Our Mission:

We study how young children break into language and how they learn words. Language learning occurs in contexts in which young children are engaged in activities with objects and other people. Because words are about objects, people, emotions, and actions, early language learning is not just about language. We study language learning in all these contexts with a special interest in how what children are doing supports learning. We are especially interested in how action (looking, pointing, playing) organizes perception and attention. Our studies compare children learning different languages and from different cultures so that we can understand the various routes to language learning. We also study children who are learning language at faster and slower rates with the goal of understanding how to structure tasks to support attention and early word learning in children who are having difficulties breaking into language.

All our researchers are well-trained and aim to be friendly and knowledgeable. We strive to provide you and your young child scientist with a welcoming and rewarding visit to our lab. We believe that every baby and child is a valued contributor to science.

Dr. Linda Smith

Exploring Objects (ages 5 - 24 months)

Children were given toys to explore while wearing a head camera. We are interested in how long children spend looking at objects from particular orientations and what kind of hand movements they use to show the object to themselves. We found large changes in how children aged one to three years of age hold and look at views of objects. Children increasingly prefer to look at views that only show one side of the object - a property of adult object manipulation - and increasingly orient the object in an upright position. Results show that this development continues after the age of three, but even one year olds are systematic in their object explorations. These results help us understand how children recognize objects - and object recognition is important for many aspects of cognitive development.

Vision for Action in Toddlers (ages 12 - 30 months)

One line of research in the lab involves understanding the development of visually guided action. How do toddlers use object properties in coordination with motor skills and spatial information to perform smooth, object centered actions? We’ve put head cameras on toddlers aged 18 to 24 months and found that 18 month-olds have difficulty in aligning objects such as elongated blocks, toy
boats and radios, or simple discs with corresponding openings. In contrast, 24 month-olds easily rotate the objects to match the openings and drop them in. We are currently studying how these abilities develop between the ages of 15 and 30 months.

**Picture Book (ages 18-36 months)** How does object recognition assist in language development? In our current study, children are read a short book and asked to find specific objects in the book by pointing. We have learned that two year olds are generally very good at recognizing pictures in books. We are now beginning to manipulate the pictures to help us discover how children recognize these objects. We are creating books that show features of objects (like the snout and paws of a dog).

Perhaps children can generalize objects based on specific parts of the objects. We have also created simple versions of pictures based solely on the general shape of the object. Maybe children identify objects based on their overall shape instead of specific features. Understanding how children recognize objects gives us key information about how children acquire language.

**Early Math Concepts (ages 2 - 6 years)** The learning of early number concepts by preschool age children is crucial for school readiness and everyday life. Our research is focused on finding procedures to enhance teaching methods. Yet, before we can try to improve on the methodological aspects of teaching, we needed to study what children know about numbers before formal instruction. Right now, we are studying in detail what 2 through 6 year-olds know about concepts like place value, symbol notation and magnitude. We ask children to compare two numbers or groups of dots, asking them questions like Which is more? or Which is 64? We have learned that young children know quite a bit about numbers, although they have yet to piece all the information coherently together. New research will examine different kinds of training methods in hopes to find the most clear and efficient way to teach children about these number concepts.

**Solids, Substances, Numbers (ages 2-5 years)** Just by looking at things, we know if they are solid or not; solid things have a constant shape, whereas substances do not. We can count solid things (“three cups”), but we generally do not count substances (“some water”). But what do children know? To understand how children develop knowledge about solid objects, language, and number, we show children a novel object with a novel name (“Look at the tiso!”) We then ask children to find other objects that have the same name. The choices we give children always match either in shape or material. Results indicate that if children match things by their shape, it is likely they perceive that the novel thing is a solid object. If they match things by the material, they likely believe it is a nonsolid thing. Another exciting finding that has come from this kind of work in our lab is that the number of objects in a set influences whether or not children think of items as being solid individual objects or as being a substance. When objects are in small sets or less than 6 or so items, children pay attention to the shape of the items and think of them as separate objects.

When there are more, children may perceive these things as masses of substance, much like we would perceive sand or cereal. Even more interesting, we have found that this is the case for children across various languages and cultures including Spanish and Japanese!

**Learning and Attention (ages: bilingual and monolingual 9 month-olds to adults)**

We are interested in on how babies and young children learn to pay attention to the right information so that they rapidly learn which words go with which objects in their busy environments. Babies aged 16 to 17 months sit on their parent's lap and watch a brief video of pictures demonstrating associations between a color and a shape. What color/shape associations your child looks at longer is a good indicator of what they have learned. We also work with the bilingual population (all ages) to examine how sorting through double the amount of language information changes how bilinguals allocate their attention and learn differently from their environment.

Thank you parents for your ongoing support and dedication to our research! And to all the Day Care Centers and Preschools for allowing us to visit and conduct our research!