What’s new in the CLAD Lab?
Sharing our research and learning from others

The CLAD Lab team enjoyed hosting a booth with the Infant Studies Lab at the Potawatomi Zoo’s annual Zoo Boo Event. We were thrilled to meet so many families interested in learning more about our research on math learning!

Our team members are always seeking ways to gain new knowledge and skills. This past summer, Elena Silla, junior, participated in an internship at Yale’s Social Cognitive Development Lab. She worked with Prof. Yarrow Dunham and grad student, Richard Ahl, to study social cognition in 4-8 year old children. Research has shown that children prefer individuals who have more resources as compared to those who have fewer resources. Elena worked with the Yale team on a study to clarify the reasons for this preference. They found that children’s expectations about sharing may underlie their preferences. That is, children like people with more resources because children expect them to give their resources away.
Benefits of allowing children to choose to share

Encouraging children to share their prized possessions with others can seem like a losing battle, but a recent study by Nadia Chernyak and Tamar Kushnir at Cornell University suggests that preschoolers may be more likely to demonstrate this prosocial behavior in the future when they are allowed to choose to sacrifice their valued items to help someone else today. In the study, children were introduced to a doggy puppet who was feeling sad. In one condition, children were given the “costly” choice to share their sticker with the sad doggy, or to keep it for themselves. In the second condition, children were given the easy choice between sharing the sticker with doggy or putting the sticker away. In a third condition, children were required to share their sticker with doggy (with no choice).

Good news: almost all children regardless of condition shared their sticker with the sad doggy! Next, children were given three new stickers and were introduced to a new elephant puppet who was feeling sad. They were given the option of how many stickers to share with the elephant (up to 3). Children who had earlier made the costly choice to share their sticker with the doggy shared more stickers with the elephant than either those who made the easier choice or those who were required to give their sticker to the doggy. The researchers suggest that when children are allowed to make the costly choice to share a valuable item instead of keeping it for themselves, they are able to evaluate their actions and see themselves as a prosocial person (“I shared, so I must like to share”). These findings suggest that parents and teachers can help children develop prosocial, altruistic behavior by allowing them to make costly choices to share or not to share.

Using stories to teach geometry

Anyone who spends time with young children knows that they love to hear stories. This natural interest might make stories a valuable tool for teaching new concepts. Research by Beth Casey and colleagues at Boston College recently demonstrated that teaching geometry to kindergarteners in the context of a story helps them stay engaged in the lesson and retain the material. Children in the study learned about part-whole relations. Half of the children were randomly assigned to a condition in which they learned by helping characters in a story solve various math problems. For example, one scenario involved a boy dropping a square table top he’s bringing to the emperor. He meets a character who encourages him to make different shapes from the broken table pieces in order to open a special gate to help the empire. Children in the control condition practiced the same geometry skills without any accompanying story. Children in both conditions then completed two geometry puzzle tasks: one with the same shapes they had learned about and one with a wider variety of puzzle pieces. Children in the story condition improved on the geometry puzzle tasks more than children in the control condition. Thus, storytelling can be useful for more than just entertainment- it can provide an effective medium for teaching young children new mathematical concepts!
Feedback can sometimes hinder students’ math learning

Teachers and parents might say something like “great job” when a child solves a math problem correctly or “that’s a good try, but that’s not right” when a child solves a problem incorrectly. Providing learners with this type of feedback about correctness is widely assumed to be helpful for learning. However, recent research by former CLAD Lab team member, Emily Fyfe, who is now a postdoc at the University of Wisconsin-Madison, suggests that providing verbal feedback--either positive or negative--can sometimes cause more harm than good. She and her graduate advisor, Bethany Rittle-Johnson of Vanderbilt University, conducted a study with second and third graders to see how feedback affects math learning. They first gave half of the students instruction on how to solve the target math problems and half of the students no instruction. All of the students were then asked to solve a set of math problems under one of two randomly-assigned feedback conditions. In the feedback condition, students were told if their answer was right or wrong after solving each problem. In the no-feedback condition, students solved all the problems without any feedback from the tutor. Results showed that feedback about correctness had positive effects, but only for students who had not originally received instruction on how to solve the problems. Feedback had the opposite (negative) effect on the students who had received instruction on how to solve the problems. Emily and her colleagues speculate that knowing something about the concept leads students to feel more pressure to solve problems correctly, so feedback in this case triggers emotional reactions that interfere with performance on the problems. These results suggest that feedback may not always be as useful as it seems and, further, that small tweaks to the way children are taught can affect what children learn. How the material is taught is just as important as the content itself!

Current opportunities to participate in our studies

3rd graders - We are starting a study that examines children’s attention to math problems during instruction. Sessions will last 30-40 minutes and take place in our lab at Notre Dame. All participating children will receive instruction on a math concept that is important for future mathematics achievement. If you have a 3rd grader who would like to participate, please contact us at clad@nd.edu.

Babies - Prof. Jill Lany and her Infant Studies Lab are always looking for babies to participate in their language learning studies! If you and your baby are interested in participating, please contact them at babylab@nd.edu.
CLAD team updates

We welcomed three new members to the CLAD Lab this Fall. Alex Acuña, Rachel Iverson, and Patrick Rodgers, sophomores, have completed lab training and are working on several of our ongoing projects.

Rachel and Patrick have joined Natalie Vos and Alex Viegut, juniors, in helping Alex Bohnsack, senior, and Connor O’Rear, grad student, with the lab’s counting studies.

Connor and Caroline Byrd Hornburg, grad student, both presented the lab’s research this October at the Ninth Biennial Meeting of the Cognitive Development Society.

We also want to wish congratulations to Caroline and her husband, Dave Hornburg, who were married this summer!

After participating in a summer internship (described on the front page), Elena Silla, junior, went abroad to study in Ireland this semester. We are excited to hear all about it next semester!

Taylor Kelly and Ellie Sato, seniors, are working with Bri Devlin, project coordinator, to code recently collected data from our NSF-funded longitudinal studies.

Bri has also been preparing for several other studies coming this fall, including a first grade follow-up to last year’s kindergarten study and a study focusing on how different perceptual features of sets influence how undergraduates interpret those sets. Steven SonSon, senior, and Shannon Gaylord and Thomas Hughes, juniors, have been helping with these projects.

Nicole McNeil, lab director, gave a plenary address at the Annual Conference on Research in Undergraduate Mathematics Education (RUME), which was held in Pittsburgh, PA. She also gave an invited talk at the Math Cognition Conference sponsored by the National Institute of Child Health and Human Development (NICHD), which was held in St. Louis, MO.

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