

Does Experience Influence 10-month-olds' Understanding of Collaboration?

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Introduction

Very little is known about how humans come to be good collaborators, which is surprising since collaboration is fundamental to our everyday lives. The present research begins to fill this void by investigating whether experience shapes the development of an understanding of collaboration.

Previous research using a visual habituation paradigm has shown that, by 14 months, infants possess a basic understanding of collaboration.¹ That is, infants understand that during a collaborative problem-solving task (i.e., removing a toy from a box), the collaborative partners are working towards a common goal.¹

However, because 14-month-olds have been shown to engage in collaborative problem-solving activities, this work does not reveal how experience influences the development of an understanding of collaboration.

This question can be examined with 10-month-olds, who do not engage in, or demonstrate an understanding of, collaborative problem-solving tasks^{2,3,4}.

Research Question: Does active and/or observational experience promote an understanding of collaboration in 10-month-old infants?

References

- ¹Henderson, A. M. E., & Woodward, A. L. (2011). "Let's work together": What do infants understand about collaborative goals? *Cognition*, 121, 12-21.
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- ³Duncan, S., & Farley, A. M. (1990). Achieving parent-child coordination through convention: Fixed and variable-sequence conventions. *Child Development*, 61, 440-453.
- ⁴Ross, H. S., & Lollis, S. P. (1987). Communication within infant social games. *Dev. Psych.*, 23, 241 - 248.
- ⁵Sommerville, J. A., Hildebrand, E. A., & Crane, C. C. (2008). Experience matters: The impact of doing versus watching on infants' subsequent perception of tool use events. *Dev. Psych.*, 44, 1249 - 1256.
- ⁶Sommerville, J. A., Woodward, A. L., & Needham, A. (2005). Action experience alters 3-month-old infants' perception of others' actions. *Cognition*, 96, B1-B11.

Acknowledgements

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Methods

Observational Experience Condition

Participants: Eighteen 10-month-old infants (*mean age* = 9 months, 28 days, *range* = 9 months, 15 days to 10 months, 10 days)

Procedure: Infants observed four trials in which two experimenters worked together to remove a toy from inside a transparent box.



PART 1: TRAINING

Active Experience Condition

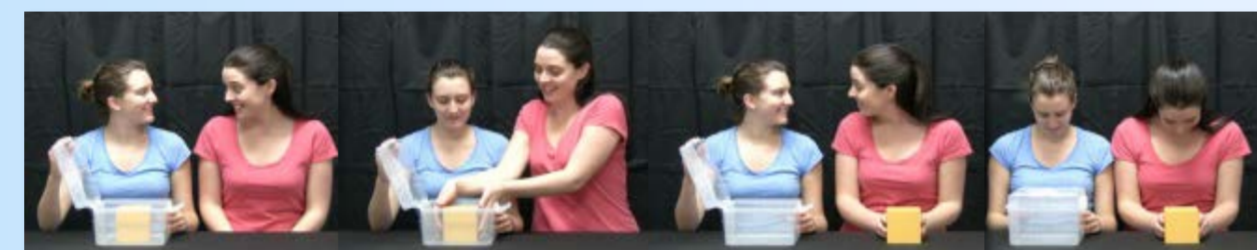
Participants: Thirty-six 10-month-old infants (*mean* = 9 months, 25 days, *range* = 9 months, 9 days to 10 months, 18 days)

Procedure: Infants engaged in four trials in which they were required to collaborate with an experimenter to remove a toy from inside a transparent box.

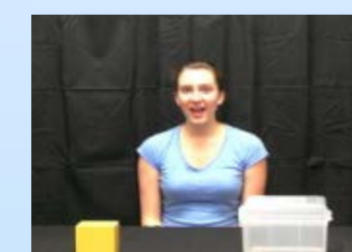


Infants in both conditions were then habituated to one of two events (see below). Infants in the observational experience training condition only saw the collaboration habituation event. Infants in the active experience training condition either saw the collaboration or onlooker habituation event. After habituation, infants watched six test trials in which the test actor grasped either the box or the toy.

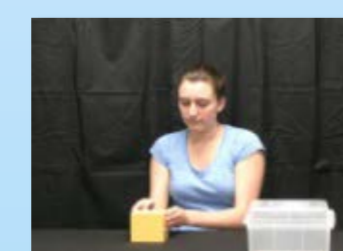
PART 2: VISUAL HABITUATION PARADIGM



Collaboration Habituation event:
Box-opener opens a box for the toy-getter who retrieves the toy from inside.



Familiarization trial:
"Hi. Where is it? Where'd it go?"
This event familiarizes infants to the test trial set-up.



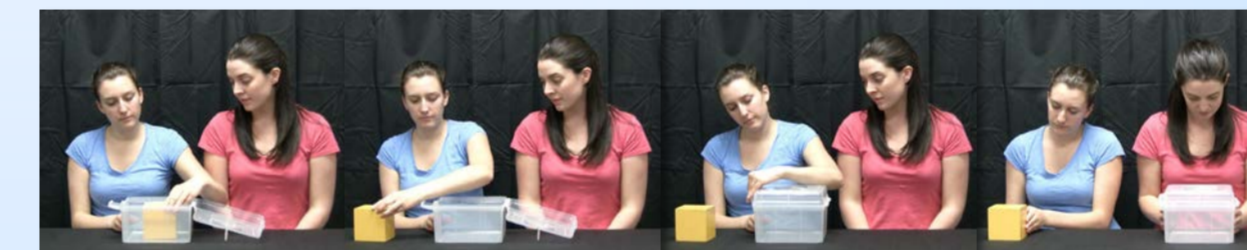
Toy test trial:
Box-opener grasps toy (i.e., **collaborative-goal**)



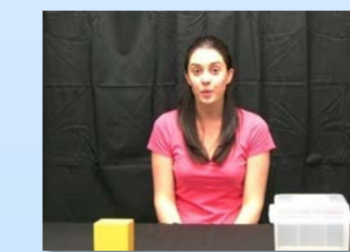
Box test trial:
Box-opener grasps box (i.e., **individual-goal**)

Collaboration Event Prediction:

If infants understood the event as a collaboration (i.e., toy as the collaborative-goal), they should look longer towards the box test trials.



Onlooker Habituation event:
One actor opens a box and retrieves the toy from inside while the onlooker watches.



Familiarization trial:
"Hi. Where is it? Where'd it go?"
This event familiarizes infants to the test trial set-up.



Toy test trial:
Onlooker grasps toy (i.e., **means-ends goal**)

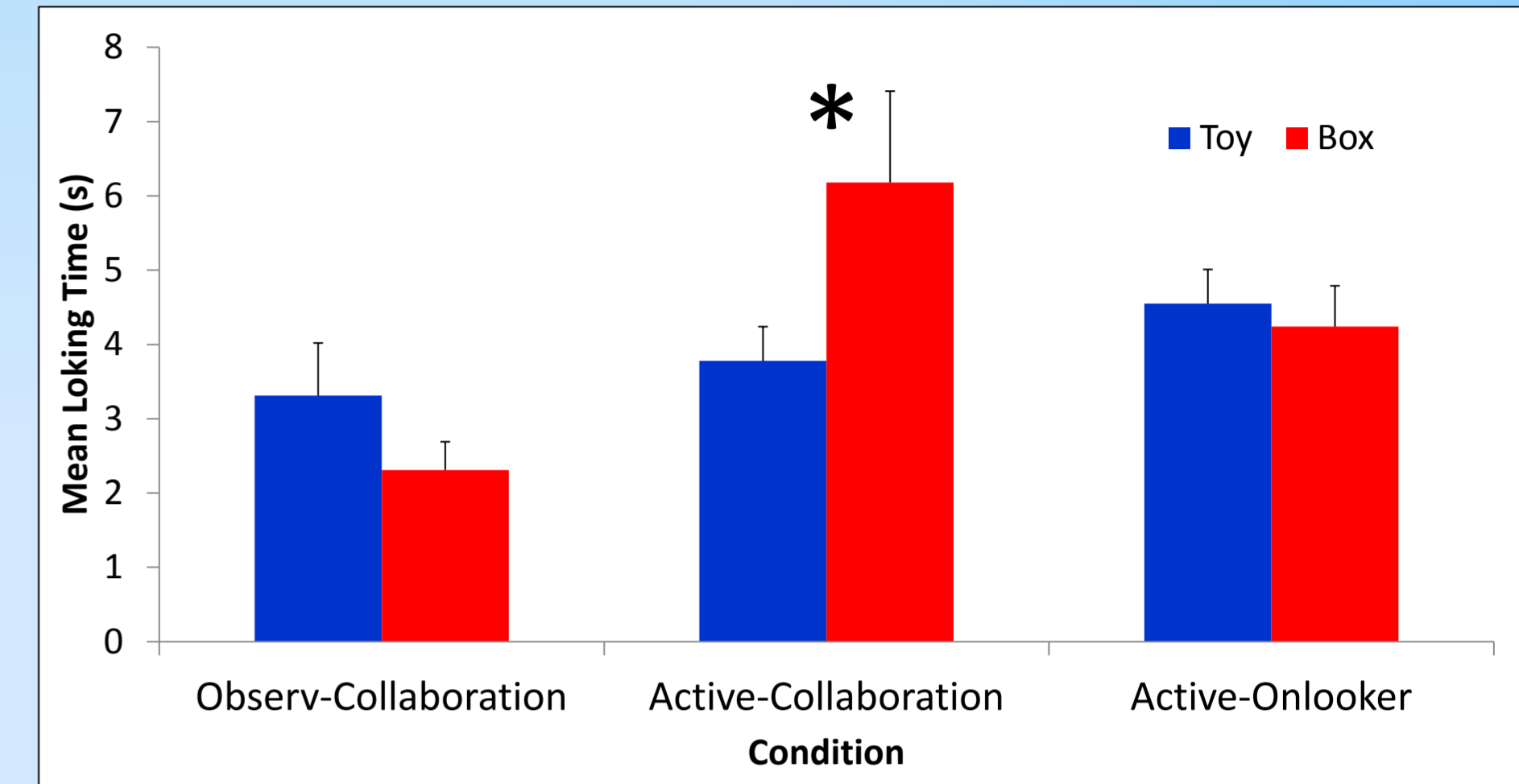


Box test trial:
Onlooker grasps box (i.e., **action goal**)

Onlooker Event Prediction:

If infants generalize means-ends goals across people, regardless of whether they are collaborating, infants should look longer towards the box test trials.

Results



Observational Experience – Collaboration Event Condition

Infants did not look reliably longer towards either test event, $t(17) = 1.50$, $p = .15$, $d = 0.41$, $r = 0.20$.

Active Experience - Collaboration Event Condition

Infants looked reliably longer on the box test trials, $t(17) = 2.36$, $p = .03$, $d = 2.58$, $r = 0.79$.

Active Experience - Onlooker Event Condition

Infants did not look reliably longer on the box test trials, $t(17) < 1$.

Finding: Active Experience Matters!!

Providing infants with active experience (but not observational experience) with a box-toy collaborative activity promoted infants' understanding of the collaborative-goal structure underlying a similar collaborative activity.

Critically, active experience did not guide infants to over-attribute the goal of the means-ends sequence (i.e., to get the toy) to any individual who was present for the sequence of events but not collaborating.

General Discussion

Our findings provide the first evidence that *active* experience in a collaborative task promotes infants' ability to identify collaborative goals. That is, 10-month-olds demonstrate an understanding of collaboration only after they have been provided with the opportunity to actively engage in a collaborative activity.

Importantly, our findings also show that active experience promotes infants' understanding of collaborative goals and not simply a general understanding of the goal structure underlying means-ends events.

Our findings are consistent with previous work demonstrating that active experience is central to the emergence of an understanding of simple goal-directed action^{5,6}.

Demonstrating that experience in a laboratory context shapes infants' collaborative understanding suggests that activities could be designed for use in infants' everyday lives to promote infants' collaborative understanding and behaviour.