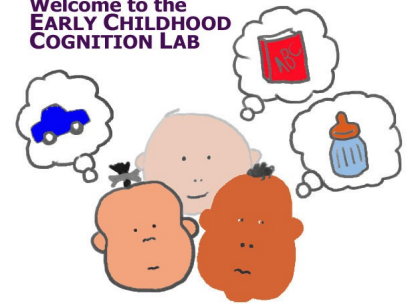


Early Childhood Cognition Lab

Welcome to the
EARLY CHILDHOOD
COGNITION LAB



Institute for Learning and Brain Sciences

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RESEARCH GROUP

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At ECCL, we are interested in exploring how infants and children develop the ability to represent and reason about human action and explain the behavior of others. For adults, a key part of understanding our own behavior and the actions of others is perception of behavior as motivated by a set of goals, intentions, and desires. For instance, upon seeing a woman reach for a cookie, we might decide that she likes cookies and reaches for the cookie because she wants to eat it. This ability enables us to predict the outcome of the actions of those around us and adjust or change our behaviors. We ask:

How do infants represent their own and others' actions? When does the understanding of our actions as guided by goals develop?

What factors contribute to changes in infants' and children's action production and understanding?

How do infants and children remember and learn from their own and others' actions?

CURRENT STUDIES

Understanding Causality

A critical part of mature human reasoning involves the ability to recognize cause and effect relationships and the factors that can alter cause and effect. This study investigated whether infants understand that human intervention can alter the causal status of launching sequences. Ten and twelve-month-old infants watched one of two sequences. In the hand launching sequence, a human hand pushed the first car, so that it bumps into the second car, causing it to roll away. In the human intervention sequence, the first car rolled on to the stage but immediately as it made contact with the second car, a human hand moved the car away. To test whether infants saw the first event (hand launching) but not the second (hand intervention) as causal, we showed babies another clip, in which we inserted a pause when the two cars came into contact. We predict that babies who saw the hand launching sequence first will find the sequence with a pause to be different, since it broke the cause-effect relationship. However, if babies see the hand intervention sequence, inserting a pause should not make a difference, since it was the hand, and not the first car, that cause the second car to move. These results would imply that infants recognize causal relationships, and can distinguish them from events that happen together, but are not causally related.

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Infant Studies



Understanding others' preferences

Adults recognize that preferences drive consistent pursuit of objects across different places. This study examines 9.5-month-old infants' ability to generalize another person's preference for a select object. In the study, infants observe an actor consistently pursue a target object (a toy frog or a toy car) in one room, and then move to a second room where they again observe the actor pursue that same object OR a different object. We predict that if infants understand the actor's goal as a consistent preference, they should look longer to events in which the actor pursues a novel object in the second room.

Previous findings in our lab suggest that only under certain circumstances, namely, when the actor's preference display is accompanied by a brief language utterance (e.g., "I like frogs!"), do infants generalize the actor's preference to the second room. We have also found that infants' own language abilities are related to their performance on this task. Infants with greater reported language competency more readily transferred the actor's preference across the two rooms.

More recently we have investigated the factors within the actor's language that infants use to understand preferences. Language provides attentional cues, emotional cues, and language-specific cues all of which may facilitate understanding. We've found that infants use language-specific cues (not emotion or attentional cues). We suggest that infants, like adults, use others' words in order to interpret and understand their behavior.



Infants' Ability to Predict Others' Goals

Predict Cane looks at 10-month-old infants' strategy use with a cane and how this experience can guide their attention to events in a different context. Infants are provided with initial training on how to use a cane to retrieve a toy and then view an actor performing similar actions. In a preliminary control condition without a training component, results suggested that infants looked equally to two events, where the actor retrieved either the cane or the toy on alternating trials. The current study looks at how infants' own experience may play a role in which event they look longer at.

Infants are first placed in a highchair with a sliding table in front of him or her. The warm-up trials consist of the infant reaching and grabbing a single toy. Next, there are two pre-test trials. Here, a toy is placed in the crook of a cane and, without any help, the infant attempts to solve the problem by pulling the cane to grab the toy. Training trials follow where the experimenter trains the infant to use the cane to get the toy by using such techniques as modeling. After succeeding in three out of four consecutive trials, the post-test trials are administered. During the post-test trials, the experimenter judges whether or not the infant has improved from the pre-test trials. If there is improvement, the infant moves to the habituation room for the second portion of this study.

The second part of the study consists of up to eight trials. The infant watches an actor attempting to obtain an out-of-reach toy using a cane behind a puppet-like stage. The problem is exactly the same problem the infant encountered in the training portion of the experiment. As the actor reaches for the cane, the screen suddenly being raised interrupts their action. When the screen comes back down, the actor is either holding the cane or the toy. The outcome of the actor with the toy is expected and the outcome of the actor with the cane is unexpected. If the infant understands that the actor's behavior is about getting the toy, they will gaze longer at the unexpected event of the actor with the cane. How long an infant looks at the two outcomes is measured and analyzed to see if the infants transfer the information between the training and habituation trials and to see if they understand the relationship between their own and others' actions.



RECENT PRESENTATIONS

Sommerville, J. A. (2007, November). From ends to means: Infants' developing tool use representations. Invited colloquium, Duke University, Raleigh, NC.

Crane, C.C., Braun, K.D., Somerville, J.A. (2007, October). The Role of Language in Infants' Understanding of Others' Preferences. Poster presented at Cognitive Development Society, Santa Fe, NM.

Sommerville, J.A. (2007, October). Weight A Minute: Twelve-month-old infants' problem-solving behavior reflects unseen properties of goal objects. Poster presented at Cognitive Development Society, Santa Fe, NM.

Sommerville, J. A. (2007, September). Infants' understanding of goal-directed action: The role of agentive and observational experience. Invited talk presented at the Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany.

Sommerville, J. A. (2007, September). Me, myself and I: The role of agency in development. Paper presented at the conference on Self, Intersubjectivity and Social Neuroscience: From Mind and Action to Society, Torun, Poland

Sommerville, J. A. (2007, September). Infants' understanding of goal-directed action: The role of agentive and observational experience. Invited talk presented at the Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

LAB ACCOMPLISHMENTS

Erika Feldman passed her general exams and advanced to candidacy!

Catharyn Crane and **Erika Feldman** completed their Masters degrees!

Catharyn Crane and **Kara Braun** presented a poster at the Cognitive Development Society meeting!

Erika Feldman had a talk accepted at the International Conference on Infant Studies!

Rachel Brainerd had a poster accepted at the International Conference on Infant Studies!

LINKS FOR PARENTS

<http://www.talaris.org/>

<http://www.pepsgroup.org/>