The Role of Spatiotemporal Relations in Infants Encoding of Individuals
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Is Spatiotemporal Information Sufficient?
Spatiotemporal cues for individuation:
- Multiple objects cannot occupy the same space at the same time.
- A single object cannot occupy two different locations in space at the same time.

Previous research has argued that object individuation is principally governed by:
1. Attending to an object’s spatiotemporal identity.
2. Individuation is not dependant on surface characteristics.

Spatiotemporal uniqueness of two objects may not be sufficient for object individuation:
- Recent research has demonstrated that infants sometimes fail to use clear spatiotemporal cues for individuation. (Cheries, Feigenson & Carey, 2001)

Explaining Infants’ Failure to Individuate
Without spatiotemporal information, infants’ poor performance may be due to:
1. Failure to successfully encode the individuals as separate tokens.
2. Failure to maintain these representations as distinct in memory.
We tested this distinction with three studies using 10-month-old infants.
Property Information Provides a Cue
We successfully replicated previous results showing that infants fail to reach more for 2 objects over 1 object in the spatiotemporal alone condition but succeed when the objects are heterogeneous.

Spatiotemporal Information is Insufficient
These results temper the view that typical spatiotemporal cues are fundamentally sufficient for successful individuation early in development. Infants use property contrasts (Exp 1) and spatial relationships (Exp 3) to help correctly encode the number of distinct individuals present in an object array.

Failure to Encode or Failure to Remember?
The spatiotemporal side manipulation only altered the objects’ initial presentation, yet infants succeed in this experiment, and not the top-of-the-box experiment. This suggests that infants’ previous failure reflected their inability to correctly establish distinct representations rather than a failure to maintain them under occlusion.

References

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