The Role of Labeling in Acquiring Kind Concepts in Infancy

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Recent research suggests that at around 9 or 10 months, infants begin to represent kind concepts such as ball and duck, and this is also the age at which they begin to comprehend count nouns such as "ball" and "duck." Two recent studies raise the question of whether language plays an active role in constructing kind concepts. Balaban & Waxman (1997) found that when given a label (e.g., "a rabbit") along with pictures of rabbits during familiarizations, 9-month-old infants spent more time looking at the exemplar from a new category (e.g., a pig) paired with a novel exemplar from the old category (e.g., another rabbit) on the test trials. Without labeling, however, no such preference was found. They argued that labeling facilitates infants' object categorization. Xu & Carey (1996) asked 10-month-old infants to infer the number of objects behind an occluder upon seeing two objects from two different kinds/sortals (e.g., a ball and a duck) emerging from behind the occluder one at a time. They found that at 10 months, only infants who understood words such as "ball" and "duck" succeeded in using kind information to individuate objects.

These studies raise the possibility that distinct labels may give infants pointers to distinct kinds/sortals, as suggested by Xu (1997). In the present study, we predict that using the Xu & Carey (1996) paradigm while labeling each object (e.g., "a ball" vs. "a duck"), 9-month-old infants who do not understand any words yet as a group would succeed in inferring two distinct objects behind the screen.

Twenty-four 9-month-old infants were tested in three conditions: the two-word condition, the one-word condition, and the baseline condition.

In the two-word condition, a ball was brought out from behind the screen and a voice said, "a ball," then the ball was returned behind the screen. Next a toy duck was brought out from behind the same screen and a voice said, "a duck," then the duck was returned behind the screen. Each object was brought out and labeled 6 times. On the test trials, the screen was removed to reveal two objects (the consistent outcome) or one of the two objects (the inconsistent outcome). Looking times were recorded.

In the one-word condition (i.e., the control condition), the ball and the duck were brought out from behind the screen one at a time, but each one was labeled "a toy." The test trials were identical to those in the two-word condition.

In the baseline condition, no object was brought out from behind the screen. The screen was simply removed to show the one-object and two-object outcomes. This provides a measure of infants' intrinsic preference for the one- or two-object outcome.

Analyses of variance were performed comparing each of the experimental conditions with the baseline condition and the two experimental conditions with each other, with type of trial (test vs. baseline) and number of objects in the outcome (1 vs. 2) as variables.

Two-word condition and baseline. There was an interaction between type of trial and outcome, $F(1,22) = 6.938$, $p < .02$. The infants looked longer at the two-object outcome on the baseline (Mone-object = 9.4s; Mtwo-object = 5.1s) but they looked longer at the one-object outcome on the test trials upon hearing two labels for the two objects (Mone-object = 8.6s; Mtwo-object = 7.3s).

One-word condition and baseline. There was no interaction between type of trial and outcome, $F(1,22) = .754$, $p = .395$. The infants looked longer at the two-object outcome on the baseline and test trials when only one label was used for the two objects (Mone-object = 5.4s; Mtwo-object = 7.8s).

One-word condition and two-word condition. There was an interaction between type of trial and outcome, $F(1,22) = 3.303$, $p < .08$. The infants showed different patterns of looking on the test trials of the two word conditions.

The main result of the experiment was that when two labels were provided in the Xu & Carey (1996) object individuation task, 9-month-old infants succeeded in inferring two distinct objects. This effect does not appear to be true of any language input, since the infants who heard only one label failed.

The hypothesis that is made possible by these data is that perhaps children have a built-in expectation that words which refer to objects are count nouns and count nouns map onto sortals. If two count nouns are present, there must be two sortals. It is this syntax-semantic mapping between count nouns and sortals which allowed the infants to succeed earlier in the Xu & Carey task.

Tentatively, we conclude that learning words such as "cup" and "ball" may indeed play a role in constructing concepts such as cup and ball.

References

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