



INFANT COGNITION NEWS

Review of Research Findings For Participating Families

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From the research lab of **Dr. Barbara Younger-Rossmann**
Department of Psychological Sciences, Purdue University



Do infants understand toy objects as symbols for “real” objects?

Studies of categorization and conceptual development in infants often make use of small toy models of animals or vehicles. The inferences drawn in these studies depend critically on the assumption that infants understand that small toys or models symbolically represent “real” kinds. If infants watch an adult model “putting a dog to bed” and then imitate the action using other available animal models, the conclusion that infants represent *animals* as “things that sleep” is not warranted if the symbolic relations between the toy models and their referents are not understood.

Surprisingly, there is very little evidence regarding infants’ understanding of symbolic relations between small models and real objects. In our recent research, we have been developing a preferential looking procedure to address this question. Children between 10 and 26 months of age have been shown pairs of videotaped images of real objects (e.g., a recorded image of a rabbit to their left and an image of a bird to their right). Then, the infant is shown a small model corresponding to one of the objects depicted in the videos. Longer looking to the matching video is interpreted as evidence that infants understand the relation between the model and its referent.

Our initial studies suggest that an appreciation of the symbolic nature of small models of animals, vehicles, and household objects is a surprisingly late achievement. In general, infants younger than age 18 months were unable to make use of the small models to guide their attention to the corresponding real objects. Even at 18 months, evidence of this understanding was limited. By 26 months, children very clearly demonstrated their understanding of the symbolic link between the small models and their referents. Our studies also suggest that young children’s symbolic understanding is mediated by language. Regardless of their age, children who produced more words at the time of their participation in the object-to-video matching task showed a greater tendency to look longer to the matching videos.

This research was conducted in collaboration with Dr. Kathy Johnson at IU-PU Indianapolis, with the support of the National Science Foundation.

Cats and Dogs: Do the categories infants form reflect what they see or what they know?

Laboratory-based studies of categorization have made it clear that even very young infants are able to categorize a variety of objects, including different species of animals. A question that has never really been resolved, however, is whether infants’ categories are formed “on-line” as they are shown members of a particular category in the lab, or if prior knowledge or representations of the objects influence infants’ categorization performance in laboratory

studies. We have been examining asymmetries in infants’ categorization of cats and dogs as a way to determine whether infants’ categories are determined exclusively by the perceptual input – what they see when shown different members of a category, or if infants are influenced as well by what they know – prior representations gained through everyday experience with cats and/or dogs.

Previous research has shown an interesting pattern in 3- to 4-month-old infants’ categorization of cats and dogs. Infants who are initially familiarized with a category of cats form a category of cats that excludes dogs (infants look longer at a dog than a new cat after seeing several examples of cats). In contrast, infants who are familiarized with dogs form a category that includes both dogs *and* cats! This asymmetry in categorizing cats and dogs has been explained in terms of an asymmetry in the surface perceptual characteristics of the two categories. Basically, dogs are more variable along a variety of dimensions (ear length, body size, tail length) than are cats. Infants familiarized with the more variable category form a more inclusive category to reflect the variation they see across members of the category.

If the categories very young infants form reflect the variability in the perceptual properties of the animals, and this is taken as evidence of a “bottom-up” approach to categorization, a developmental investigation of asymmetries in categorization (or more specifically, the disappearance of the asymmetric pattern of categorization) should tell us when prior representations or knowledge contributes to categorization. If infants have formed distinct representations for cats and dogs based on their everyday experience (at home, in the park, from books or television), and these prior representations influence infants’ performance in laboratory-based categorization procedures, they should no longer be influenced directly by the asymmetric surface characteristics of the animals they are shown. In fact, we have found that very young infants – 4-month-olds – do show the asymmetric pattern of categorization described above. In contrast, by 10 months of age, infants show a symmetric pattern of categorization. The older infants in our study formed categories of cats that excluded dogs as well as categories of dogs that excluded cats. Thus, it appears that young infants are influenced primarily by what they *see*; categorization in older infants also appears to be influenced by what infants *know*.

Research is ongoing...

We owe a special **thank you** to the families who have participated in our studies. Our progress in understanding early conceptual development is dependent on your involvement. ***Your support in past and future research endeavors is greatly appreciated!***

Questions? Call us at 496-3127. E-mail: inflab@sla.purdue.edu