

Infants' Generalization of Causal and Non-causal Actions Across Social Groups

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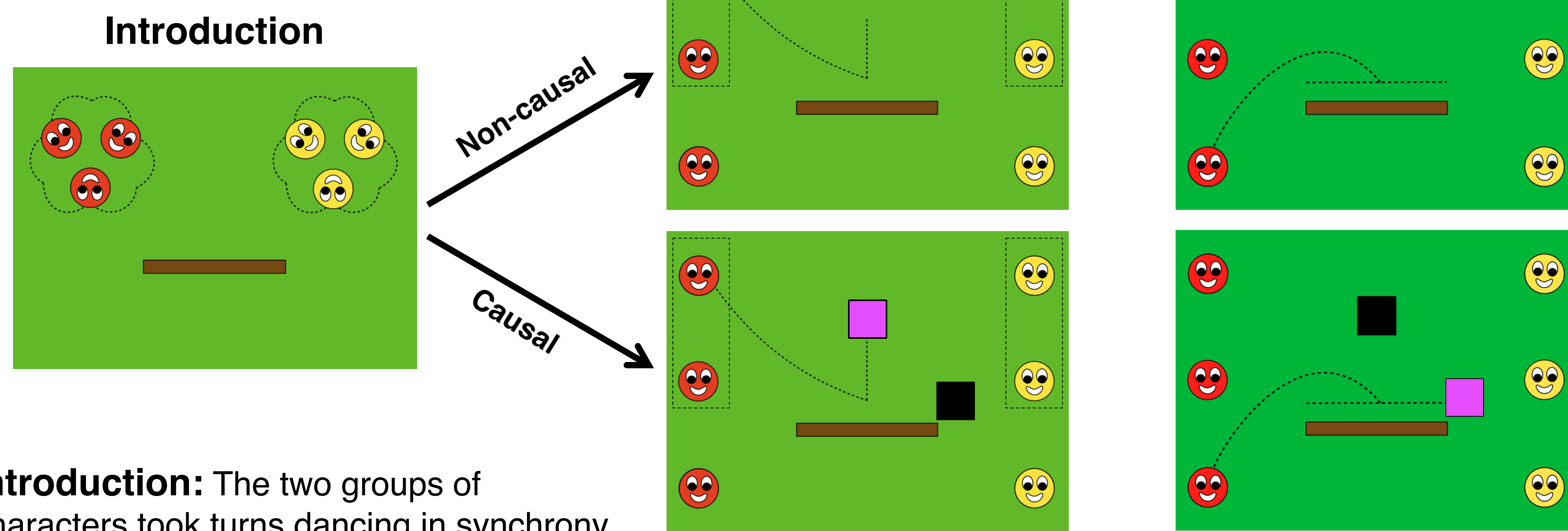
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Study 1: Generalizing Causal vs. Non-causal Actions

Adults expect members of social groups to act alike (Bodenhausen & Macrae, 2000). Previous work shows that preverbal infants also expect common behaviors amongst social groups (Powell & Spelke, 2013).

These past studies tested infants' generalizations of non-causal actions. Here we hypothesize that infants will *not* similarly generalize causal behaviors across groups. Causal actions can be explained in terms of their external goals (Schachner & Carey, 2013), and thus don't require social explanations. Moreover, there may be separate core domains of social vs. agentic reasoning in infancy (Spelke, Bernier & Skerry, 2013).

Participants: 48 7.5- to 9.5-month-olds and 46 11.5- to 13.5-month-olds (The 24 infants in each age range assigned to the non-causal condition were reported in Powell & Spelke, 2013a, 2013b)



Introduction: The two groups of characters took turns dancing in synchrony

Familiarization (4 trials): The top two characters from one group jumped on the platform, and the top two characters from the other group slid back and forth on it.

Causal Condition: Jumping and sliding characters contacted black boxes which then turned purple.
Non-causal Condition: There were no boxes; jumping and sliding characters produced no external effect.

Test: The last member of each group performed the same action (i.e. both jumped or both slid), such that one character matched its group (group consistent trials), and one did not (group inconsistent trials).

Round 2: Familiarization (2 trials, top member of each group acting once) and test trials were repeated a second time.

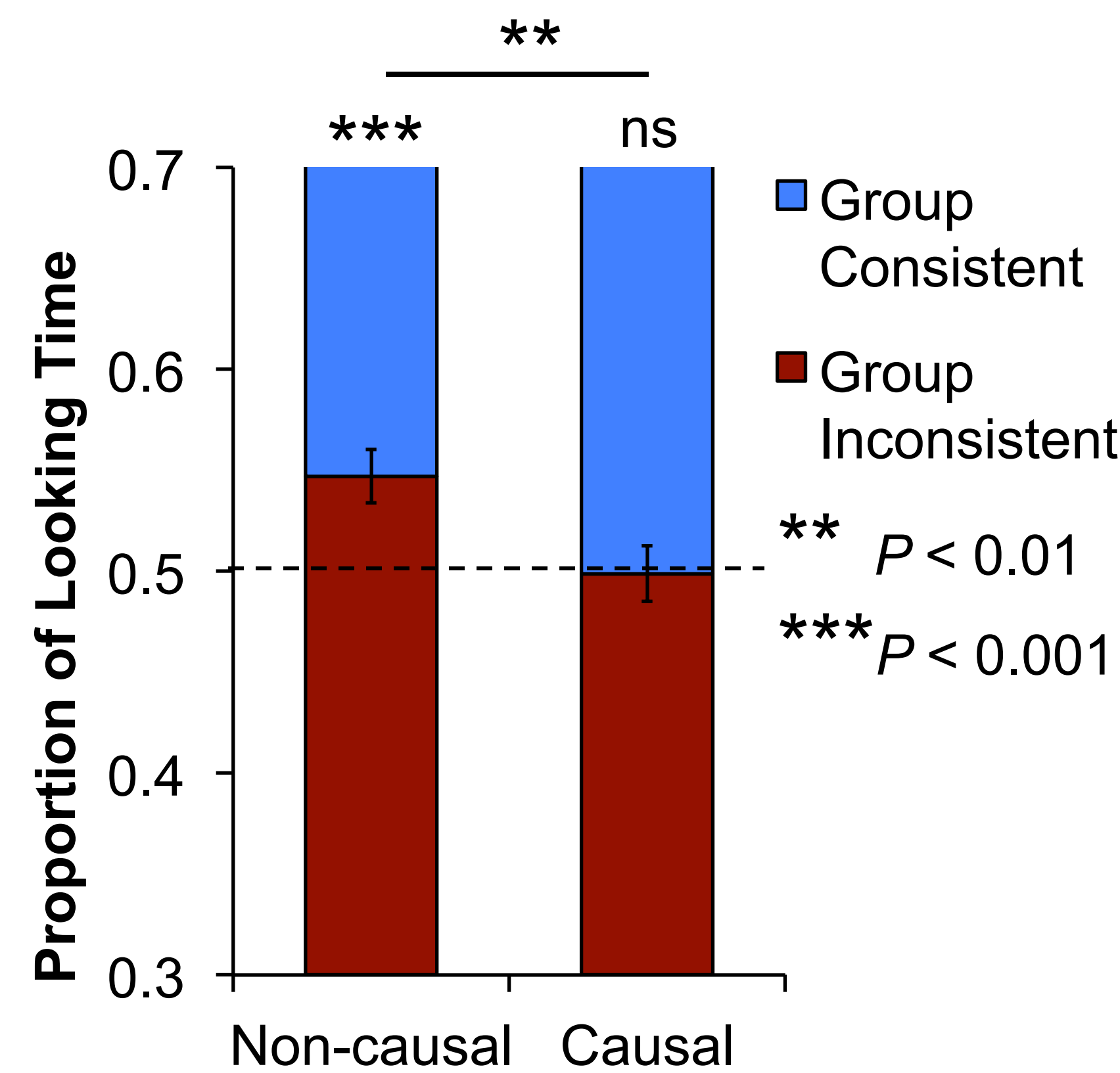
Results:

-There was a significant trial type x condition interaction, $F(1,86) = 7.84, P < 0.01$. There were no significant interactions with age.

-Infants in the non-causal condition looked significantly longer at group inconsistent trials, $t(47) = 3.56, P < 0.001$.

-In the causal condition, looking times to consistent and inconsistent trials did not differ significantly, $t(45) = 0.09, P > 0.9$.

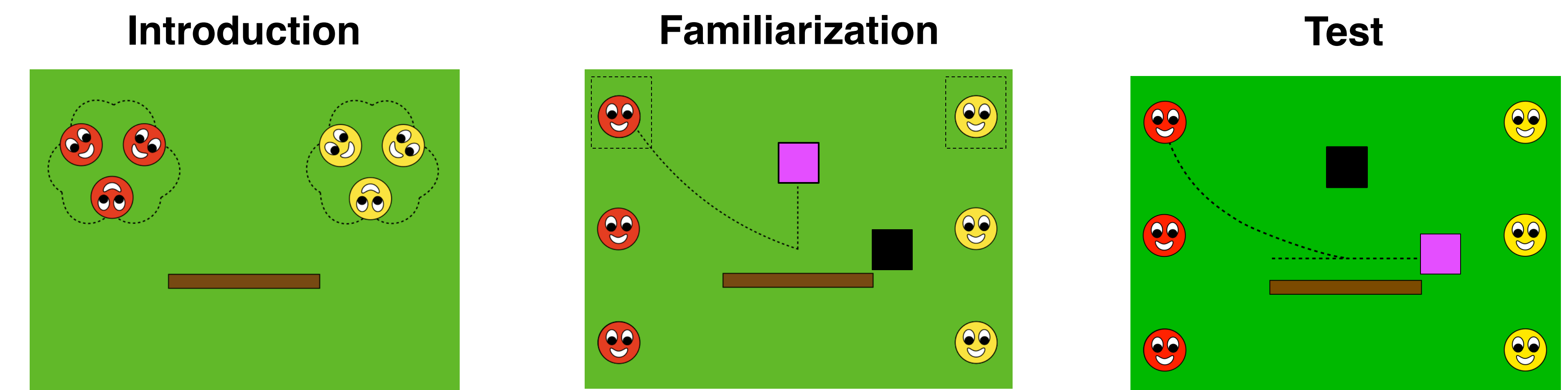
Discussion: The reliable violation of expectation response that infants show to group inconsistent non-causal actions does not occur when they are presented with causal actions. Infants may interpret causal actions in terms of their instrumental goals rather than their social relevance.



Study 2: Individual Action Control Experiment

The second experiment was designed to rule out the possibility that the outcomes of the causal actions distracted infants, which might prevent them from tracking the consistency or inconsistency of actions not only across social groups but within individual behavior as well.

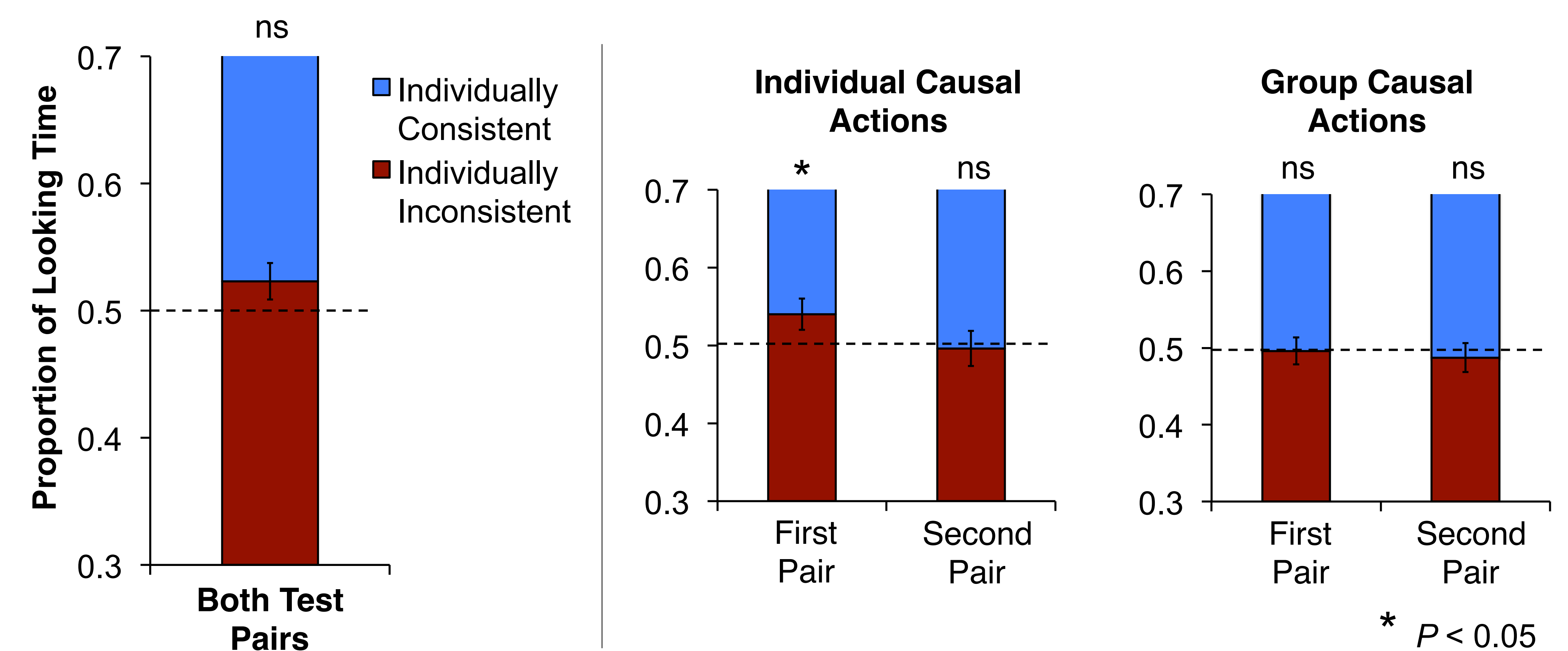
Participants: 24 7.5- to 9.5-month-olds and 22 11.5- to 13.5-month-olds



Methods: The procedure was the same as in Study 1 except that only the top character from each group acted during familiarization and test.

Those two characters performed contrasting actions during familiarization, and then one switched to an individually inconsistent action at test.

Results: Averaging across both test pairs, there was no significant main effect of trial type $F(1,42) = 2.47, P < 0.1$. Separating the two test pairs did reveal significantly longer looking to individually inconsistent actions in the first test pair but not the second. There was no sign of a similar initial difference in looking to group inconsistent actions in the causal condition of Study 1.



Discussion: Although the results are weak, infants' reaction to the first test pair suggests the outcome of the causal actions does not prevent them from learning agent-action contingencies. The lack of effect in the second test pair may be a product of the individual actor's highly variable action profile across the two rounds of trials in this condition.

References

Bodenhausen, G.V. & Macrae, C.N. (2000). *Ann. Rev. Psychol.* 51:93-120. Schachner, A. & Carey, S. (2013). *Cognition*. 129:309-327. Acknowledgments: This work was supported by the National Institutes of Health (5R01HD023103-23).
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