



# Preverbal Infants' Third-Party Imitator Preferences

## Animated Displays versus Filmed Actors

Heather L. Kosakowski<sup>1,2</sup>, Lindsey J. Powell<sup>1</sup>, & Elizabeth S. Spelke<sup>2</sup>  
<sup>1</sup>Brain and Cognitive Sciences, MIT, <sup>2</sup>Department of Psychology, Harvard University  
 Center for Brains, Minds, & Machines



### Introduction

- Imitation promotes prosocial behavior (Chartrand & Bargh, 2012; Carpenter, Uebel, & Tomasello, 2013).
- Preferential looking tests suggest 4-month-old infants prefer agents that imitate (Powell & Spelke, in prep).
- Newborn infants process schematic and real face stimuli similarly (Farroni et al., 2005).

### Questions

- Do children learn that imitation is positive through extensive social interaction, or do even young infants prefer imitators?
- Will infants still demonstrate an imitator preference if actors are used instead of animations?

### Participants

- 97 four- to five-month-old infants (4;00-5;15).

### Methods

#### Familiarization

##### Responders Condition

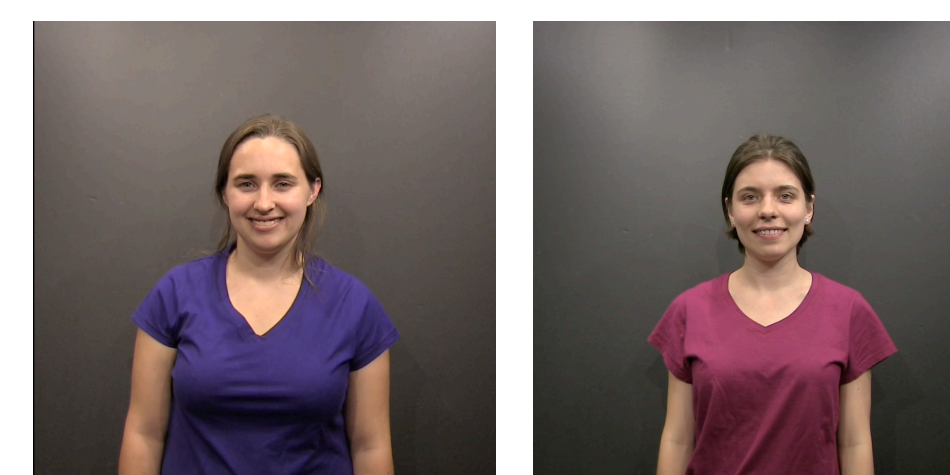
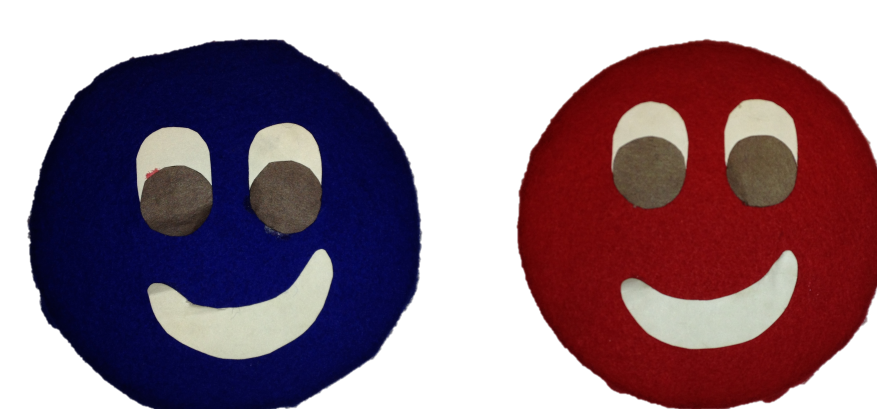
The Initiator performs an action and Responder 1 performs the same action (imitating) or a contrasting action (not imitating). Then the Initiator repeats her action and Responder 2 does the opposite of Responder 1.

##### Initiators Condition

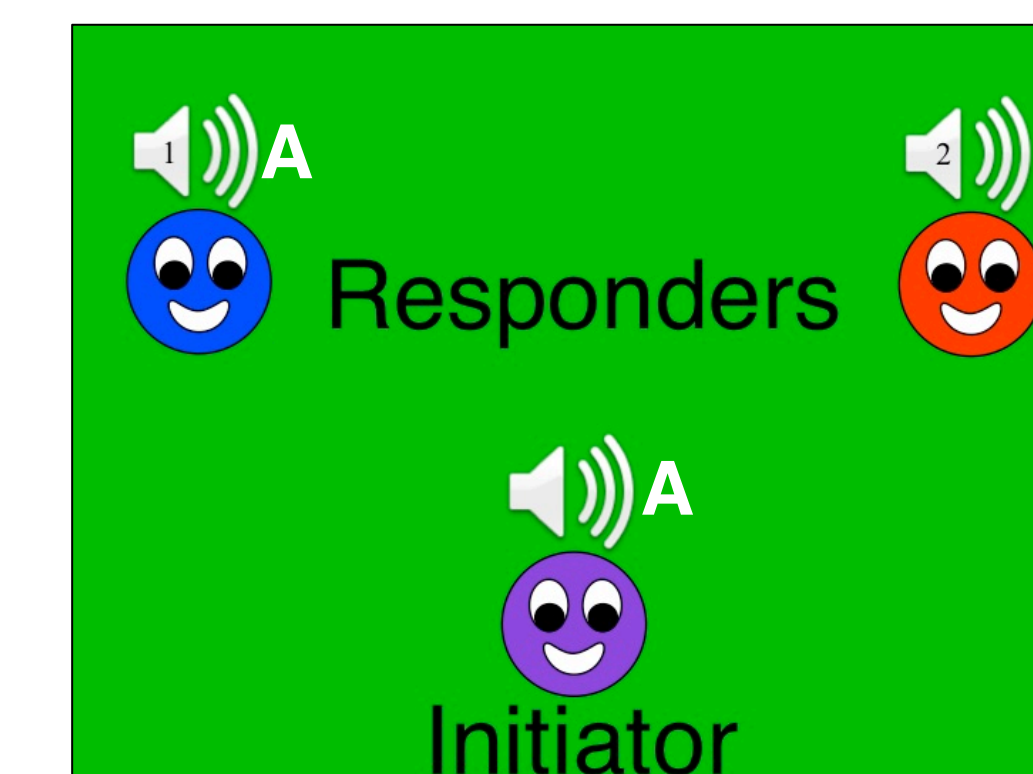
Initiator 1 performs an action, and the Responder performs the same action (imitating) or a contrasting one (not imitating). Then Initiator 2 performs the contrasting action and the Responder performs the same action as before.

#### Preferential Looking Test

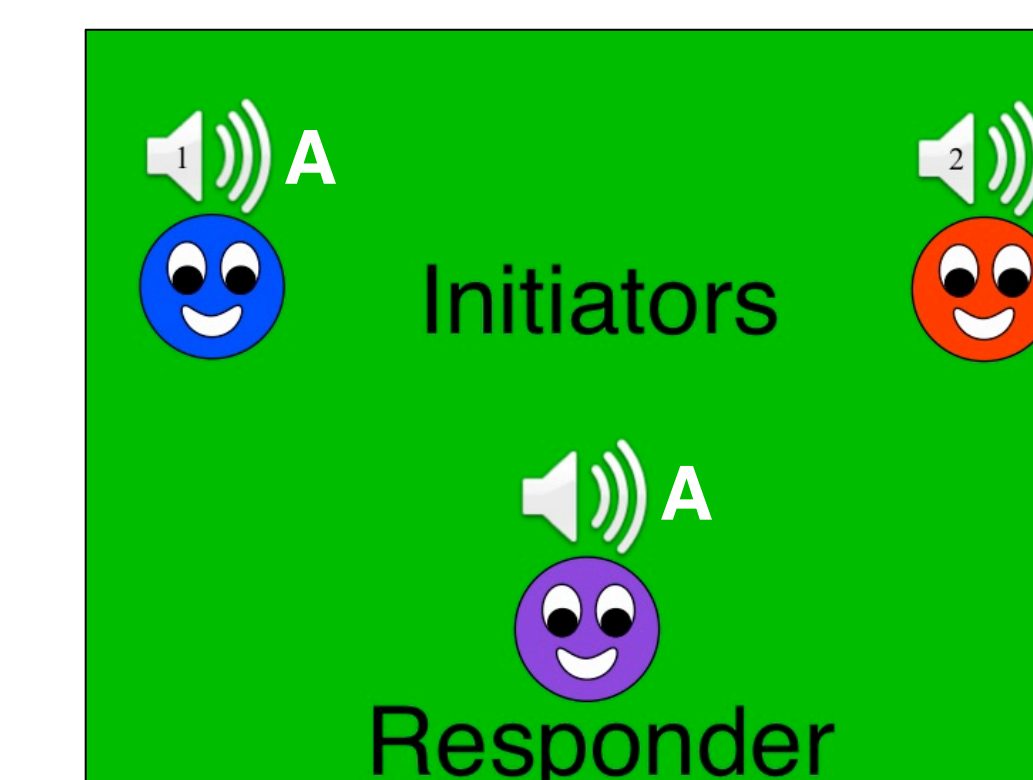
After four rounds of familiarization, we measured the amount of time infants spent looking at each character during a 20 second time period.



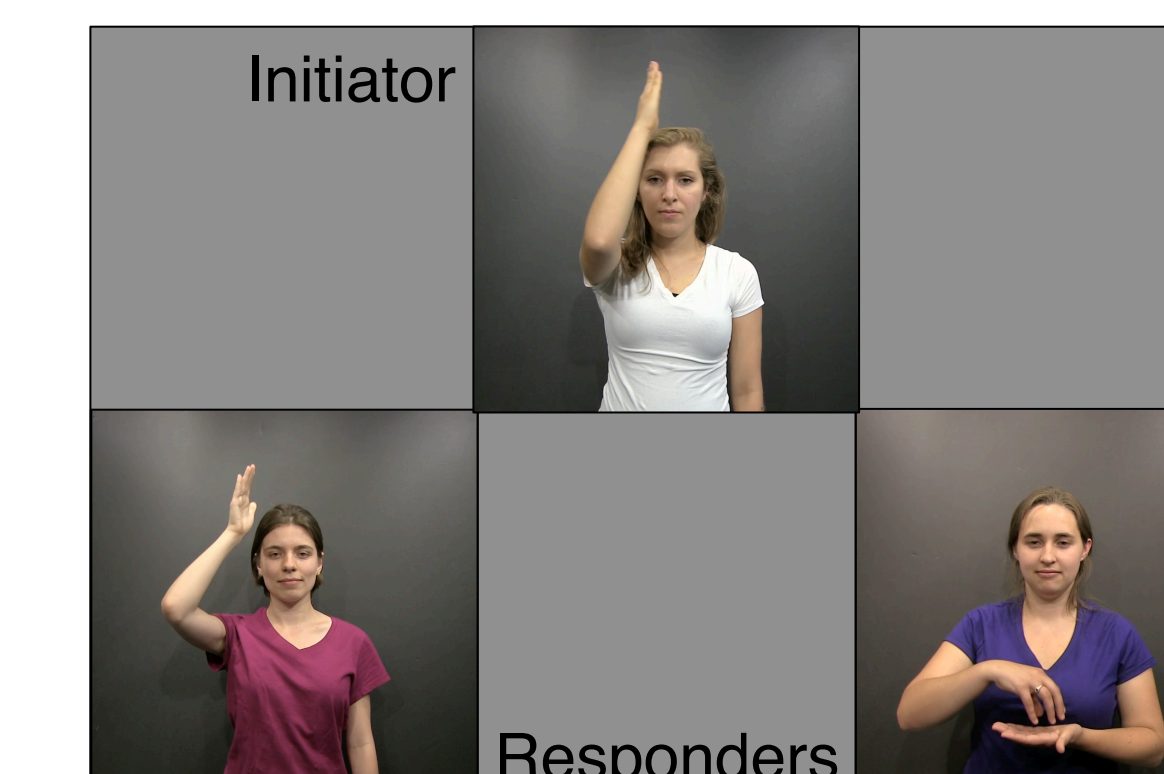
#### Animated Displays



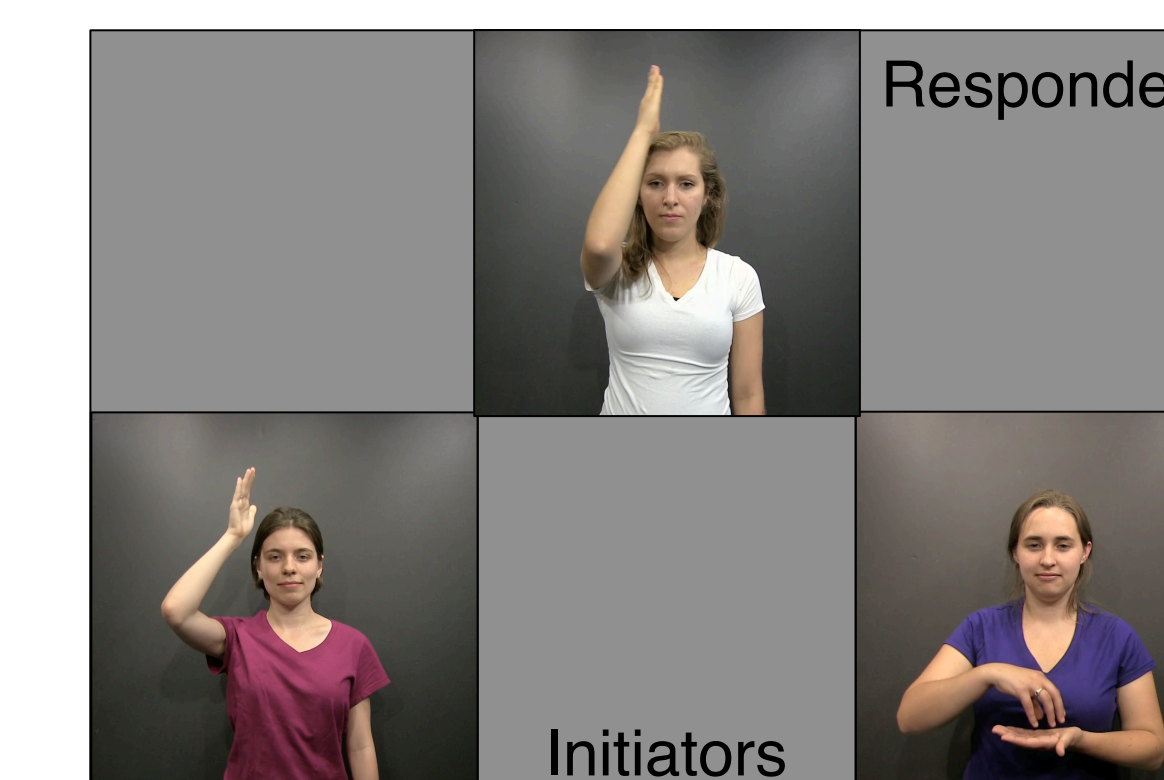
Characters jump and produce a sound (high or low).



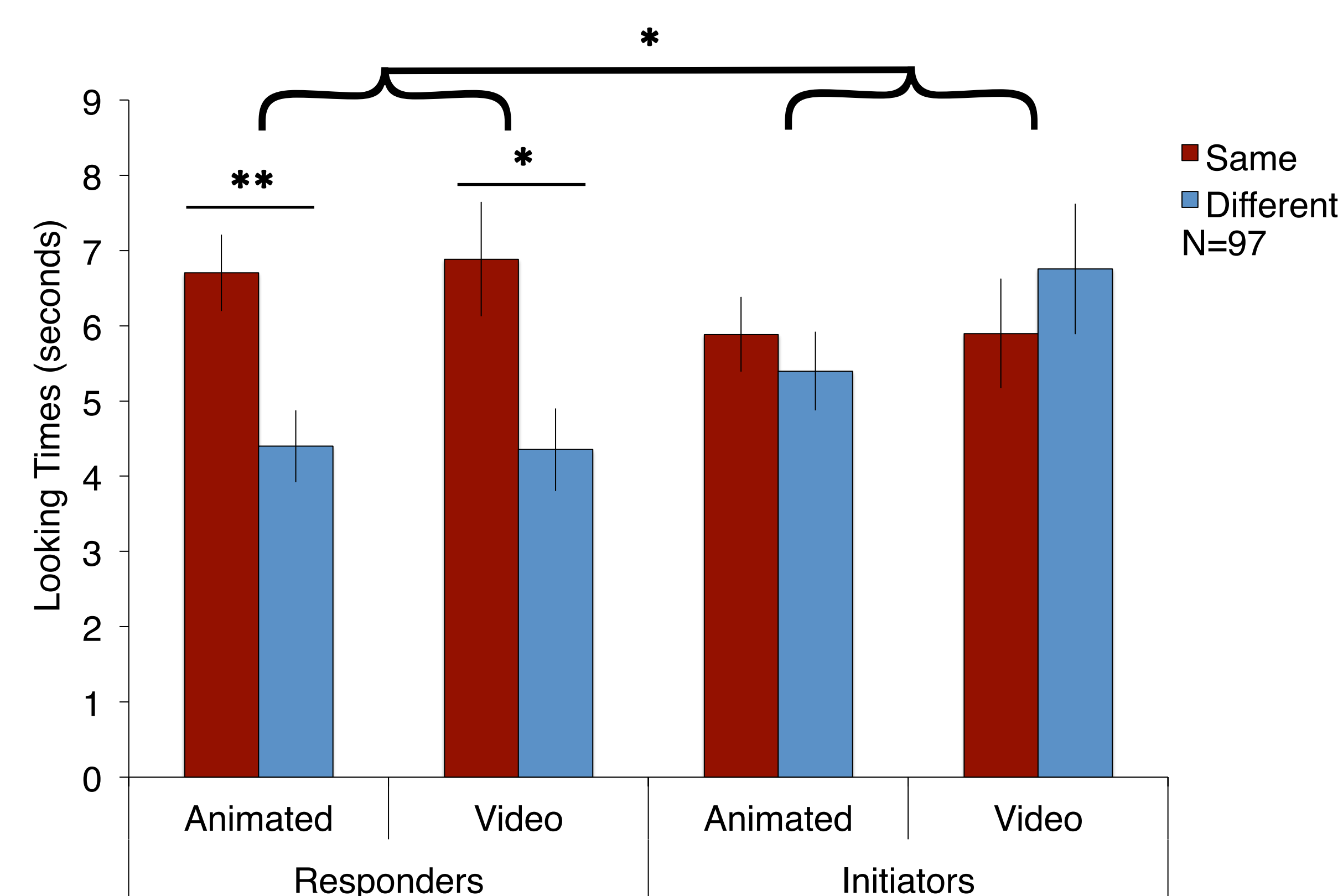
#### Video Displays



Actors say "ah" and produce an action modified from American Sign Language.



### Results



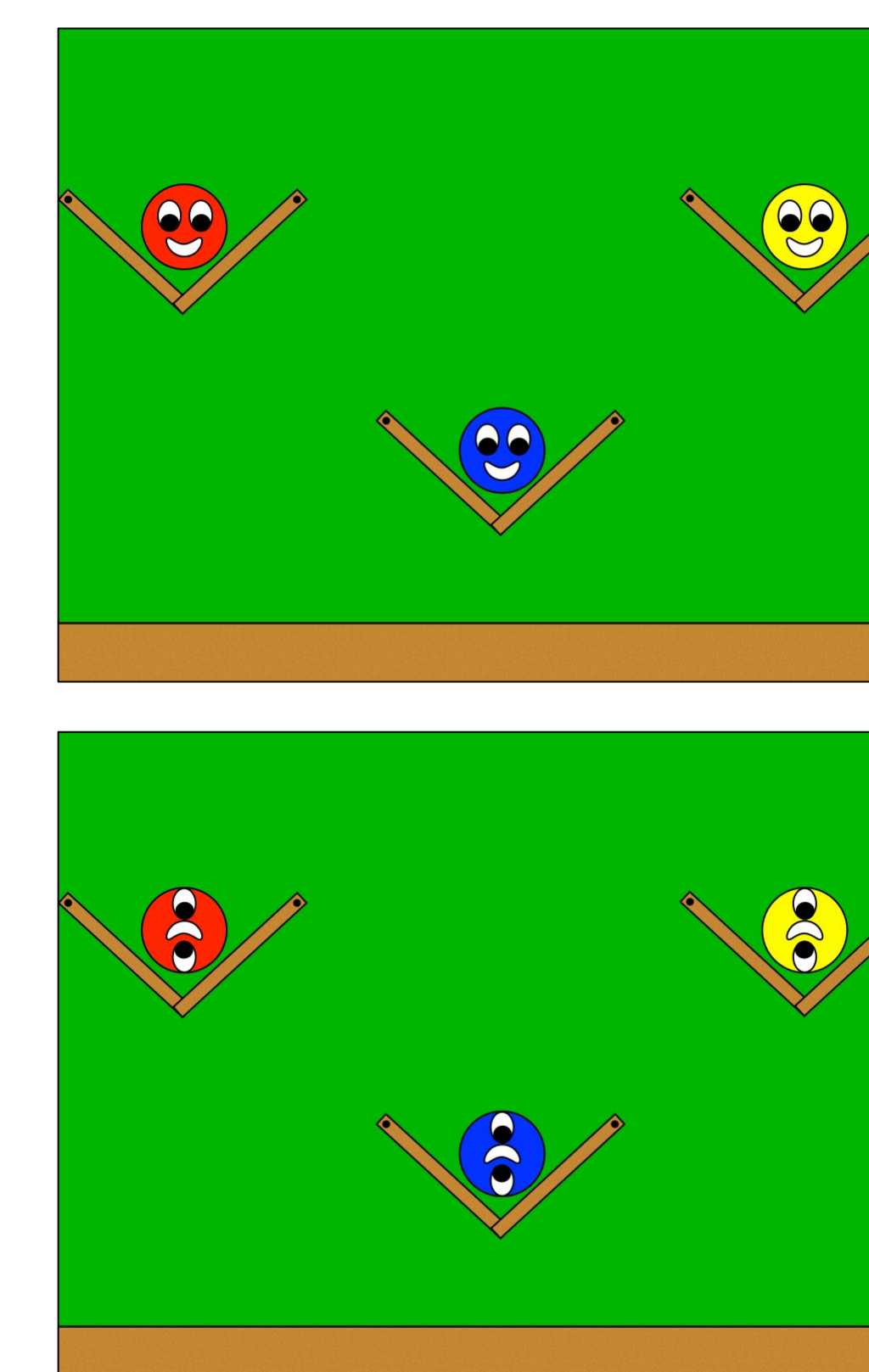
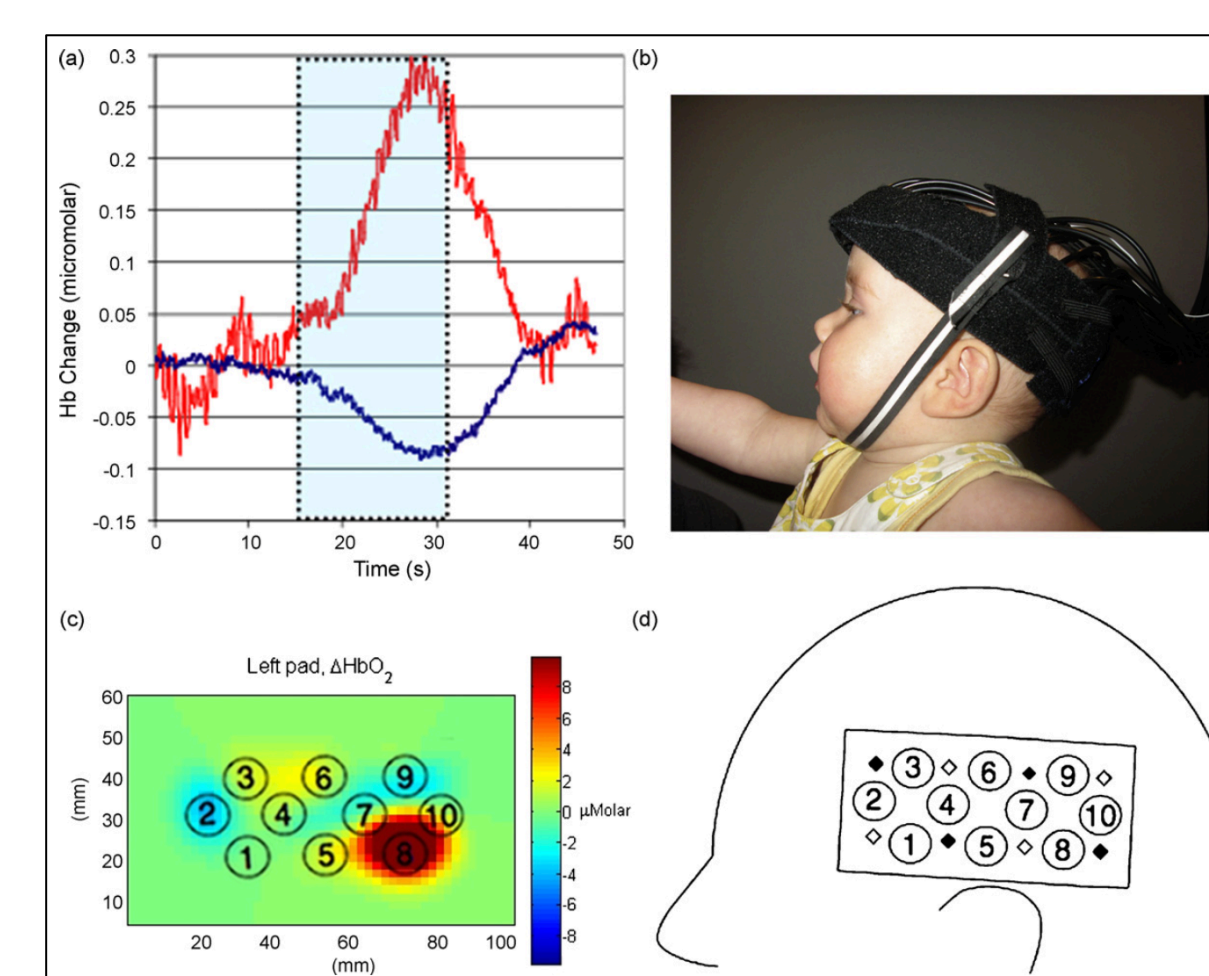
- Interaction between condition and action [ $F_{(1,97)} = 6.58, P < .05$ ].
- Infants look longer at the imitator than the non-imitator: animated [ $t(23) = 3.26, P < .01$ ]; video [ $t(23) = 2.80, P < .05$ ]
- Infants fail to differentiate between the target and non-target: animated [ $t(24) = 0.63, P > 0.5$ ]; video [ $t(23) = 0.62, P > 0.6$ ]

### Future Directions



New actors.  
Simplified movements.

Measure functional neural activation using NIRS



Agents vs. Objects

### Conclusions

- Infants prefer third-party imitators but do not demonstrate a preference for targets of imitation.
- Infants' imitator preferences are reliable in both animations and video displays.

### References

Chartrand, T. L., & Bargh, J. A. (1999). *J. Pers. Soc. Psychol.*  
 Carpenter, M., Uebel, J., & Tomasello, M. (2013). *Child Development.*  
 Farroni T., Johnson, M. H., Menon, E., Zulian, L., Faraguna, D., & Csibra, G. (2005). *PNAS.*  
 Lloyd-Fox, S., Blasi, A., & Elwell, C. E. (2010). *J. Neurobiorev.*  
 Powell, L. J. & Spelke, E. S. (in preparation).  
 Over H., & Carpenter, M. (2014). *Devel. Sci.*

### Acknowledgements

The Center for Brains, Minds, and Machines, The Harvard Laboratory for Developmental Studies, The Spelke Lab, and the families who participated.  
 Mandana Sassanfar, PhD, Aracely Aguirre, Kaitlin Bohon, Sophia Clavel, Rayna Edels, Galina Gagin, Rosa Guzman, and Hannah A. LeBlanc.  
 This material is based upon work supported by the Center for Brains, Minds and Machines (CBMM), funded by NSF STC award CCF-1231216.

