

# Psychology 3016: Lecture 5

## Social Cognition 1

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# Social Cognition Learning Outcomes

## **Learning Outcomes across the Social Cognition mini-course**

LO1 – demonstrate a deep understanding of the evidence to show different aspects of social cognition in human children and the great apes.

LO2 – consider the strengths and limitations of experiments used to test social cognition in humans and apes.

LO3 – explain how results from experiments used to test social cognition provide evidence to show different aspects of social cognition.

LO4 – understand how experimental results of tests of social cognition can inform knowledge and practice regarding child social-cognitive development and autism spectrum disorder.

LO1 – critically consider what the research evidence tells us about the development of social cognition and determine what questions remain.

# Essential Course Readings

## Three theoretical papers:

1. Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*, 28(5), 675-691.  
*Open peer commentary is not obligatory reading*
2. Liszkowski, U. (2013). Using Theory of Mind. *Child Development Perspectives*, 7(2), 104-109.
3. Low, J., & Perner, J. (2012). Implicit and explicit theory of mind: State of the art. *British Journal of Developmental Psychology*, 30, 1-13.

## Two empirical papers:

1. Senju, A., Southgate, V., White, S., & Frith, U. (2009). Mindblind Eyes: An Absence of Spontaneous Theory of Mind in Asperger Syndrome. *Science*, 325, 883-885.
2. Buttelmann, D., Carpenter, M., & Tomasello, M. (2009). Eighteen-month-old infants show false belief understanding in an active helping paradigm. *Cognition*, 112(2), 337-342.

# Basics

- Mirror self recognition
- Empathy
  - Contagion
  - Helping
- Goal and intentions
- Perception and knowledge
- False belief understanding

# Self-recognition

- Self-recognition and the sense of self
  - A physical identity
  - An individual
  - Helps us understand our own point of view
- Theory of mind
  - GLOBAL SENSE: others are different from you
    - others may be driven by different goals and intentions (apes, elephants, dogs?)
  - NARROW SENSE: to be able to represent oneself as a thinker (more to come)

# Basics

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# Empathy: contagion

- Basic building block of empathy?
- Mirror neurons for emotion?
  - You smile, I smile, I feel happy so I know you must also feel happy
- AFFECTIVE EMPATHY:
  - I feel the way you feel
  - I resonate
  - I don't necessarily understand why you feel that way

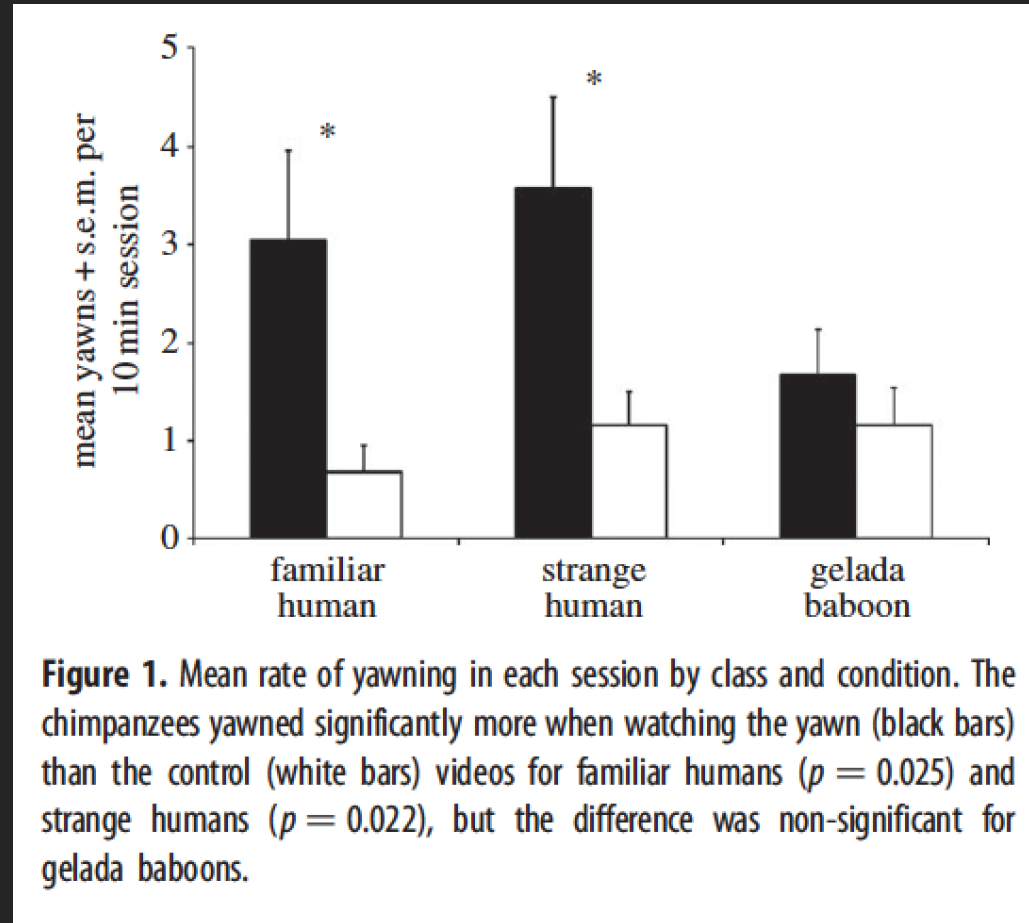




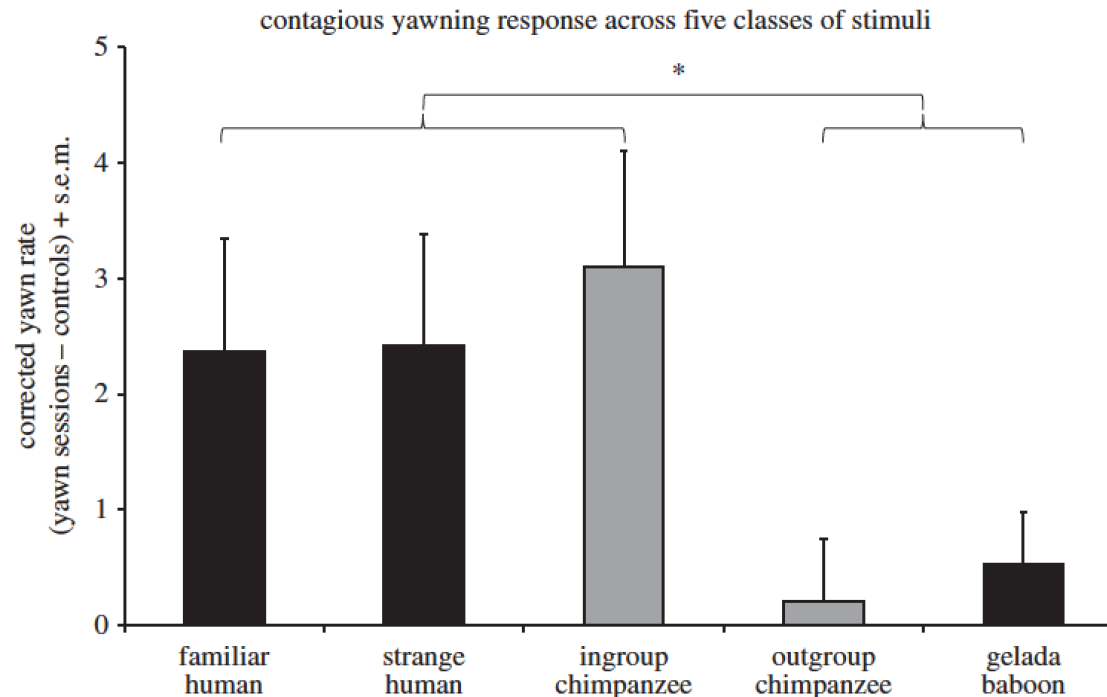
# Empathy: contagion

This study simply asked how often chimpanzees engage in contagious yawning and the extent to which it is driven by the model's characteristics (**familiarity and species**)

Campbell & de Wall (2014)

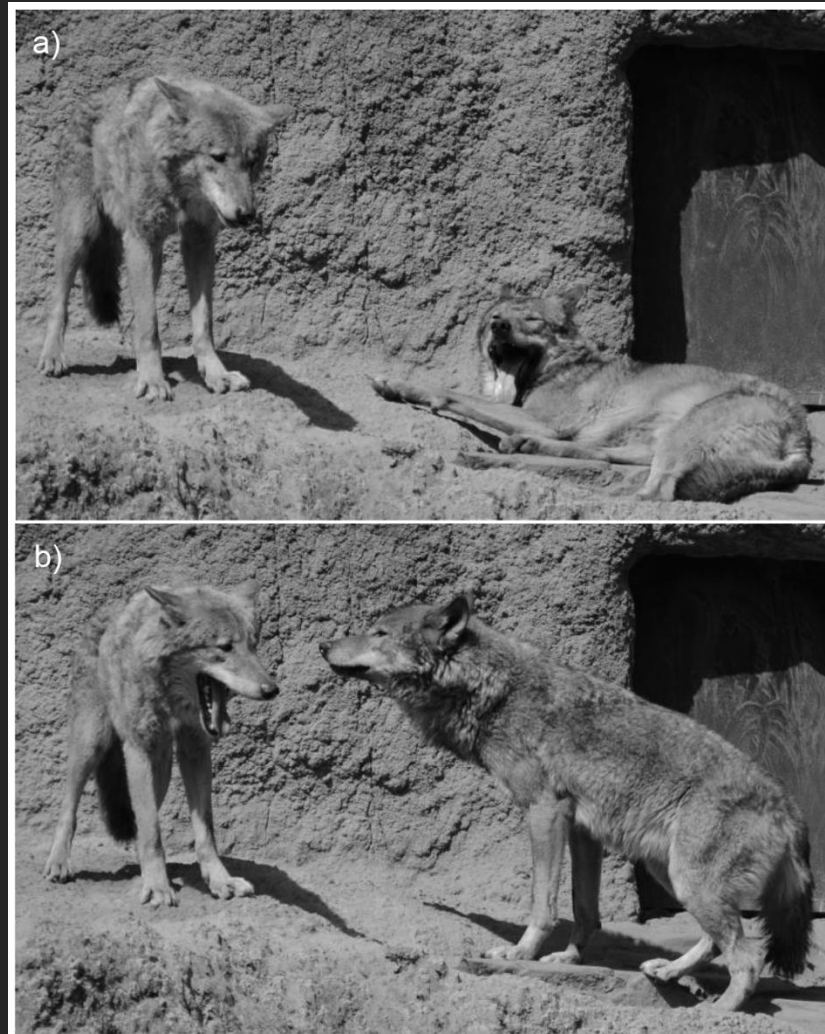


# Empathy: contagion



**Figure 2.** We calculated a yawning index for each individual by subtracting the number of yawns in the control sessions from the number of yawns in the yawn sessions for each class. The graph presents the mean differences + s.e.m. Data for ingroup and outgroup chimpanzees come from our earlier study [13] (grey bars). Previously, we studied 23 chimpanzees in 20 min sessions [13], and in this study (black bars) we worked with 19 chimpanzees in 10 min sessions. The data for [13] have been sampled and restricted to match the current parameters (the same 19 chimpanzees for 10 min), thus a side-by-side comparison with the graphs from [13] will not match. The response to familiar humans, strange humans and ingroup chimpanzees was significantly greater than the response to outgroup chimpanzees and gelada baboons ( $p = 0.003$ ).

# Empathy: contagion



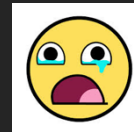
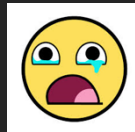
A social mechanism  
– but perhaps not  
very sophisticated

# Basics

- Mirror self recognition
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- False belief understanding

# Empathy - helping

- Response is **not just a mirror of the other**



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# Empathy: helping

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PLOS BIOLOGY

## Spontaneous Altruism by Chimpanzees and Young Children

Felix Warneken<sup>\*</sup>, Brian Hare, Alicia P. Melis, Daniel Hanus, Michael Tomasello

Department of Developmental and Comparative Psychology, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

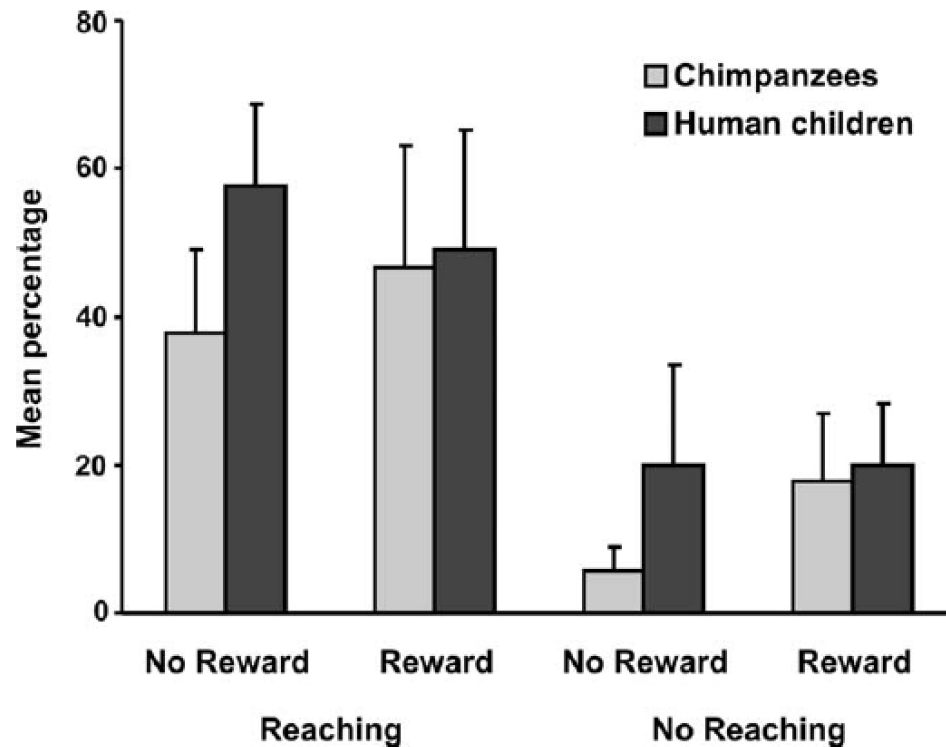
**People often act on behalf of others. They do so without immediate personal gain, at cost to themselves, and even toward unfamiliar individuals. Many researchers have claimed that such altruism emanates from a species-unique psychology not found in humans' closest living evolutionary relatives, such as the chimpanzee. In favor of this view, the few experimental studies on altruism in chimpanzees have produced mostly negative results. In contrast, we report experimental evidence that chimpanzees perform basic forms of helping in the absence of rewards spontaneously and repeatedly toward humans and conspecifics. In two comparative studies, semi-free ranging chimpanzees helped an unfamiliar human to the same degree as did human infants, irrespective of being rewarded (experiment 1) or whether the helping was costly (experiment 2). In a third study, chimpanzees helped an unrelated conspecific gain access to food in a novel situation that required subjects to use a newly acquired skill on behalf of another individual. These results indicate that chimpanzees share crucial aspects of altruism with humans, suggesting that the roots of human altruism may go deeper than previous experimental evidence suggested.**

Citation: Warneken F, Hare B, Melis AP, Hanus D, Tomasello M (2007) Spontaneous altruism by chimpanzees and young children. PLoS Biol 5(7): e184. doi:10.1371/journal.pbio.0050184

# Empathy - helping

- Intentional helping?
- Reaching associated with reward?
- Hierarchical bonds – delayed reward/reciprocation?

# Empathy: helping



**Figure 2.** Experiment 1

Mean percentage of trials with target behavior (handing the out-of-reach object to the recipient) as a function of species and condition. Error bars represent the standard error of the mean (SEM). Each subject participated in one of the four conditions in a between-subject comparison.



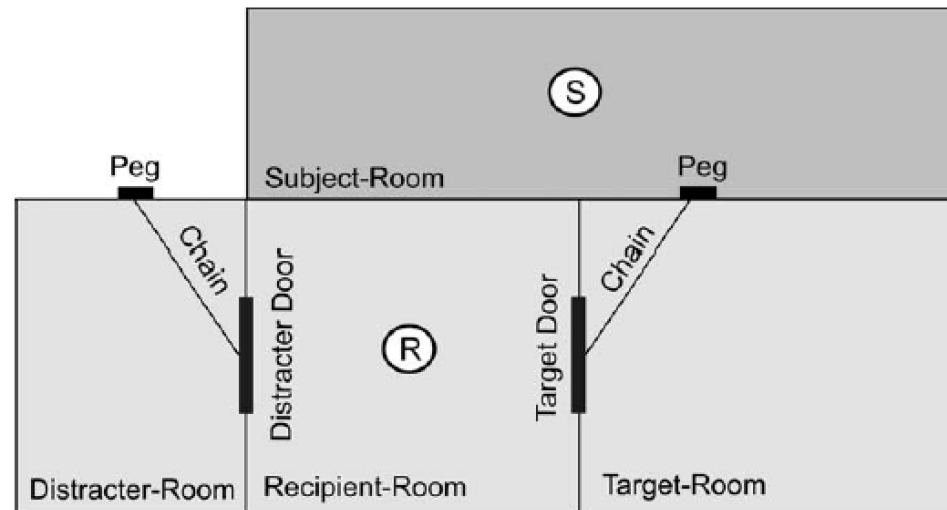
# Empathy - helping

- Intentional helping – seems so
- Reaching associated with reward – no
  - Both children and chimpanzees retrieve the item when the adult seems to be reaching for it
  - But – a non-tangible reward of helping?
- Hierarchical bonds – delayed reward/reciprocation?
  - No - same behaviour with unfamiliar humans

# Empathy - helping

- Is this because they are humans?
  - Trained chimpanzees
  - Used to performing behaviours to get a reward
  - Are they acting in their own interest?
- What about when it is another chimpanzee that needs help?

# Empathy: helping



**Figure 4.** Test Area and Setup in Experiment 3

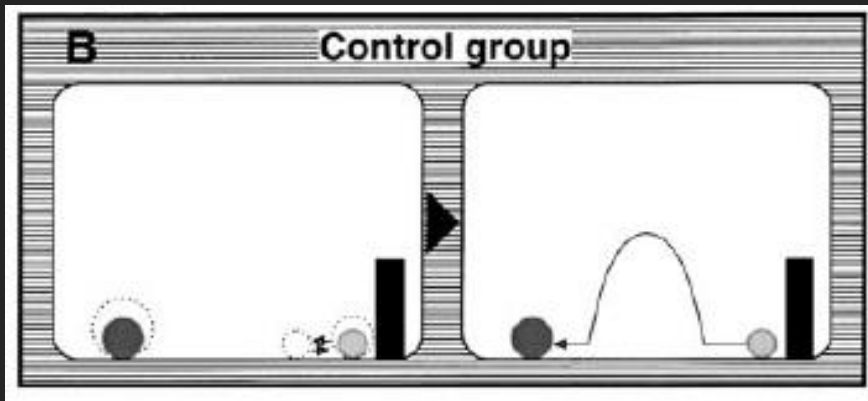
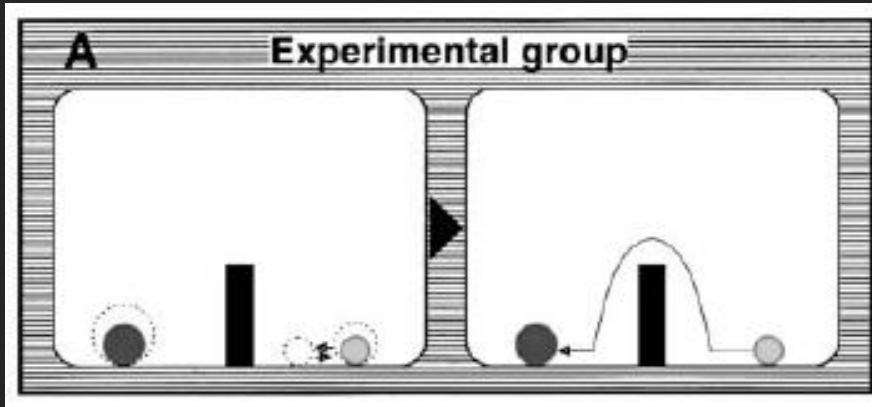
Both the target and the distracter door were held shut by chains. The recipient (R) could not access either chain, but the subject (S) could release the chain of the target door. In the experimental condition, food was placed in the target room, so that the recipient would try to open the target door and the subject could help by releasing the target chain. In the control condition, food was placed in the distracter room, so that the recipient would try to open the distracter door. In this situation, it was irrelevant (with respect to the recipient's attempt to open the distracter door) whether the subject released the target chain. The target measure in both conditions was whether the subject released the target chain.

# Basics

- Mirror self recognition
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- False belief understanding

# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)



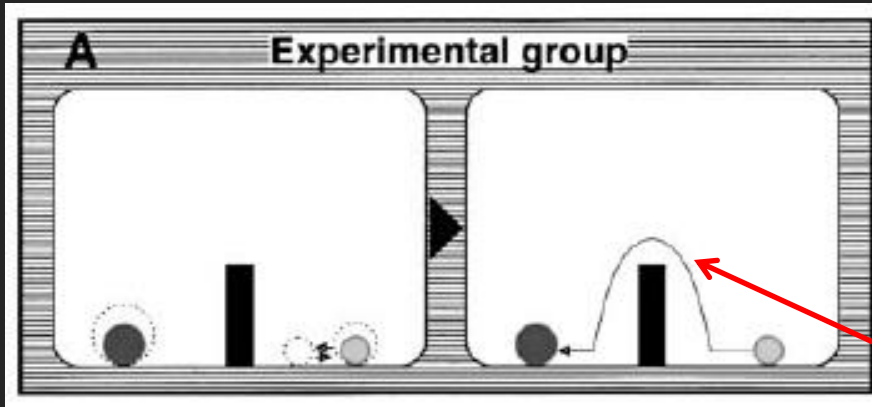
1. Six- and nine-month-old Infants are habituated to one of two conditions (A or B)

You can see here that the elements depicted are the same but in A, the experimental group, the jump of the smaller ball can be interpreted as **instrumental**; that is, it is **necessary to reach** the larger ball.

These studies are important, take some time to understand them properly

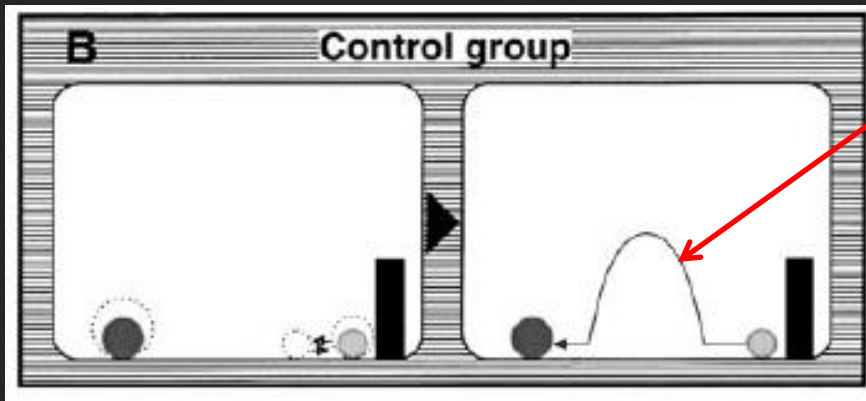
# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)



Rational action - intention

Notice the same indirect path

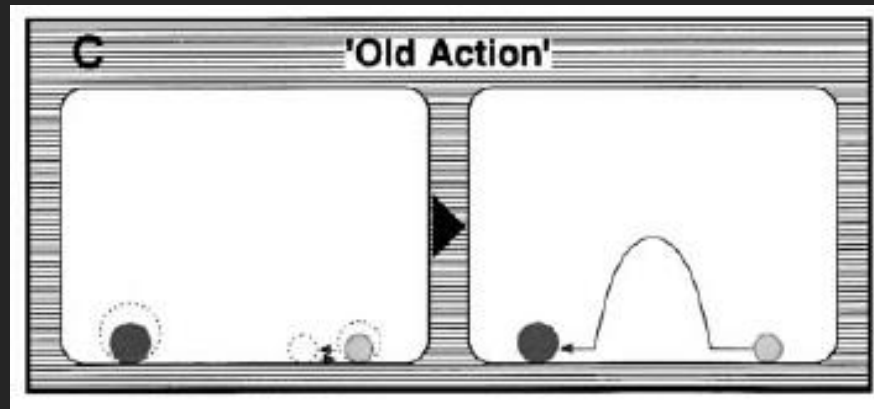


Irrational action – no intention

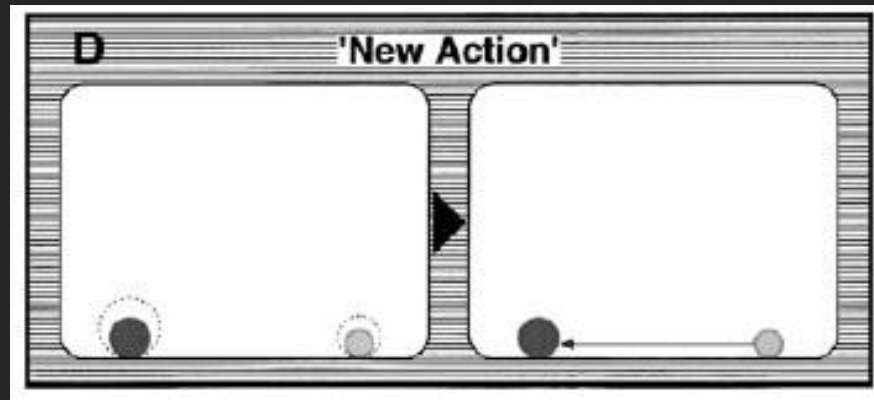
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# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)

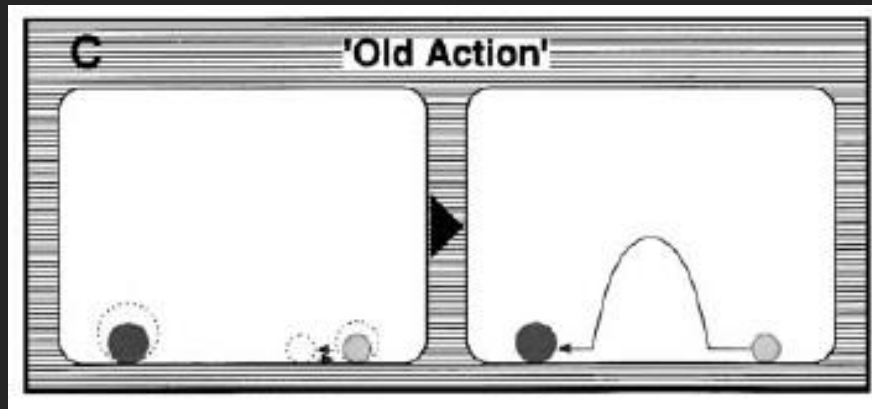


2. In the test trial, infants saw either an old action (C) or a novel action (D). Critically, D could be interpreted as 'rational' because the obstacle was no longer there.

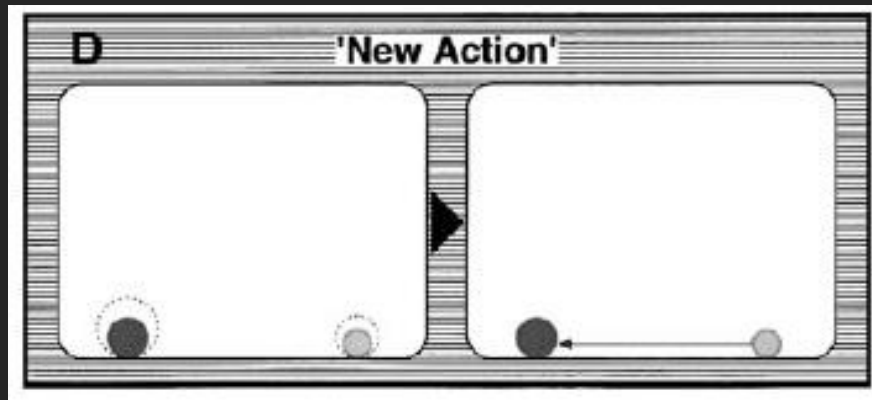


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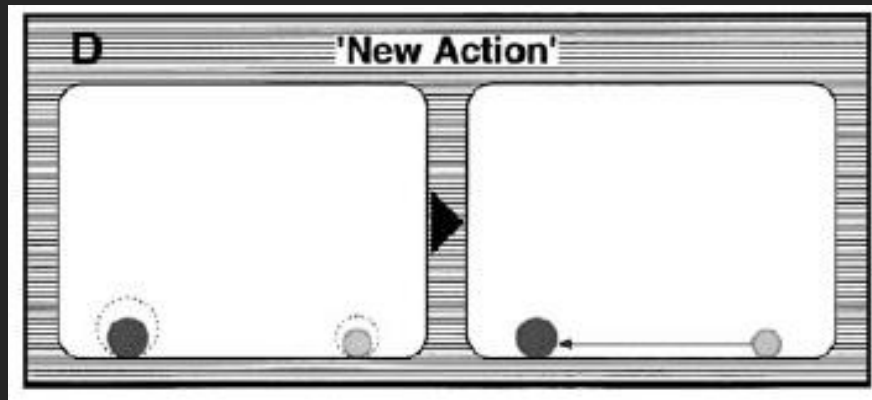
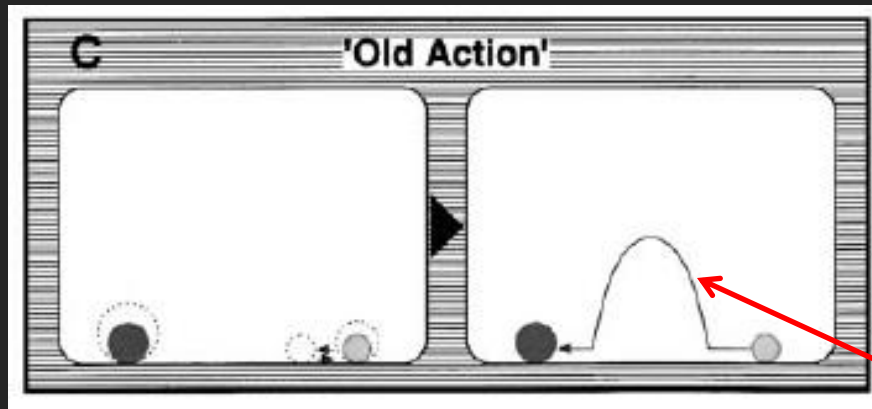


**Question:** In which condition did infants show more *attention recovery*? (i.e., which condition captured their attention?)



# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)



Familiar action is no longer goal directed

# Infant sensitivity to Goal Directed Agency

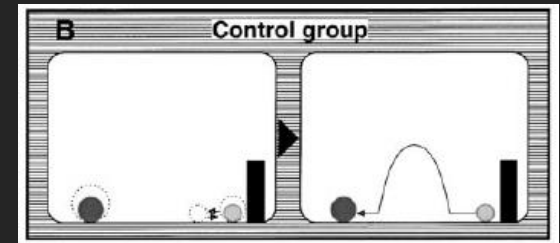
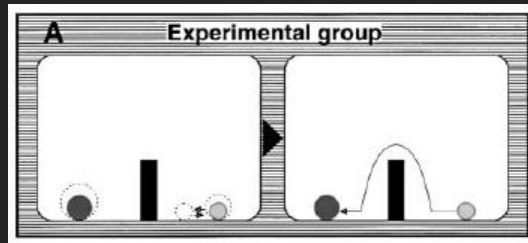
Gergely et al. (1995); Csibra et al., (1999)

Habituation phase

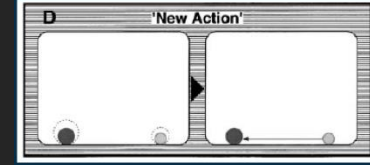
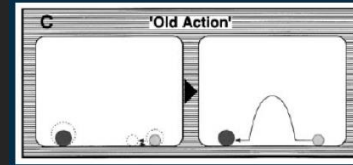
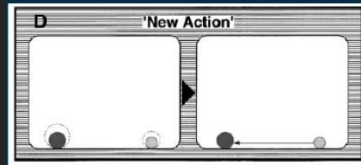
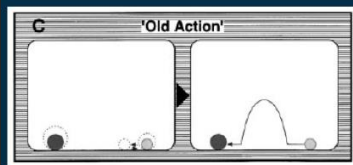
6-month-olds ( $n = 24$ ) and  
9-month-olds ( $n = 24$ )

## Design

Infants allocated to either  
experimental group (A)  
OR control group (B)



## Test trials



Old action first

Old action second

Old action first

Old action second

Experimental Group

Control Group

# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)

Results: In the control group at 9 months, no major differences

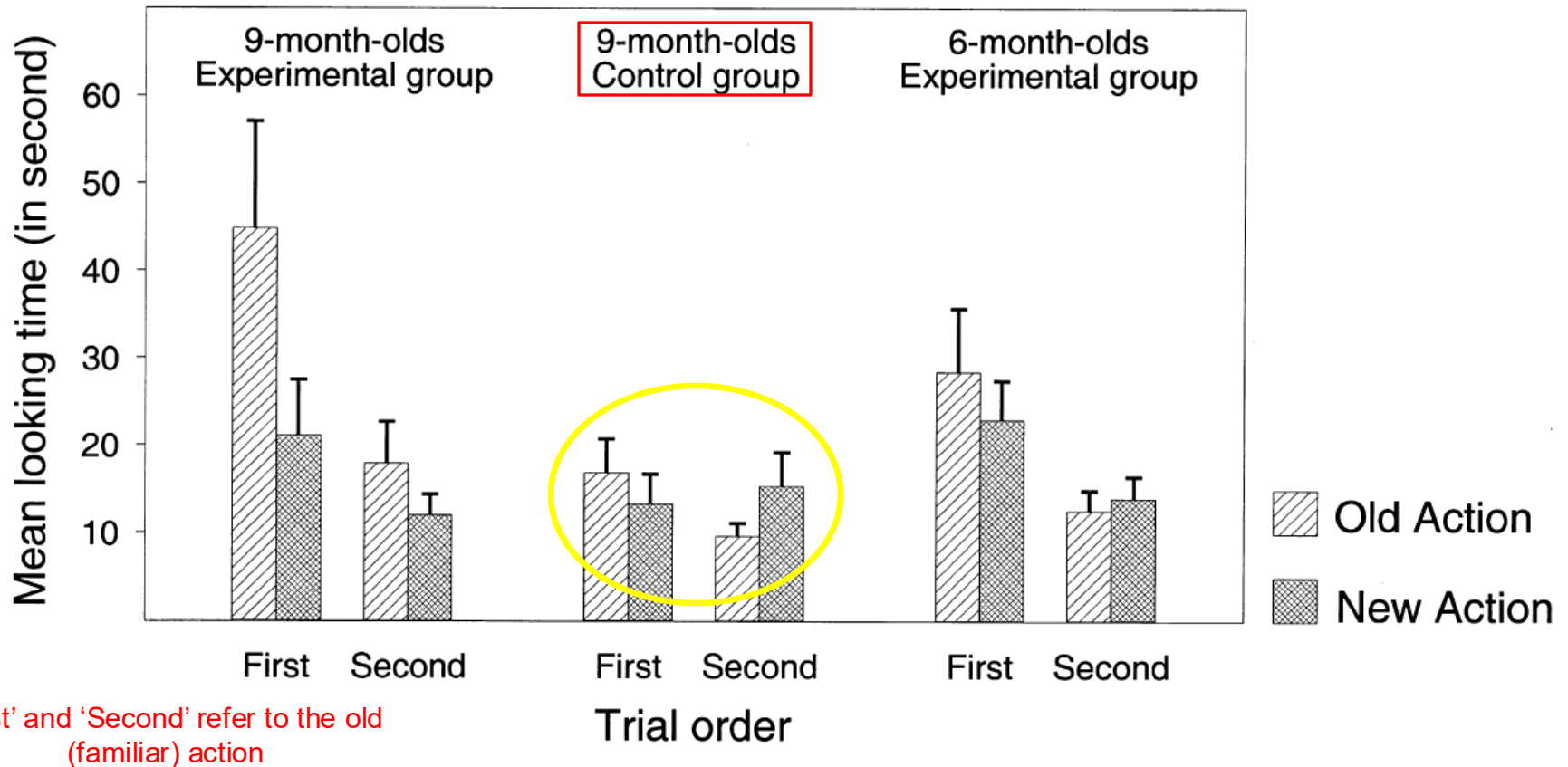


Fig. 2. Mean looking times (and standard errors) in the test phase of Expt. 1 as a function of event type and order of presentation.

# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)

Results: In the experimental group at 9 months, a strong attention recovery for OLD action!

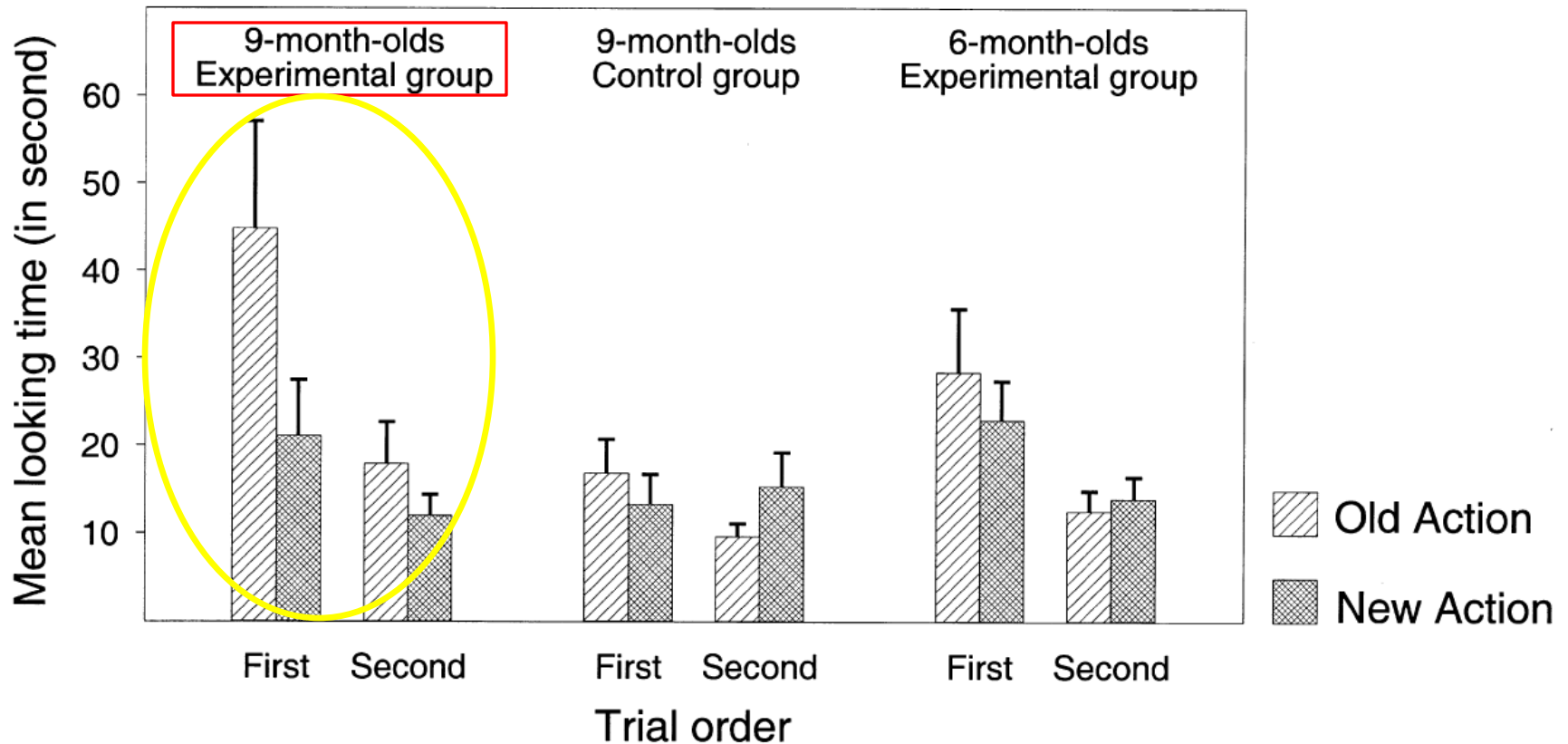


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# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)

Results: Particularly marked when the old action was first

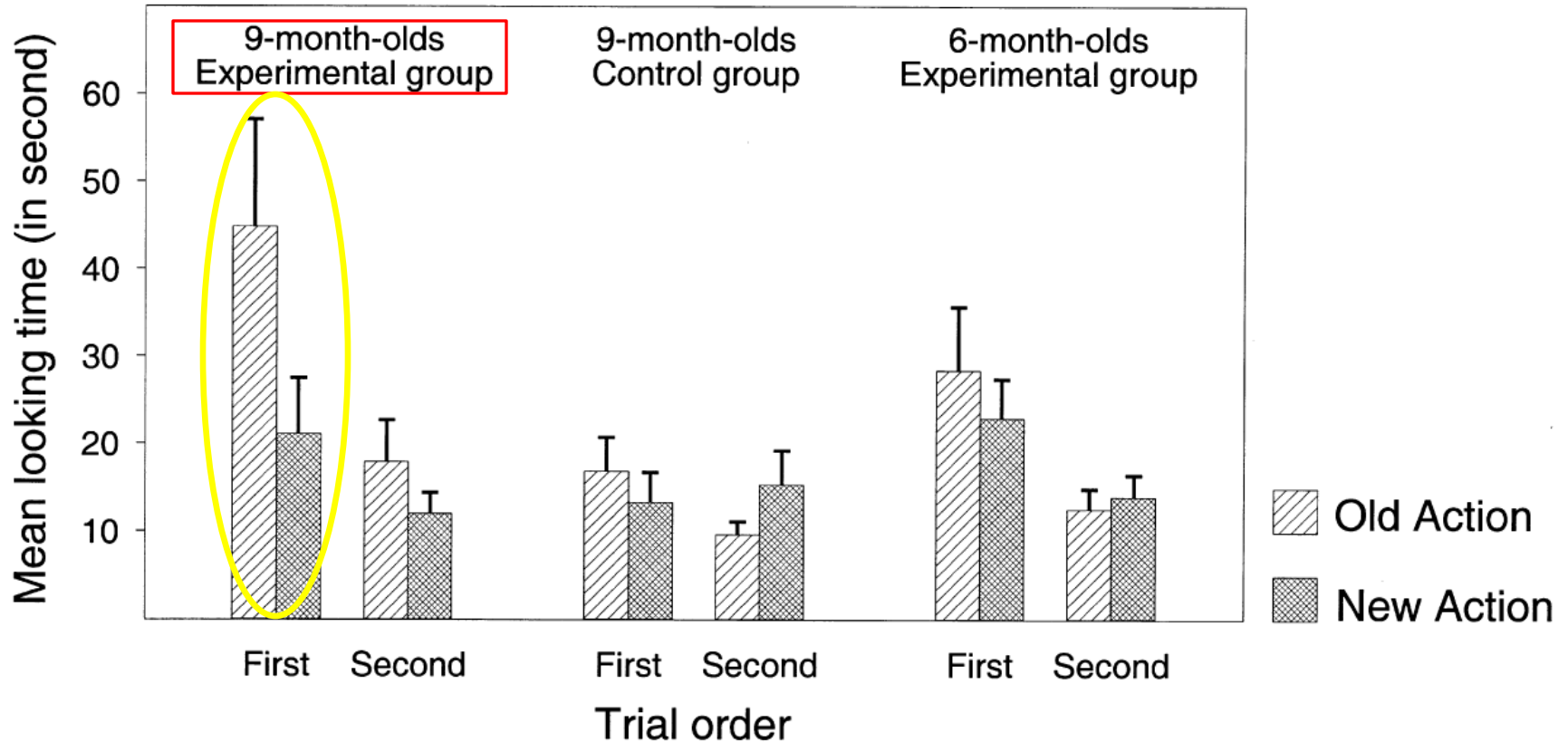


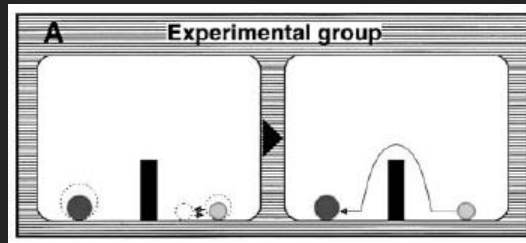
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# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)

Habituation phase

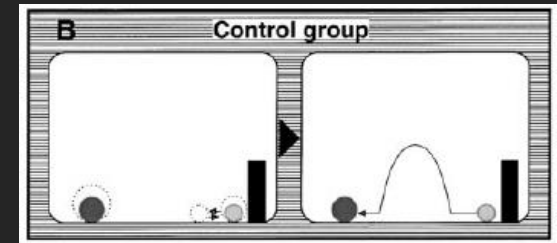
6-month-olds ( $n = 24$ ) and  
9-month-olds ( $n = 24$ )



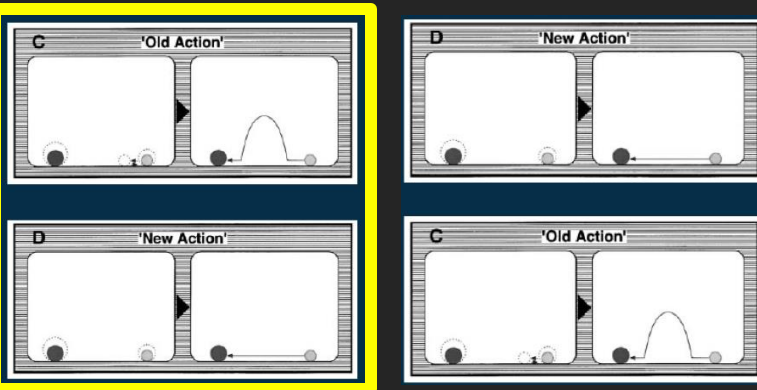
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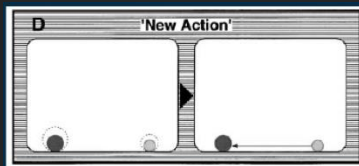
9-month-olds ( $n = 24$ )



## Test trials

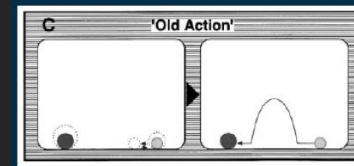


Old action first

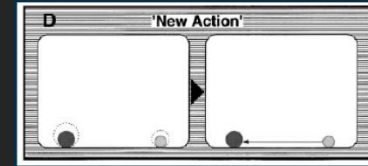


Old action second

Experimental Group



Old action first



Old action second

Control Group

# Infant sensitivity to Goal Directed Agency

Gergely et al. (1995); Csibra et al., (1999)

Results: Not much going on for the 6 month olds (compare with 9 months)

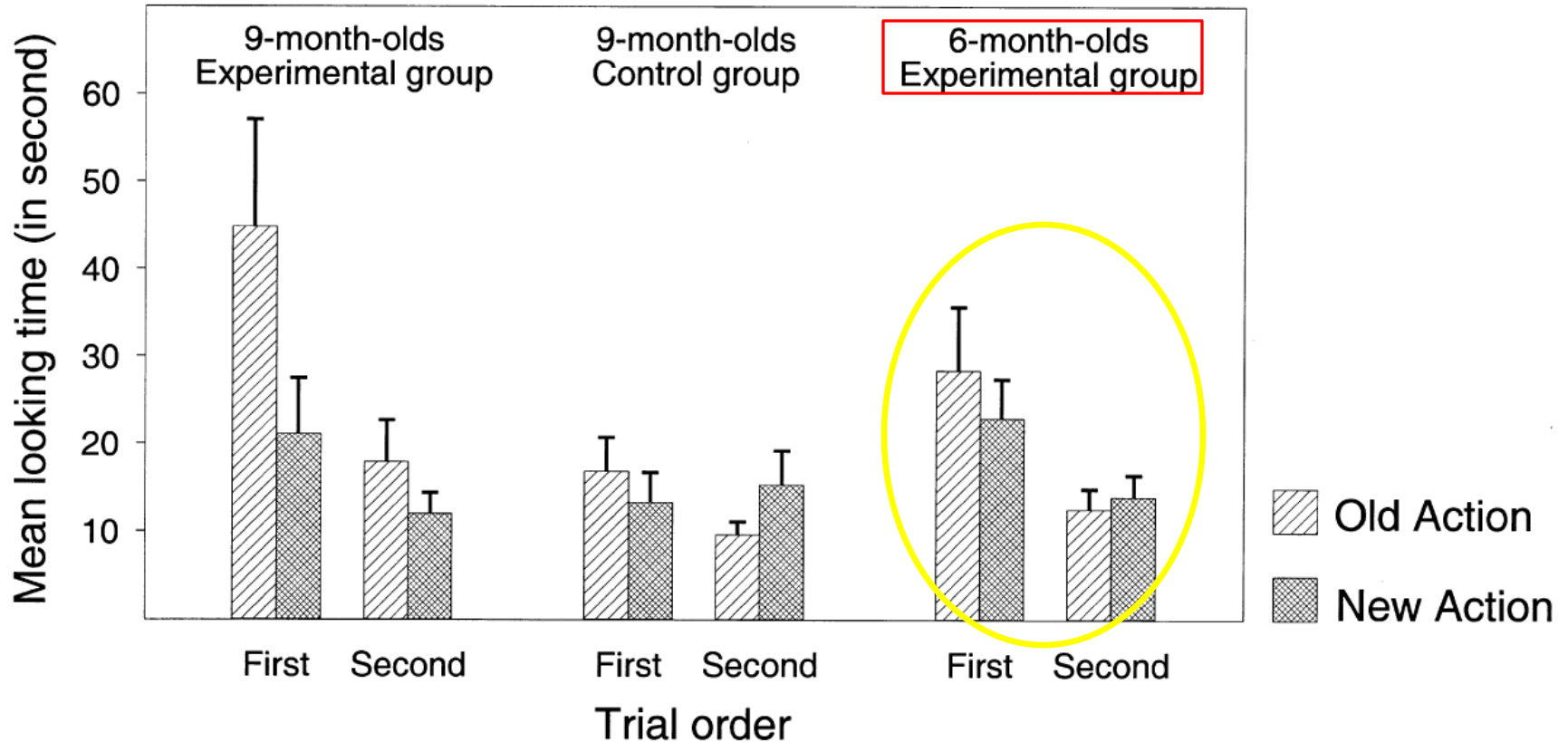


Fig. 2. Mean looking times (and standard errors) in the test phase of Expt. 1 as a function of event type and order of presentation.

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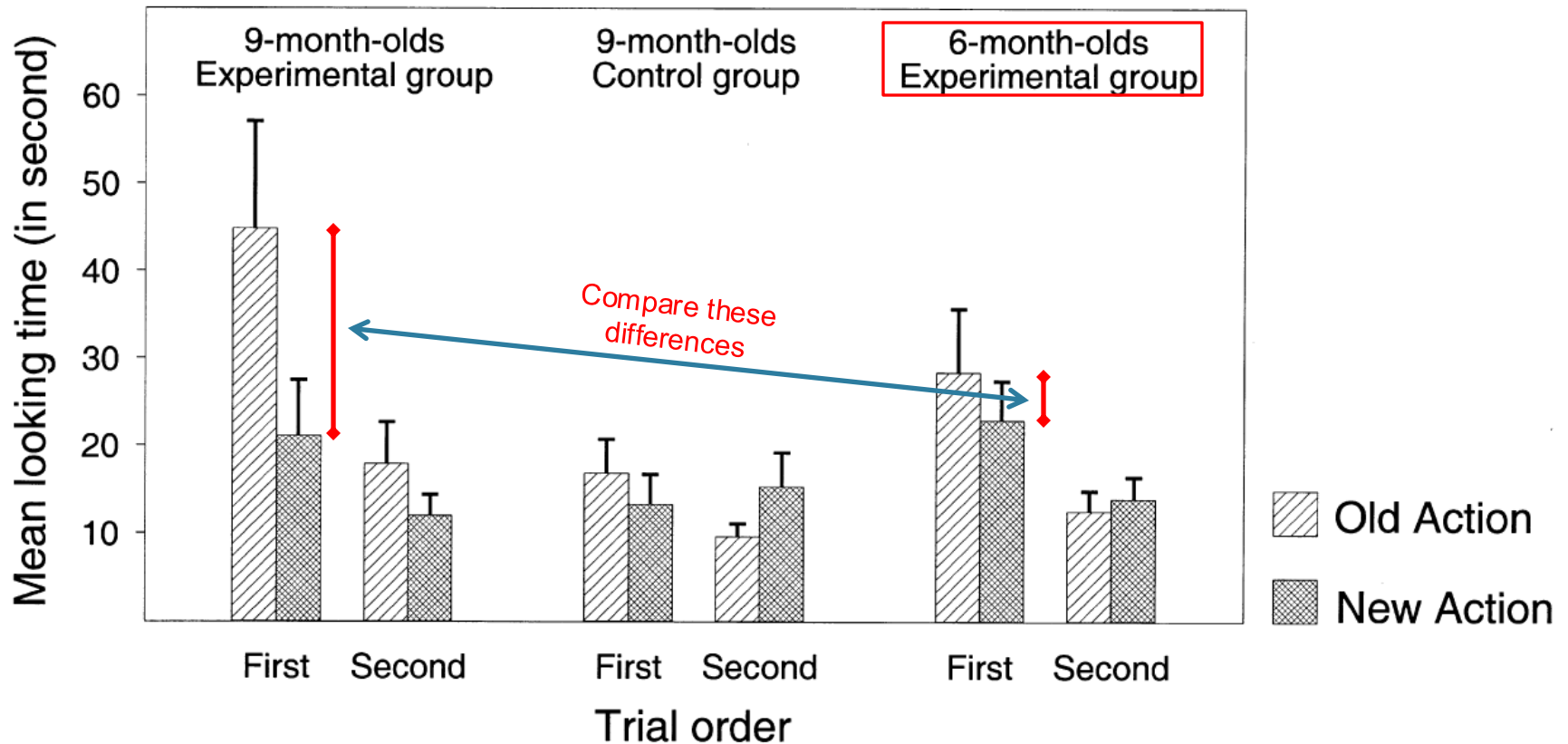


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# Goals and intentions

Review

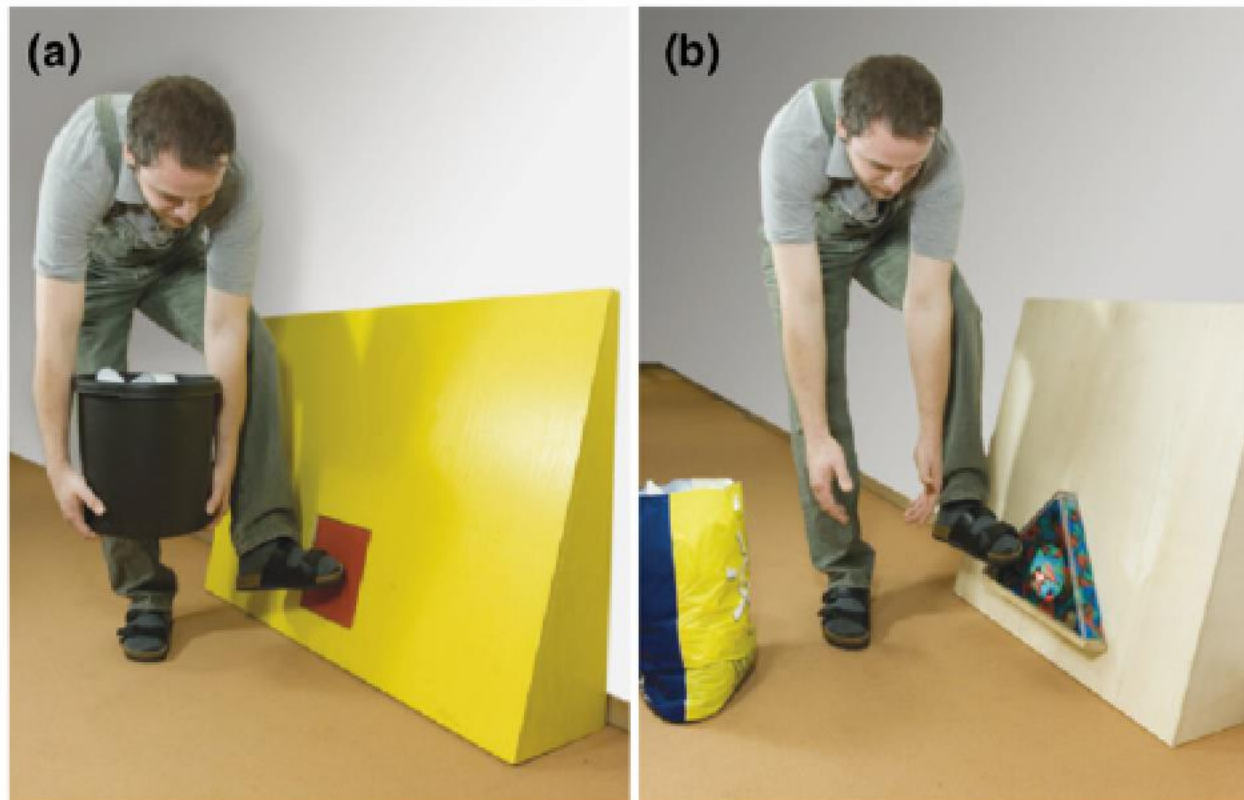
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PRESS

## **Does the chimpanzee have a theory of mind? 30 years later**

**Josep Call and Michael Tomasello**

Max Planck Institute for Evolutionary Anthropology, Deutscher Platz 6, D-04103 Leipzig, Germany

# Goals and intentions



*TRENDS in Cognitive Sciences*

**Figure I.** Turning on the light with the foot because (a) E wanted to or (b) E had to (because his hands were occupied) in the Buttelmann *et al.* [28] experiments.