



Concepts and Theories in Human Development

University of Michigan

Dear Parents,

We are writing to describe ongoing research projects at the Concepts and Theories in Human Development lab at the University of Michigan. In our studies, we examine children's early language and concepts. Childhood is a period of remarkable learning and growth, and the ages from toddlerhood through early elementary school involve particularly exciting changes, for children and their families! During this period of development, children are learning words, organizing experiences into categories, and forming intuitive "theories" about the world around them.

If you have previously participated in our research, we are very grateful for your help! Thanks to your participation, we are constantly making new discoveries about the nature of children's thinking. We also wish to thank the National Institutes of Child Health and Human Development, the National Science Foundation, and the University of Michigan, which help support this work.

This newsletter describes some of the studies we are currently working on or recently completed. We hope that you and your child enjoy your visit(s) to our lab!

Susan A. Gelman

Frederick G. L. Huetwell Professor of Psychology



A mom and child look through pictures together

Pictures Versus Objects

(Liza Ware, Susan Gelman, Felicia Kleinberg)

When parents and children spend time together, two of the most popular activities include looking at pictures (in books and photo albums) and playing with toys. Both of these are "play" – but are they equivalent? Or do

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pictures and objects lead children and parents to focus on different aspects of the world?

In this study, we looked at the ways in which pictures and objects bring out different ways of thinking about how objects relate to one another.

We invited mother-child pairs to play with a set of toy objects and a set of color drawings of objects, just like they would at home. The children included a younger group (2-year-olds) and an older group (4-year-olds). We then looked at the ways in which participants linked two or more items together. Parents and children discussed a wide range of links, including: a shared category (for example, a cow and a horse are both animals), a shared aspect (for example, the cow and the horse both have brown spots), or a shared theme (for example, the cow and the horse are friends).

We found that participants talked very differently about pictures than about objects. With pictures, both children and their parents made more links based on shared-category and shared-aspects, whereas with objects, they made more links based on theme. These findings reveal a new way that book-reading fosters a special kind of interaction that is especially conducive to learning about categories.



A child learns about object functions

Object Fun(ctions)

(Liza Ware)

How do young children learn to divide the world into categories of things, such as 'dogs,' 'cars,' and 'apples'? Developing this ability is critical because it will help children organize the world around them and label objects.

In this study, we explored how 17- to 19-month-olds learn to use different characteristics of objects to group them into categories, such as similarities in objects' shapes, colors, textures, and functions. For example, if they are shown that two objects have the same function (e.g., both are used to scoop and pour) do they expect that these objects belong to same category of things and have the same name?

This study is unique because it examined toddlers' learning over a 7-week period. We examined how different play experiences with objects and their functions impact how toddlers' categorize objects. We also measured participants' vocabulary growth during the course of the study to see if there is a relation between their language acquisition and how they categorize objects.

Our results show that learning about functions plays a critical role in toddlers' category learning. If they learn that two objects have the same function, they group these objects into a category. But learning about functions is even more powerful than that, because it can also influence how toddlers think about *other* characteristics. For example, if toddlers are repeatedly shown that objects' functions are usually related to their overall shapes (e.g., a ball can roll because it is round), this helps them to understand that shape is also useful for grouping objects into a category.

Explain It To Me!

(Susan Gelman, Michelle Hollander)

Young children have a strong urge to understand WHY things happen. They seek to understand both everyday events (“Why is the dog barking?”) and more puzzling phenomena (“Why is the sky blue?”). By age 2 or 3, children also start to offer their own explanations for events in their world. Sometimes their explanations focus on prior causes (for example, the dog is barking because it heard a noise), whereas other times their explanations focus on consequences or purposes (for example, the dog is barking in order to get your attention).

This study was designed to examine when children focus on prior causes and when they focus on consequences. Furthermore, we wished to learn whether different ways of posing a question could shift children’s attention to either causes or consequences.

For this study, 4-year-old children (as well as a comparison group of college students) saw a series of color photographs of animals and were asked a question about each, sometimes in a form highlighting category membership (such as, “Why do zebras run?”), and sometimes in a form highlighting the specific individual (such as, “Why is that dog barking?”).

We found that small changes in how the questions were worded led to big changes in the kinds of explanations that children (and college students) provided. When the questions focused on the category, children focused more on biological processes (such as eating, sleeping, survival) and less on mental processes (such as thinking or wanting). Also,

category-focused questions encouraged children to think about consequences more than prior causes.

These results demonstrate that 4-year-olds are flexible in the kinds of explanations they can consider, and that category language has a surprisingly powerful effect on their reasoning. This is a sophisticated verbal and conceptual accomplishment!



A mom and child read a book together

Learning New Words

(Michelle Hollander, Susan Gelman,
Lakshmi Raman)

Children learn about 14,000 words by the time they are 6 years of age – which averages to about 9 new words every day! By the time your child graduates from high school, he or she will have learned about 60,000 words. How do children accomplish this colossal task? We hypothesized that one important source of information might be clues from informational statements. When children listen to the language around them, how do statements such as “Tapirs have long snouts” or “This

echidna is spiky” influence their understanding of new words (such as *tapir* or *echidna*)?

In this study, we investigated how category-based statements might guide children’s word-learning. We wondered whether using category language could highlight core properties for children learning new words.

Four- and 5-year-old children (as well as a comparison group of college students) learned information about new animals and were then asked to categorize new examples of each type. In some versions, the information was presented using language that highlighted category membership (such as “Tapirs have long snouts”), while in other versions, the information and helping children learn new words!

information was presented using language that emphasized the individual (such as “This echidna is spiky”).

We found that properties expressed using category-based language were viewed as more central to the category identity – for both preschool children and college students. Surprisingly, this information was even seen as more important than obvious aspects of the animals’ appearances, such as their body shape.

These findings suggest that category language plays an important part in conveying

On-Going Studies

A number of studies are currently ongoing, with children at a range of ages. Here are descriptions of some of the studies we are currently running. If you would like to participate in these or other studies, please call us at (734) 647-2589 or e-mail concepts@umich.edu.

Reading Together! (Susan Gelman, Liza Ware, Felicia Kleinberg)

Much of children’s knowledge about the world comes not from direct experience but from listening to others. The way we speak provides important information for children that affect how they develop understandings of new concepts.

In this on-going study, we’re looking at how language affects the way children think.

As part of participation, 4- or 6-year old children and a parent read a book together at home daily over a 1-week period. Parents and children

also participate in a series of tasks examining comprehension, memory, and language skills.

Results from this study will be in the next newsletter.

Conversational Styles (Susan Gelman, Liza Ware, Erika Manczak)

Do parents and children talk about things in the same way? Do we each differ in how we talk about different topics?

In this on-going study, parents and four-year-old children look at pictures and talk about them together and with researchers.

Results will be published in our next newsletter.

Recent Publications

Gelman, S. A., & Ware, E. (forthcoming). Conceptual development: The case of essentialism. In Eric Margolis, Stephen Stich, & Richard Samuels (Eds.), *Oxford Handbook of Philosophy and Cognitive Science*. Oxford University Press.

Hollander, M. A., Gelman, S. A., & Raman, L. (in press). Generic language and judgments about category membership: Can generics highlight properties as central? *Language and Cognitive Processes*.

Taylor, M. G., Rhodes, M., & Gelman, S. A. (in press). Boys will be boys; cows will be cows: Children's essentialist reasoning about gender categories and animal species. *Child Development*.

Gelman, S. A. (2009). Learning from others: Children's construction of concepts. *Annual Review of Psychology*, 60, 115-140.

Legare, C., Wellman, H. M., & Gelman, S. A. (2009). Evidence for an explanation advantage in naïve biological reasoning. *Cognitive Psychology*, 58, 177-194.

Gelman, S. A., Waxman, S. R., & Kleinberg, F. (2008). The role of representational status and item complexity in parent-child conversations about pictures and objects. *Cognitive Development*, 23, 313-323.

Gelman, S. A., Goetz, P. J., Sarnecka, B. S., & Flukes, J. (2008). Generic language in parent-child conversations. *Language Learning and Development*, 4, 1-31.

Gelman, S. A., & Bloom, P. (2007). Developmental changes in the understanding of generics. *Cognition*, 105, 166-183.

Gelman, S. A., & Frazier, B. (2007). Children's understanding of authenticity. In N. Galanidou, L. H. Dommasnes (Eds.), *Telling children about the past: An interdisciplinary approach* (pp. 81-99). International Monographs in Prehistory. Ann Arbor, MI.

Gelman, S. A., Heyman, G. D., & Legare, C. H. (2007). Developmental changes in the coherence of essentialist beliefs about psychological characteristics. *Child Development*, 78, 757-774.

Gelman, S. A., & Raman, L. (2007). This cat has nine lives? Children's memory for genericity in language. *Developmental Psychology*, 43, 1256-1268.

Jipson, J. L., & Gelman, S. A. (2007). Robots and rodents: Children's inferences about living and nonliving kinds. *Child Development*, 78, 1675-1688.

Contact Us!

If you'd like more information about our studies, or to participate in a study, please contact Erika Manczak at concepts@umich.edu or call (734)647-2589.

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