

Commentary

What's Beyond Looks?

Reply to Gelman and Waxman

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In our target article (Sloutsky, Kloos, & Fisher, 2007), we presented evidence that when category information is in conflict with appearance similarity, young children's induction is based on similarity and not on category information. These findings challenge a central tenet of the knowledge-based approach—the idea that even early in development, induction is category based. Gelman and Waxman (2007, this issue) argue that because we used arbitrary groupings, our findings tell little about induction with real natural kinds. In what follows, we first respond to Gelman and Waxman's arguments. We then return to a broader debate, arguing that the knowledge-based approach is underspecified and thus has too much flexibility when dealing with disconfirming evidence.

GELMAN AND WAXMAN'S ARGUMENTS: ARE THEY POST HOC OR PRINCIPLED?

Although Gelman and Waxman acknowledge that “there is little consensus regarding where precisely one might draw the line between natural and arbitrary categories” (p. 554), they argue that our categories are arbitrary groupings rather than natural kinds. This criticism implies that children somehow know where and how to draw this line. Although this implication is questionable, we focus on the content of the argument.

Gelman and Waxman's analogy with “evensies” and “oddsies” suggests that “ziblets” and “flurps” are arbitrary groupings because (a) they differ on a single feature (i.e., fingers-to-buttons ratio) and (b) the feature is arbitrary. They state: “We know of no account that defines a natural kind by a single ratio This seems to us a profoundly arbitrary property” (p. 554).¹ However, as we show here, the analogy is misleading because these claims are factually wrong.

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¹Contrary to Gelman and Waxman's intuitions, researchers of wildlife consider the ratio of dorsal tail stripes to tail circumference to be a feature differentiating two biological species (Fargo & Laudenslayer, 1995). Given how easy it was to find this example, it is unlikely that it is unique.

First, ziblets and flurps differ on many properties. Specifically, these creatures were introduced as different kinds of animals that differ in their habitat (i.e., pets vs. wild animals), their behavior (i.e., friendly vs. vicious), a chemical in their blood, and their way of catching food. They were also referred to by different count nouns. The latter point is especially important given the claim that children “assume that every object belongs to a natural kind and that common nouns convey natural kind status (as well their accompanying properties)” (Gelman & Coley, 1991, p. 190).

Second, the observable category-inclusion property was causally determined rather than arbitrary: Ziblets were said to have more fingers than body buttons because they catch their food with their fingers (a chemical in their blood makes their fingers sticky) and do not use their buttons.² The presence of causal and causally determined properties has been claimed to be an especially important characteristic of natural kinds (e.g., Gelman, 2003).

In our view, if children hold beliefs about the inductive potential of natural kinds, the information we provided should have been sufficient to trigger these beliefs; otherwise, it is unclear how children assign completely novel entities to natural kinds. Our expectations could be wrong, but the knowledge-based approach does not specify what information about novel animals would be sufficient. Given that the psychological reality of natural kinds is so central to the knowledge-based position, this lack of specificity is striking.

Another of Gelman and Waxman's concerns is that ziblets and flurps are subordinate-level categories of “bug” and that, therefore, a property could be generalized to both ziblets and flurps. The main problem with this argument is that it is inconsistent with our data: If the children had interpreted ziblets and flurps as subordinate-level categories, then when given a fact about a ziblet, they should have generalized it to either a ziblet or a flurp, which would have resulted in chance performance. Yet their performance was not at chance.

²It is unlikely that the children merely ignored these explanations, given their accurate recall at the end of the experiment (see the follow-up to our Experiment 1 on p. 183 of Sloutsky et al., 2007).

In addition, Gelman and Waxman offer no principled or empirical account as to why different kinds of bugs should be considered (or in fact are considered by young children) to be subordinate- and not basic-level categories. For example, Waxman, Lynch, Casey, and Baer (1997) treated different species of butterflies as different basic-level categories. If different species of butterflies are different basic-level categories, why would different species of bugs be subordinate-level categories? In the absence of a clear and uniformly applied principle (or empirical evidence), this criticism becomes too arbitrary to be informative. Thus, the criticisms of our stimuli are either inconsistent with the facts or post hoc, rather than principled.

HOW TO ADVANCE THE DEBATE?

The target article and Gelman and Waxman's Commentary should be considered within a broader debate about mechanisms of early induction. Our findings support a broad position that various generalization processes, including induction of properties, are driven by low-level perceptual and attentional mechanisms (e.g., French, Mareschal, Mermillod, & Quinn, 2004; Rogers & McClelland, 2004; Sloutsky & Fisher, 2004; Smith, Jones, & Landau, 1996). The knowledge-based account does not dispute the role of low-level mechanisms, but argues that these mechanisms are "mediated through conceptual knowledge" (Booth, Waxman, & Huang, 2005, p. 493; see also Booth & Waxman, 2002; Gelman, 2003), such as a belief that things belong to natural kinds.

Given that the role of conceptual knowledge is the principal difference between the two positions, the debate could be substantially advanced only by evidence that either supports or disputes such a role. However, although the knowledge-based account argues that conceptual knowledge is important, it offers little detail as to what conceptual knowledge is, where it comes from, under what conditions it is deployed, and how it mediates associative mechanisms. Specifically, this account leaves open whether conceptual knowledge is acquired by means of low-level mechanisms and whether conceptual knowledge always mediates these mechanisms. In our view, a lack of answers to these questions gives the knowledge-based approach too much flexibility in dealing with disconfirming evidence. At the same time, even hypothetical answers to these questions would flesh out the underlying theory, thus reducing the flexibility and potentially advancing the debate.

Acknowledgments—We thank Susan Gelman, John Opfer, and Chris Robinson for their helpful comments.

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(RECEIVED 11/14/06; REVISION ACCEPTED 12/5/06;
FINAL MATERIALS RECEIVED 12/8/06).