



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

Learning Through Language

(Susan Gelman, Liza Ware, Felicia Kleinberg)

One of the most common ways parents teach their children new things about the world is through pictures and books. Parents often show their children a single picture of something, and introduce information corresponding to the picture. Sometimes the information is about the specific instance (such as "This bear is climbing a tree"), but sometimes it is about the entire category (such as "Bears climb trees").

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Past research from our lab has shown that children are sensitive to this distinction between specific information and general information. For example, children are more likely to extend the property of climbing trees to the entire category of bears, when they hear the general fact versus the specific fact.

In the present study, we wondered how this kind of language might affect how children think about a brand-new category they had never heard before. If children hear a series of general statements about a new animal, will they reason differently about that animal, as compared to children who hear a series of specific statements about the animal?

To examine this question, we invited parent-child pairs to read a book that we prepared about a made-up animal. Parents read the book at home repeatedly over one to two weeks. For some families, the books were written so that every page referred to the entire category (“Zarpies chase shadows”). For other families, the books were written so that every page referred to a specific instance (“This zarpie chases shadows”). Yet another set of families heard no labels whatsoever (“This chases shadows”). We then gave the participating parents and children a series of tasks aimed to examine how they reason about zarpies. For example, participants might learn a new fact about one zarpie, and be asked whether it generalizes to other zarpies.

We found that children and parents reasoned quite differently about zarpies, depending on the language they had heard during the book-reading. For example, those who learned about zarpies as an entire category made more generalizations about new facts, treated zarpies as more stable over time, and even gave different explanations for why an animal had certain features.

These results demonstrate that the language we provide when talking to young children has powerful effects on how they reason about the world. Moreover, these same effects are taking place for parents as they read to and teach their children!



“That’s Mine!”

(Susan Gelman, Erika Manczak, Nick Noles)

One of children’s first words is “mine”, and even toddlers will object if someone tries to take a toy from them without permission. But what do children think it means to own a toy?

In this study, 2- and 3-year-old children and U-M college undergraduates were shown sets of toys (3 per set) in which one toy was designated as belonging to the participant and one toy was designated as belonging to the researcher. The toys were then scrambled up and participants were asked to pick which toy belonged to them or, as a comparison, to pick which toy they liked best. In some of the sets, all three toys were equally attractive but distinct (such as a truck, a car, and a plane). In some of the sets, all three toys were identical (three identical motorcycles). And in some of the sets, the child was assigned a “boring” toy (such as a Styrofoam cone) whereas the researcher was assigned a more interesting toy (such as a fire engine).

We found that participants of all age—even 2-year-olds!—were highly attuned to ownership cues and could correctly report ownership under a variety of circumstances. For example, even when the toys were identical, children correctly tracked which of the toys belonged to themselves.

Children three years and older were able to differentiate between what they *liked* and what they *owned* (for example, selecting the Styrofoam cone as their own, even though they thought it wasn’t as attractive as the fire engine).

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Time to Teach!

(Susan Gelman, Sarah Stilwell, Erika Manczak)

When we speak in different contexts, we very often change the way we express ourselves. An adult speaking to a child will likely talk differently than if she was conversing with her employer. But when do we develop this ability to adjust our language and in what ways does our language change?

In this study, children 4- and 5-years old as well as University of Michigan undergraduates were given picture books and were asked to pretend to discuss those books either as if they were chatting with a friend or as if they were teaching the pictures to an alien from outer space. In a related study, we asked participants to pretend to be kindergarten teachers as well as children younger than themselves while looking at the picture books. We then compared the way that participants talked in each of the situations.

We found that children and adults did change the way they spoke when they were teaching versus talking to someone. Specifically, when participants of both ages were in a teaching role, they tended to invoke more information about categories, such as “dogs have four legs.” When participants were in chatting roles, on the other hand, they focused more on the specific pictures shown and talked about more personal experiences (“this dog has four legs” or “I have a dog with four legs”). However, children only showed this difference when they were given the teaching role last. If they were asked to be a teacher first, they tended to use category language throughout both tasks. This suggests that both children and adults are aware of the contexts in which they speak and are able to adjust their speech accordingly. Furthermore, category language is a powerful and familiar way of talking that is hard for children to stop once they’ve begun.

However, 2-year-olds made correct ownership decisions only when the toys they received were as desirable as the other toys. We also found that owning a toy made it more attractive, for participants of all ages (including adults). Thus, it seems all ages are very sensitive to ownership cues and by age 3, children recognize that they don’t get to own something just because they want it.



Letting Hands Do the Talking

(Meredith Meyer, Susan Gelman, Sarah Stilwell)

Young children learn a lot about the world in the course of normal, everyday interactions with their parents. One way they learn is through spoken language, but parents' gestures can also convey information. In one of our ongoing studies, we are examining what kinds of gestures parents are using with their toddlers while they play with familiar animals. We're also asking college students to guess what parents are talking about based only on parents' gestures --no sound! Results from this study will be published in the next newsletter.

Language and Memory

(Susan Gelman, Sarah-Jane Leslie)

Does the language we use have an effect on children's memory? We were interested in studying how well children remember general information that is presented to them in language (for example, "Hippos like to swim"). There is currently a debate as to what types of generalizations children find easiest to understand and learn, and studying children's recall provides a useful test.

For this study, 3- and 4-year-old children (as well as a comparison group of college students) were asked to remember a series of facts about animals. For example, participants saw a photo of a bear and heard a generalization, either using a quantifier (such as "All hippos like to swim"), or without any quantifier (such as "Hippos like to swim"). After a short break, they were asked to recall the sentences they were taught as best they could, with pictures to help them remember. We were interested in whether children and adults would find quantified forms easier or harder to recall than non-quantified forms.

We found that children had a strong tendency to remember quantified sentences as if they were not quantified. For example, whether they had heard "All hippos like to swim" or "Some hippos like to swim", they tended to remember it simply as "Hippos like to swim". This suggests that children tend to forget more precise information regarding how often a property appears, and to retain just that the property holds in general.

These results suggest that we have to be careful when talking to children, as they may misremember information as being more absolute than it really is. For example, if they hear "Some dogs have fleas", they may remember this as "Dogs have fleas", and overgeneralize the information.

Conversational Styles

(Susan Gelman, Sarah Stilwell,
Erika Manczak, Alex Was)

Do parents and their children talk about things in the same way? In this ongoing study, parents and four-year-old children looked at pictures of everyday things (e.g., lion, firefighter, orange) and talked about them together and separately with a researcher. Our results reveal some interesting similarities in parents' and their children's conversational styles. For example, we examined how often participants talked about the general category of things that the item in the picture belonged to (e.g., "Lions are the king of the jungle"). An alternative way to talk about the items would be to focus on the individual object in the picture (e.g., "That is a big lion").

We found there were large individual differences in how often people focused on categories versus individuals. Importantly, if a parent was more likely to talk about categories when looking at the pictures, so was his or her child. Parents and children who talked more about categories to each other also talked more about categories in their independent conversations with the researcher. This suggests that parents and their children have similar conversational styles—both when talking with each other and when talking with other people. Hence, parents seem to have an important influence on how children talk about the world around them.



Flexible Thinking

(Amanda Markowitz, Susan Gelman, Liza Ware)

How flexibly do children organize their everyday experience into categories? There are many ways that an object can be categorized. For example, a basketball can be grouped with other similar items (such as a football or a soccer ball), or it can be grouped with the context it usually appears in (such as with a basketball hoop or basketball shoes). Categorizing an object with other similar items is known as “taxonomic” categorization; categorizing an object with its context is known as “thematic” categorization. We hypothesized that children are flexible thinkers, and can emphasize either taxonomic or thematic categorization, depending on how the question is asked.

In this study, children and adults were given sets of pictures or toy objects and were asked to pair a target item with another item from the set. For example, they were asked to pair a basketball with a football [taxonomic choice], a basketball hoop [thematic choice], or a piece of corn [unrelated choice]. Half the participants were asked to point to their answer choice; the others were asked to physically manipulate the items (actually placing the basketball with the match). We found that both children and adults responded flexibly, selecting the taxonomic choice more often when asked to point to their response, and selecting the thematic choice more often when asked to manipulate the items. These results show that subtle changes in how a question is asked can elicit different ways of thinking, even for preschool children.

This project was completed as a part of an honors thesis for U-M undergraduate Amanda Markowitz. Congratulations, Amanda!

Categorical Teaching

(Jenna Hedglen, Amanda Brandone, Susan Gelman)

From a very young age, children hear statements about categories. These sentences often convey important information and can be very helpful in teaching children about categories. But what exactly do children assume when they hear category information? What do categories mean to children?

In this study, children saw pictures of groups of imaginary animals. Some of the animals in the groups displayed a key feature (ex: wings) and some did not. One group of children were asked to select the picture that best illustrated a sentence (ex: “Sapers have wings”) from among 4 alternatives in which 0, 2, 4, or 6 out of 6 animals displayed a key feature. Other children were asked to use a picture (in which 0, 2, 4, or 6 out of 6 animals displayed a key feature) to determine whether a sentence was true or false. Sentences differed on whether they were statements about a category or were quantified with “some,” “most,” or “all” (ex: “*Sapers* have wings” vs. “*Some sapers* have wings”).

We found that 4-year-olds understand the meaning of the quantifiers “some”, “most”, and “all”. We also found that children interpreted category statements in the same nuanced way that adults do. Like adults, they chose to match category statements (ex. *Sapers* have wings), with pictures in which the majority of the animals displayed the key property. Like adults, children also accepted the same category statements as true even when only a few animals in the picture displayed the feature. These results suggest that by 4 years of age, children understand categories in much the same way that adults do.



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 conceptlab@umich.edu

Reading Together!

(Susan Gelman, Sarah Stilwell)

How do children think about objects and value? In what ways do parents help children understand the authenticity of items across environments? One study that brings parents and children together investigates the way parents and their children talk together about various objects in different contexts.

In this single visit study, parents and children (ages 3 ½ to 4 ½ and 5 ½ to 6 ½) read a series of three books together and discuss questions about the themes presented in the books. Parents and children also participate in a series of tasks examining comprehension.

Results from this study will be published in our next newsletter.

Understanding Value

(Susan Gelman, Sarah Stilwell, Erika Manczak)

Do children understand the value of things? How do children make judgments about what is worth the most money? At what age do children really start to understand the value of objects? This study aims to understand the ways children think about the value of objects, and how it differs for item type. We are also interested in the evolution of conceptual understanding of authenticity.

In this single visit study, children (ages 4 ½ to 5 ½) play two short games with a researcher. These games involve looking at and labeling objects, and making judgments about price and value.

Results will be in the next newsletter.

If you schedule a lab visit to participate in one of these studies, we provide free parking for the session, and your child receives a small gift for participating. You will also be compensated \$10 for you time. Additionally, any other siblings are more to welcome to come along during your visit! Our research staff are happy to play with your other children in our playroom while your child completes the study.

Recent Publications

- Cimpian, A., Gelman, S. A., & Brandone, A. C. (2010). Theory-based considerations influence the interpretation of generic sentences. *Language and Cognitive Processes, 25*, 261-276.
- Gelman, S. A. (2010). Generics as a window onto young children's concepts. In F. J. Pelletier (Ed.). *Kinds, things, and stuff: The cognitive side of generics and mass terms*. (New Directions in Cognitive Science v. 12.) New York: Oxford University Press.
- Rhodes, M., Gelman, S. A., & Brickman, D. (2010). Children's attention to sample composition in learning, teaching, and discovery. *Developmental Science, 13*, 421-429.
- Brandone, A. C., & Gelman, S. A. (2009). Differences in preschoolers' and adults' use of generics about novel animals and artifacts: A window onto a conceptual divide. *Cognition, 110*, 1-22.
- Frazier, B. N., & Gelman, S. A. (2009). Developmental changes in judgments of authentic objects. *Cognitive Development, 24*, 284-292.
- Frazier, B. N., Gelman, S. A., & Wellman, H. M. (2009). Preschoolers' search for explanatory information within adult-child conversation. *Child Development, 80*, 1592-1611.
- Frazier, B. N., Gelman, S. A., Wilson, A., & Hood, B. (2009). Picasso paintings, moon rocks, and hand-written Beatles lyrics: Adults' evaluations of authentic objects. *Journal of Cognition and Culture, 9*, 1-14.
- Gelman, S. A. (2009). Learning from others: Children's construction of concepts. *Annual Review of Psychology, 60*, 115-140.
- Gelman, S., Ware, E., & Kleinberg, F. (2010). Effects of generic language on category content and structure. *Cognitive Psychology, 61*, 273-301.
- Hollander, M. A., Gelman, S. A., & Raman, L. (2009). Generic language and judgments about category membership: Can generics highlight properties as central? *Language and Cognitive Processes, 24*, 481-505.
- Legare, C., Wellman, H. M., & Gelman, S. A. (2009). Evidence for an explanation advantage in naïve biological reasoning. *Cognitive Psychology, 58*, 177-194.
- Rhodes, M., & Gelman, S. A. (2009). A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology, 59*, 244-274.
- Rhodes, M., & Gelman, S. A. (2009). Five-year-olds' beliefs about the discreteness of category boundaries for animals and artifacts. *Psychonomic Bulletin and Review, 16*, 920-924.
- Taylor, M.G., Rhodes, M., & Gelman, S.A. (2009). Boys will be boys, cows will be cows: Children's essentialist reasoning about human gender and animal development. *Child Development, 79*, 1270-1287.

Contact Us!

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

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