of learning create better memory, we hope to add to the body of research that helps foster more effective school and learning environments.

The Importance of Learning at Home

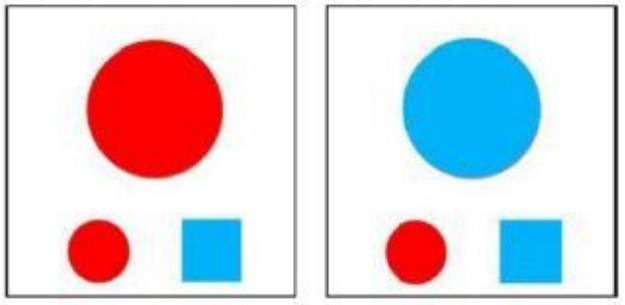
In another variation on our knowledge integration work, we gave 4 and 7-year-olds the chance to learn some facts at home prior to being asked to combine new information in the laboratory. We mailed stories home to the families and asked parents to read the stories to their children several times before their visit. Some of the stories were related to the information they later learned in the laboratory (e.g., information about flower petals) whereas others were unrelated (e.g., information about dolphins). All children did great—they showed very good memory for the stories read at home! Moreover, similar to earlier studies, the combination of novel facts was higher in older children compared to younger children. One of the interesting findings is that children seemed to combine the facts equally well regardless of whether they received stories that were related or unrelated to the information learned in the laboratory. Further, compared to when they learn all the facts in the laboratory, we found that children do better when parents read some of the information at home. This research has taught us that the act of reading to your children may promote knowledge extension in a more formal setting, irrespective of the specific content. In an effort to further understand what improves learning and memory, future research will continue to examine the factors that support knowledge development in younger and older children.

What Makes Us Good at Generating Our Own Knowledge?

In our study of how children acquire knowledge, we are also interested in what processes are necessary for children to learn from texts and be able to combine individual pieces of information into new knowledge. This line of study will help us promote the development of skills necessary for academic performance. This past year we have been measuring working memory, long term visual and auditory memory, controlled attention, and reasoning skills to see how they relate to performance on learning tasks. We are also comparing lab performance with children of the same age completing similar tasks in the school setting to see how our lab results translate to learning in schools.

In this study, children came into the lab on 2 occasions a week apart. Children were read stories separated by vocabulary, memory, and attention tasks. They were then asked about the information from the stories they were read and knowledge extension questions that required putting information from more than one story together. Children then completed with a reasoning task and a memory task.

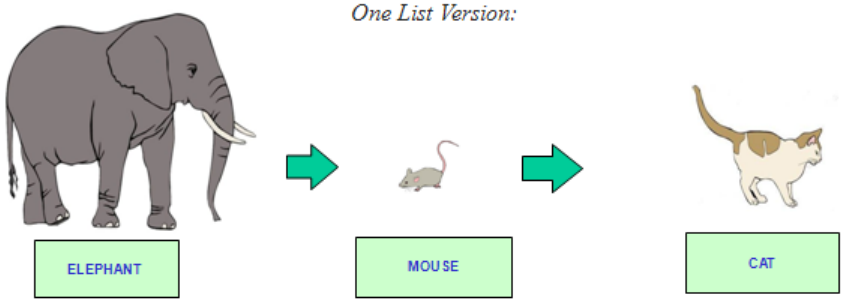
Data collection is ongoing with 4, 6, and 8-year olds!



Children and adults typically respond to "Match the Shape" more quickly on trials such as the left side compared to the right side. This is a measure of controlled attention.

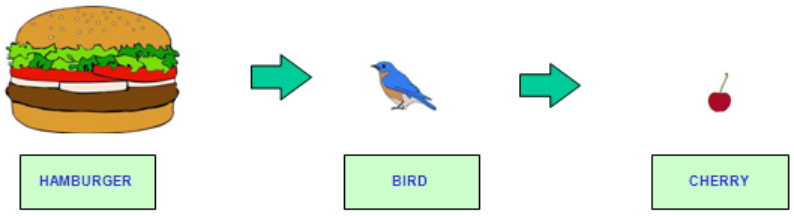
LIST SORTING

One List Version:



QUESTION: Tell me the animals in size order. ANSWER: Mouse, Cat, Elephant

Two List Version:



QUESTION: Tell me the food in size order from smallest to biggest and then tell me the animals in size order. ANSWER: Cherry, Hamburger, Bird

This is a measure of working memory in which the children must not only remember the pictures, but be able to arrange them in size order.

Memory for Emotional Pictures

Adults often have better memory for emotional experiences, such as weddings and car accidents. This "emotional memory enhancement" effect appears in both behavioral and brain responses. In an ongoing series of studies, we are studying the emergence of emotional memory enhancement in childhood, and how it changes with development.

Using a brain imaging technique called event-related potentials (ERP), we can see if there are unique patterns of brain activity for emotional versus neutral experiences, and whether that activity relates to behavioral responses. In a prior study we used ERP to examine brain activity while 5- to 8-year-old children viewed emotional scenes for the first time, and then again during a later memory task. Children had larger brain responses for emotional scenes (positive and negative) than for neutral scenes. Though children remembered the scenes very well, only older children had better memory for the emotional scenes than the neutral ones. This tells us that the "emotion effect" emerges earlier in the brain than it does in behavior.

A child wearing an ERP cap

In a different study we examined how modifying the emotionality of a scene impacts memory. We used a technique called reappraisal to prompt participants to perceive scenes as more or less emotional than they normally would. For example, a picture of a car falling off a cliff typically evokes a negative response. However, when accompanied by the explanation that it is a picture of a stunt car in an action movie, the image is reappraised as less negative. The results from this study indicate that emotion enhances memory in 5- to 8-year-olds, at least for negative scenes. Importantly, this study was the first to show that manipulating emotion responses affects later memory in children. This finding demonstrates that emotion impacts memory even in school-age children.

In the current study, children between 8- and 16-years-old are asked to look at emotional scenes. The children wear ERP caps so that we can record brain activity throughout the study. We are eager to see how this study will provide insight into how emotion affects memory from middle childhood through the teenage years. Data collection is ongoing, so we hope to see you in the lab soon!

Memory for Emotional Personal Memories

We recently finished a 2-year long study that examined emotional memories in children and adolescents ages 8-13 years old. During the study, we conducted an interview where we talked with children about memories from the past year of their lives. Each participant was provided with a word, like bus or cheese, and asked to think of a specific memory related to the word. Sometimes children were asked to think of positive memories or negative memories in response to a word, but the majority of the memories were positive. After we were finished talking with children about their memories, we took an ERP recording while they thought about their memories. During the ERP recording, children were shown the words for which they thought of the memories and were asked to think about the memories that they told us. We were interested in measuring children's brain activity in response to positive and negative emotional stimuli and looking at how that changes across development. We believe that memory will be enhanced for the emotional, positive and negative memories when compared to that for neutral memories. Past research has shown preferential processing for memories that are emotional.

Sharing Our Research Across the World!

Members of our lab have gone to several research conferences this year! At each one we presented our own research and learned a great deal from others. Check out our pictures!

Society for Applied Research in Memory and Cognition
Victoria, BC, Canada

Society for Research in Child Development, Philadelphia, PA

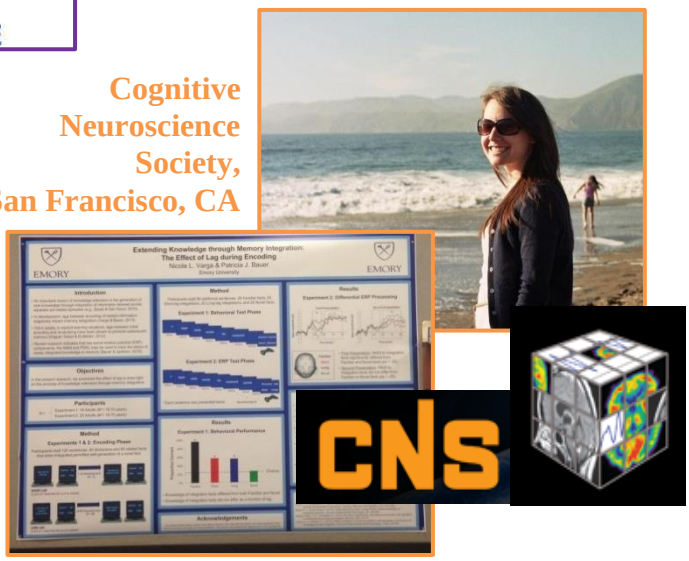
aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

New York City, NY

TENTH ISB

International Symposium on Bilingualism, New Brunswick, NJ

Cognitive Neuroscience Society, San Francisco, CA



Thank You to Our Undergraduate Research Assistants!

We are fortunate to have had many undergraduate research assistants helping us with all aspects of our research. They provided enormous support in all aspects of our research, from scheduling participants and running testing sessions to transcribing and coding, among many other lab activities! Special thanks to Allison and Adna who have been in the lab for almost 2 years and been involved in numerous projects!

Allison Carr
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Christine So
Caroline Srenby
Steven Summey
Danielle Trottier
Roheen Virani
Hallie Whitman
Laura Winstone

child study center
EMORY UNIVERSITY

Do you know any families who might be interested in participating in child development studies at the Emory Child Study Center? Please visit the Child Study Center website at:

www.psychology.emory.edu/childstudycenter

or Call/Email:

404-727-7432/childstudies@emory.edu

We here at the Bauer Lab would especially like to thank YOU for participating in our research! Our efforts would not be possible without such willing and enthusiastic participation. We can't wait to have you back for another study!

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