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# Infants' Tracking of Split-objects

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## Introduction

Previous research suggests that infants use several kinds of information to identify and keep track of objects in their visual world. One source of information that is used from very early in infancy is spatiotemporal continuity (Wynn, 1992; Aguiar & Baillargeon, 1999). However, infants fail to use another source of information until 12 months of age: perceptual properties of objects (Xu & Carey, 1996). Xu, Carey, & Quint (2004) argues that tracking of perceptual information is related to infants' acquisition of *sortals* or *kinds*: categories of object which shares particular perceptual properties (e.g., shape, but not color)

However, if an object is split into two or more pieces, for example, then infants cannot rely on spatiotemporal continuity (i.e., one object has split into more than one object) or perceptual property information (i.e., split objects almost always have a different shape than their whole counterpart) to represent the initially whole object.

The psychological literature on "object-files" in adults yields further insight into how a mature visual system handles these simple transformations. Mitroff, Scholl, & Wynn (2004) measured object-specific priming benefits (OSPBs) as adults tracked the appearance and disappearance of letters on circles as they moved on a screen. OSPBs were reduced when the original object split and the authors offered two accounts of how feature-information was passed onto the split-objects: features were either copied to both split-objects (with weaker strength), or passed to only one.

This current project seeks to explore infants' understanding of this object-transformation. We hope to address two questions. First, do infants understand the sorts of simple transformations that *kinds* can undergo? Second, what information is passed onto daughter-objects if an object is split?

## Method

Ten- and twelve-month old infants were tested in a violation-of expectancy paradigm, where they saw using real-objects placed behind an occluder on a stage. Infants' expectations about splitting actions were evaluated by placing an object behind an occluder, cutting that occluder, and then manipulating the outcome when the occluder was removed.

Infants first saw three baseline trials where two boxes with hinged doors were brought onto the stage. The doors were opened, and three outcomes were possible: a *whole* outcome (i.e., either a whole duck, shoe, brush, or giraffe was present in one box), a *split* outcome (i.e., one half of

that same object was present in each box) or a *copy* outcome (i.e., a miniature version of the whole object was present in each box; two copies of the original, half the size). Looking time was recorded for each outcome.

Three test trials followed, where a larger box was brought onto the stage. The same whole object used in the baseline trials was placed inside the box. The box appeared to be cut in half by a flat, rigid piece of cardboard, and the two halves of the box were moved to opposite sides of the stage. The doors were then opened, and the same three outcomes were presented. Presentation of the outcomes was counter-balanced.

## Results & Conclusions

Preliminary results suggest that infants of both ages showed different patterns of looking to the split-outcomes versus the copy-outcomes. This effect holds only for animate items, as opposed to inanimate ones. Looking times for these infants suggest that the split-outcome on test trials (compared to the split-outcome on baseline trials) was longer compared to the copy-outcome on test trials (compared to the copy-outcome on baseline trials). It may be the case that 10- and 12-month-old infants expected the object features to be copied onto each of the miniature objects. Further work is being conducted to clarify these results, and on-going studies will look further into possible differences between split- and copy-outcomes, the role of animacy cues, and possible differences between age groups.

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