Music & Movement Classes

Welcome back, Lauren Hraber! Mrs. Hraber conducts Music and Movement classes with all of the children at the Children's School every other week. Our first classes for the fall were held on September 22nd and will continue approximately every other week for the rest of the school year.

Lauren Hraber is an experienced preschool and elementary music teacher with a MED in Special Education from the University of Pittsburgh and a BFA in Piano Performance from Carnegie Mellon University. She spent 10 years teaching General Elementary Music in Baldwin–Whitehall, Woodland Hills, and Canton City Schools. Lauren founded Piano Tots for preschoolers and has spent the last 10 years teaching Piano Tots classes. Presently, Lauren serves as the music teacher at several preschools in the Pittsburgh area. Lauren's family includes husband Zach and 2 children - Maddy & Jax, a Children's School alum.

Keeping Parents Informed about Research

The **Research Spotlight** section of the monthly newsletter is one way Children's School parents can learn about research in progress. Also, each time your child participates in a study that involves playing a "game" with a researcher (i.e., as opposed to merely being observed), he or she will get a **participation sticker** suggesting that you, "Ask me about the … game" and a **study description** detailing the task. We also have **recent articles** resulting from Children's School research posted on the school web site (www.psy.cmu.edu/childrensschool) and a notebook of articles in the office. Feel free to contact Dr. Carver to discuss any questions you have about research.

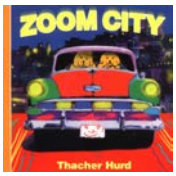
Observations for Psychology Assignments: Students from Dr. David Rakison's Child Development class conduct periodic observations throughout the fall. For each assignment, they observe specific differences between preschoolers and kindergartners in motor skills, social interactions, language, etc.

Research Methods Class Studies: Students in Professor Anna Fisher's Developmental Research Methods class will start with a lab entitled **The Animal Names Game** to explore age related changes in children's working memory capacity by having them do a word span task. The experimenter starts with a short list of animals for the child to repeat and gradually lengthens the list. As part of this study, the students are varying the length of the animal names (e.g., frog vs. butterfly) to determine whether it is the number of items in the list or the amount of time it takes to say the items that determines how much can be remembered. Later in the semester, students will work in small groups to conduct a study of their own design, which will be approved both by their instructor and by Dr. Carver.

Research Spotlight

The iPad Game

Cassandra Eng, a new graduate student working with Dr. Erik Thiessen, is studying the vocalizations young children make in response to stories presented in typical book format and via iPad with animations embedded within the story. They'd like to see if the animations encourage children to vocalize more frequently than would a normal storybook. During each session, a researcher reads a child one story, *Zoom City* (Hurd, 1998), in two different formats: a regular board book and on an iPad. As the experimenter reads the story on the iPad, she activates animations embedded within the words of the story. For example, when the researcher clicks on the word "zoom", a picture of a car glides off the screen. The order of the two book types varies and children's responses are videotaped so the researchers can compare their vocalizations across the two conditions. The study results may inform the development of future electronic books for children.



The Moving Eyes Game

The world around us is complex and maintaining focused attention can sometimes be challenging, even for adults. The goal of this project in Dr. Erik Thiessen's lab is to investigate the developmental course of deliberate selective attention and to examine factors that play a role in attentional selectivity at different points in development. In this project, researchers ask children to play a game in which they see several objects moving on a Tobii T60 eye tracker (which looks like a typical computer screen) landing on one of the nine screen locations, each a different color. Children are instructed to watch a particular object while ignoring the rest of the objects. When the objects stop moving and disappear from the screen, children are asked to name the color of the grid in which the object disappeared. Children play the Moving Eyes Game several times, tracking either many objects or just a few objects at a time. Children's performance in the Moving Eyes Game will help researchers to map the developmental course of deliberate selective attention and improve scientists' understanding of this cognitive ability required for successful performance in many everyday tasks.

The Finding Pictures Game

As children learn about things in the world around them, they also learn about how different things are related to each other. For instance, children can learn that different things are *taxonomically* related when they share features with each other (e.g., *dog* and *seal* both have fur), or *thematically* related when they are associated with the same event (e.g., *dog* and *bone*). Sometimes, things can be both taxonomically related, such as *cat* and *dog*, which both share features and are often associated with each other. The purpose of Dr. Anna Fisher and graduate student Layla Unger's study is to explore how children's knowledge of these relations develops with age. During this study, children look for a specific target picture amongst an array of four pictures depicted on a computer screen that includes the target picture, a related distractor picture, and two unrelated distractor pictures. Each target picture appeared in 3 arrays, in which the related distractor was either taxonomically related, thematically related, or both taxonomically and thematically related. While looking for the target picture, children's eye gaze was recorded using an eye tracker. By examining children's looks towards the related distractor pictures, researchers can investigate the development and activation of children's knowledge about relationships between different things.

Additional Research Opportunity

functional Near Infrared Spectroscopy (fNIRS)

Dr. Anna Fisher and graduate student Layla Unger are the first to begin using *functional Near Infrared Spectroscopy* (fNIRS) techniques for research at the Children's School. This technique has been approved by CMU's IRB as a minimal risk procedure for use with young children, but the research permission form that families signed for the 2016-17 school year does not cover its use. Thus, participation in fNIRS studies, like the one described below, requires separate parental permission.

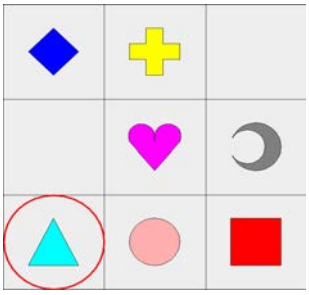
fNIRS records brain activity by measuring changes in blood flow in a given region of the brain. Changes in blood flow are measured by emitting infrared light into the scalp and underlying tissues, including the surface of the brain, at a frequency that is primarily absorbed by blood. By detecting the amount of light that is absorbed, we can infer changes in blood flow over the course of a cognitive task. Light is emitted and detected by diodes positioned on the scalp and held in place with a soft cap. The benefit of fNIRS is that it allows the child to sit and move comfortably while doing the task. The near infrared light exposure is comparable to sun exposure MINUS the UV wavelengths. The researchers also have health and safety protocols to ensure that the caps are free from lice and that the light never shines in the children's eyes.

During the parent orientation meeting, each family received a permission form for the use of fNIRS The permission slip describes fNIRS studies in much more detail. Please contact Dr. Carver if you have any questions about fNIRS or would like another copy of the permission form.

The Moving Eyes Game with fNIRS

The world around us is complex and maintaining focused attention can sometimes be challenging, even for adults. The goal of this project in Dr. Anna Fisher's lab is to investigate the developmental course of deliberate selective attention and to examine factors that play a role in attentional selectivity at different points in development. This study examines the neural bases of attention development by asking children to complete an attention task while their prefrontal cortex (PFC) activity is recorded using functional Near Infrared Spectroscopy (fNIRS).

The attention task involves children playing a game in which several objects are moving on a computer screen and landing on one of several screen locations. Children are asked to watch a particular object while ignoring the rest of the objects (e.g., watch the blue triangle). When the objects stop moving and disappear from the screen, children are asked to indicate the grid in which the target object disappeared.



Between the trials of this task, children see three arrows pointing left or right and have to report the direction the middle arrow is pointing. This non-challenging task makes it possible for us to record a baseline reading of prefrontal brain activity when children are not engaged in an effortful task. Children's performance and neural activity in the Moving Eyes Game will help us to map the developmental course of selective sustained attention and improve our understanding of this basic cognitive ability required for successful performance in many everyday tasks.