

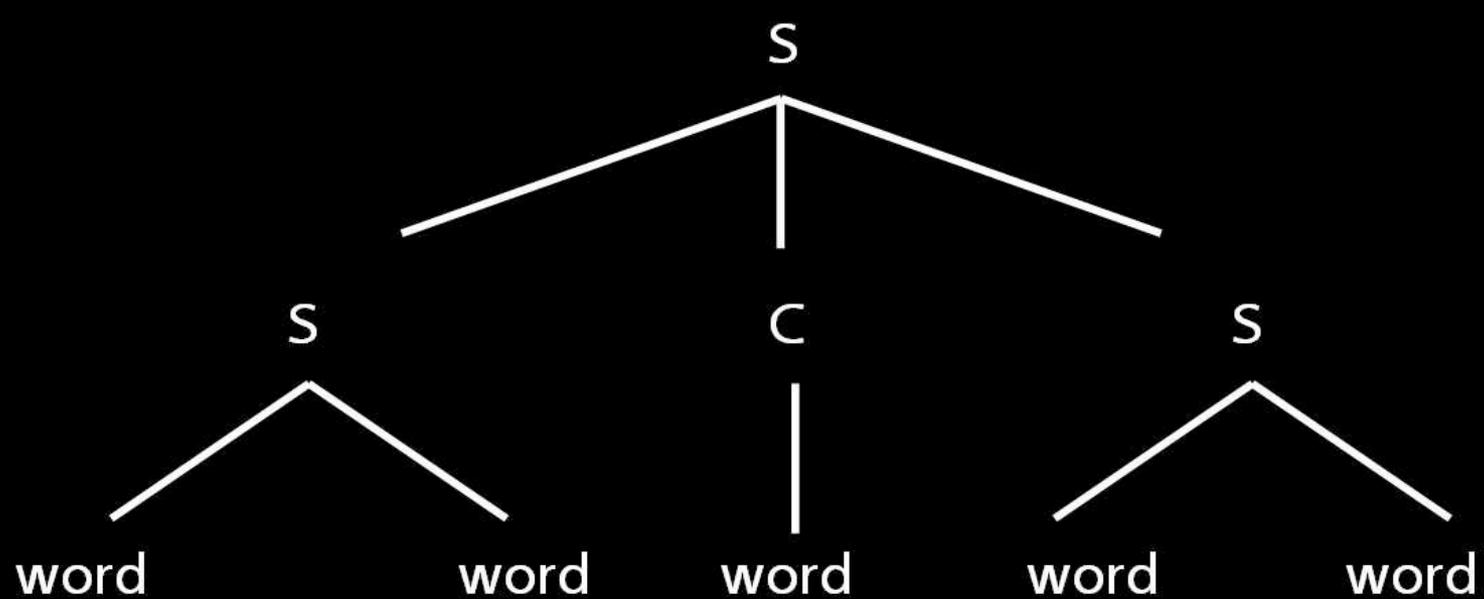
# Mindreading & Joint Action

## **1. Introduction**



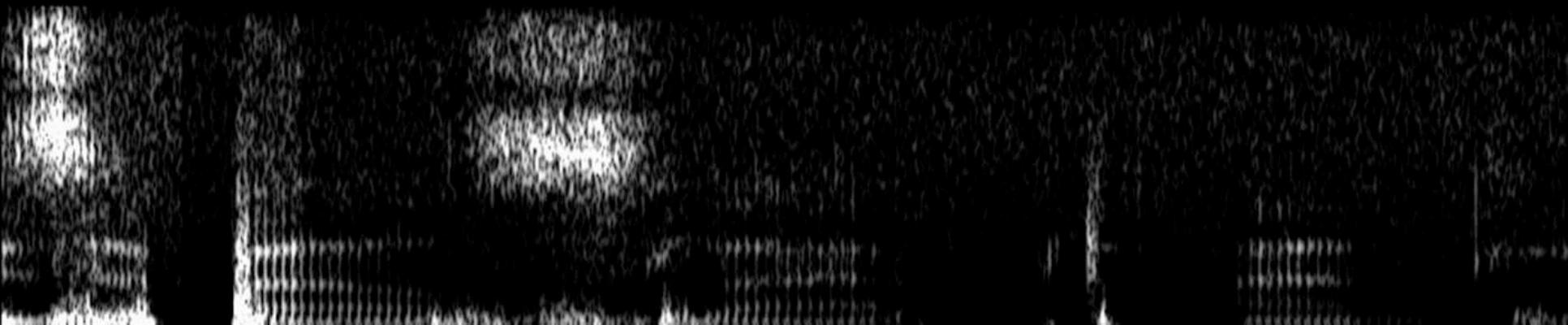
butterfills@ceu.hu

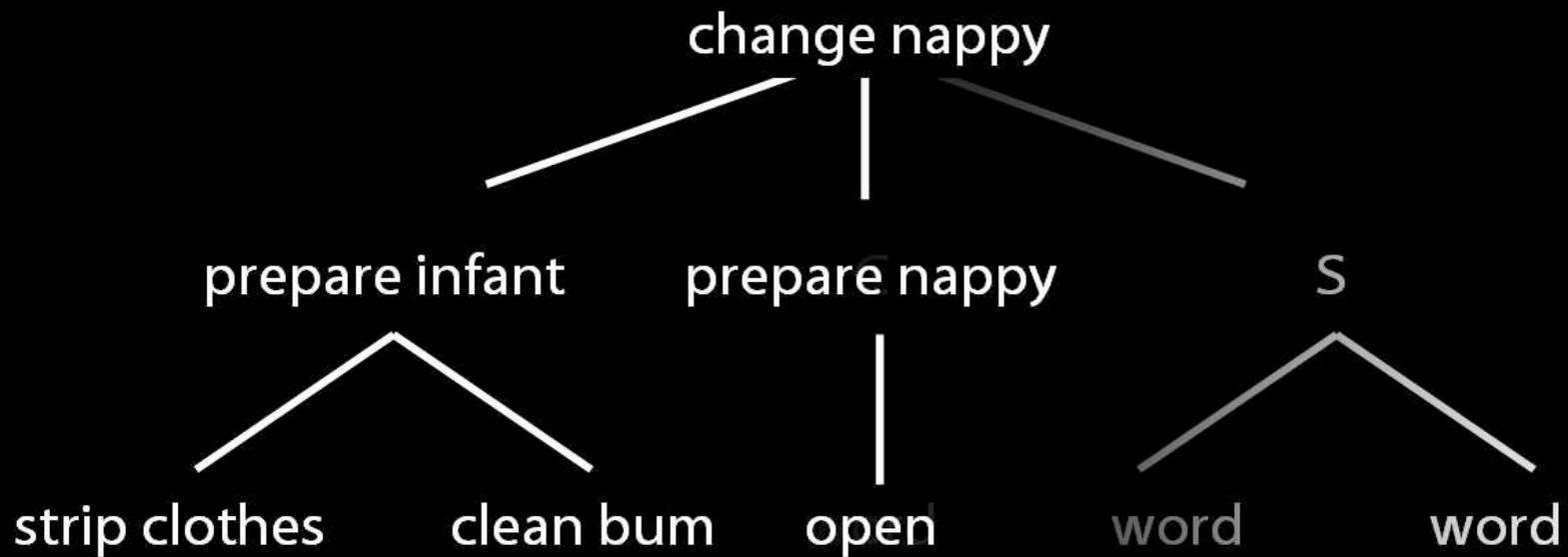
first challenge



/i//z//e//b//e//l//s//l//e//p//t//e//n//d//l//i//l//i//k//r//a//i//d/

l i z ə b ɛ l ʃ l e p t ə n d l i l i k r a i d





... /reach X/ /grasp X/ /grasp Y//e//n//d//l//i//l//i//k//r//a//i//d/

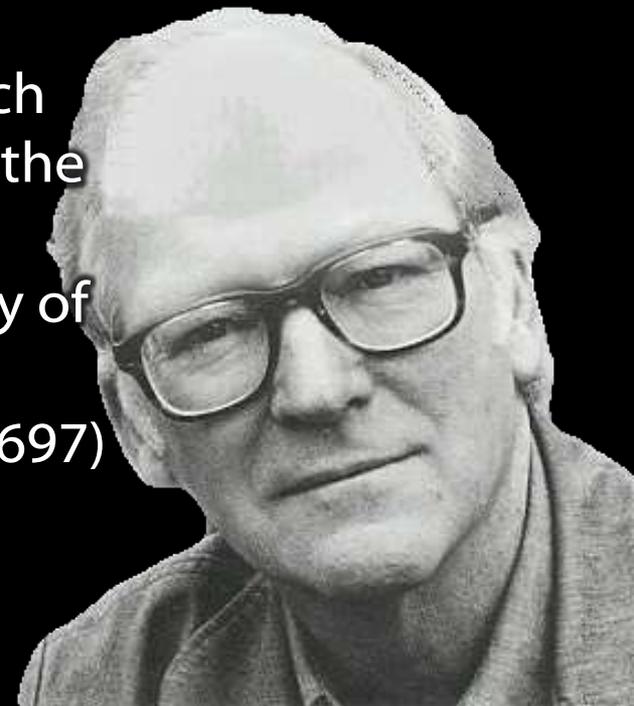
... [reach-left-hand X] [left-whole t e n d l i l i k r a i d



second challenge

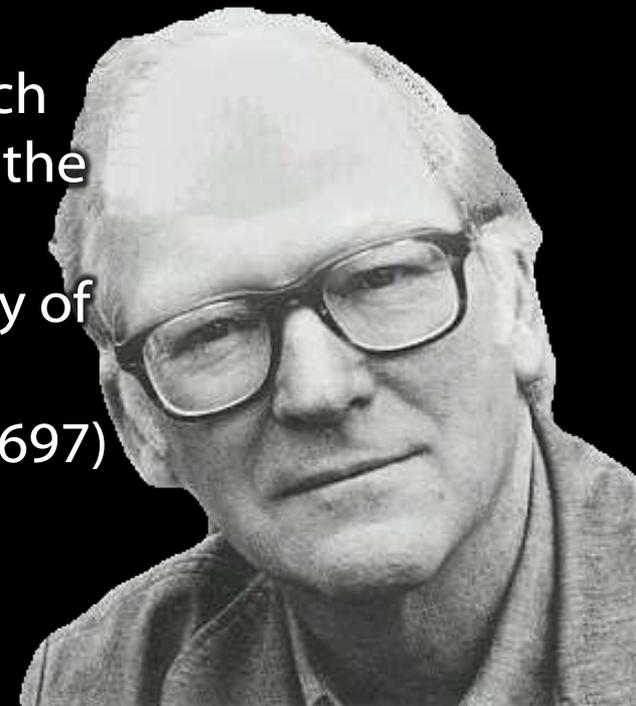
“We are stuck with our two main ways of describing and explaining things, one which treats objects and events as mindless, and the other which treats objects and events as having propositional attitudes. I see no way of bridging the gap”

(Davidson 2003:697)



“We are stuck with our two main ways of describing and explaining things, one which treats objects and events as **mindless**, and the other which treats objects and events as having **propositional attitudes**. I see no way of bridging the gap”

(Davidson 2003:697)



third challenge





“perception, action, and cognition  
are grounded in social interaction”  
(Sebanz & Knoblich 2008)



“the unique aspects of human cognition ... were driven by, or even constituted by, social co-operation”  
(Moll & Tomasello 2007)



“perception, action, and cognition are grounded in social interaction”  
(Sebanz & Knoblich 2008)

fourth challenge

philosophical tools

What Are Mental States?

Tracking, Measuring and Representing Beliefs

What is Core Knowledge (or Modularity)?

Radical Interpretation

Actions, Intentions and Goals

Goal Ascription: the Teleological Stance and Motor Awareness

What Is Joint Action?

Shared Intention and Motor Representation in Joint Action

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October 10:

Sugden, R. (2000). Team preferences.

October 24:

Matthews, R. J. (1994). The measure of mind.

October 31:

Davidson, D. ([1984] 1973). Radical interpretation.

November 14:

Bratman, M. (1984). Two faces of intention.

not adequately understanding

not adequately understanding

### *Objectivity*

Could there be mindreaders who are able to identify differences in belief despite not understanding what it is for a belief to be true or false?

### *Self-awareness*

Does being a mindreader entail being able, sometimes, to identify one's own mental states and actions?

### *Evidential basis*

What evidence could in principle support the ascription of a particular belief to a given subject, and how does the evidence support the ascription?

### *Holism*

Could there be mindreaders who can identify intentions and knowledge states but not beliefs?

a puzzle

# Infants' false-belief tracking abilities

Infants' false-belief tracking  
abilities

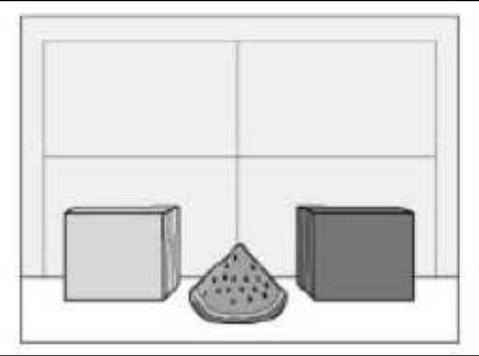
Violation of expectations  
- with change of location

(Onishi & Baillargeon 2005)

Anticipating action

- pointing

(Knudsen & Liszkowski 2011)

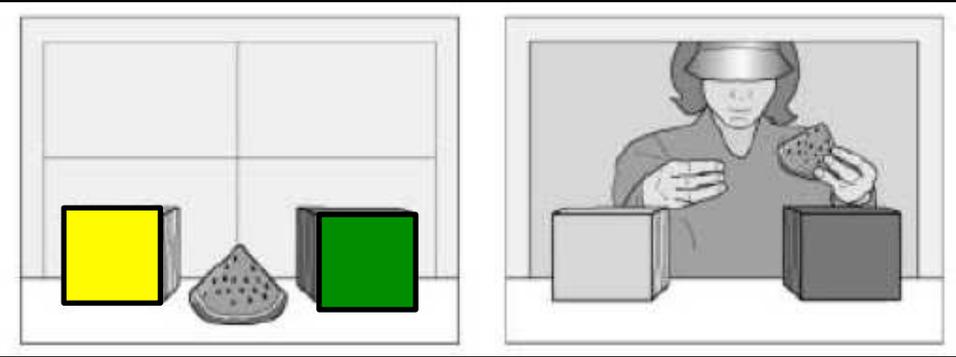


Onishi & Baillargeon (2005)



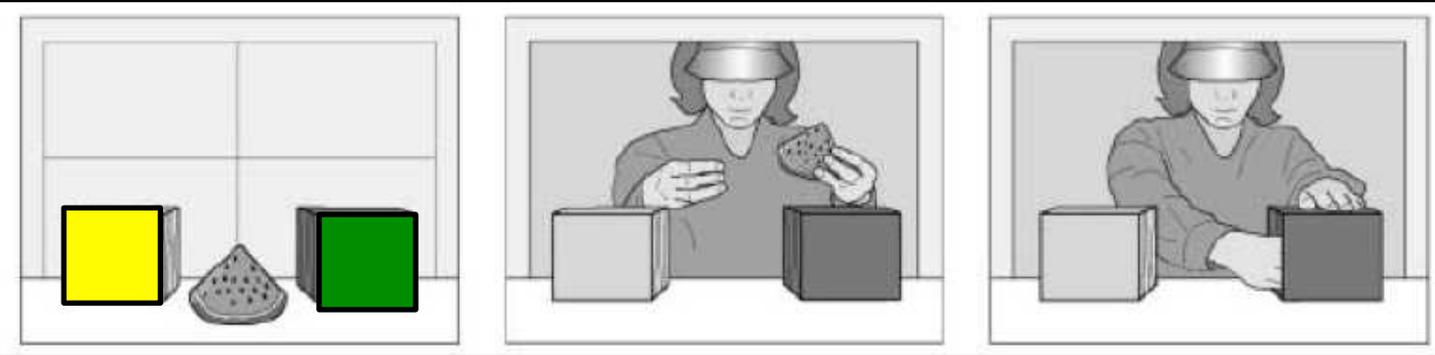
Yellow

Green

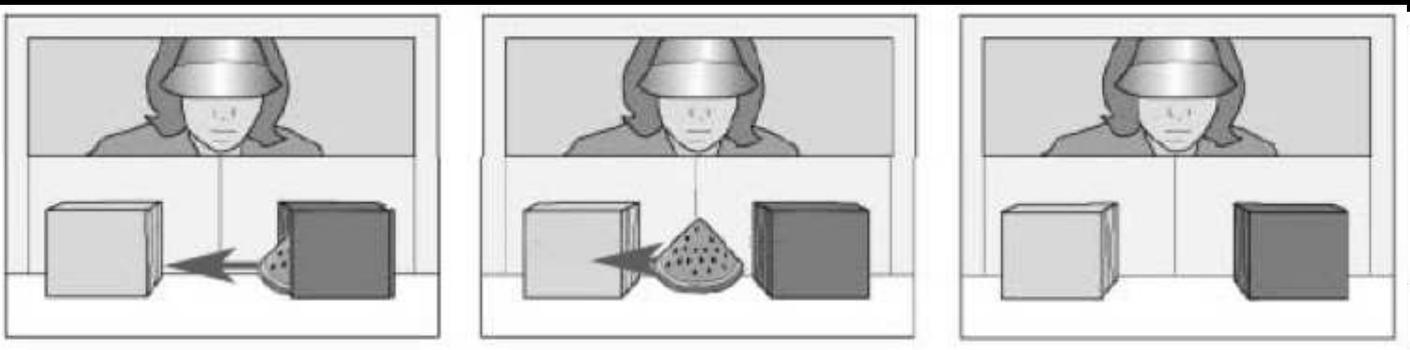
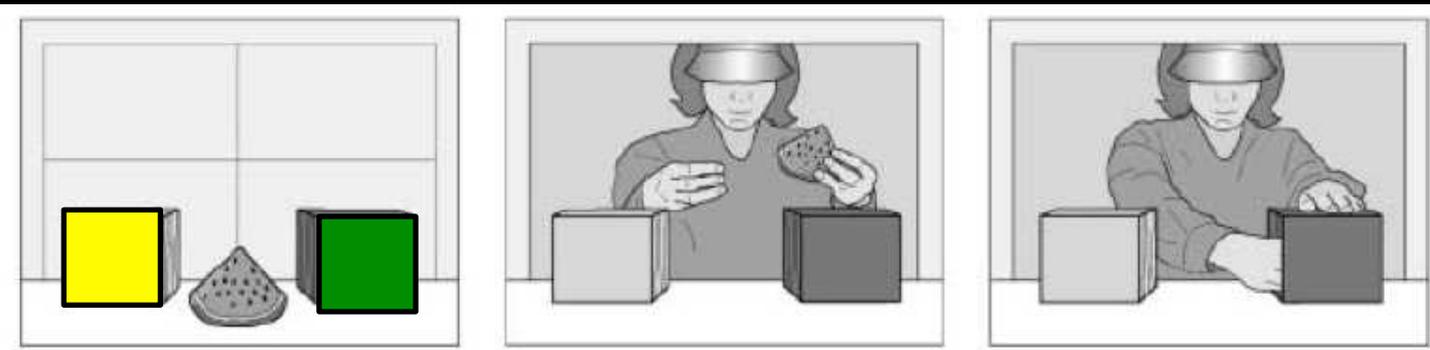


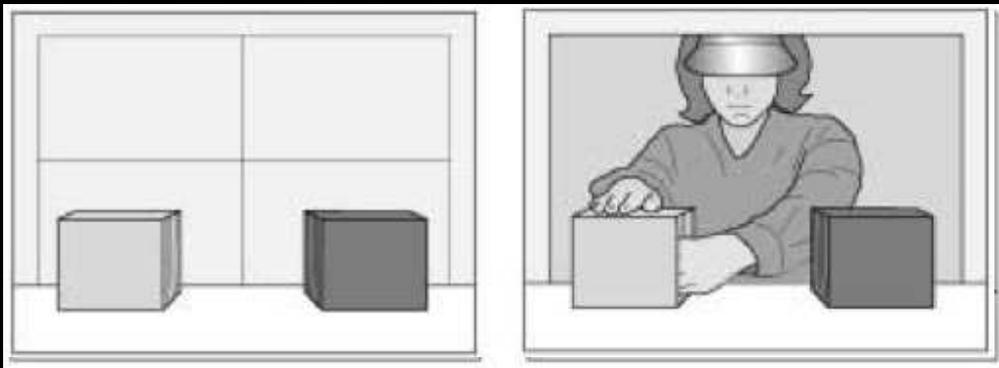
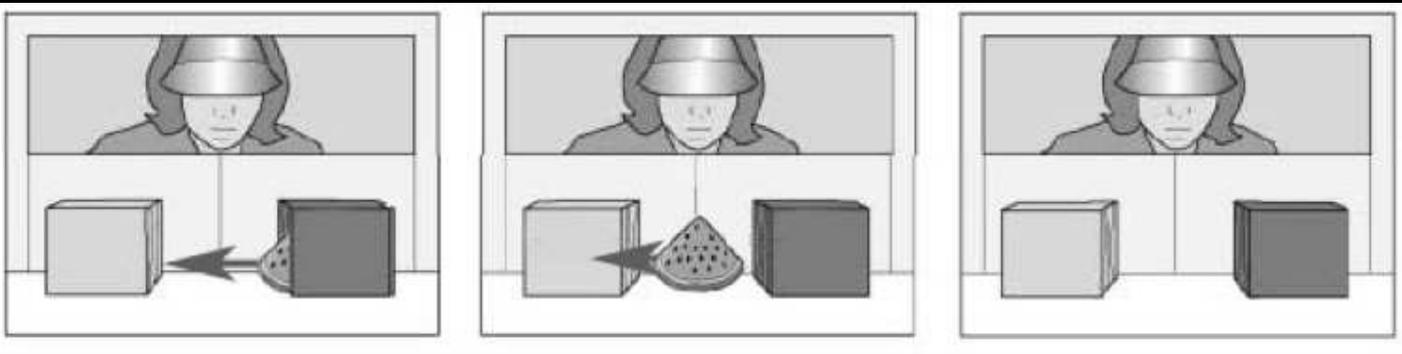
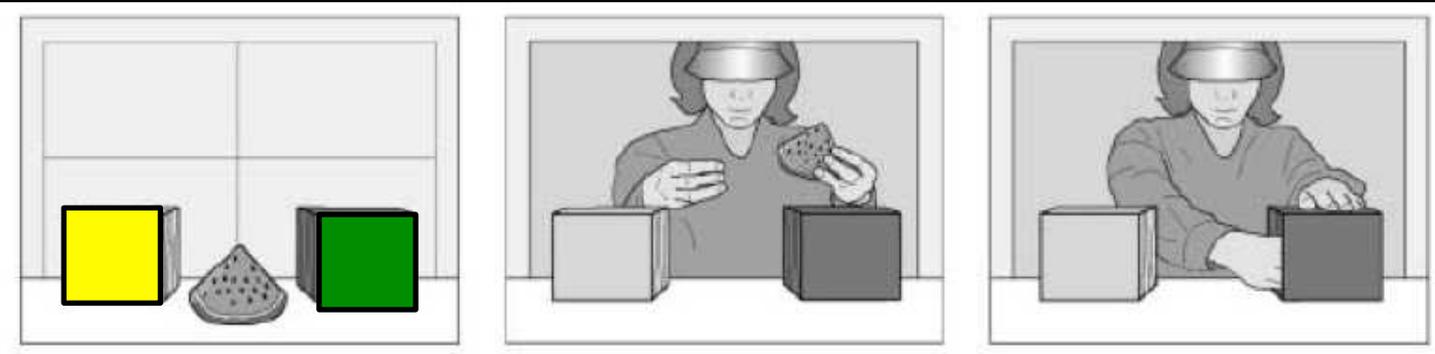
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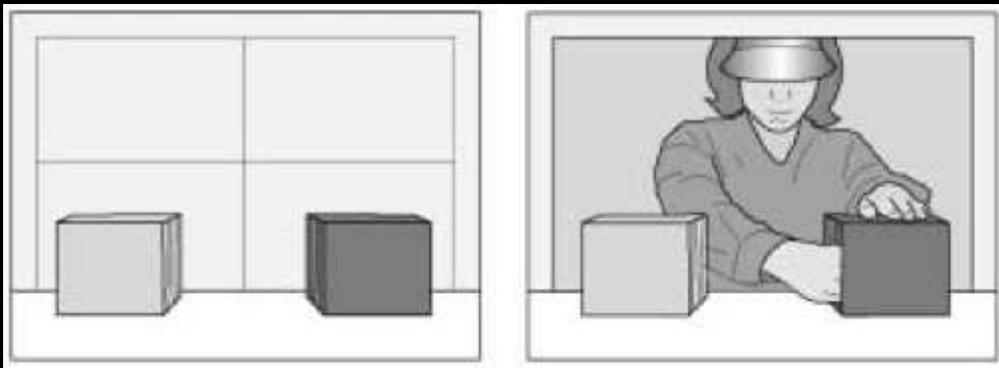
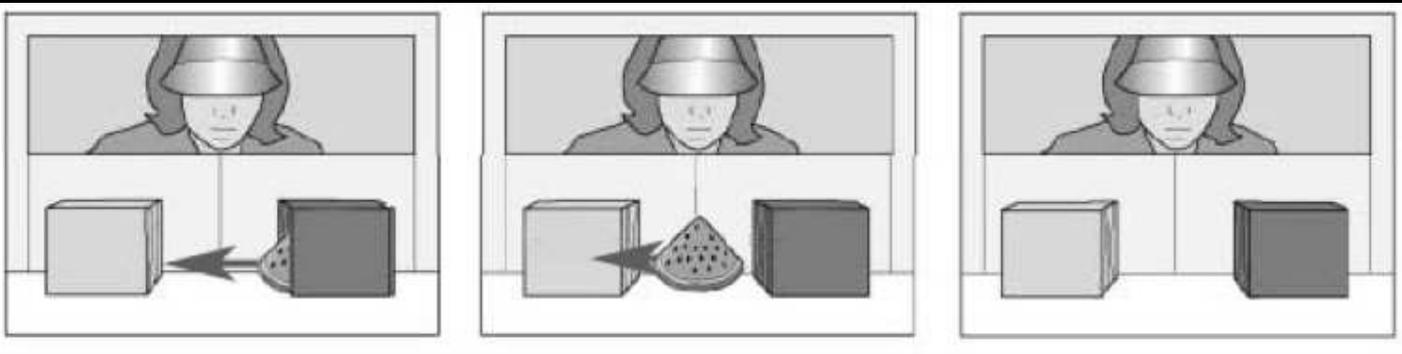
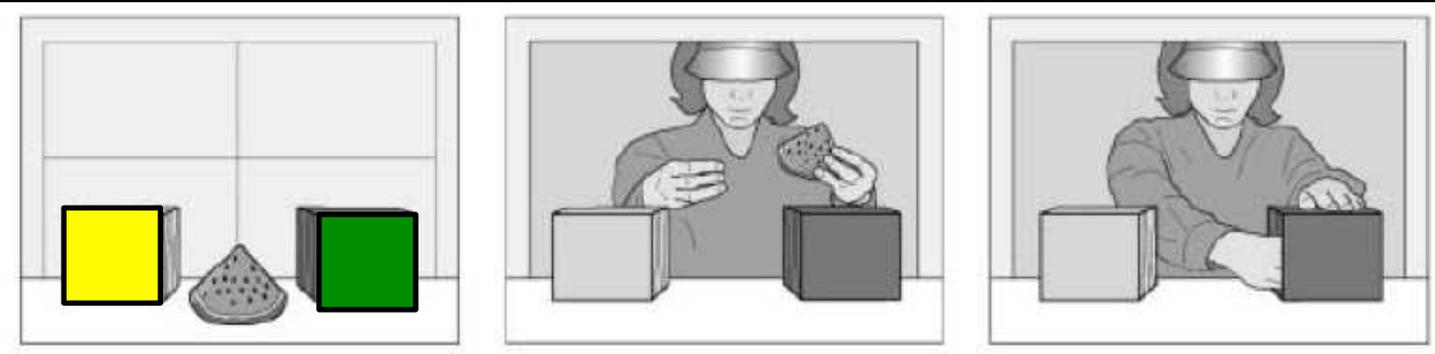
Green

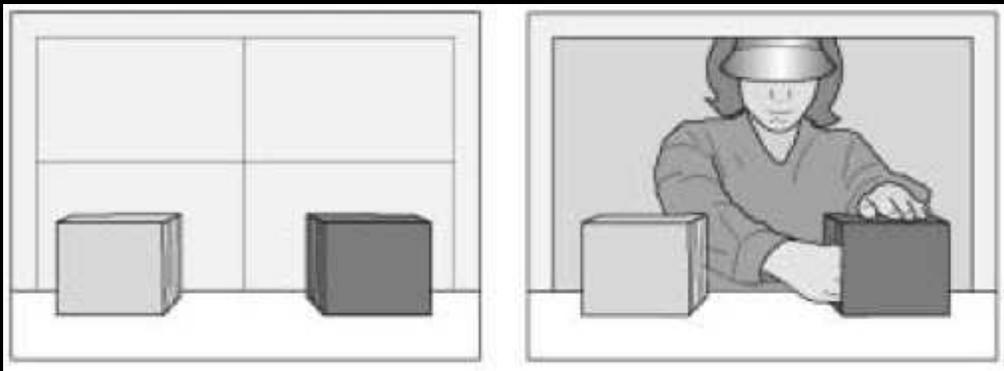
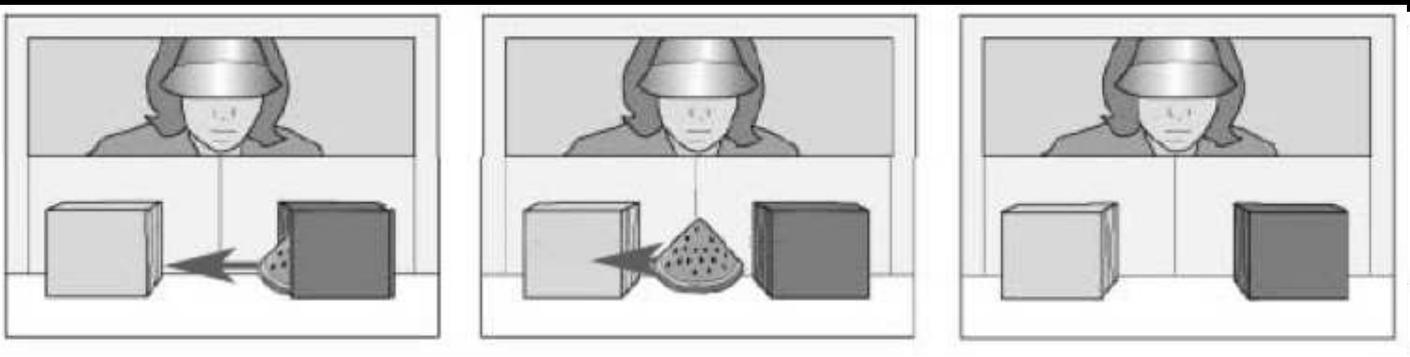
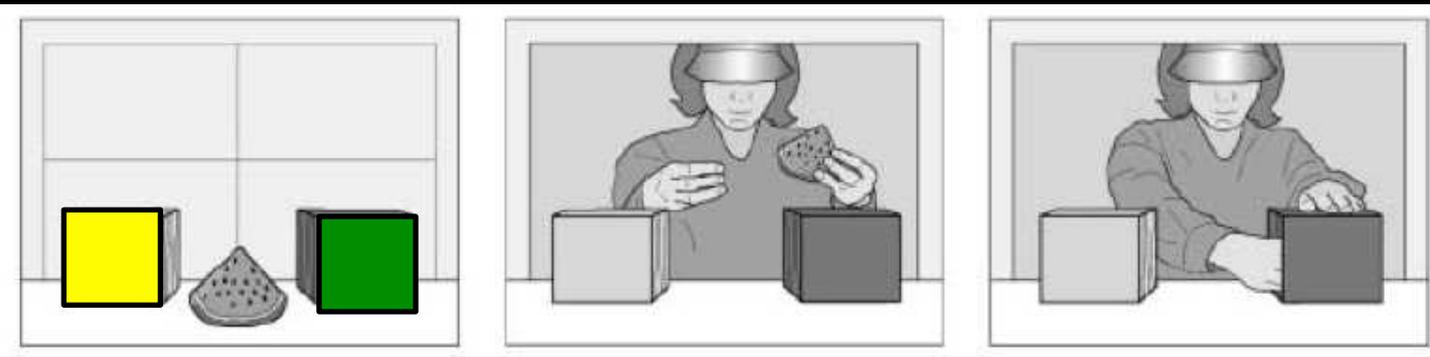


Yellow      Green

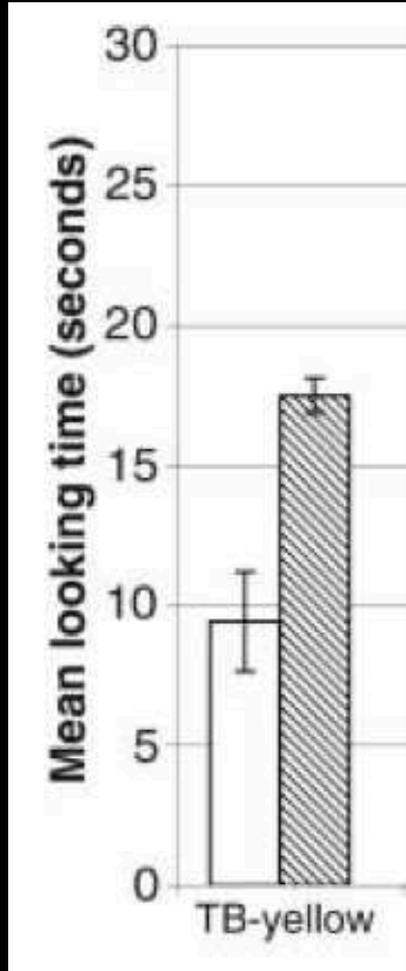




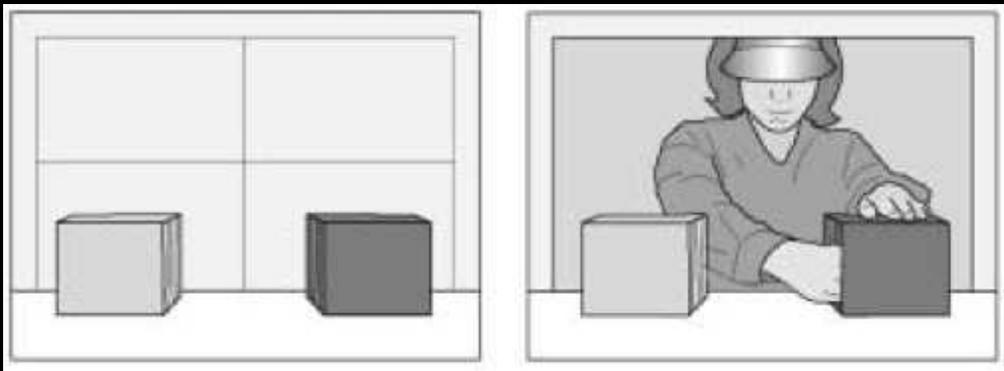
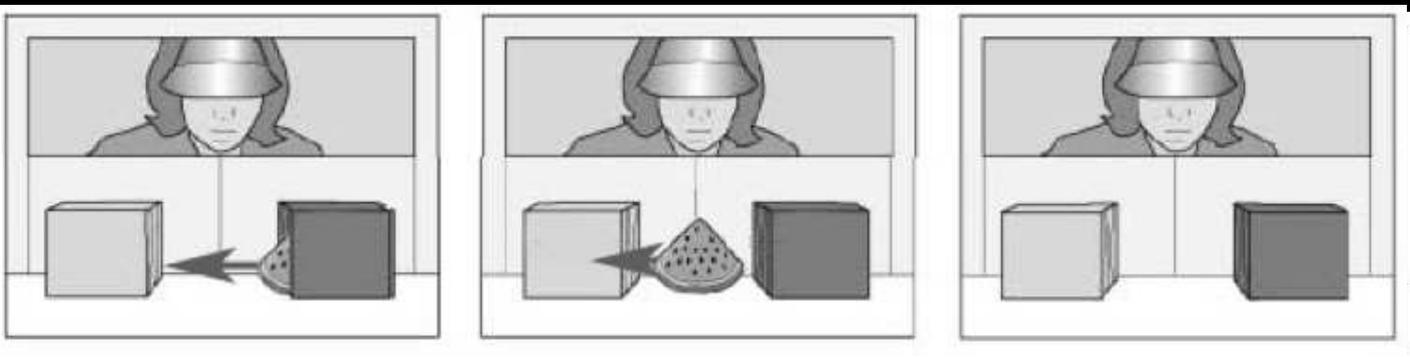
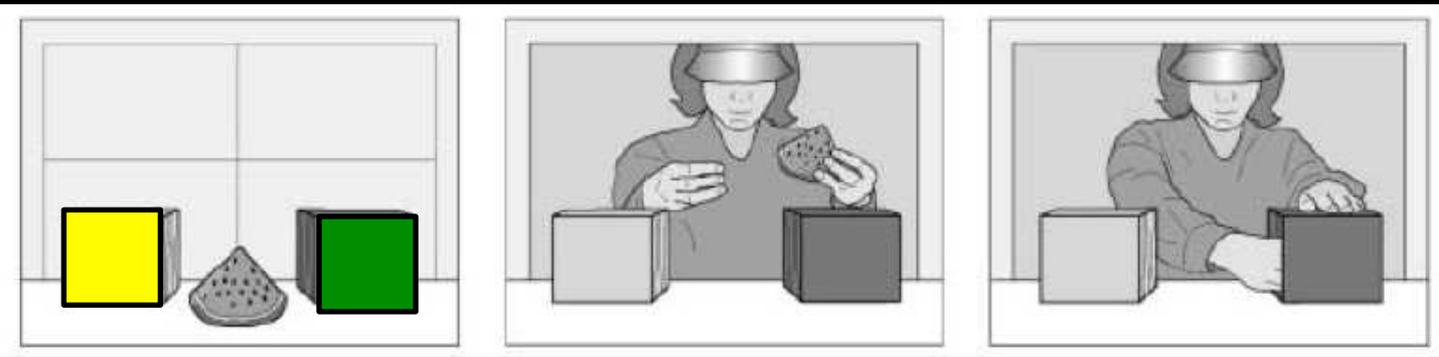




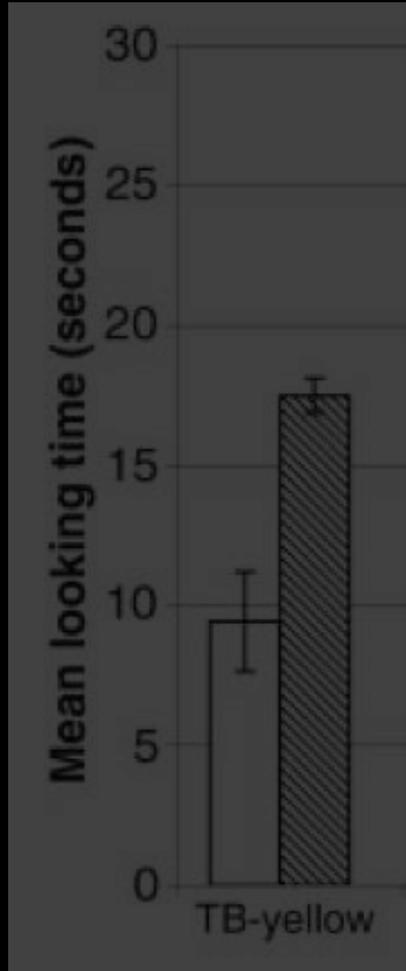
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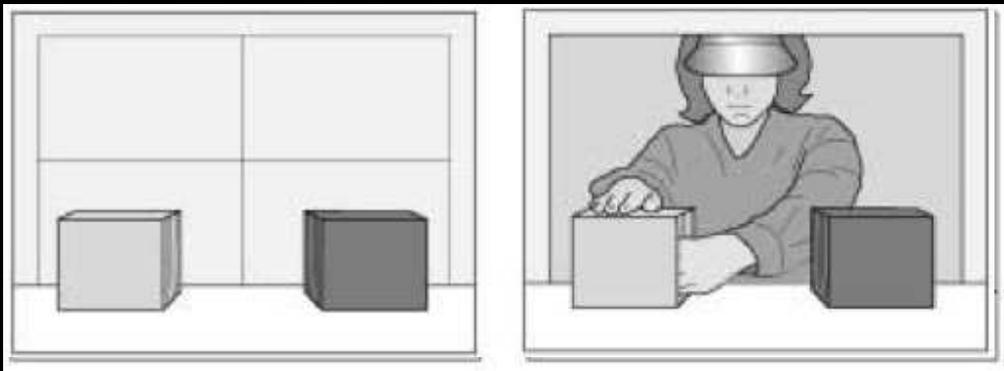
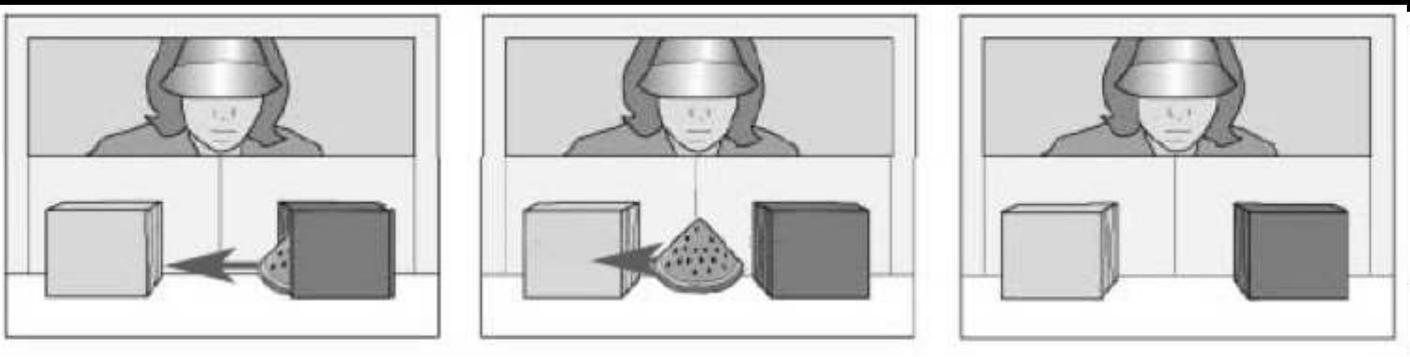
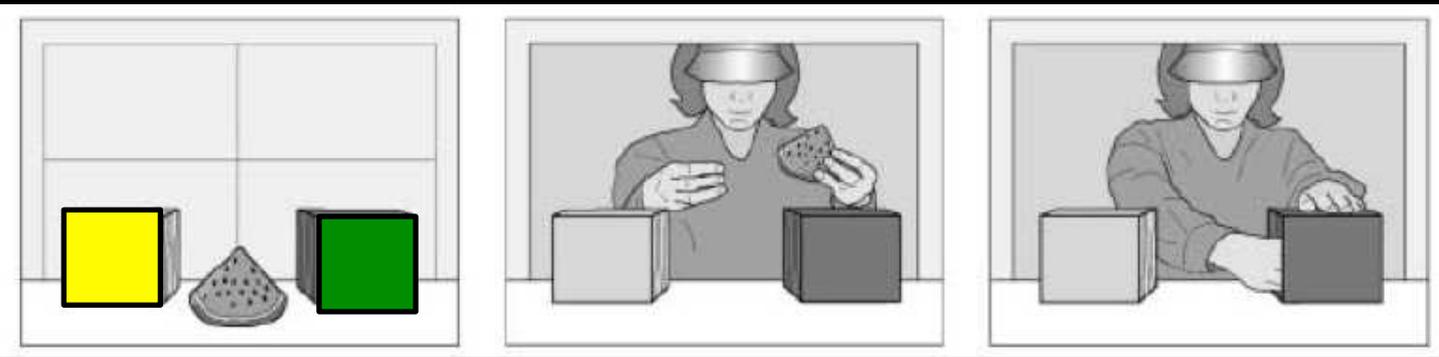
Onishi & Baillargeon (2005)



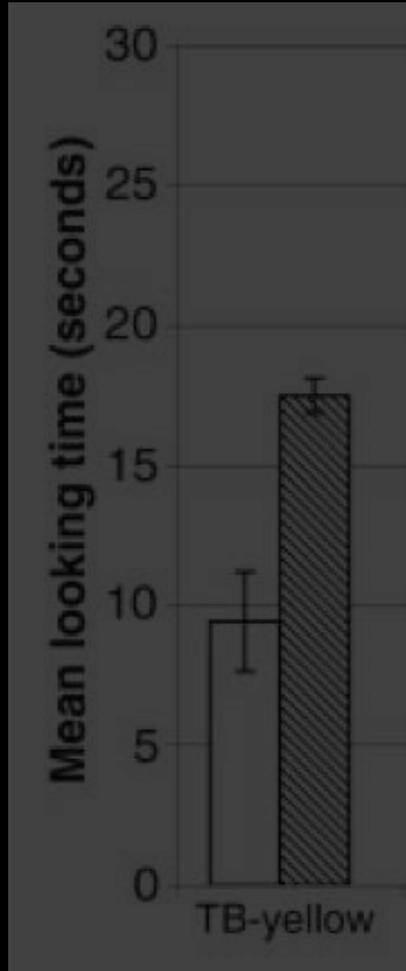
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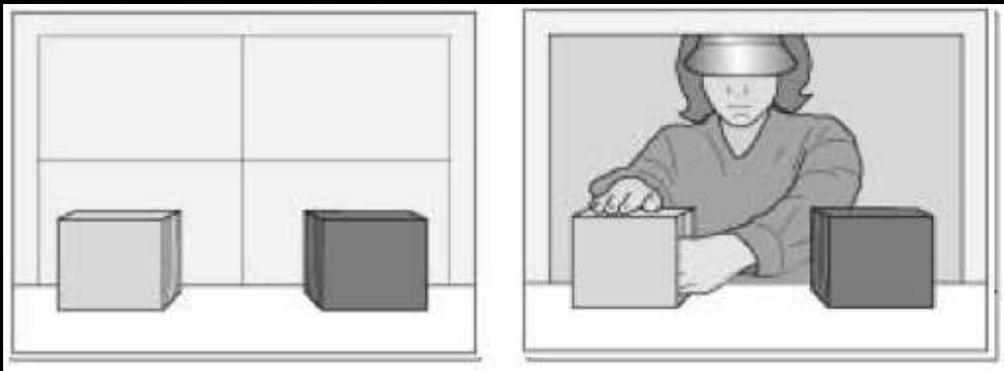
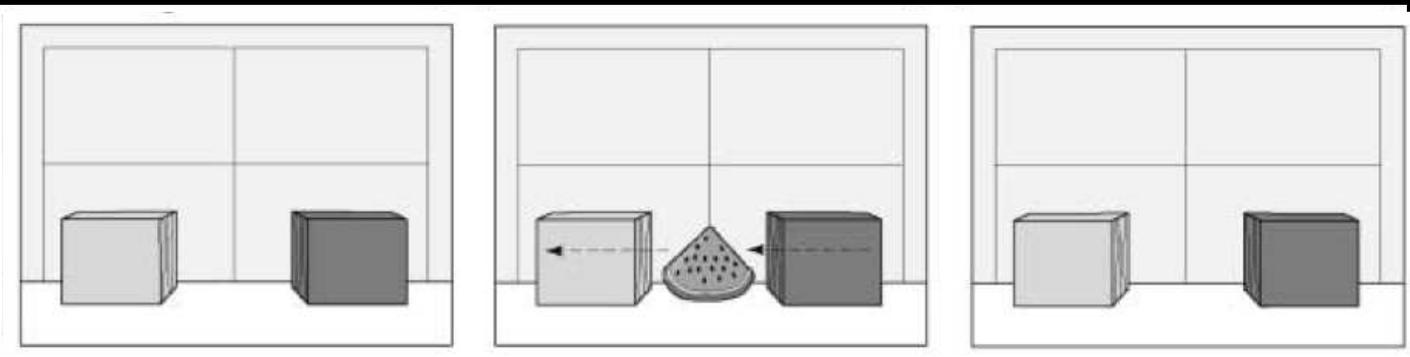
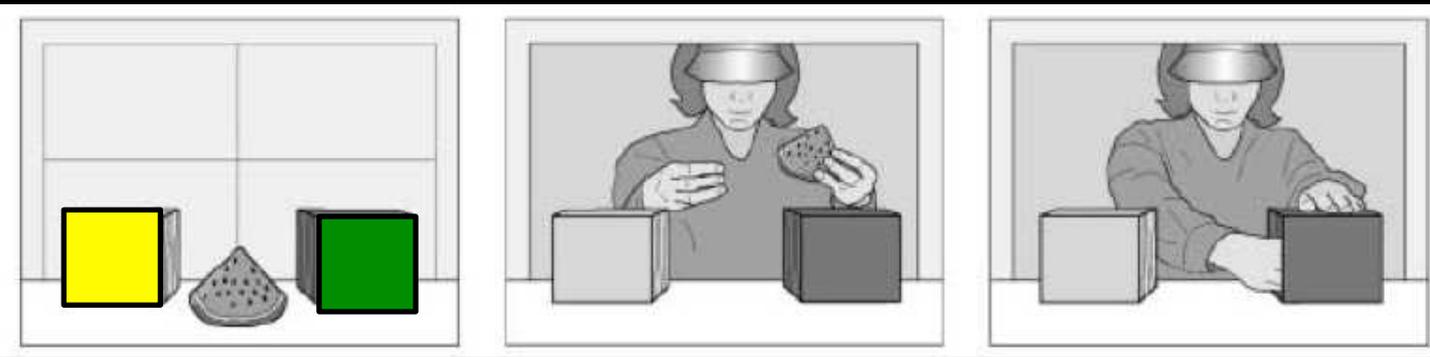
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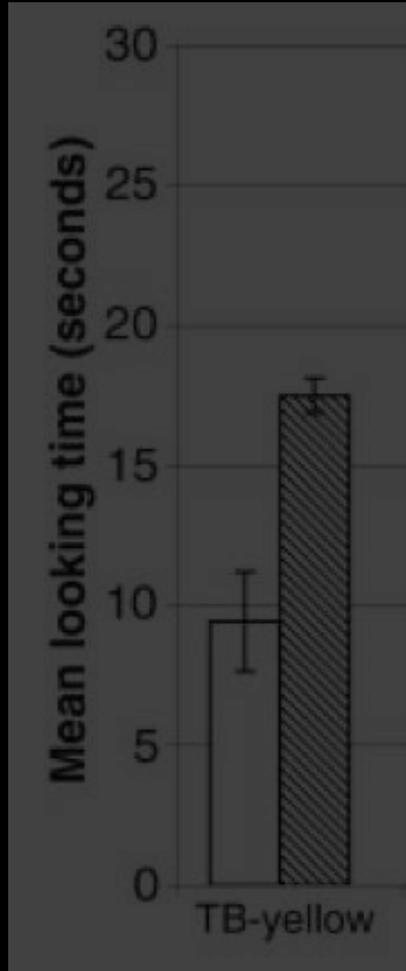
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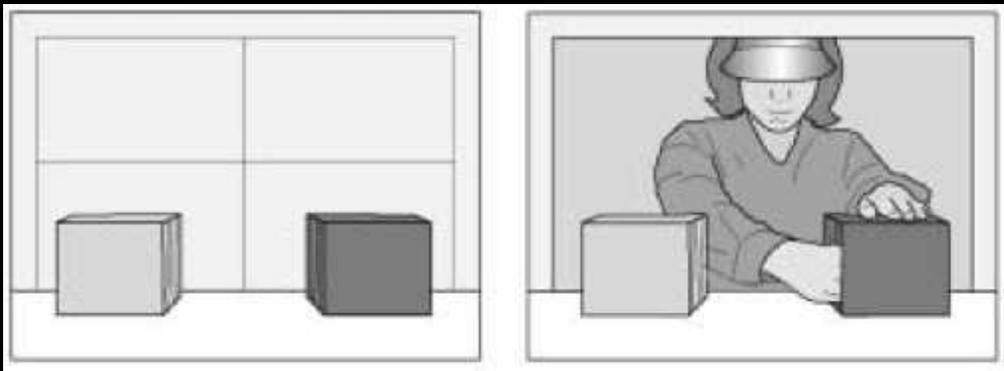
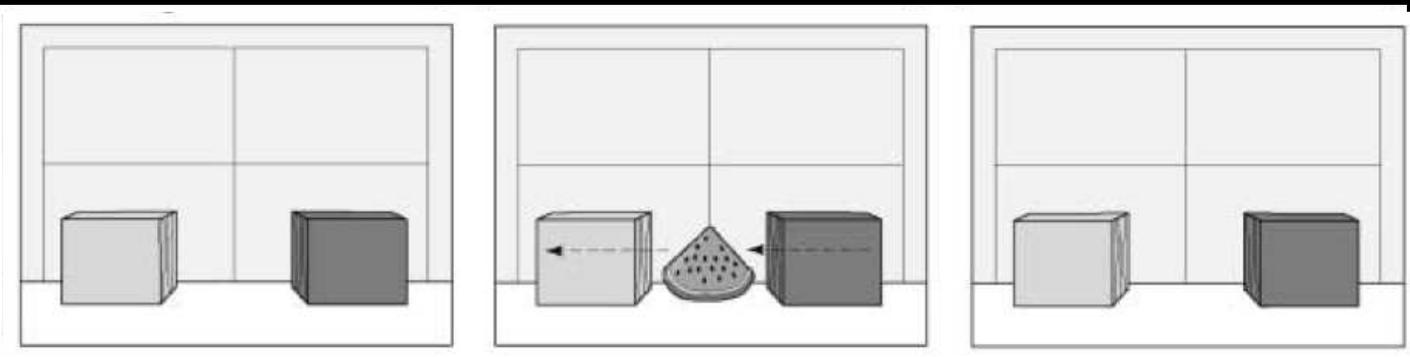
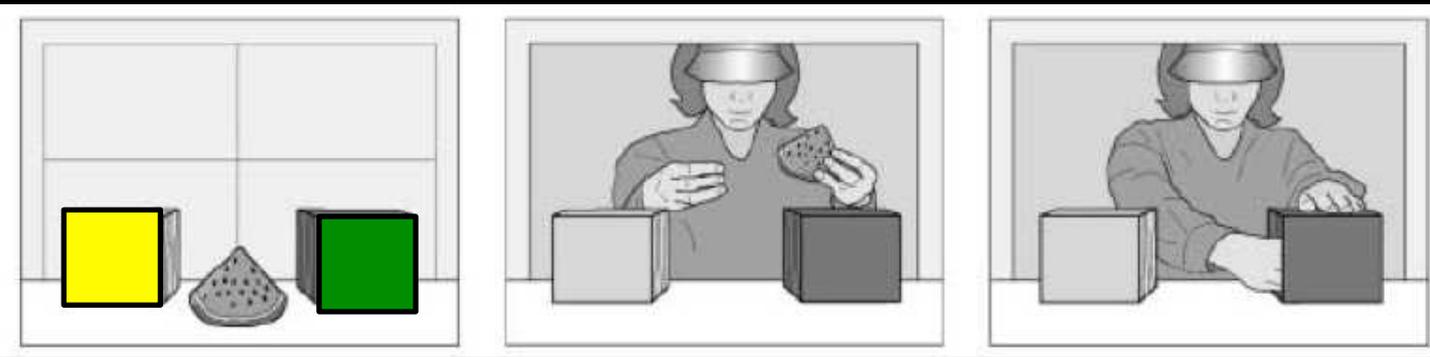
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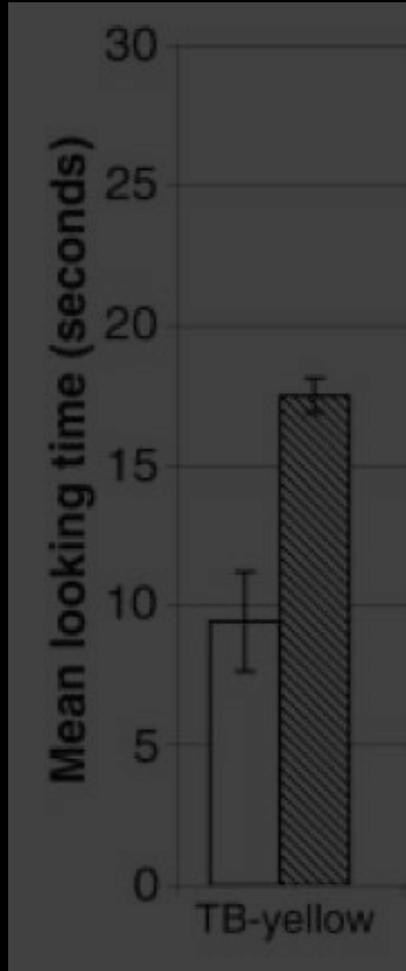
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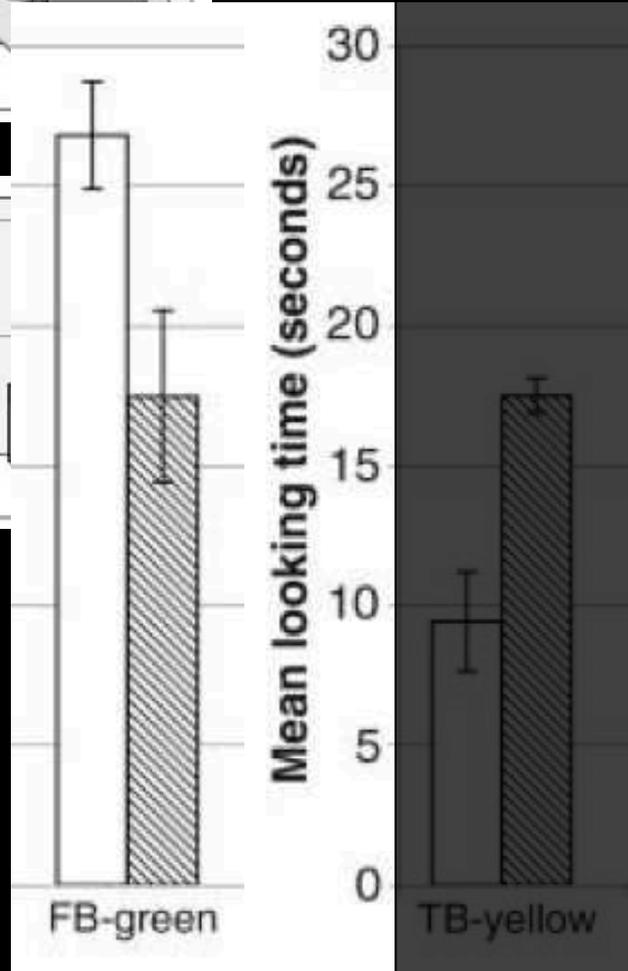
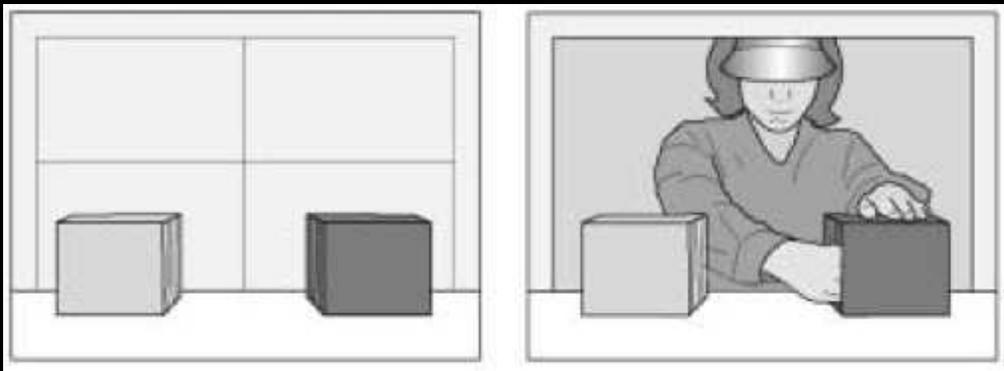
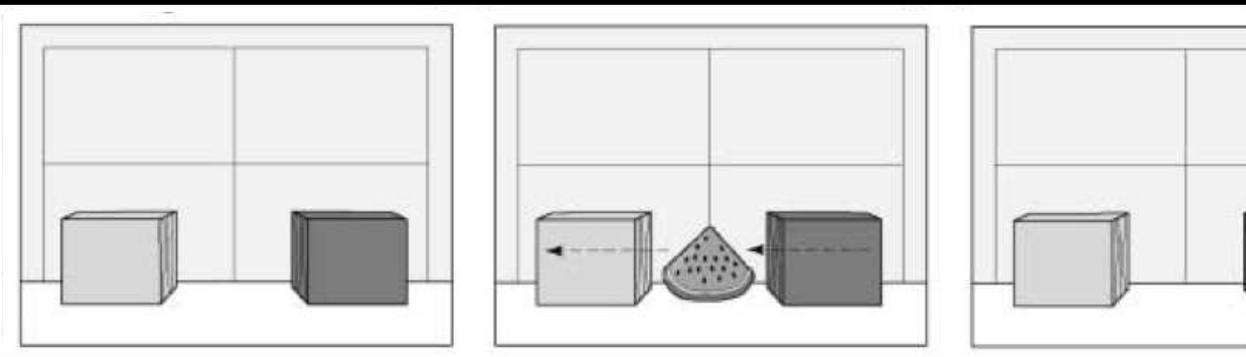
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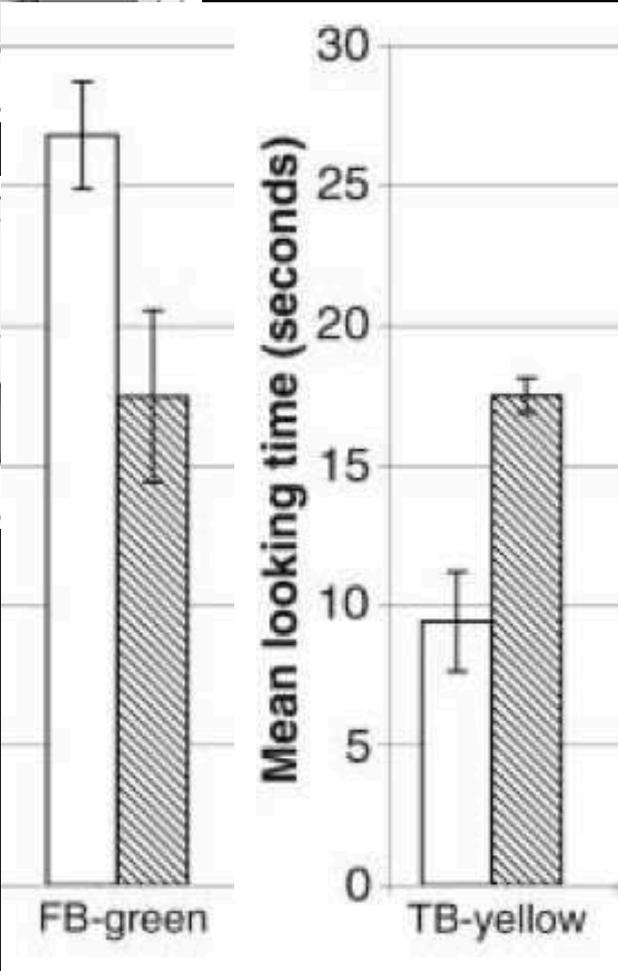
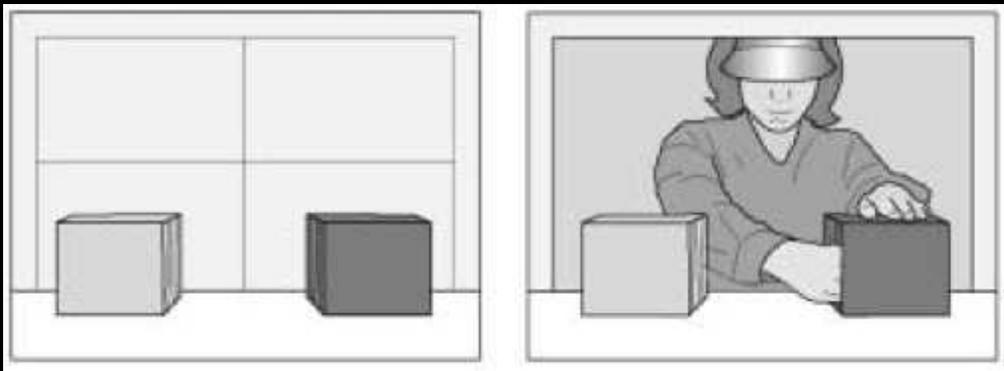
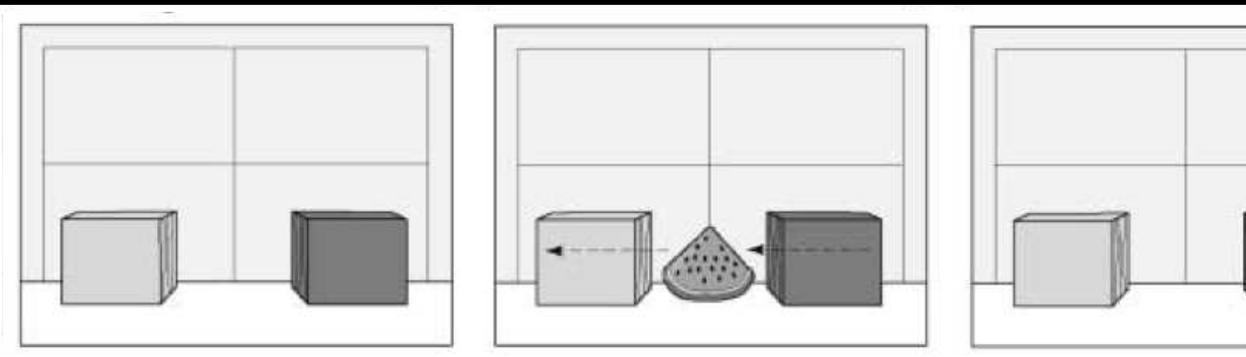
□ yellow-box  
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Onishi & Baillargeon (2005)



□ yellow-box  
 ▨ green-box



Onishi & Baillargeon (2005)



Knudsen & Liszkowski (2011)



Knudsen & Liszkowski (2011)



Knudsen & Liszkowski (2011)

A woman with short brown hair and glasses, wearing a dark blue long-sleeved shirt, is standing in a room. She is reaching out with her right hand to place a blue circular toy on top of a grey container. To her right, another identical grey container with a blue circular toy on top is visible. The background is a plain, light-colored wall. A speech bubble is overlaid on the image, pointing to the blue toy she is placing.

I'll leave my toy  
here [target  
container]



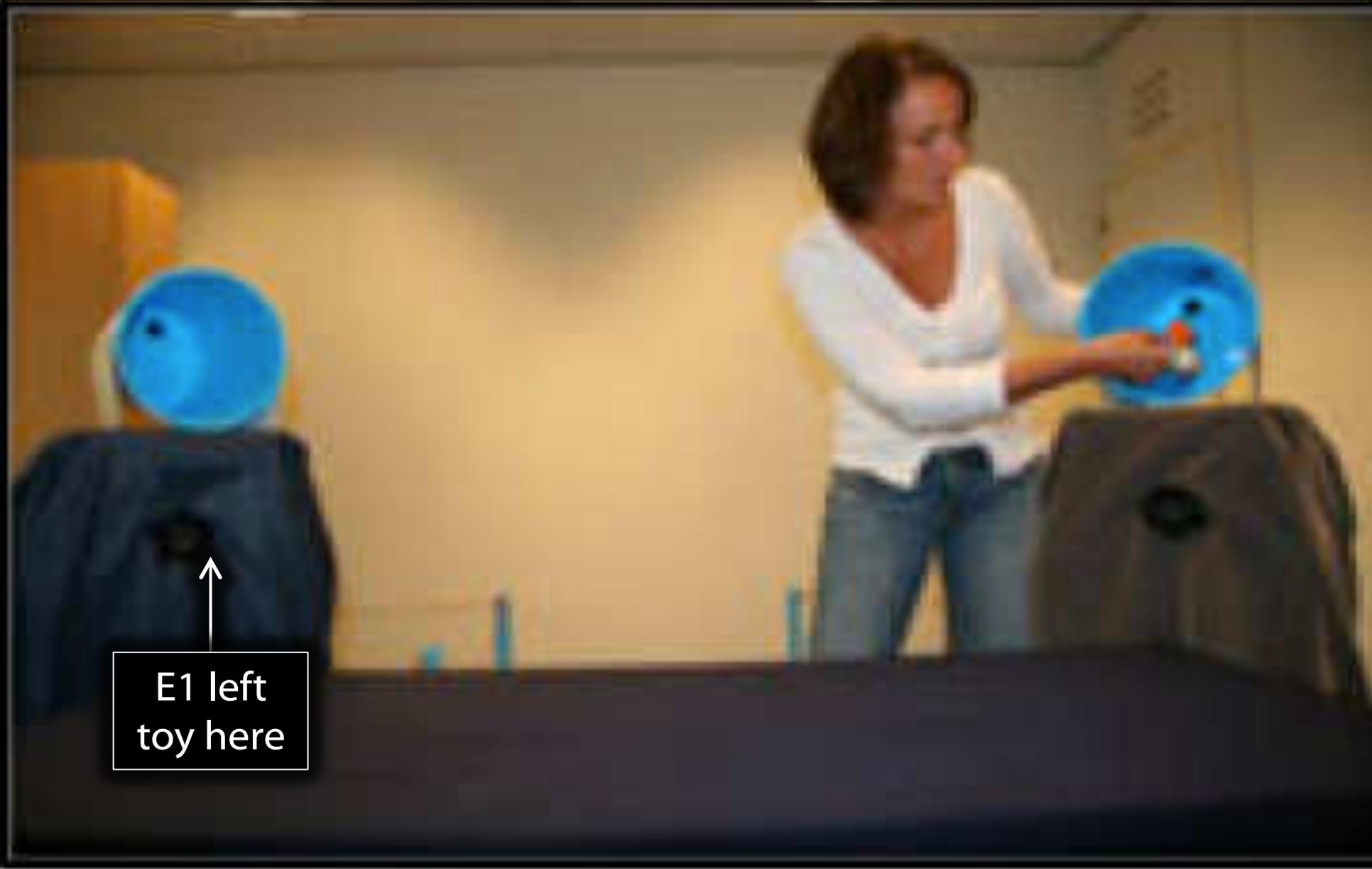
I'll leave my toy  
here [target  
container]

E1 left  
toy here



This is E2. She  
is cleaning up

E1 left  
toy here



E1 left  
toy here



E1 left  
toy here



I'll put it [the toy] in my pocket

E1 left  
toy here



E1 left  
toy here

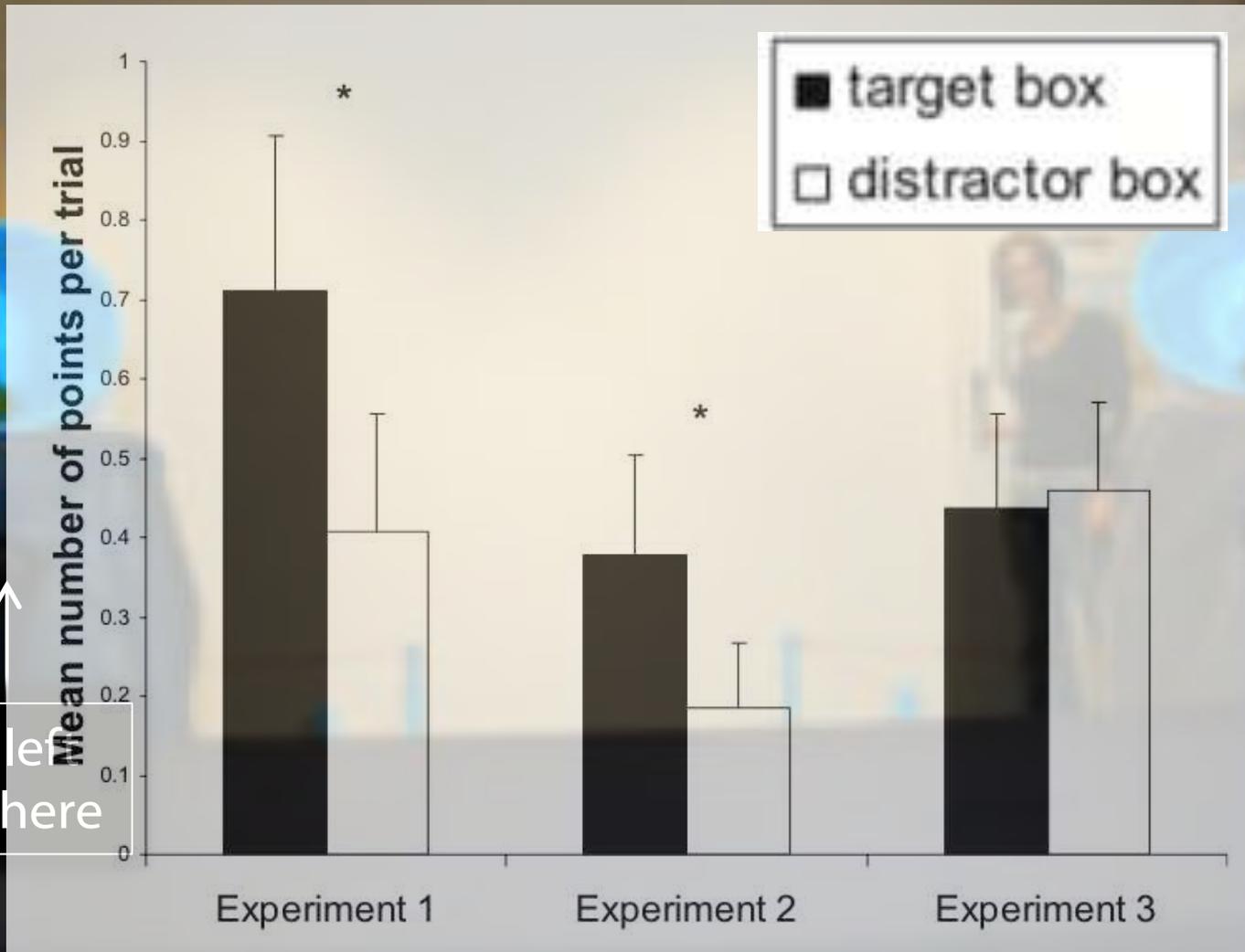


E1 is coming back



E1 left toy here





E1 left  
toy here

Infants' false-belief tracking  
abilities

Violation of expectations  
- with change of location

(Onishi & Baillargeon 2005)

Anticipating action

- pointing

(Knudsen & Liszkowski 2011)

## Infants' false-belief tracking abilities

### Violation of expectations

- with change of location
- with deceptive contents
- observing verbal comm<sup>n</sup>

(Onishi & Baillargeon 2005)

(He et al 2011)

(Song et al 2008; Scott et al 2012)

### Anticipating action

- looking
- pointing

(Southgate et al 2007)

(Clements et al 1994)

(Knudsen & Liszkowski 2011)

### Helping

(Buttleman et al 2009)

### Communicating

(Southgate et al 2010)

### Altercentric interference

(Kovacs et al 2010)

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- with deceptive contents
- observing verbal comm<sup>n</sup>

(Onishi & Baillargeon 2005)  
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(Song et al 2008; Scott et al 2012)

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- pointing

(Southgate et al 2007)  
(Golan et al 1994)  
**A-tasks** (Golan & Liszkowski 2011)

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(Buttleman et al 2009)

## Communicating

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## Altercentric interference

(Kovacs et al 2010)

1. There are subjects who can pass A-tasks

2. These subjects' success on A-tasks is explained by the fact that they **can** represent (false) beliefs

3-year-olds fail false belief tasks

## 3-year-olds fail false belief tasks

prediction

- action

- desire

(Wimmer & Perner 1983)

(Astington & Gopnik 1991)

retrodiction or explanation

(Wimmer & Mayringer 1998)

## 3-year-olds fail false belief tasks

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- action

(Wimmer & Perner 1983)

- desire

(Astington & Gopnik 1991)

retrodiction or explanation

(Wimmer & Mayringer 1998)

select a suitable argument

(Bartsch & London 2000)

own beliefs (first person)

(Gopnik & Slaughter 1991)

involvement (deception)

(Chandler et al 1989)

nonverbal response

(Call et al 1999; Low 2010 exp.2)

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test questions word-for-word  
identical to desire and pretence  
tasks

(Gopnik et al 1994;  
Cluster 1996)

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tasks

(Perner 1983)

(Gopnik 1991)

(Mayringer 1998)

(London 2000)

### **B-tasks**

(Gauthier 1991)

(Wimmer 1989)

(Wimmer 1999; Low 2010 exp.2)

(Wimmer 1994;

Wimmer 1996)

Children tend to pass them some time after their third birthday.

Abilities to pass these tasks has a protracted developmental course stretching over months if not years.

Success on these tasks is correlated with developments in executive function and language

Success on these tasks is facilitated by explicit training and environmental factors such as siblings

Abilities to succeed on these tasks typically emerge from extensive participation in social interactions



**B-tasks**

1. There are subjects who cannot pass B-tasks.

3. These subjects' failure on B-tasks is explained by the fact that they **cannot** represent (false) beliefs

1. There are subjects who can pass A-tasks but cannot pass B-tasks.
2. These subjects' success on A-tasks is explained by the fact that they **can** represent (false) beliefs
3. These subjects' failure on B-tasks is explained by the fact that they **cannot** represent (false) beliefs

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# Infants' false-belief tracking abilities

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- with change of location
- with deceptive contents
- observing verbal comm<sup>n</sup>

(Onishi & Baillargeon 2005)  
(He et al 2011)  
(Song et al 2008; Scott et al 2012)

## Anticipating action

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- pointing

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**A-tasks** (Golan & Liszkowski 2011)

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All B-tasks impose a requirement (or set of requirements) other than the requirement to represent a false belief.

## 3-year-olds fail false belief tasks

prediction

- action

- desire

retrodiction or explanation

select a suitable argument

own beliefs (first person)

involvement (deception)

nonverbal response

test questions word-for-word

identical to desire and pretence

tasks

(Wimmer & Perner 1983)

(Astington & Gopnik 1991)

(Wimmer & Mayringer 1998)

(Bartsch & London 2000)

(Gopnik & Slaughter 1991)

### **B-tasks**

(Chartrand et al 1989)

(Call et al 1999; Low 2010 exp.2)

(Gopnik et al 1994;

Cluster 1996)

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### **B-tasks**

(Charlier et al 1989)

(Call et al 1999; Low 2010 exp.2)

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not adequately understanding



plans

goals

motor action

motion

change nappy

prepare infant

prepare nappy

S

strip clothes

clean bum

open

word

word

clauses

words

motor action

sound

. /reach X/ /grasp X/ /grasp Y/ /e//n//d//l//i//l//i//k//r//a//i//  
[reach-left-hand X] [left-whole t e n d l i l i k r a i d





'joint action [is] any form of social interaction whereby two or more individuals coordinate their actions in space and time to bring about a change in the environment.'

(Sebanz, Bekkering & Knoblich  
2006: 70)

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