Hello and **Thank You** from the SPACE Lab!

Dear Parents, Friends, and Teachers,

We've been busy since our last newsletter! Thank you for all of your help and support! Without families and schools like yours, we would not be able to conduct our research.

This newsletter summarizes findings from studies we conducted over the past year and previews some ideas for future research in our labs. If you have any questions as you read, please feel free to contact us for more information!

Best wishes,

Vanessa Simmering, Director of the SPACE Lab & Assistant Professor of Psychology
A look at SPACE Lab studies...

Co-development of spatial skills and language (Lead Researcher: Hilary Miller)

Many different cognitive skills develop together in early childhood, making it difficult to determine whether some skills depend on others. Much of our prior research has focused on children’s spatial skills, which may be supported by learning spatial words. To test how spatial language might relate to children’s spatial skills, we compared 4-year-olds’ performance across a number of spatial tasks—imagining how two pieces of a shape form one shape, mentally rotating a picture to find another that matches, or picking which two pictures show the same spatial relations—to their ability to describe verbally where a mouse was in a spatial scene. We were particularly interested in what kinds of words kids chose to describe where the mouse was when some of the objects in the scene looked the same—did they use only location words, or did they also use size and color words? In different scenes, color and size words could be helpful (as in the one to the right) or not. Our results showed that children’s skills in using language to describe spatial scenes were developing simultaneously with their spatial abilities. We think these results provide evidence that children’s attention to task-relevant information supports the development of both spatial language and more general spatial skills. We are currently designing a training study to test whether helping kids learn what to pay attention to will lead to improvements in both spatial skills and language.

What makes a camel a camel? When children learn general versus specific features (Lead Researcher: Clint Jensen)

Children learn many different concepts during early childhood, some of which are general (like “animal”) and some of which are specific (like “camel”). Some of these concepts have uniquely identifying characteristics, like the hump on a camel. Research on aging and dementia shows that adults lose specific information from concepts before general information—they may forget that a camel should have a hump, but they will remember that it should have four legs. We are currently studying whether children first learn the concepts that are lost later in aging, that is, do they learn general features before specific features? If so, this may explain why general features persist longer in aging. We have tested this by showing children pairs of animals with or without characteristic features of certain concepts, like a camel with a hump versus a camel without a hump, and as a comparison, a donkey with a flat back versus a donkey with a hump. We ask children to choose which animal is real and which is ‘silly’, and then we compare whether their choices were more accurate for general or specific features. Our results showed that 3-year-olds make the same kinds of errors as the elderly, recalling the general information better than specific information; by 5 years old, however, children recall all information equally well. These results can help us understand how features are learned over time, and may provide insights into re-teaching information that was lost to those with memory impairments.

How similarity affects children’s memory (Lead Researcher: Chelsea Grahn)

When you have to remember more than one thing at a time, does having them be similar to each other help or harm your ability to remember? Research on memory for lists of words (like a grocery list) suggests that similarity can lead to memory errors: if you had both carrots and broccoli on your list, for example, you might think celery was also on your list when it really wasn’t. Surprisingly, research on memory for visual features (like colors) shows the opposite effect: adults are more accurate when the colors all come from one color category, like three shades of red, rather than from different categories, like one blue, one green, and one red. We were interested in whether this effect was also true for children, who don’t remember colors as precisely as adults do. In two studies using two different kinds of tasks (either pointing to a changing color or saying whether colors matched), we’ve found that 3- and 5-year-olds’ memory is no better or worse with similar colors, but 6- to 7-year-olds show the same advantage that adults do. These results help us understand how children represent color information in memory, and how these representations change over development.