

Mindreading and Joint Action

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Theory of mind *abilities* are
widespread



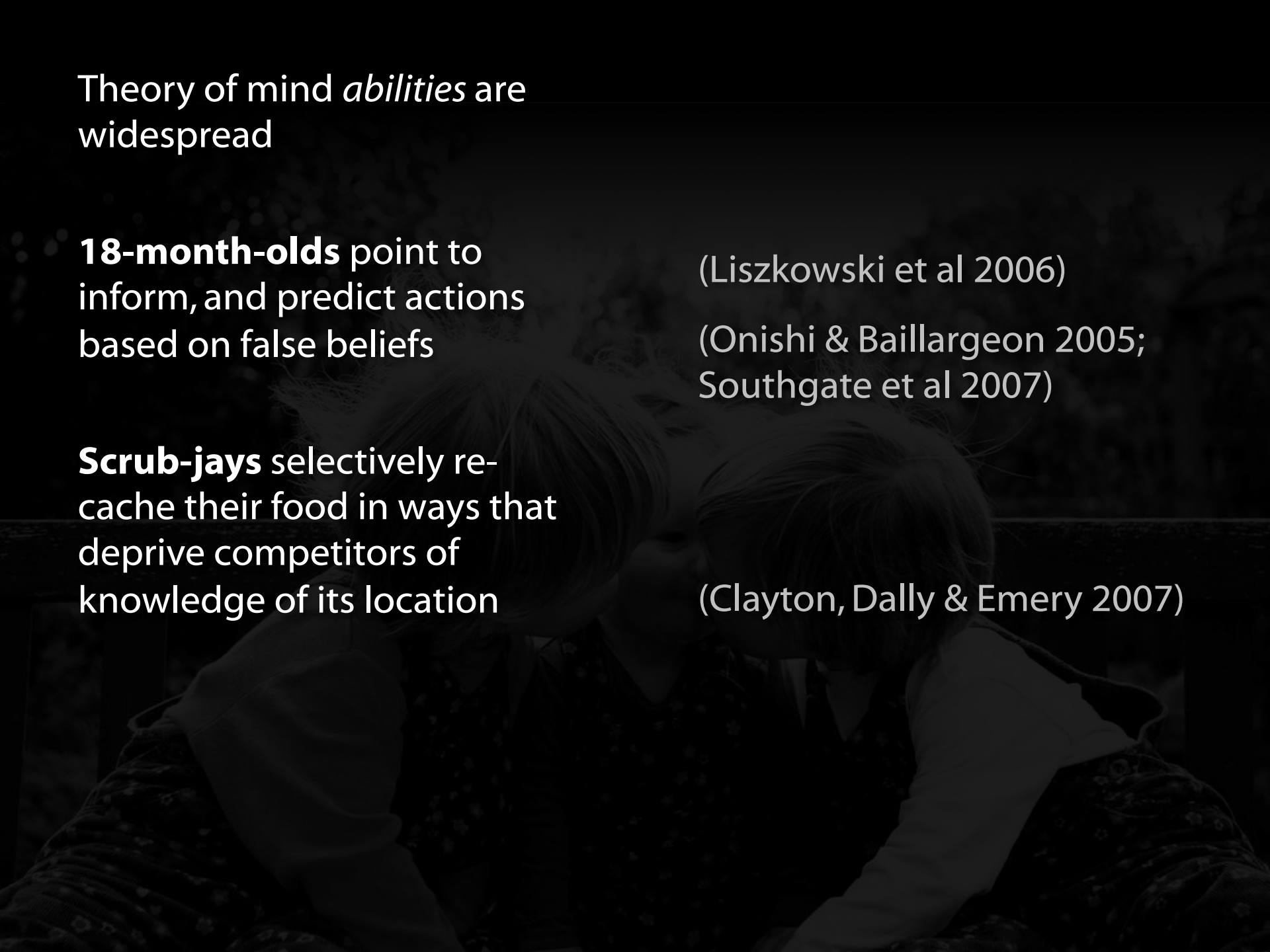
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18-month-olds point to inform, and predict actions based on false beliefs

(Liszkowski et al 2006)

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- development tied to acquisition of executive function and language

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- working memory

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first

What could infants, chimps and scrub-jays represent that would enable them, within limits, to track others' perceptions, knowledge, beliefs and other propositional attitudes?

question

A black and white photograph of two young children. In the foreground, a toddler with light hair, wearing a patterned shirt and dark overalls, is looking down and smiling. Behind them, a baby is also visible, looking towards the camera.

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Intentional relation

e.g. She is interested in that chocolate

e.g. She is smiling at me

Propositional attitude

e.g. She believes that the chocolate is in that cupboard



Your *field* = a set of
objects related to you by
proximity, orientation,
lighting and other factors



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proximity orientation lighting barriers trajectory

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You *encounter* an object =
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Principle 1: one can't goal-directedly act on an object unless one has encountered it.



proximity orientation lighting barriers trajectory

Your *field* = a set of objects related to you by proximity, orientation, lighting and other factors

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You *register* an object at a location = you most recently encountered the object at that location

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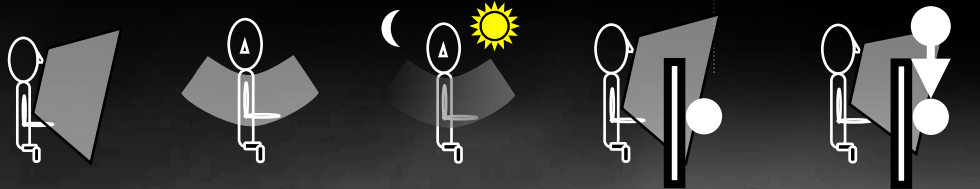
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Principle 3



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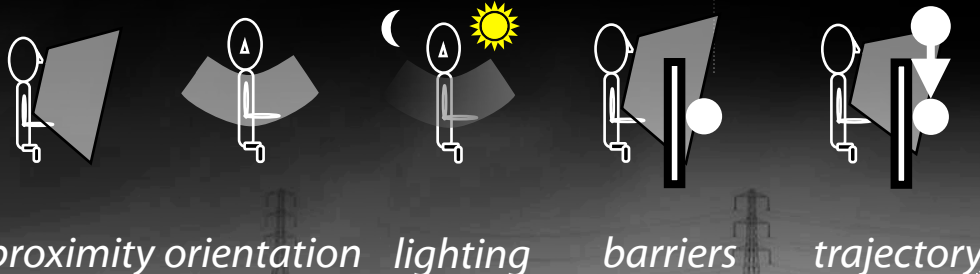
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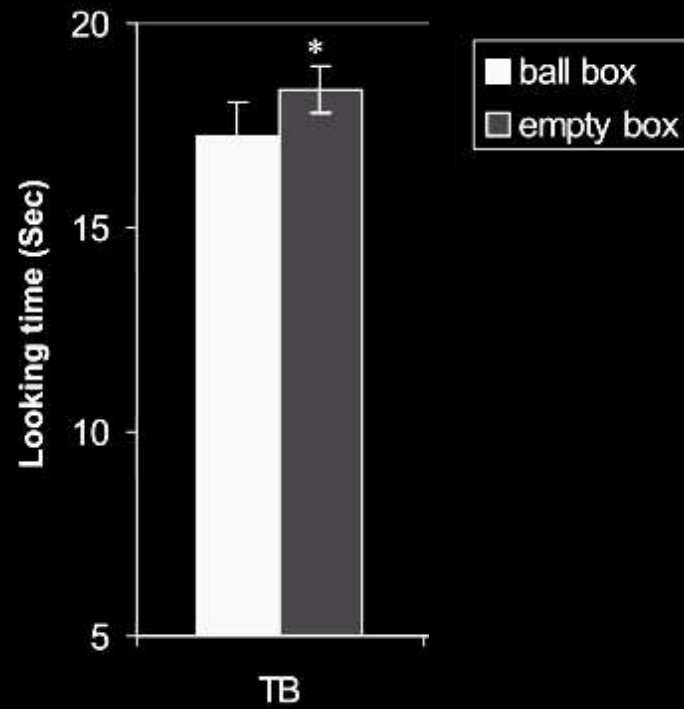




source Träuble, Marinovic, & Pauen (2010)



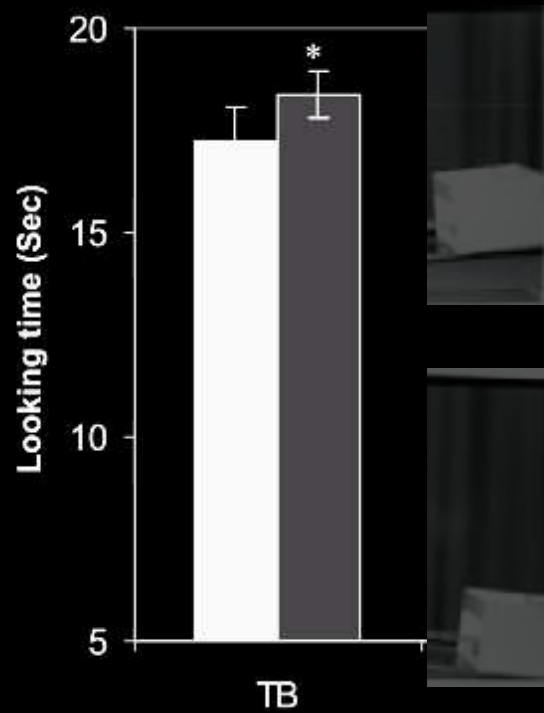
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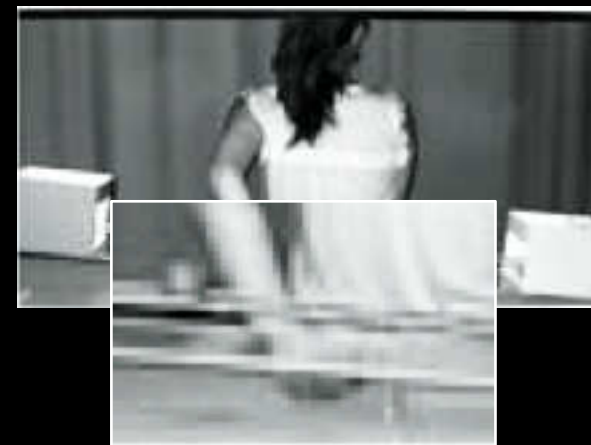
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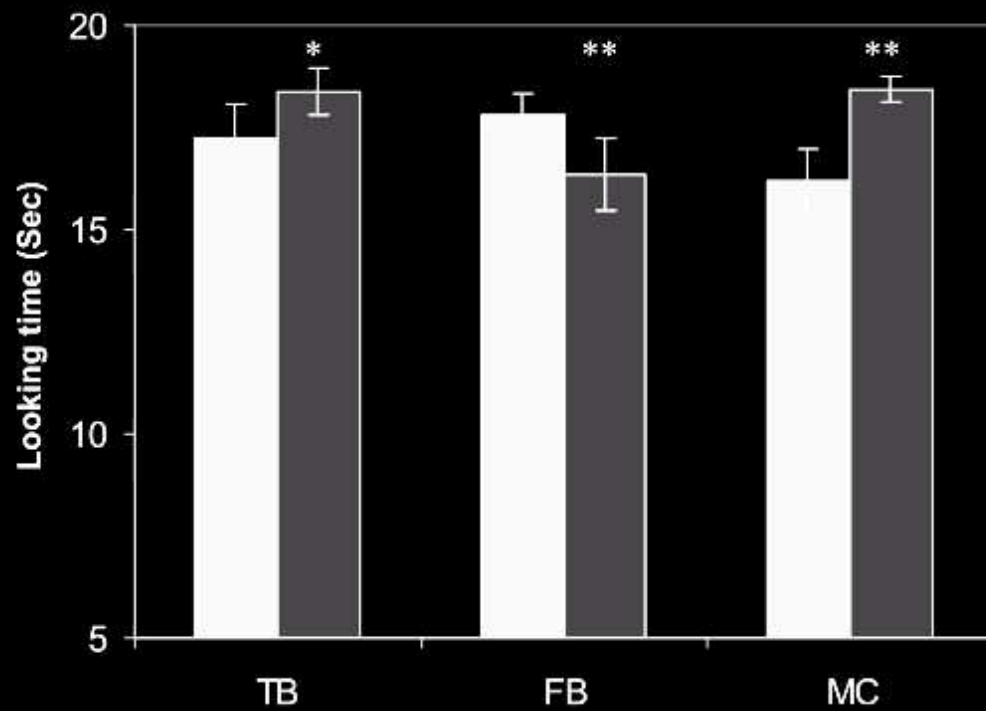
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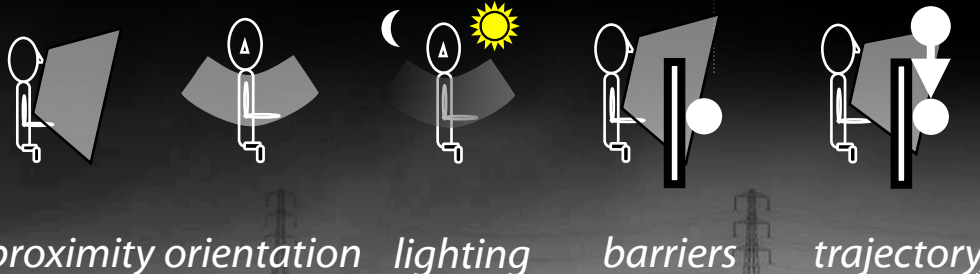
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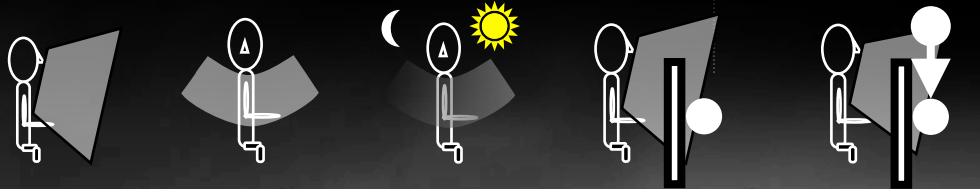
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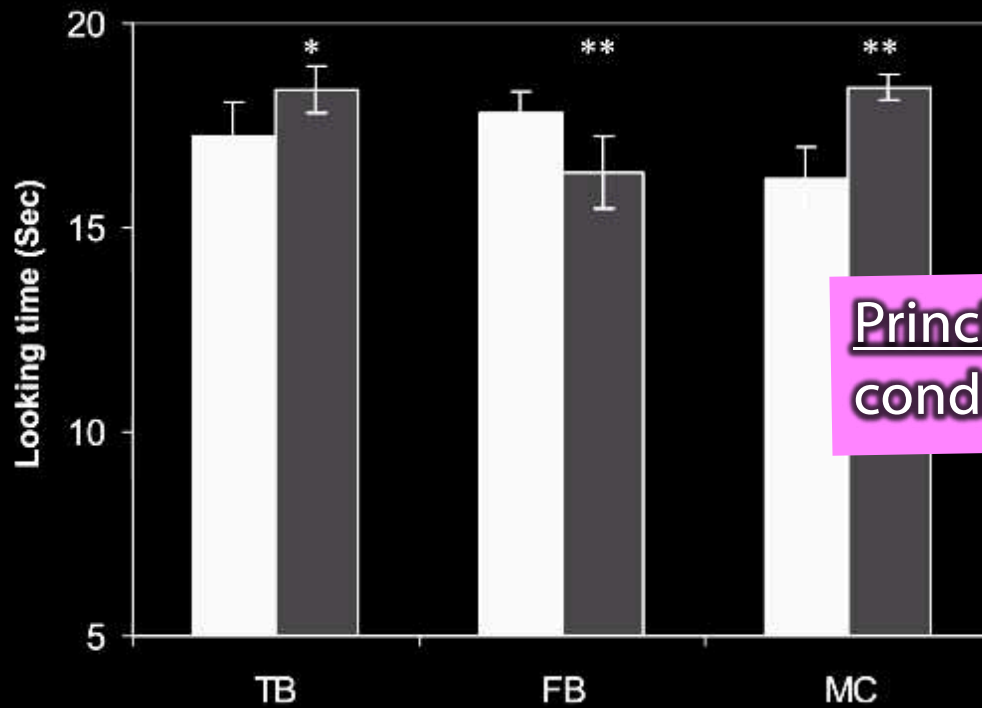
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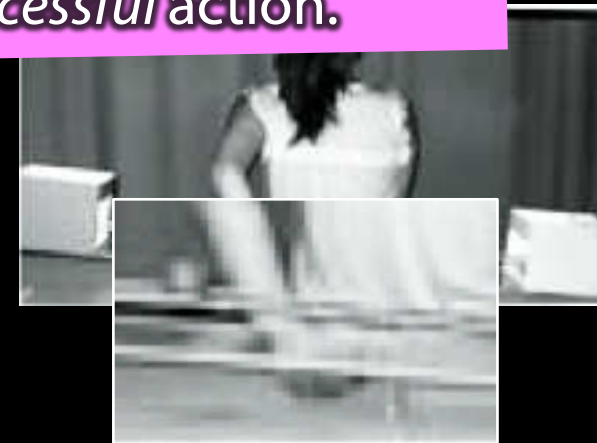
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proximity orientation lighting barriers trajectory



Principle 2: correct registration is a condition of *successful* action.



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signature limits

1. Charly is Samantha

2. Mitch believes that Charly is in Baltimore

3. Mitch believes that Samantha is in Baltimore

(1) & (2) \nrightarrow (3)

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4. Mitch registers <Charly, Baltimore>

5. Mitch registers <Samantha, Baltimore>

(1) & (4) \Rightarrow (5)

	False belief about location	False belief about identity
Subjects represent registration	<i>pass</i>	<i>fail</i>
Subjects represent beliefs	<i>pass</i>	<i>pass</i>















"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)

tidying up the toys together

(Behne et al 2005)

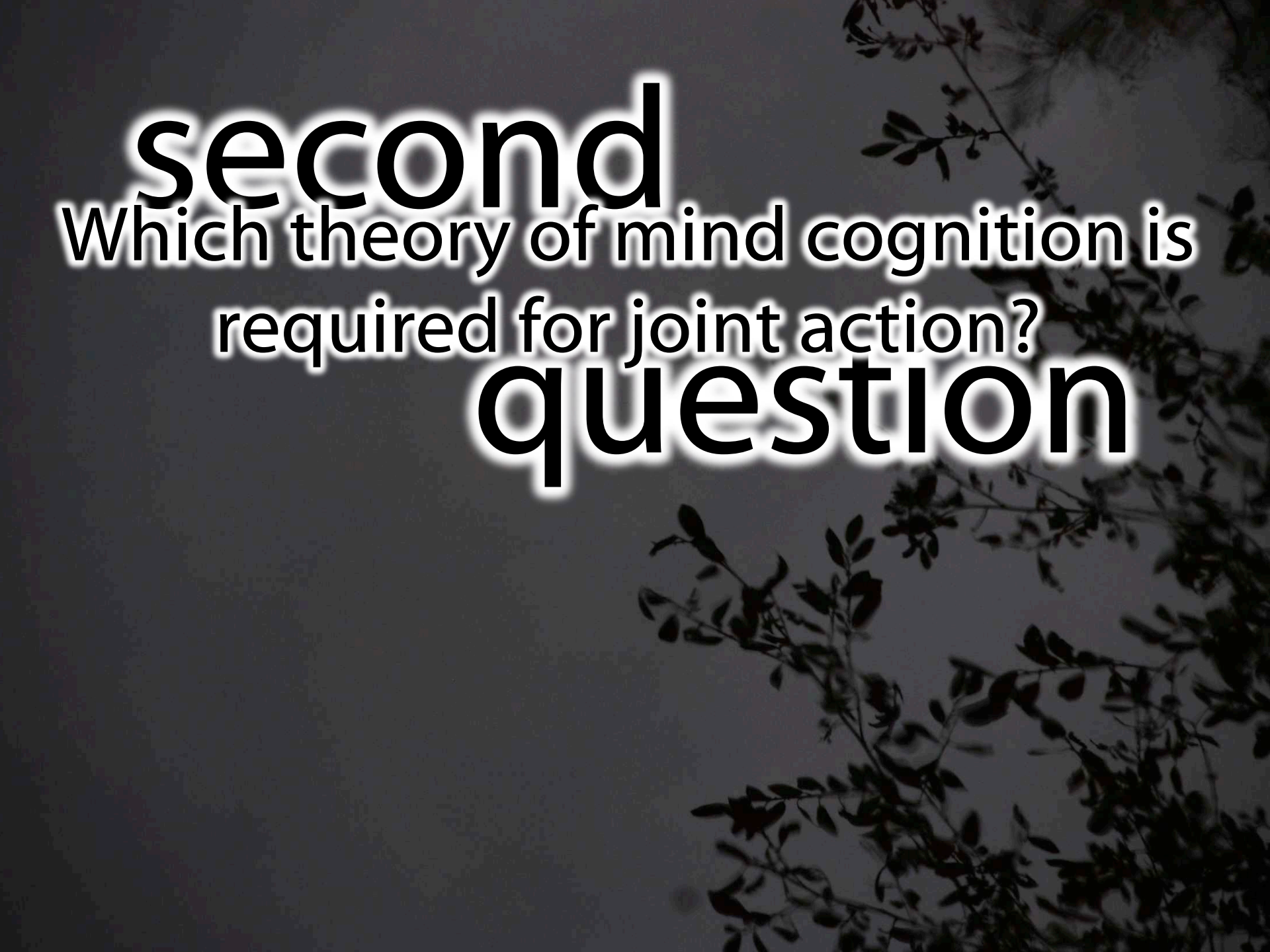
cooperatively pulling
handles in sequence to
make a dog-puppet sing

(Brownell et al 2006)

bouncing a ball on a large
trampoline together

(Tomasello & Carpenter 2007)

pretending to row a boat
together



second

Which theory of mind cognition is
required for joint action?

question

shared intention

'I take a collective action to involve a collective
[shared] intention.'

(Gilbert 2006, p. 5)

'The sine qua non of collaborative action is a joint goal
[shared intention] and a joint commitment'

(Tomasello 2008, p. 181)

'the key property of joint action lies in its internal
component [...] in the participants' having a
"collective" or "shared" intention.'

(Alonso 2009, pp. 444-5)

'Shared intentionality is the foundation upon which
joint action is built.'

(Carpenter 2009, p. 381)



We have a shared intention
that we J =

“1. (a) I intend that we J and
(b) you intend that we J

“2. I intend that we J in
accordance with and
because of Ia, Ib, and
meshing subplans of Ia and
Ib; you intend [likewise] ...

“3. 1 and 2 are common
knowledge between us”

(Bratman 1993: View 4)



Intentions about intentions



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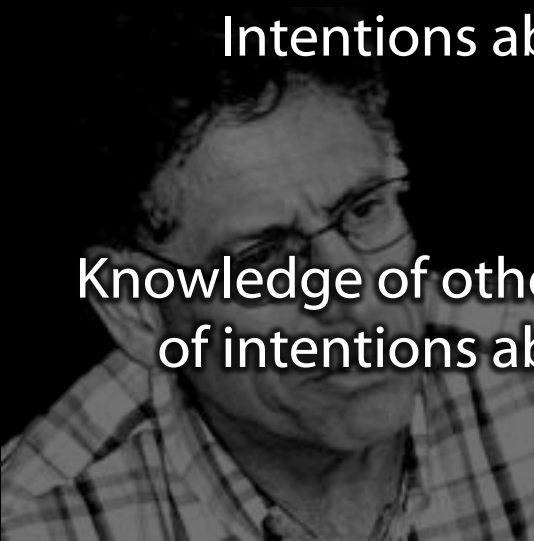
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Intentions about intentions

Knowledge of others' knowledge
of intentions about intentions



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2. Shared intention requires sophisticated theory of mind cognition.

Therefore:

3. Abilities to engage in joint action could play no significant role in explaining the emergence, in evolution or development, of mindreading.

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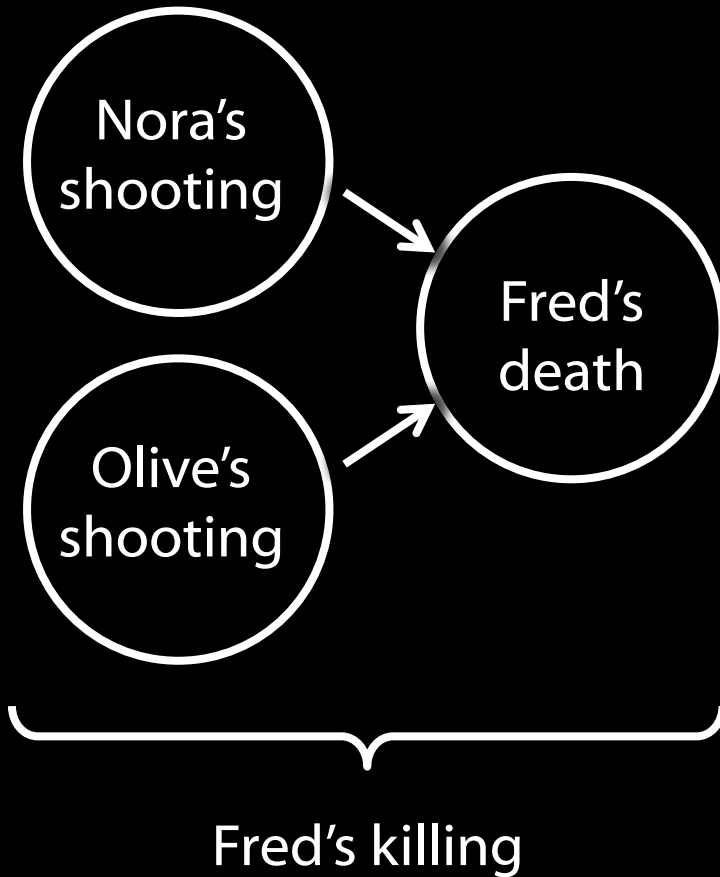
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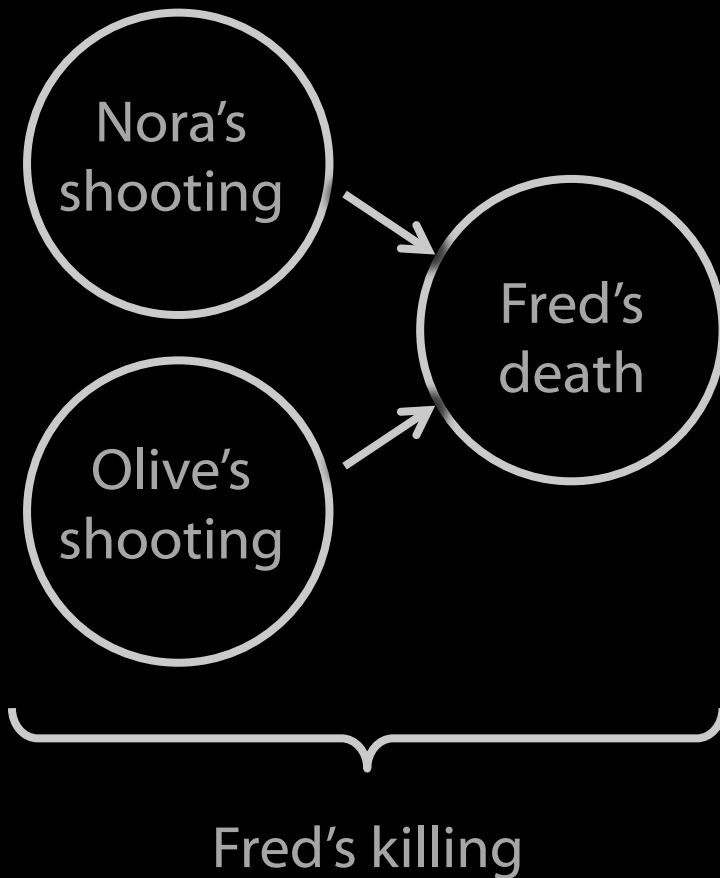
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Joint action:
an event with two or more
agents (Ludwig 2007)

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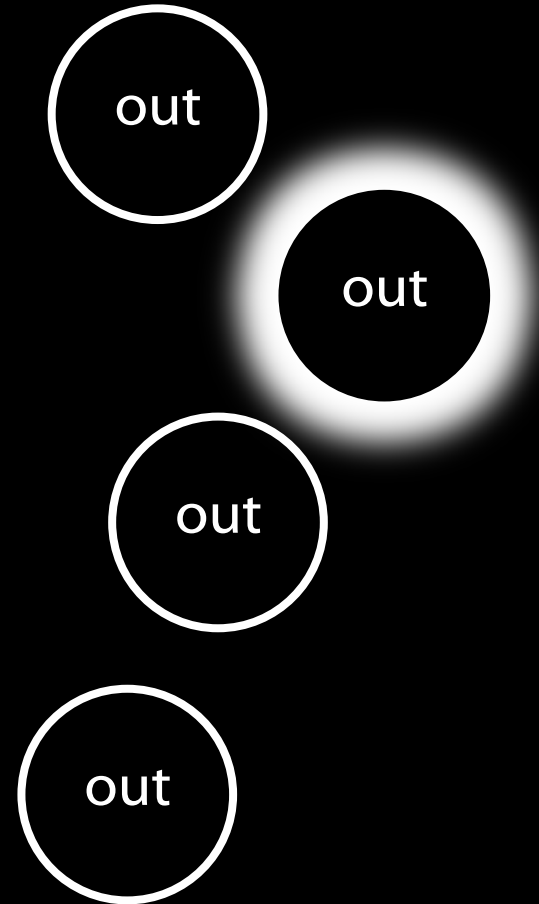
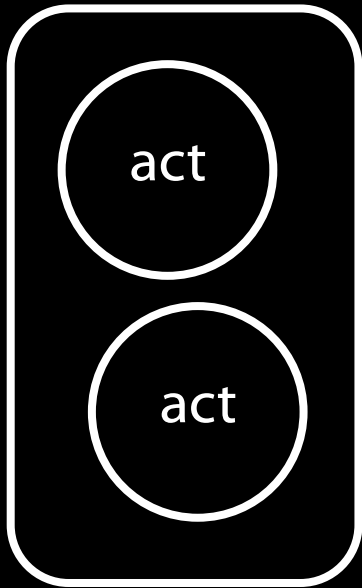
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Goal-directed joint action: an event with two or more agents which, taken as a whole, is directed to a goal.

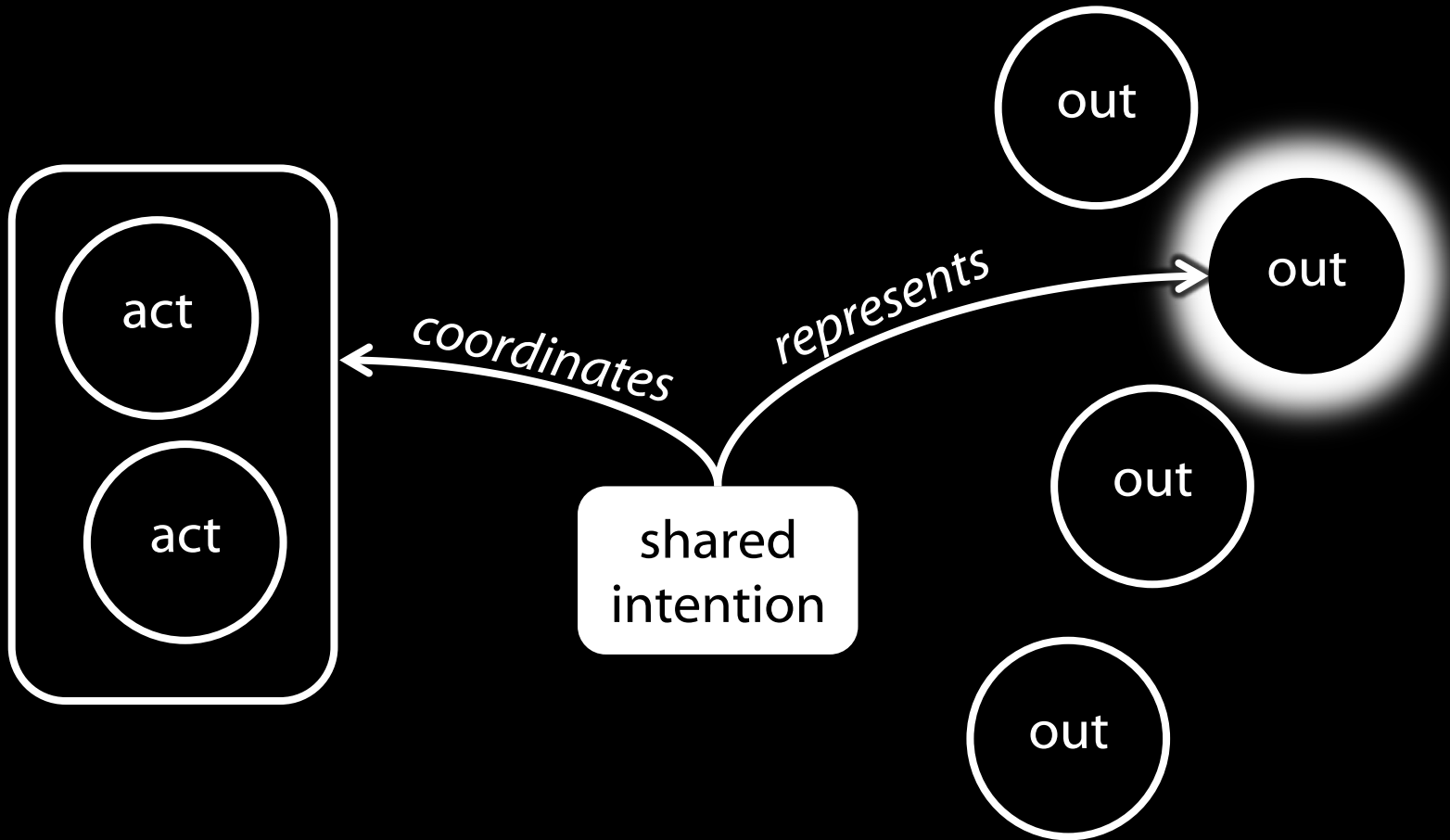
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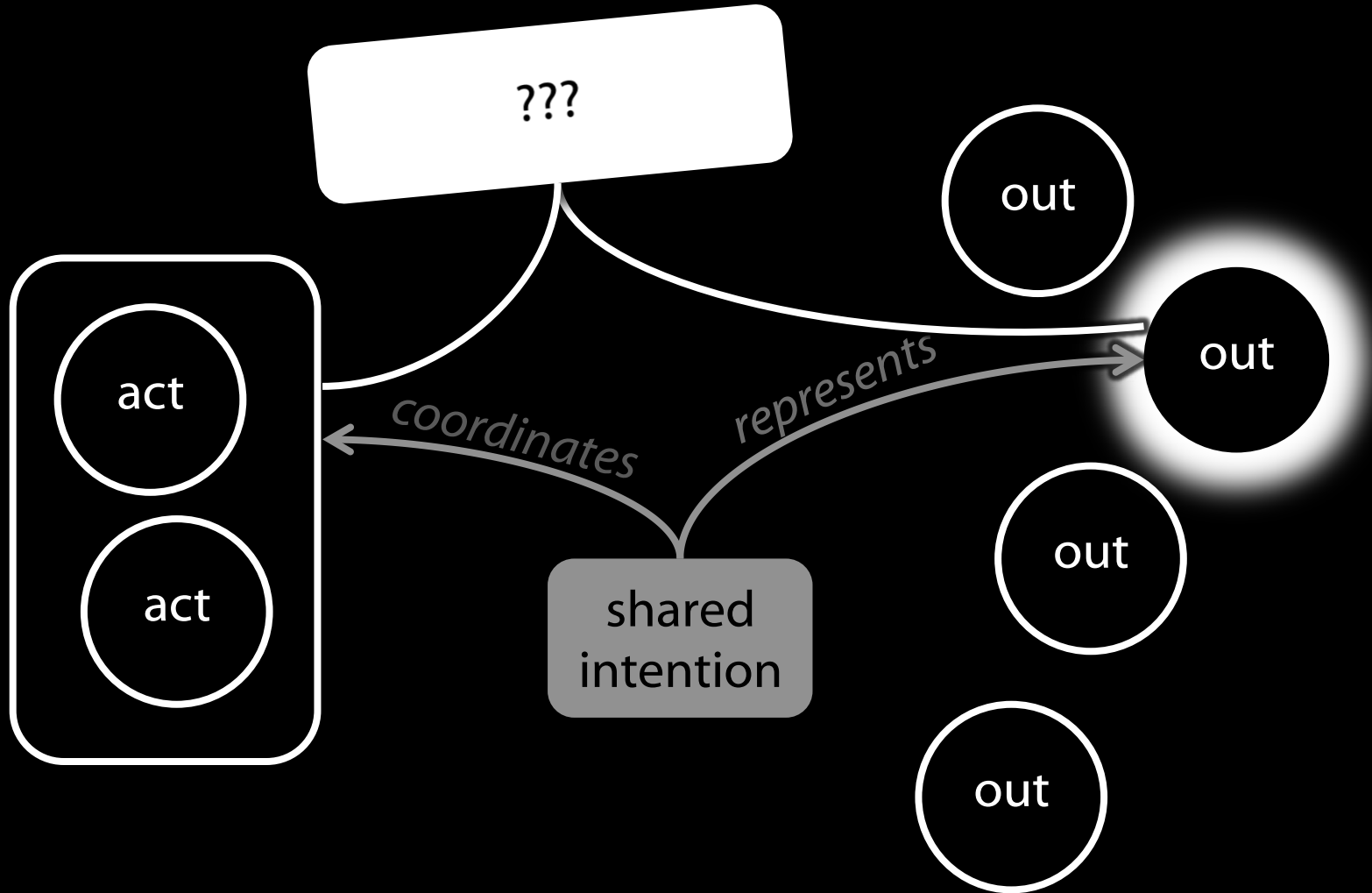
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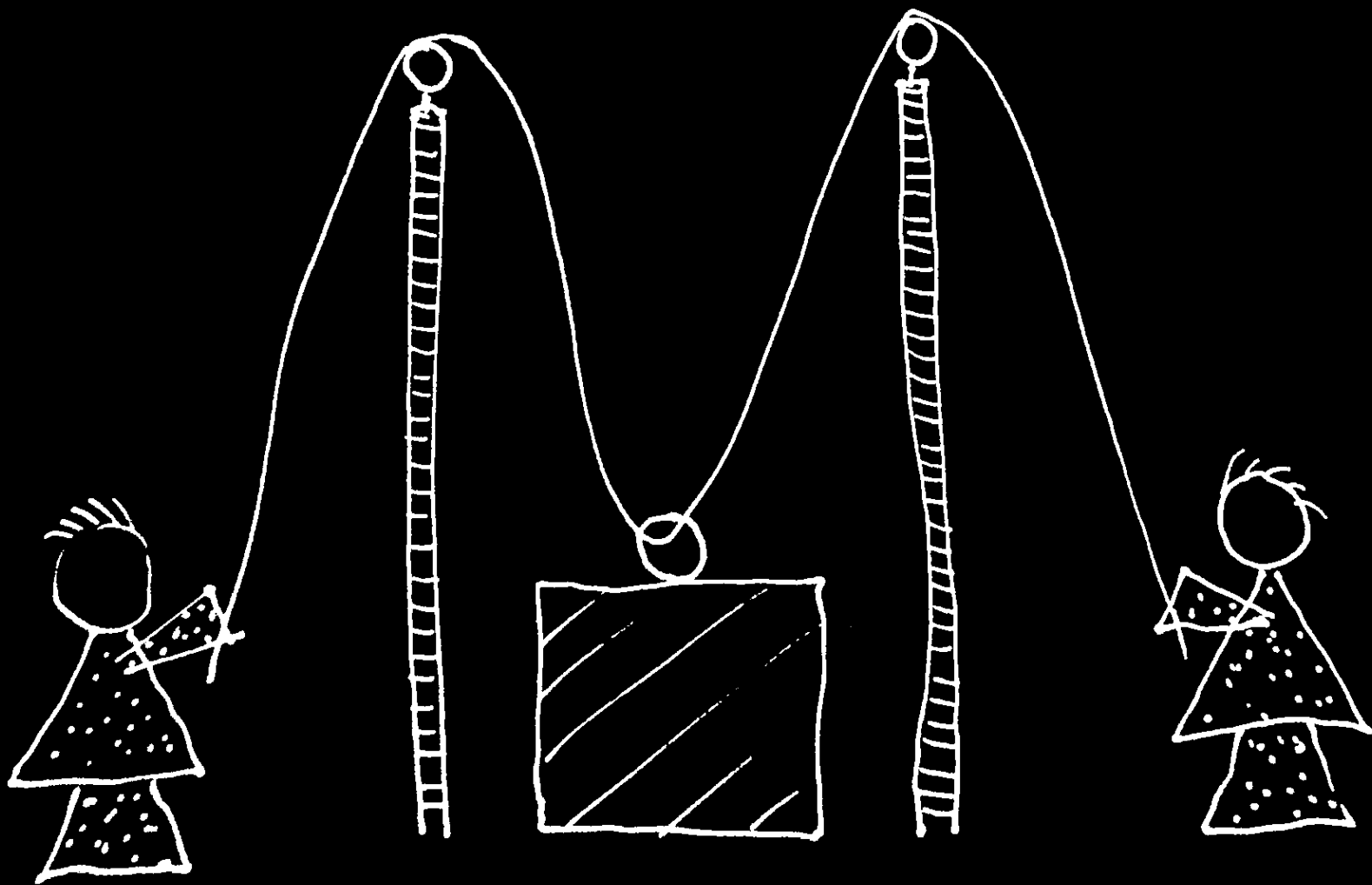
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G is a collective goal

- (a) it is a distributive goal;
- (b) the agents' activities are coordinated; and
- (c) coordination of this type would normally facilitate occurrences of outcomes of this type.



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(b) the agents' activities are coordinated; and

(c) coordination of this type would normally facilitate occurrences of outcomes of this type.

Each agent expects each of the other agents to perform activities directed to the goal.

Each agent expects the goal to occur as a common effect of all their goal-directed actions.

A black and white close-up photograph of a young child with light hair, looking directly at the camera with a finger in their mouth. The text "third question" is overlaid in a large, bold, black font with a white outline.

**third
question**

failed reach



point



source: Hare & Tomasello (2004)

The problem of opaque means

The problem of false belief

your-goal-is-my-goal

your-goal-is-my-goal

1. We are about to engage in some joint action* or other

2. I am not about to change my goal.

Therefore:

3. Your actions also will be directed to this goal.

[*in at least the minimal sense associated with distributive goals]

failed reach



point



source: Hare & Tomasello (2004)

failed reach



point



source: Hare & Tomasello (2004)

“to understand pointing, the subject needs to understand more than the individual goal-directed behaviour. She needs to understand that ... the other attempts to communicate to her ... and ... the communicative intention behind the gesture”

(Moll & Tomasello 2007)

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point



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Csibra's 'two stances':

Teleological and referential action interpretation 'rely on different kinds of action understanding'

These are initially two distinct 'action interpretation systems' and they come together later in development

Csibra (2003, p. 456)

joint action (ability
to share goals)

minimal theory of
mind cognition

understanding
communicative intent

other stuff

communication by
language

other stuff

full-blown theory of
mind cognition

