COGNITIVE DEVELOPMENT NEWS

brought to you by the Cognition Learning And Development (**CLAD**) Lab at Notre Dame

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What's new in the CLAD Lab?

New building, new adventures

Greetings from the CLAD Lab! We are settled in to our new lab space in Corbett Family Hall. Stop by and say "hi" sometime.

We have been busier than usual this academic year. We not only settled into the lab, but also continued working on our shared book reading sessions with children at local preschools and started working with caregivers and children in our NSF-funded shared book reading study.

We are currently inviting caregivers to come to the lab with their preschoolers for a single session to help us learn more about how they look at picture books together. Caregivers of preschoolers (ages 3-4.5 years) are encouraged to email us at clad@nd.edu to schedule at time to visit. Consider signing up soon!

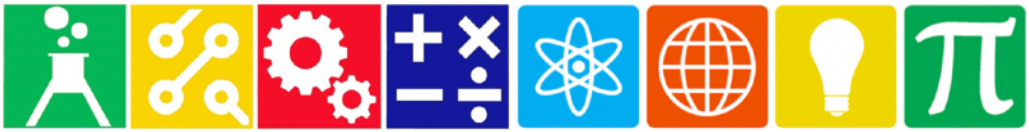
Back in February, we enjoyed meeting local children and caregivers at our interactive exhibit at the 27th annual Science Alive! We had fun working with children on their understanding of equivalence as well as number recognition and arithmetic fluency!

Increasing interest in STEM fields with utility value writing

Teachers often search for the best ways to increase their students' understanding, performance, retention, and interest. In particular, there is a high demand for increasing students' interest in science, technology, engineering, and mathematics (STEM) fields and then retaining those students who are interested. A recent study conducted by researchers at Indiana University and the University of Wisconsin showed that student writing focused on the *utility value* of STEM topics to everyday life can increase performance and persistence in STEM. Utility value refers to the perception that the given information or task is useful or important for a student's present or future goals.

The experiment was conducted with 577 college students in a 2-semester biology sequence to determine if having students write about the utility value of the subject increases student performance and persistence. The study also considered the effects of intervention dosage (writing 1, 2 or 3 times) and time of semester (beginning versus end).

As predicted, results showed that utility value writing can increase class grades, enrollment in the second semester of the sequence, and persistence in a STEM major. The effects of dosage and time of year were complex and depended on students' baseline achievement, with students with low GPAs benefitting more from writing at the beginning of the semester and students with high GPAs benefitting more from writing at the end of the semester. Teachers and parents alike may be able to improve children's performance and interest in STEM by helping them reflect on the value and relevance of the topics to their everyday lives!



Featured CLAD Lab study: Understanding the equal sign matters

For many students, algebra remains a barrier to college and career success. Pinpointing factors that can increase students' preparation for and access to algebra may help us start to address this this issue. CLAD Lab alum Percival Matthews and his colleague Lynn Fuchs examined if students' early knowledge of the equal sign may be associated with students' later success in algebra. Second-grade students were assessed on a battery of tasks, including measures of IQ, attention, arithmetic skill, number line estimation, and understanding of the equal sign. They were then followed longitudinally and assessed again in 4th grade on two algebraic concepts: equations and functions. Matthews and Fuchs were interested to see if students' knowledge of the equal sign in 2nd grade was uniquely predictive of performance on the algebra tasks in 4th grade, controlling for their performance on the other baseline measures.

Results showed that understanding of the equal sign in 2nd grade was uniquely predictive of algebra skill in 4th grade. In fact, equal sign knowledge was a stronger predictor than the other factors (IQ, attention, arithmetic skill, number line estimation) combined! Therefore, this is further evidence that equal sign knowledge predicts later algebra knowledge. Future studies will need to address whether this effect is causal. In the meantime, educators and policymakers interested in improving algebra access for students may want to consider taking steps to improve students' equal sign knowledge as early as 2nd grade.

Increase vegetable consumption by reading picture books!

Many parents are looking for ways to increase their child's consumption of vegetables. A recent study by researchers from Radboud University and the University of Amsterdam suggests that there may be benefits to reading children books that include characters eating vegetables.

The study examined whether or not picture books can encourage 4-6 year old children to eat more vegetables. Working with 160 students from both urban and suburban school districts, researchers randomly assigned 104 of the children to one of four book reading conditions, while retaining the other children for a baseline group that was not exposed to the book reading.

Children in all reading conditions read a book on five consecutive days in school about a character who rescues his friend by eating carrots to make him fit and strong. They were randomly assigned to one of four reading conditions in a 2x2 design that differed according to the reading style (passive vs interactive) and the character in the book (rabbit vs turtle). Children who received the passive style sat quietly and listened to the story, whereas those who received the interactive style participated in conversation about the book.

Results showed that children in the book reading groups consumed more carrots on average than children in the baseline group when given free choice of what to eat (carrots, cucumbers, cheese, or salty sticks). Moreover, carrot consumption was higher for children assigned to the interactive reading style than those assigned to the passive reading style. The assigned character (rabbit versus turtle) did not seem to matter.

So, there may be help at the library for parents who struggle to get their children to eat vegetables. Consider browsing the library for books that feature vegetables and then engage in conversation with your children while reading those veggie-filled books!

Current opportunities to participate

3-4.5 year olds - We are interested in how parents and children look at picture books together. Children will participate with a caregiver in a single session in Corbett Hall that lasts ~45 minutes. If you have a child who is between 3 and 4.5 years old and would like to participate, please email us at clad@nd.edu to set up a time.

All ages - *The Shaw Center for Children and Families* is home to many different research projects designed to help support and build stronger families. You can see a list of their current projects at shaw.nd.edu/community-resources/ or email shawcenter@nd.edu for more information.

CLAD team updates

Joanna Azar, *lab manager*, continued to organize a team of undergrads and research assistants to help with our book reading intervention study at local preschools this academic year. She also started inviting caregivers and parents to come into the lab for our shared book reading study.

Mary Fairchild and **Naomi Nothdurft** returned as research assistants this year and we welcomed **Alyssa Dosmann, Julia Crant, Sara Norwood** and **Christie Albright**. These research assistants joined several of our undergrads, including **Alice Felker, Claire Rudden, Grace Devitt,** and **Alli VanOverberghe,** to continue the book reading intervention study in local preschools.

Undergraduates **Samuel Adofo, Katie Bellaschi, Basia Czajkowski, Olivia Jazbutis** and **Caila Lindsey** joined the lab this semester and are also helping with the ongoing counting projects.

Bridget Naylor-Komyatte, **Lily Kenesey**, **Carolina Botero**, and **Christina Hayford**, *seniors*, conducted senior Capstone projects through their ESS minor.

Wiktoria Kozlowskia, Kimberly Walter, and **Elizabeth Chen,** *seniors*, have been diligently working on their senior thesis projects this academic year. We look forward to telling you more about some of their findings in a future newsletter.

Patrick Kirkland, *grad student*, will be presenting posters at two upcoming meetings: one for the National Council of the Teacher's of Mathematics (NCTM) in San Diego and one for the American Education Research Association (AERA) in Toronto, Canada.

Connor O'Rear, *grad student*, gave at talk on our counting work at the annual conference of the Cognitive Science Society in Madison, WI. He presented a related poster at the Society for Research in Child Development (SRCD) in Baltimore, MD last week.

Nicole McNeil, *lab director,* has been invited to serve as a discussant on two upcoming conference symposia: one at the annual meeting of AERA in Toronto and one at the annual meeting of the Midwestern Psychological Association (MPA) in Chicago.

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