Seeking Host Families

The Children’s School will be hosting 2 undergraduate students from Duksung Women’s University in Seoul, South Korea for an International Practicum Program. A total of 8 Early Childhood Education students will be in Pittsburgh for practicum experiences at our school, Falk, Carlow’s Campus School, or Pitt’s University Child Development Center. To help the students experience family life in Pittsburgh, we are recruiting two host families who live close to the university to provide housing and some meals for one male or one female practicum student from Sunday, January 28th through Sunday, February 11th. Proximity to CMU is essential so that the students can use public transportation or rides from teachers to travel to and from school. Please contact Dr. Carver at sc0e@andrew.cmu.edu if you are interested in this hosting opportunity. Former host families will be happy to share their experiences with you, and student photos and bios will be available soon.

Undergraduate Research

Dr. Anna Fisher’s Developmental Research Methods students are preparing their final projects for the semester. They are beginning to pilot test their projects on the topics listed below. Families whose children participate will receive fuller parent descriptions via the child’s backpack. Everyone can read the study descriptions on the Research Bulletin Board near the office door. Notice the interesting range of important topics in early childhood development!

• Does clutter on the activity table impact children’s speed and accuracy when completing iSpy tasks that vary in difficulty? (The Pictures Game, AM 4’s and K)

• How do children consider merit vs. need when suggesting fair distribution of extra goods? (The Story Game, PM 3’s, PM 4’s & K)

• How well can children of different ages identify emotions and link them to the situations that might trigger them? (The Matching Faces Game, AM 3’s, AM 4’s & K)
  Which child below looks sad? What situation might have made the child sad? Why?
Research Spotlight

functional Near Infrared Spectroscopy (fNIRS)

Dr. Anna Fisher’s research team is using functional Near Infrared Spectroscopy (fNIRS) techniques for research with children whose parents have given permission. 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 2017-18 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.

Each family received a permission form for the use of fNIRS during the enrollment process. Please contact Dr. Carver if you have any questions about fNIRS or would like another copy of the permission form so you can enroll your child.

The Brain @ Play Study

This year, the fNIRS team is conducting several sessions to measure children’s brain activation in the left and right prefrontal cortex during free play. In Session #1, they provide a set of toys and ask children to play with them for 5 to 8 minutes. This procedure allows the team to measure the ‘resting state’ brain activation, i.e., brain activation in the absence of an externally prescribed goal or task. As children develop, the different brain regions that are involved in a common set of tasks become more coordinated in their activity, even when the brain is ‘at rest’. To obtain a reliable measurement of the resting state brain activity, the researchers ask each child to participate in this task several times in one week.

Next, the researchers measure children’s prefrontal brain activity during The Opposites Game. This game is often used by researchers around the world to investigate the development of inhibitory control in young children. Inhibitory control refers to one’s ability to suppress responses that are not appropriate in a given moment (such as eating cookies before dinner, answering a teacher’s question out of turn, or taking a toy that another child is using). This ability is crucial to successful functioning in many areas of life, including academic
success, health and wellbeing, and social relationships. In the Opposites game, children are instructed to say “day” when given a picture of the moon, and “night” when presented with a picture of the sun. This game requires children to suppress responses that are not appropriate based on the rules of the game (such as saying “day” when shown a picture of the “sun”).

In another session, researchers measure children’s prefrontal brain activity during The Memory Game, which involves reading children strings of familiar but unrelated words (for example: cat, bottle, truck). First, the children are asked to repeat the words in the same order in which they were spoken, and then during the second round of the game, children were asked to repeat the words in reverse order (truck, bottle, cat). The game with short 2-word sets and increases the number of words up to 6 words if children can successfully repeat the words backwards. This game measures an aspect of working memory: one’s ability to hold and manipulate information in memory until a task is completed. People use this ability when following directions to a new place or calculating tip amount in a restaurant.

Another session involves two games: The Sorting Game and The Fish Game. Many researchers around the world use these games to investigate the development of inhibitory control in young children. Although inhibitory control skills keep developing well into adolescence, there are marked changes to this ability during the preschool years. In the Sorting Game, researchers present children with a set of cards depicting familiar objects that differ on two dimensions (such as color and shape). They first ask children to sort cards into bins according to one dimension (for example, shape), and upon completing the task, they sort the cards again according to the other dimension (color). Then, children have to alternate between sorting by shape and color based on a cue provided by the experimenter for each sorting card. This game requires children to suppress responses that are not appropriate based on the rules of the game (such as sorting a card based on color when asked to sort by shape) in order to provide correct responses.

In the Fish Game, researchers show a picture of fish on a computer screen, and ask children to point in the direction the middle fish is facing. Sometimes the middle fish is facing in the same direction as all the other fish, and sometimes the middle fish is facing in the opposite direction. To play this game, children have to ignore all the fish except for the middle fish – something that is much harder to do (and thus may lead to increased blood flow in the prefrontal cortex) when the middle fish was facing in the opposite direction.

Researchers are interested in documenting developmental changes in inhibitory control that occur during a school year, so they will repeat these games at the end of the school year. The broader aim of the research program is to understand how developmental changes involving increases in coordination among brain regions relate to development core cognitive capacities, including inhibitory control and working memory. By involving children in a variety of different activities that they hypothesize to differ in brain activation, they can compare the activation during inhibitory control and memory tasks to the resting state activation they measured.