Infants' Mental Representations of Objects Persist in an Occlusion Task

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BACKGROUND

Humans are remarkable for the flexibility of our mental representations. We construe the same individual (a family pet) in many ways, including as
- a distinct individual ('Scout') and
- member of a *category* (lab, dog, animate object)

This representational flexibility develops early:
At 7 & 12 months, infants' representations are influenced not only by *whether*, but *how* an object is named.[3,4]

- If a set of objects are all named with the *same consistent name*, infants focus on commonalities and form an object category, at the expense of individuating it.
- If each object in the same set is named with its own *distinct name*, infants focus on each object's unique individuating features, at the expense of forming a category.

By 8 m, infants' *individual-level* representations of *familiar* objects are sufficiently robust to guide their subsequent reasoning in an occlusion event.[1,2,5]

- If a familiar object is occluded briefly by a screen, infants expect the same object to appear when the screen is removed, and are surprised if a new object appears.

But how robust are infants' *new* individual-level representations of a novel object, established in the context of distinct naming?

RESEARCH QUESTION

Are infants' newly-created object representations, established on the basis of a *single* naming episode, sufficiently robust to persist over an occlusion event?

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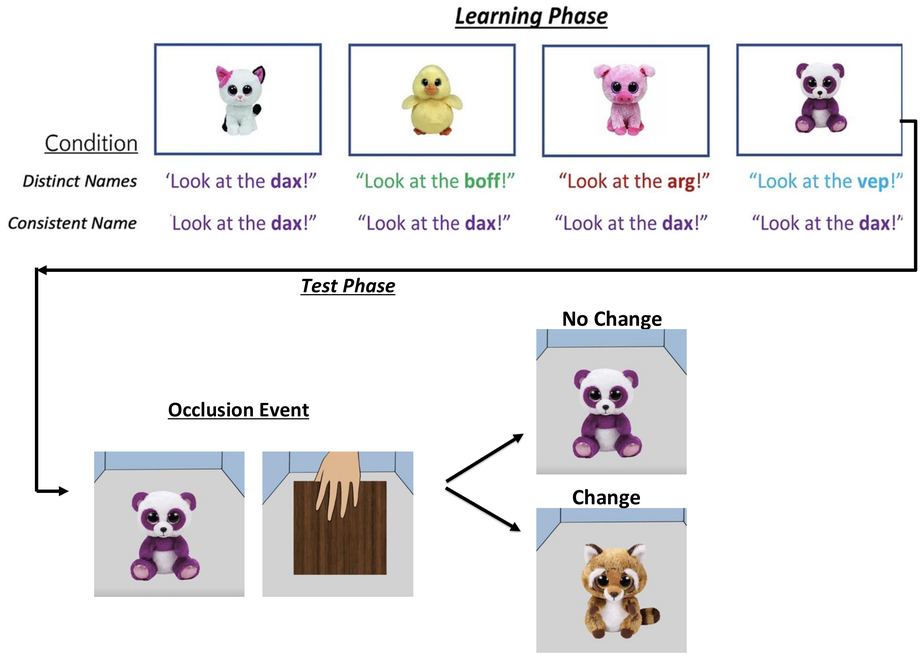
STUDY DESIGN

Participants: 12-month-old English-acquiring infants (N = 108, M_{age} = 11.85 months, 52 female)

Design: Identical to LaTourrette & Waxman (2020) with one exception: at test, infants view an occlusion event. Infants are assigned randomly to a Naming Condition (Consistent vs. Distinct Names applied during Learning) and to an Occlusion Condition (No Change vs. Change event presented at Test).

Learning Phase: Infants view four toy animals, each introduced with either a *distinct* name (DN), or the same, *consistently-applied* name (CN) (order of presentation is randomized).

Test Phase: Infants observe the most recently seen object (Learning Phase Trial 4) disappear from view, occluded by a screen. When the screen lifts, infants view either the same animal (*No Change condition*) or a different animal (*Change condition*).



PREDICTION

We predict that new individual-level representations will be created by a single naming event in the Distinct Naming Condition; these will be sufficiently robust to persist over an occlusion event.

Change Trials: Infants in the DN, but not the CN, condition will establish individual-level representations and will therefore be surprised by the object change; Infants in DN will look longer than those in CN at the revealed object.

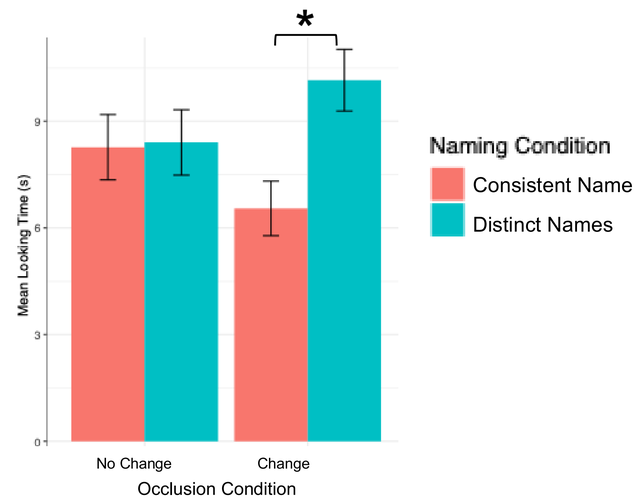
No Change Trials: DN infants and CN infants should not differ.

RESULTS

New individual-level representations, established in the Distinct Naming condition, are sufficiently robust to persist over an occlusion event.

A linear model with Naming Condition and Occlusion Condition as predictors revealed a significant effect of Naming Condition (β = 1.86, $t(104) = 2.12$ $p = .037$).

Moreover, as predicted,
Change Trials: Infants in the Distinct Names condition looked significantly longer at the revealed object than infants in the Consistent Name condition ($M_{difference}$= 3.6 seconds , $t(49.91) = 3.11$, $p = .003$).
No Change: There were no differences as a function of Naming Condition ($M_{difference}$= .12 seconds, $t(54) = .09$, $p = .93$).



DISCUSSION

Infants' individual-level representations of novel objects, established on basis of a single distinct naming episode, are robust enough to persist over an occlusion event and to guide infants' reasoning about that object as an event participant.

Infants' sensitivity to the occlusion event was influenced not only by *whether*, but *how* the objects had been named during Learning.

This is striking because the object representation is new, and formed from just one single naming episode.

This line of work will illuminate the strength and precision of the powerful link between language and cognition