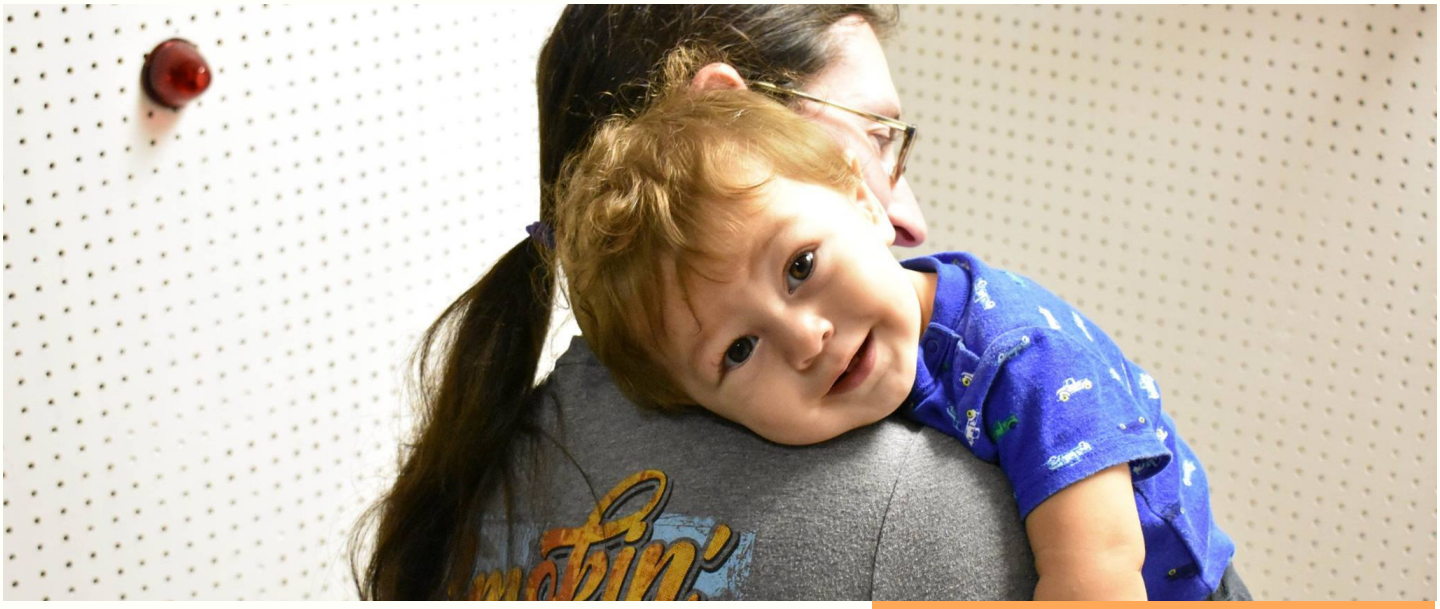
SUMMER 2021

# INFANT & CHILD STUDIES

*at the University of Maryland*



## Your Guide to Development Research

This issue of our newsletter highlights some current studies from our various offices as well as recent findings. Our work is made possible by the participation of local families, just like you!

Our research group, comprised of professors, graduate students, post-doctoral fellows, undergraduate students, post-baccalaureate researchers, and lab managers, hopes you enjoy reviewing our exciting progress made this year.

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SUMMER 2021

# HEARING AND SPEECH SCIENCES

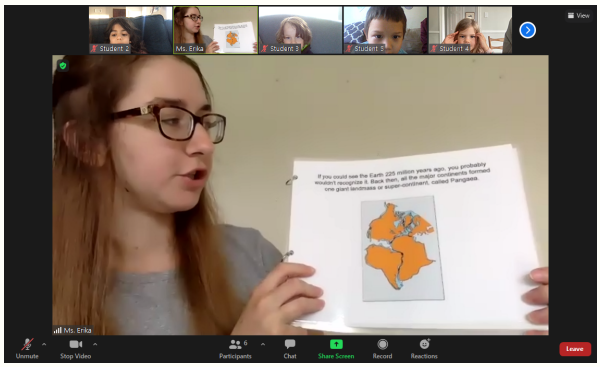
The goal of the HESP department is to advance the science behind speech, language, and hearing through continuous research efforts.

## Language Development Lab

### New Projects

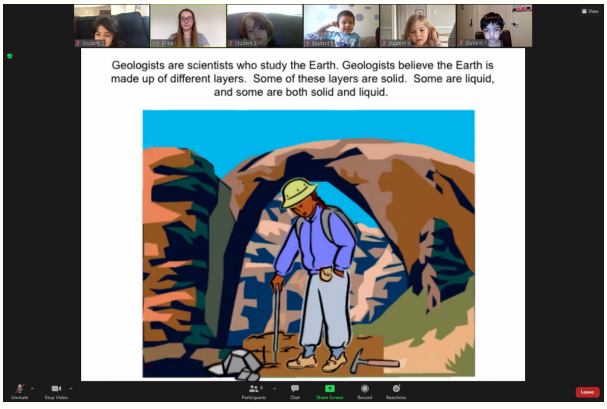
When the pandemic began, many schools pivoted to remote education, and teachers were suddenly tasked with helping students navigate video-conferencing platforms like Zoom for synchronous remote instruction. Video-conferencing platforms offer different viewing options that arrange video and screen inputs in different ways. However, this feature may have unintended consequences for learning. Since the viewing options create a tradeoff between the visibility of the content, teacher, and peers, they introduce unique attentional demands as well as opportunities for social engagement. We were interested in which view options best support young children's learning.

We created a study with mock virtual classrooms on Zoom, where small groups of children aged 4-6 years old participated in short science lessons with a "teacher" from our lab. First, each child went to a breakout room with a research assistant who asked questions about the content of the lessons, just to see what they already knew. Then, children went to the main room to listen to a lesson together, presented in a storybook style. Before the lesson started, parents were instructed to use a particular view setting. After the lesson, children went back to their breakout rooms to answer questions about the lesson. In total, children participated in three lessons, each shown with a different view setting.



Active speaker view: Maximizes ease of seeing teacher, moderate ease seeing classroom materials

Gallery view: Maximizes social engagement with peers, moderate ease of seeing teacher, most difficult view for seeing classroom materials



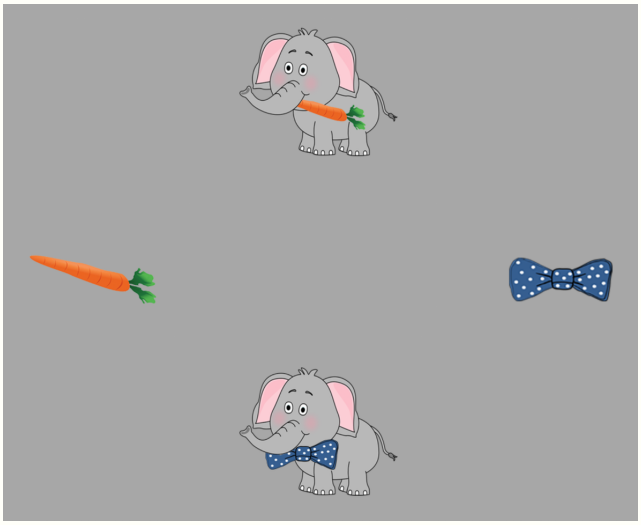

Screenshare: Maximizes ease of seeing classroom materials, most difficult view for seeing the teacher

So far, we have found that children are learning from the lessons: they show significant improvement on the questions asked after the lessons compared to before the lessons. That's good news for virtual learning, especially since our study featured a completely unfamiliar teacher and classmates! However, there were differences between the view options. The greatest improvements were seen in the active speaker view, in which the teacher's video feed is the largest on the screen, and the teacher presents the storybooks by holding them up to the camera. Because kindergarteners' attentional control abilities are still developing, active speaker view may help by eliminating the need to look back and forth between different screen locations to see both the teacher and the lesson materials, and by minimizing classmates' videos, which are likely distracting.

# Language and Cognition Lab

## New Projects

### See what I'm saying? Lead researcher: Zoe Ovans



The main goal of our current research is an attempt to solve a sentence processing mystery: children hear speech very quickly (about 2 words per second), and at each word they're making unconscious, mental guesses about meaning and sentence structure that they have to revise/update with each new word. However, research on inhibition and cognitive control has shown that children have difficulty revising their initial guesses outside of language.

How then do they manage to interpret real-time speech so quickly and (for the most part) effortlessly? We're currently testing the hypothesis that children rely more heavily on particularly reliable cues (like verbs) when their cognitive control system is more engaged, and this clever strategy helps them process sentences more easily as they hear them. Since this research involves eye-tracking in an online experiment, a secondary goal of this research is to validate online eye-tracking as a method for language science research. Children hear sentences while viewing cartoon pictures like the one here, and we use a video recorded from their webcam to determine where they were looking and therefore how they subconsciously interpreted the sentences. Conducting this research online allows us to recruit participants from a wider participant pool, and generally puts less of a burden on parents than traveling to the lab.

### Understanding Family Language Environments: Lead researcher: Yi Ting Huang

This research investigates how children's spoken-language comprehension is shaped by experience with parental input. Across socioeconomic status (SES), children hear input that varies in quantity and quality. These differences impact early language abilities which in turn affect later academic performance. However, reliance on aggregated measures (e.g., input quality, vocabulary size) obscures underlying mechanisms. To isolate processes that mediate between input and outcomes, this project examines how language experience influences comprehension strategies in 5- and 6-year-olds from varying SES backgrounds, and tests the hypothesis that input properties regulate what cues are informative for inferring sentence meanings.

# Learning to Talk Lab

## Completed Studies

Michelle Erksine, PhD student

Listening to an unfamiliar accent or dialect can be a challenging task, even for adults who have a lot of experience listening to different accents and dialects. But how do children, who may have much less experience hearing different dialects, process and comprehend unfamiliar dialects? In this study, we examined children's comprehension of sentences that were spoken in a familiar and an unfamiliar dialect of English. In both dialects of English, we examined children's speed and accuracy in comprehending two types of sentences: a) sentences with predictive verbs (e.g., read the book) and b) sentences with neutral verbs (e.g., choose the cake). We measured comprehension through children's eye-gaze. Children played a computer game in which they heard sentences in both dialects and saw four pictures (see Figure A below). A camera monitored how quickly and frequently children looked to the correct image based on the sentence they heard. We found that across familiar and unfamiliar dialects of English, children were quicker at processing sentences containing predictive verbs. More importantly, we found that children were able to process both the familiar and unfamiliar dialect with comparable speed and accuracy. The results of this study taught us that in simple sentences, children are remarkably adept at understanding some unfamiliar dialects of English (see Figure B below).


Figure A. An example trial with four pictures (the correct image – book; and 3 unrelated pictures). The recorded sentence that accompanied the display is written next to it for visual reference.

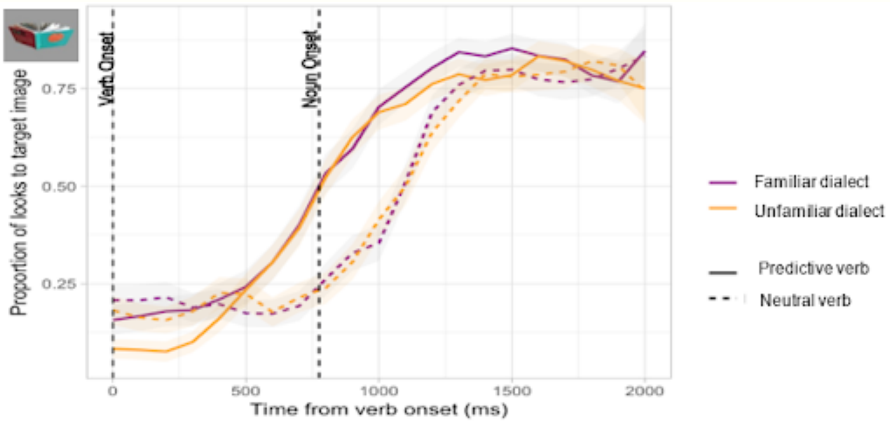



Figure B. Each line illustrates the frequency with which children look to the correct image (e.g., book) as the sentence unfolds from the point of hearing the verb (e.g., read) until the end of the sentence.

# New Projects

Kathleen Oppenheimer, PhD student: “I study how children learn to understand sentences. During two virtual visits that are each 45 minutes long, 5-year-old children will listen to short sentences and respond by touching or moving items on an iPad. We’ll take breaks to stretch or play short games.”

Michelle Erskine, PhD student: “Listening to an unfamiliar accent or dialect can be a challenging task, even for adults who have a lot of experience listening to different accents and dialects. But, how do children, who may have much less experience hearing different dialects, process and comprehend unfamiliar dialects? In this study, we examine how 7- to 9-year-old children comprehend sentences spoken in familiar and unfamiliar dialects of English. Children will play a computer game in which they listen to sentences spoken in a variety of dialects while their eye movements are monitored by a camera. By participating in this study, families will help researchers understand how we can better support children as they continue to develop and learn from others in a growing multicultural society.”

Arynn Byrd, PhD student: “My current study is evaluating how kids use verbs to disambiguate sentences. Kids listen to sentences and are asked to select the picture that matches what they heard. It’s administered on an ipad and is for children 7-9. My second study is for adults.”

Christina Blomquist, PhD student: "My project looks into how children with cochlear implants and their peers with normal hearing recognize spoken words. Children will complete an activity on a computer that involves listening to a word and selecting the picture of the word they heard. During the activity, their eye gaze will be recorded to see what pictures they are looking at as they hear each word. This study is for children in the age range of 9 to 12 years old."

# ANNOUNCEMENTS

## Future Projects

Next in the Language Development lab, we hope to study the impact of internet bandwidth issues on children's learning by presenting lessons via pre-recorded videos that are either good quality, have audio/video asynchronies, or have intermittent freezing. We hope that results of these studies will help with developing evidence-based recommendations for teachers, school administrators, software developers, and families seeking to navigate virtual education and better support children's learning in online contexts.

We are currently looking for 4- and 5-year-olds to participate! Contact us at Ldev@umd.edu for more information.


KidTalk Language Scrapbooking is an app where families with children ages 1 through 8 can record their children's speech and create a digital language scrapbook. The app includes fun pictures to jumpstart conversations and participants receive ideas to promote parent-child interactions. As language researchers, we want to understand if and how recent changes in children's learning environments (e.g., wearing masks, online learning) affect language development. We hope the information we collect will help support families during and after Covid-19. Learn more here, https://www.kidtalkscrapbook.org/, and start scrapbooking!

Congratulations to our graduates Razan Ahmed, Alexandra Heyl, Sarah Kim, Chidinma Ogbonna, Abby Rosler, and Emily Thomas!

# HUMAN DEVELOPMENT

The core mission of the Human Development department is to advance our knowledge on the growing human across varying levels. This can range from an individual's genetic make up to the overarching society.

## Cognitive Development Lab

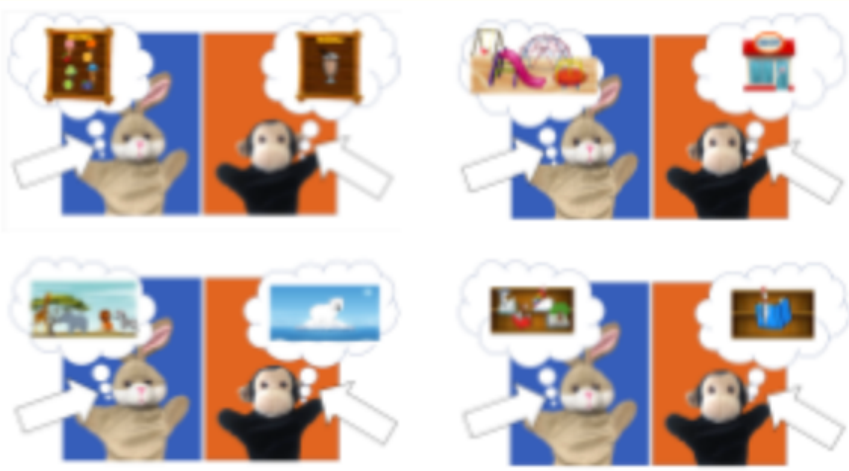
### Who Asks Better Questions?

In an online study with 4-through 7-year-olds, we explored two main questions related to children's abilities to learn from other people: (1) Can young children identify a better, or more efficient question, when someone else asks it? And (2) Do children generalize the ability to ask good questions to other cognitive abilities, like being more reliable in sharing new information, more knowledgeable, and generally more competent?

To address these questions, we scheduled Zoom appointments with families, and showed children animated presentations of puppet characters playing a scripted Question Game. Kids were asked to identify which character asked better questions. After that, we described three vignettes targeting those related cognitive abilities: (1) Kids were asked to endorse the claim of one of the characters in an unrelated information-sharing task (reliability); to identify which character they thought would be a better teacher (knowledgeability); and to select a character to help them troubleshoot how to fix a broken toy (competency).

We found that kids can identify better questions, and they extend that ability to knowledgeability and competency, but not to reliability. We also found that kids got better at explaining their choices as they aged, and that the ability to provide an explicit justification for their reasoning was related to how well they did in these tasks.

Understanding how children reason about learning through inquiry, and the people in their world who contribute to that learning, may help us to develop tools to support children's own questions, and the decisions they make about who to ask for information in the future.

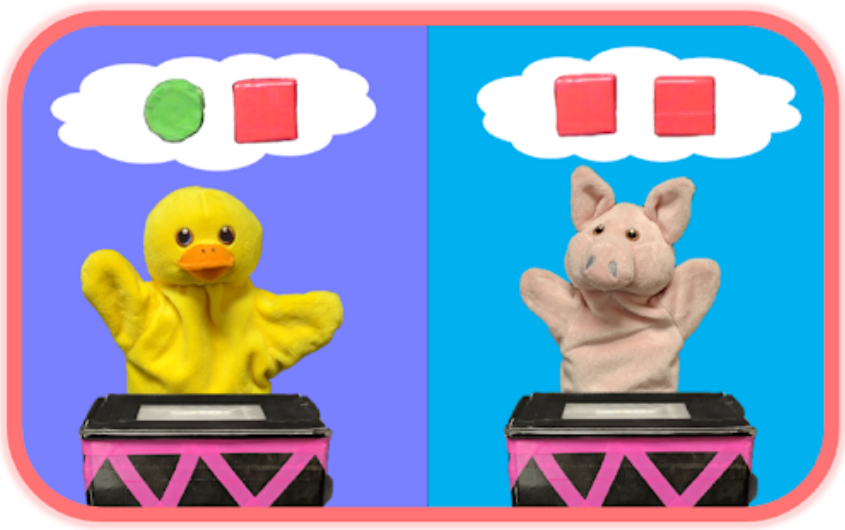


# New Projects

## Who's Playing a Trick?

Human communication is guided by an assumption that the communicator intends to convey what they believe to be the truth, presenting evidence that is representative of that truth. One line of our research examines the developing ability to overcome this default assumption to detect deceptive intentions, when the evidence selected is a skewed representation of the truth. Children as young as 4 can select the optimal sample of evidence for the purpose of leading someone else to a particular conclusion. Our research explored whether children could leverage this ability, to reason about the composition of sampled evidence and what someone would be led to believe as a result, to detect when evidence is being used in a deceptive manner.

In an online study, children 5- through 7-years of age participated in an activity remotely and independently. Children were first introduced to a new toy and learned that two pairs of blocks made the toy light up. To help Bear, a naïve puppet who wanted to learn how a toy works, children were asked to decide between two possible teachers, each of whom created a video demonstration for Bear to watch. Children watched the videos; one teacher used a representative sample (i.e., one block of each kind) for demonstration, and the other, a valid but skewed sample (i.e., two blocks of the same kind).



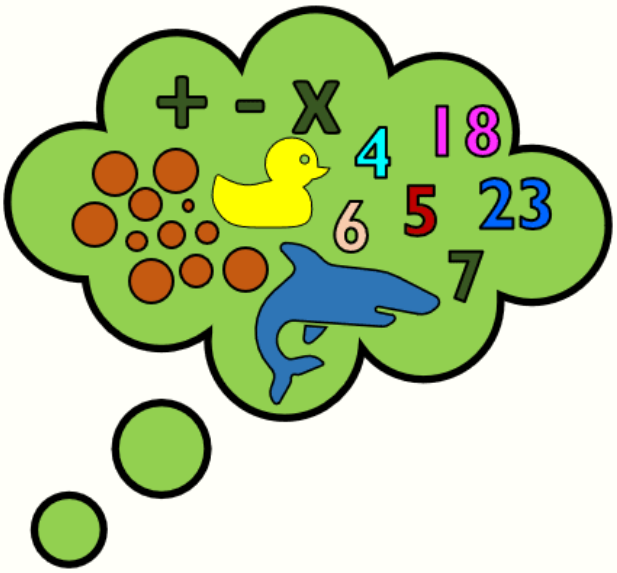
Children were asked to select which of the two teachers wanted to "play a trick" on Bear and which wanted to "help teach" Bear how the toy works. Then, with respect to each video demonstration, children were asked to explain what Bear would be led to believe. Finally, children chose one of the two teachers, Pig or Duck, as the teacher from whom they would prefer to learn about how a new toy works.

Overall, children identified the skewed sampler as the one that wanted to "play a trick", as opposed to "help teach," Bear, but their inclination to do so increased with age. Likewise, the quality of children's explanations regarding what Bear would be led to believe based on each video increased overall with age too. However, irrespective of age, quality ratings were greater among children who identified the skewed sampler as the one who wanted to "play a trick," and the representative sampler as the one who wanted to "help teach."

Finally, across all ages, children who identified the appropriate sampler as acting with an intention to help Bear were consistent in selecting that same puppet as their own teacher.

Overall, this research contributes to our understanding of children's developing ability to integrate their reasoning about what inferences are afforded by the evidence someone presents and their intentions to inform, or mislead, others.

# New Projects




## What Does it Take to Solve Math Problems?

Children's ability to perform mathematics is influenced by a set of basic mental or cognitive processes, called executive functions. While we know that these processes influence learning and achievement in general, their relations to specific mathematical skills are underspecified. In several projects, we look at how school-aged (8- to 10-year-olds) children's working memory (the ability to retain and retrieve information), inhibitory control (the ability to suppress irrelevant information and automatic responses), and cognitive flexibility (the ability to switch between rules), related to their arithmetic skills and their knowledge of mathematical concepts like fractions, number lines, and equivalence. In Spring 2021, we completed a study in which we asked how inhibitory control relates to arithmetic skills and how children and undergraduates' performance might differ. We saw that undergraduates' inhibitory control related to how fast they answered simple one-digit and two-digit addition/subtraction problems. However, we noticed that children's inhibitory control did not relate at all to their arithmetic skills.

Two ongoing collaborative projects address this topic further. In one, we are working with colleagues from the School of Public Health to ask whether children's cognitive (working memory and inhibitory control) and mathematical development are affected by the air quality in their environment. For this study, we have recruited 30 children, all within 20 miles of the University of Maryland campus, and measured their air quality for three days using a real-time air quality tracker. The analysis is currently ongoing, but we see variation in children's activities and air quality during the COVID-19 pandemic.

In another project, we are working with colleagues from UCSF, University of Tennessee, Spelman College, and colleagues from another UMD department, to understand how African American and Latinx children's standardized math outcomes relate to their executive functions and social-emotional skills. We are hoping to recruit children from the D.C. area and aim to capture the diversity of African American and Latinx children. We aim to use both behavioral (online), qualitative, and computational methods for this study. Overall, the findings from these different projects will help us further understand how children do math and what influences their performance.

# ANNOUNCEMENTS

We had quite a few research assistants working with us over the past year, despite the impact of the pandemic on their schooling experiences and on the way that we were able to conduct our research!

- Emilie Berman has graduated (Spring 2020) and is spending some time exploring the beautiful outdoors, hiking the Appalachian Trail, before preparing application materials for medical school.

- Spencer Lin has graduated (Spring 2021) and is the in the process of securing a post-baccalaureate research position before preparing to attend graduate school.

- Hailey Gibbs has defended her dissertation, "Knowing to Ask and Asking to Know: Lessons from Children's Question Asking and Trust in Testimony," and has received her Ph.D. from UMD's Human Development and Quantitative Methodology program. Hailey is now a postdoctoral researcher at Temple Infant and Child Lab.

# PSYCHOLOGY

Researchers in the Psychology Department are committed to understanding the mind and behavior of humans, especially children!

## Neurocognitive Development Lab

### Completed Studies

"Longitudinal development of memory for temporal order in early to middle childhood"

We were able to track developmental changes in memory for three years (small lines and dots represent a single child). In this paper, we report changes in the ability to remember things in the correct order (referred to as temporal order) (Figure A).

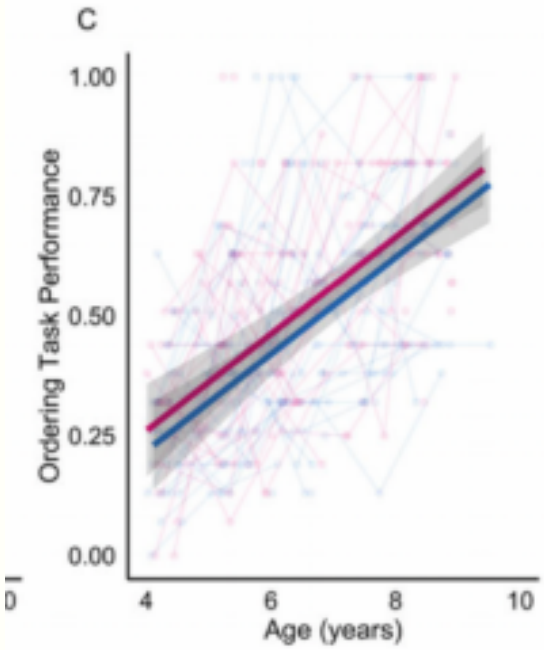



Figure A

"Modeling hippocampal subfield development"

The hippocampus is an important region of the brain for memory. It is made up of different parts that develop differently over time. We tracked the growth of these regions in our study. In Figure B, you can see how three different regions in this structure grew over time. Importantly, larger volumes were related to better performance on a memory task.

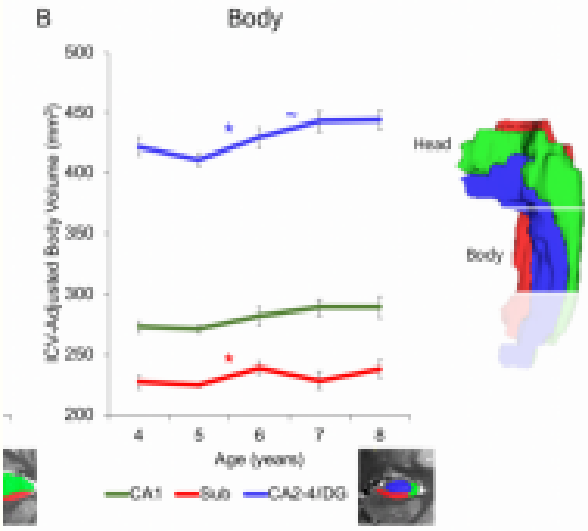
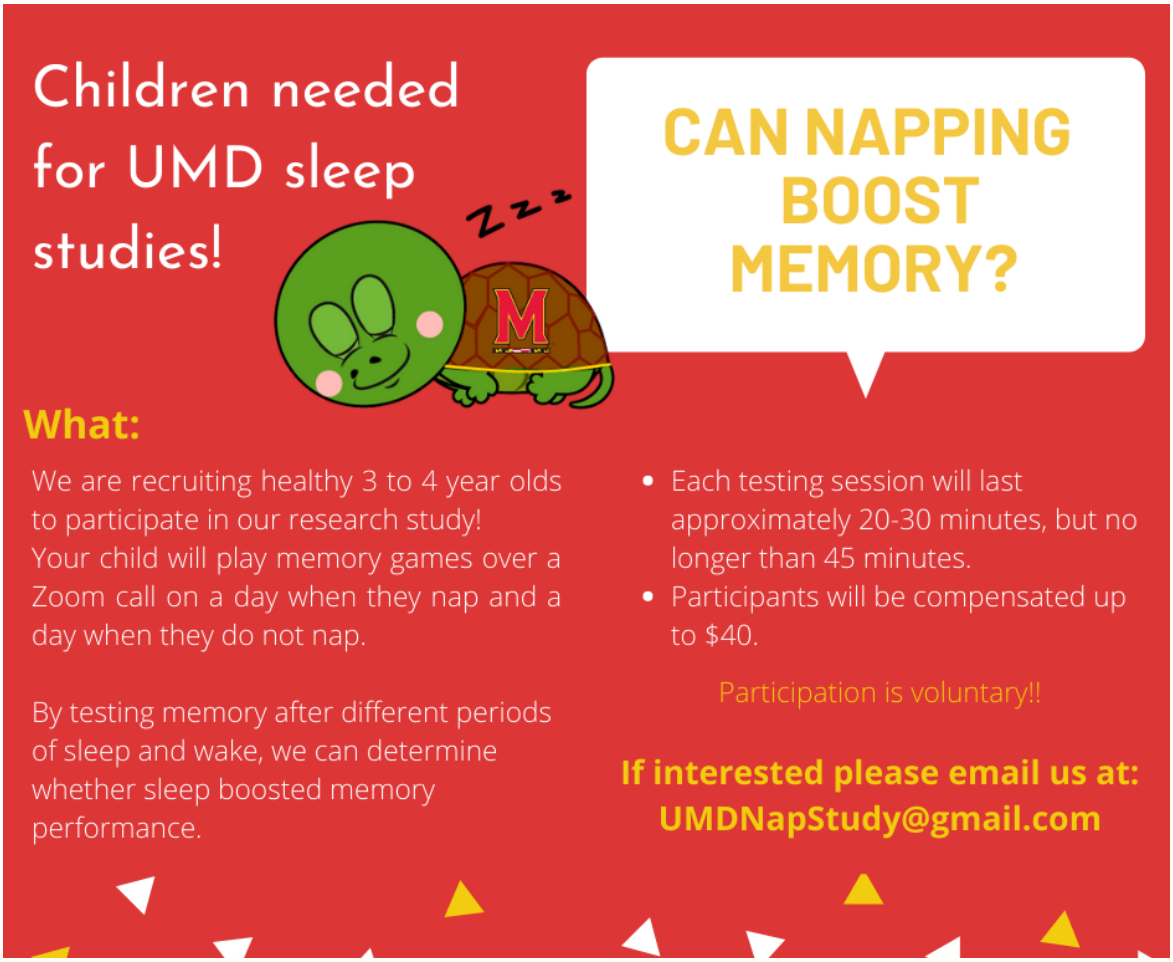


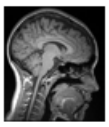

Figure B

# ANNOUNCEMENTS

## New Projects




We are currently recruiting families for both our Sleep Study and Mnemonic Similarity Task Study! The MST study is looking at how napping and sleep behavior may influence children's ability to remember details by distinguishing between a target image and a similar image.



UNIVERSITY OF MARYLAND

**The Scientists at UMD need your child's help!**

**Our new research study examines links between napping, memory, and brain development!**

- We are seeking healthy children who are 3 to 5 years old to participate in this study.
- The study involves the child:
  - Participating in memory games
  - Wearing a "Fit-Bit" activity watch
  - Radiation free MRI scan
  - Hair sample (optional)
  - Set of questionnaires (to be completed by the parent) pertaining mostly to their child
- Participation will take place over the course of roughly 16 days, including two online Zoom sessions and one in lab visit for the MRI at the University of Maryland
- Compensation is up to $90 for the entirety of the study. Your child will also receive several prizes including an image of their own brain!
- Weekday and weekend appointments available.

If interested, please contact the Neurocognitive Development Lab at UMD with any questions or to schedule an appointment
KidBrainStudy@gmail.com

The Sleep Study is recruiting 4 year olds who still nap regularly (5 days or more per week). This is a longitudinal study that hopes to look at whether naps boost memory and whether there are any correlations between memory performance and hippocampal brain volumes.

The NCDL Lab congratulates 4 amazing seniors who graduated from the lab: Congrats to Paige Munshell, Katherine Coley, Sanaa Amin, and Kelly Corkery!

We have 2 lovely graduate students, Morgan Botdorf and Kelsey Canada, that successfully defended their dissertations and moved on from our lab to continue their great work!

We are welcoming 3 new members to our lab and are excited to have Jaylin Johnson, Mary Lorenz, and Sigalle Bahary!

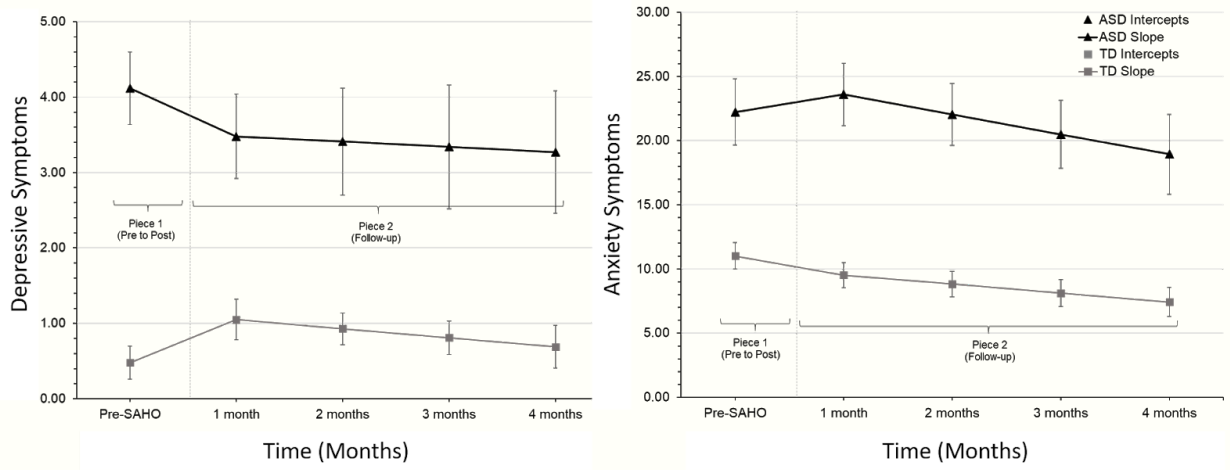
# Developmental Social Cognitive Neuroscience Lab

## Completed Studies

### Pandemic effects on mental health

On March 11th, 2020, the World Health Organization declared the coronavirus a global pandemic, and most states began implementing stay-at-home orders (SAHO) to help mitigate community spread. The significant disruption in families' lives due to the pandemic and implementation of SAHOs were thought to negatively impact children's mental health, particularly feelings of anxiety and depression. Therefore, we asked families of children aged 10 to 17 (with and without a diagnosis of autism) who had recently participated in studies within our lab to participate in three online follow-up surveys regarding their experiences during the pandemic, specifically between May and November. By following up with prior participants we could measure how mental health had changed from before the pandemic to during. Parent-reported depressive symptoms in children showed a significant change from pre- to post-SAHO with an increase in children without autism and a decrease in children with autism. There were no significant changes in anxiety symptoms in either group between before and after the SAHO. We also looked at changes in anxiety and depression symptoms over a 3-4 month period during the pandemic starting between May and September. Depressive symptoms did not change significantly over this period. However, children with autism showed a decrease in anxiety symptoms.

ASD = Children diagnosed with Autism Spectrum Disorder; TD = Children without Autism

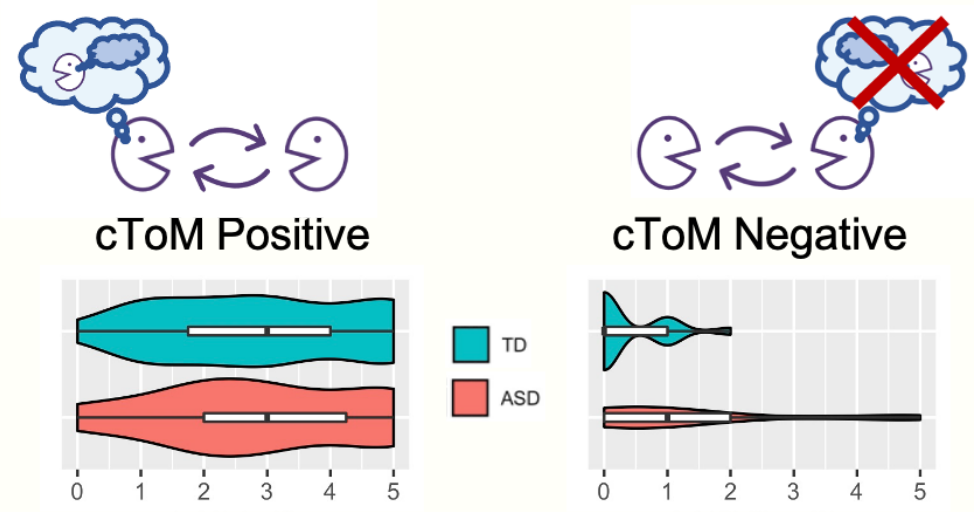



Spectrum Disorder; SAHO = Stay-at-home order.
Figure shows change in children's depressive and anxiety symptoms over time.

Our findings indicate significant variability in the impact of the pandemic on children's mental health, highlighting the need to understand factors that contributed to this variability beyond diagnosis. An important caveat is that the number of children with autism in our study was relatively small. Further, these data were collected during the first four months after initiation of the SAHO and therefore may not have captured the full impact of the pandemic. We are currently following up with these families again to examine how children and families are doing now given the recent return to school for some, lifting of mask mandates, increases in vaccinations, and for many a transition back to "normalcy" which itself may bring additional challenges for some.

## Reading others during conversation

Conversation is a key part of everyday social interactions. In order for two conversation partners to understand each other, they each must occasionally take the perspective of the other. Perspective-taking is related to theory of mind (ToM), the ability to attribute mental states such as beliefs, knowledge, and emotions to others. Both ToM and conversation are common areas of difficulty for people with autism spectrum disorder, yet few studies have directly measured the use of ToM in conversation. To address this need, we developed a novel way of measuring conversational ToM (cToM). Our measure consists of two scales: the Positive scale captures behaviors that reflect a consideration of the conversation partner's mental states, such as explicitly referring to their thoughts or feelings, whereas the Negative scale captures behaviors that reflect a lack of perspective-taking, such as providing too much, too little, or irrelevant information. Using these scales, we measured cToM in pairs of children and adolescents (ages 8–16)—some of whom were autistic, some typically developing—who engaged in 5-minute "getting to know you" conversations.




cToM = conversational theory of mind; TD = typically developing; ASD = autism spectrum disorder
Higher numbers on each scale reflect more frequent Positive or Negative behaviors—that is, behaviors that contribute positively or negatively to common understanding. TD and autistic participants displayed similar rates of Positive behaviors, but autistic participants more frequently displayed Negative behaviors reflecting a lack of perspective-taking in conversation.

As expected, the autistic children displayed more frequent behaviors on the Negative scale, which is consistent with previous reports of conversational difficulties in this population. However, the autistic and typically developing children displayed very similar rates of behaviors on the Positive scale. Across both groups, cToM Negative (but not Positive) was associated with lower performance on non-interactive tasks measuring two aspects of ToM: 1) recognizing emotions from facial expressions and 2) attributing mental states to others spontaneously (that is, without being instructed to do so). Our finding suggests that both of these abilities are important for perspective-taking in conversation. We also found that both cToM Positive and cToM Negative were associated with brain activation during a separate peer interaction task, although the two scales were associated with different sets of regions. This suggests that the Positive and Negative scales measure separate abilities. Altogether, this study begins to uncover the mechanisms behind perspective-taking in conversation, and it reveals a nuanced picture of the relative strengths and areas of difficulty among autistic individuals.

# ANNOUNCEMENTS

The DSCN Lab congratulates 11 undergraduate Research Assistants who graduated this spring: Aliceann Trostle, Nicole Chapman, Manasvinee Mayil Vahanan, Maddie Reiter, Ryan Stadler, Ryan Regars, Hema Clarence, LaShae Williams, Ming Yuan, Stephanie Moy, and Raphe Shankman. Our undergraduates are an essential part of our lab team and they have all been dedicated, hard workers over the past 1-3 years. Congratulations seniors!

One of our lab's graduate students, Diana Alkire, recently defended her dissertation, "The Role of Theory of Mind in Social Interaction" and has received her PhD from UMD's Neuroscience and Cognitive Science Program. Dr. Alkire will be staying in the lab as a Postdoctoral Associate starting in August. Additionally, Dr. Heather Yarger, a former Postdoctoral Associate in the lab, has accepted a promotion to become an Assistant Research Professor at UMD. Heather will continue to conduct research and clinical assessments with the DSCN Lab.

This July, we are excited to welcome two new post-baccalaureates to our lab, Paige Munshell and Aditi Hosangadi. Paige is a recent UMD graduate and former undergraduate assistant in Dr. Riggins' Neurocognitive Development Lab and will serve as a Project Coordinator for a new project within the DSCN Lab. Aditi just graduated from University of California, Davis and will serve as a full-time Research Assistant.

## Special thanks to local businesses and organizations in Infant and Child Studies community outreach efforts!

GREENBELT FARMERS MARKET

HOLY CROSS HEALTH
A Member of Trinity Health

Takoma Park FARMERS MARKET

PRINCE GEORGE'S COUNTY MEMORIAL LIBRARY SYSTEM

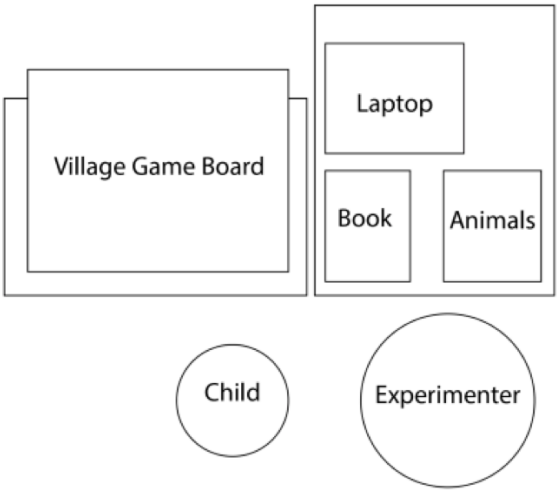
# LINGUISTICS

Research in the Linguistics Department focuses on the human capacity for language. To study this, researchers are looking at children's language development and the mental processes that support it.

## Project on Children's Language Learning

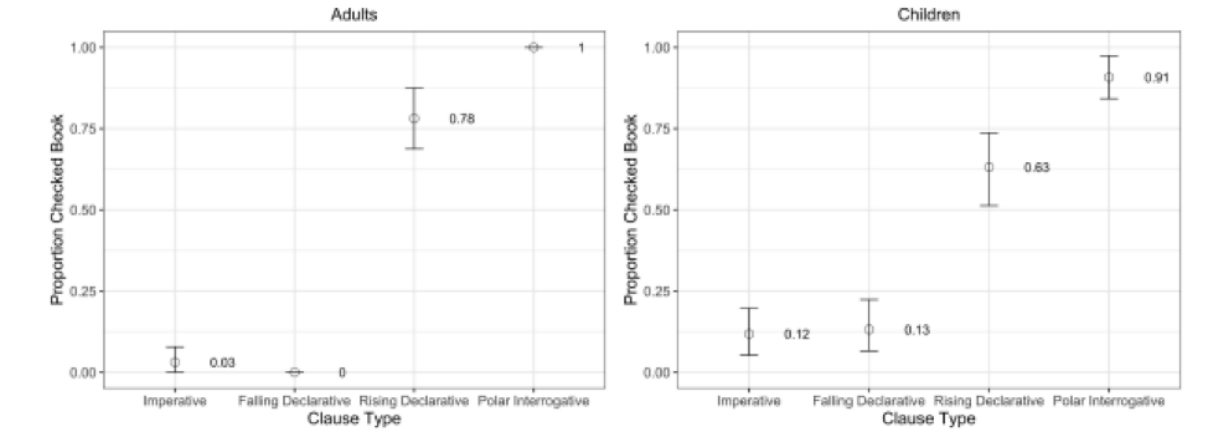
### Completed Studies

Around age three, children have learned the links between at least some of the types of sentences used in English, and the type of thing that the speaker is trying to do by saying it, such as a declarative sentence being used to announce a fact, and an interrogative sentence being used to ask a question. However, there are times that people use the sentence structure of a declarative, paired with the pitch-change of a question, to ask a question in certain situations. This could make it difficult for children to know whether they are hearing a declarative, or a question.




We invited 3- and 4-year-olds into the lab, where we had a poster-board village with different work places laid out, a stack of animal cutouts, and an encyclopedia-like book that showed where each animal worked. Boo Boo the puppet joined by video call, because she needed to get each animal to the right job for the day, but needed the child's help to put each animal in place. She remembered where some of them worked, but not all of them, so the child may need to check the book sometimes. Some of Boo Boo's sentences were instructions, such as "Put Cat in the school." Some of Boo Boo's sentences were questions, such as "Where does Cat work?" and "Does Cat work at the school?" After some practice, Boo Boo started using the sentences that we were interested in comparing directly: "Cat works at the school" with a falling, announcement-like, pitch, and "Cat works at the school?" with a rising, question-like, pitch. After the sentence with the rising pitch, if the child chose to place the cat cutout on the school, they understood it as a declarative. If the child chose to check the encyclopedia to find out whether Cat worked at the school or not, they understood it as a question.

The children who participated in this study showed that they pay attention to the rise in pitch, and respond to “Cat works at the school?” by checking the book significantly more often than when they hear “Cat works at the school.” There are several biases that we need to rule out in the next several versions of the study, but the results of this first version are a clear demonstration that children can, and often do, treat declaratives with a rising pitch as a question. We do not have an understanding of how early this knowledge is in place, and need to develop a way of asking this same research question with younger children to continue this work.




# New Projects

## Sentence Structure

When children hear a new word, we see that they can rely on what they understand from the sentence structure, to narrow down the possibilities for what the new word may mean. For an example word such as flerp, young children can use “She wipes it with the flerp!” and “She wipes the flerp with it!” to learn alternating meanings for the word when looking at the same scene. For action words, after seeing children succeed in a similar way, we wanted to see whether they can also do this when they hear the new word in a question instead of in an announcement. We have several conversations recorded, using sentences like “What is she going to flerp?” or “Is she going to flerp?” or “Is she going to flerp the toy?” After the recorded conversation ends, the video shows the girl interacting with a particular item while the description continues using the new word, and we are measuring looking time to see how much children find the scene surprising versus reasonable, based on what they just figured out about that new word.

## "Also" or "Too"

When someone adds a word like ‘only,’ ‘also,’ or ‘too,’ to a sentence, it changes the meaning of the sentence, but not in the same way that adding a word like ‘not’ changes the meaning. For a sentence such as “Dora ate a sandwich,” compared to “Dora ate a sandwich, too,” both sentences do mean that Dora ate a sandwich. The difference is in what else the speaker is considering, such as what else Dora ate. We have a lineup of different situations where three characters eat together and do different activities together, and a forgetful puppet joins the Zoom call and tries to remember which character did which one, and asks for help to get the details right. As the puppet uses sentences with ‘only,’ ‘also,’ or ‘too,’ and sentences without these added words, we get to see what preschool aged children think the relevant details are for each situation, with and without the word that shifts the meaning!

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