

Joint Action conceptual tools for scientific research

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something resembling one,
comprising two or more
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cooperatively pulling
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make a dog-puppet sing

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pretending to row a boat
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"perception, action, and cognition
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(Sebanz & Knoblich 2008)

"human cognitive abilities... [are] built
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"participation in cooperative, cultural
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construct uniquely powerful forms of
cognitive representation."

(Moll & Tomasello 2007)



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first
shared intention
part



'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)

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Functional characterisation

Substantial account



Functional characterisation

shared intention serves to
(a) coordinate activities, (b)
coordinate planning and (c)
structure bargaining

Substantial account





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Substantial account

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 la, lb, and
meshing subplans of la and
lb; you intend [likewise] ...

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

(Bratman 1993:View 4)



Functional characterisation

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Intentions about intentions

Substantial account

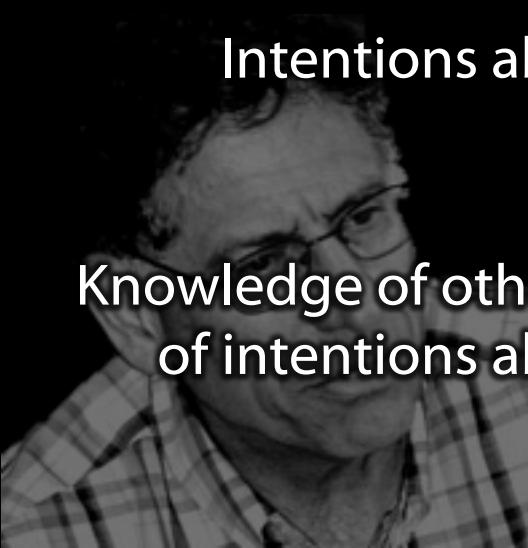
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Knowledge of others' knowledge
of intentions about intentions

Substantial account

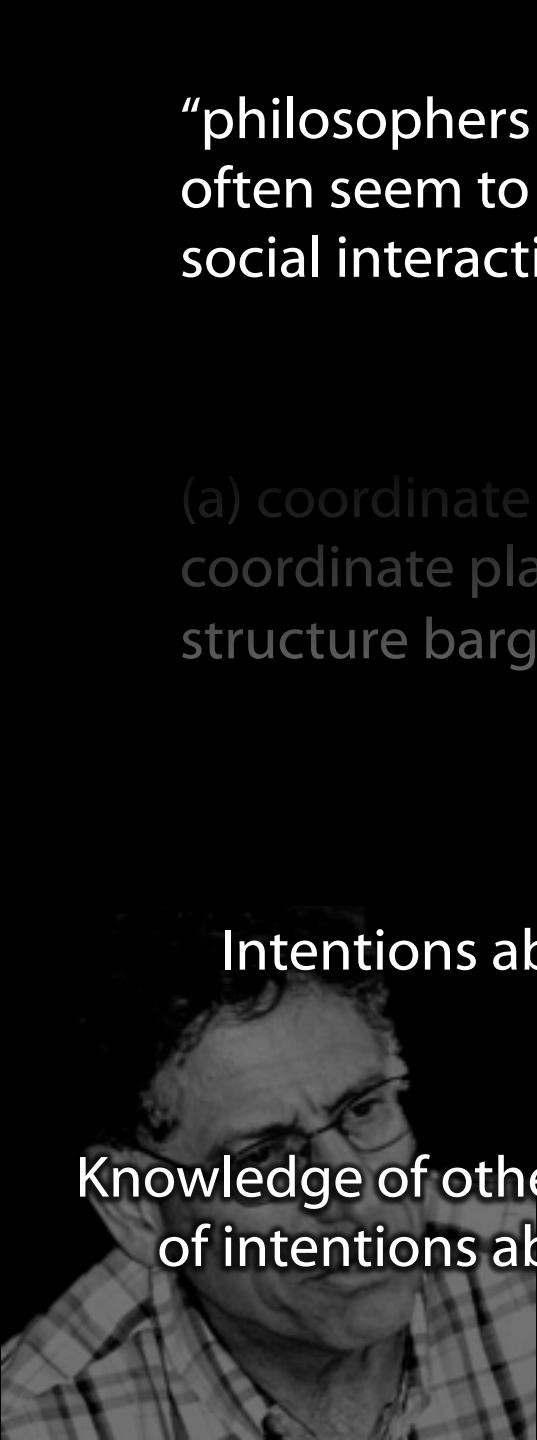
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“philosophers ... postulate complex intentional structures that often seem to be beyond human cognitive ability in real-time social interactions.”

(Knoblich & Sebanz 2008:2022)

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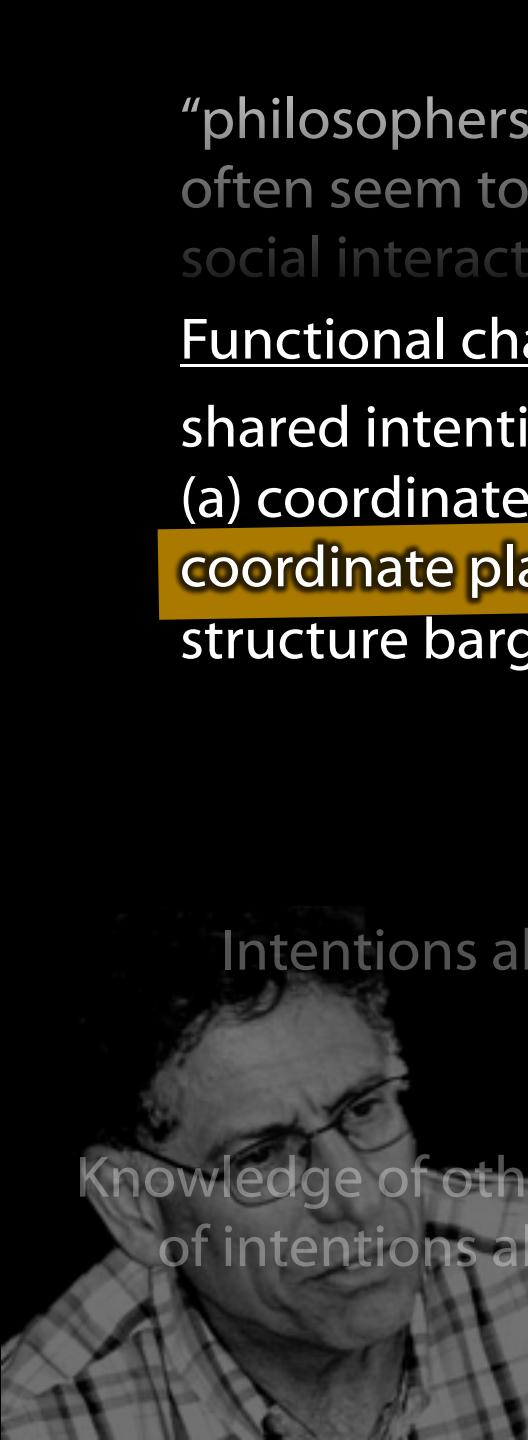
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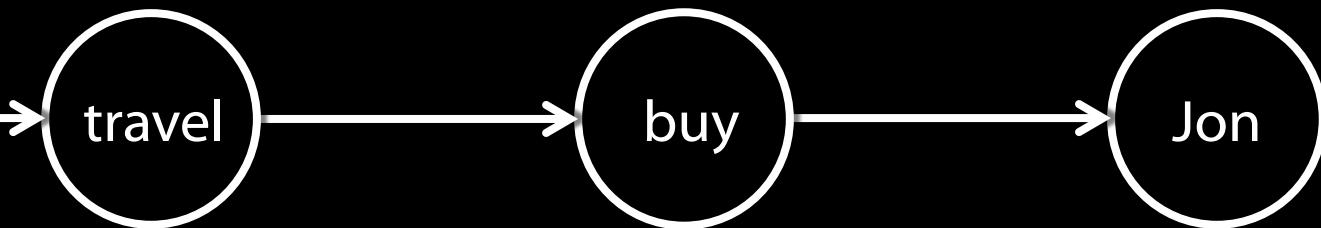
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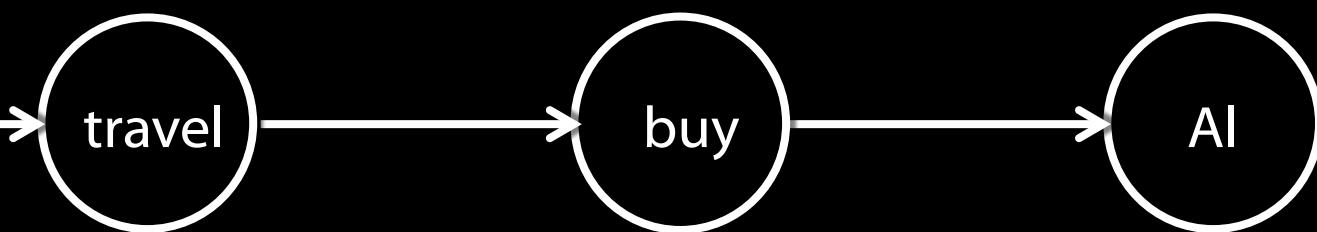
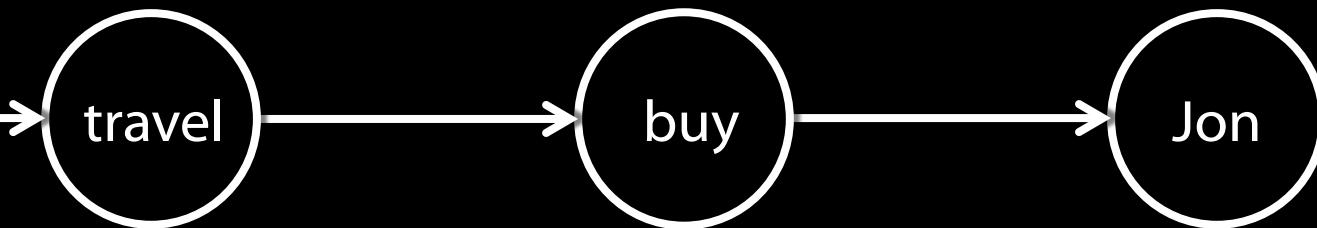
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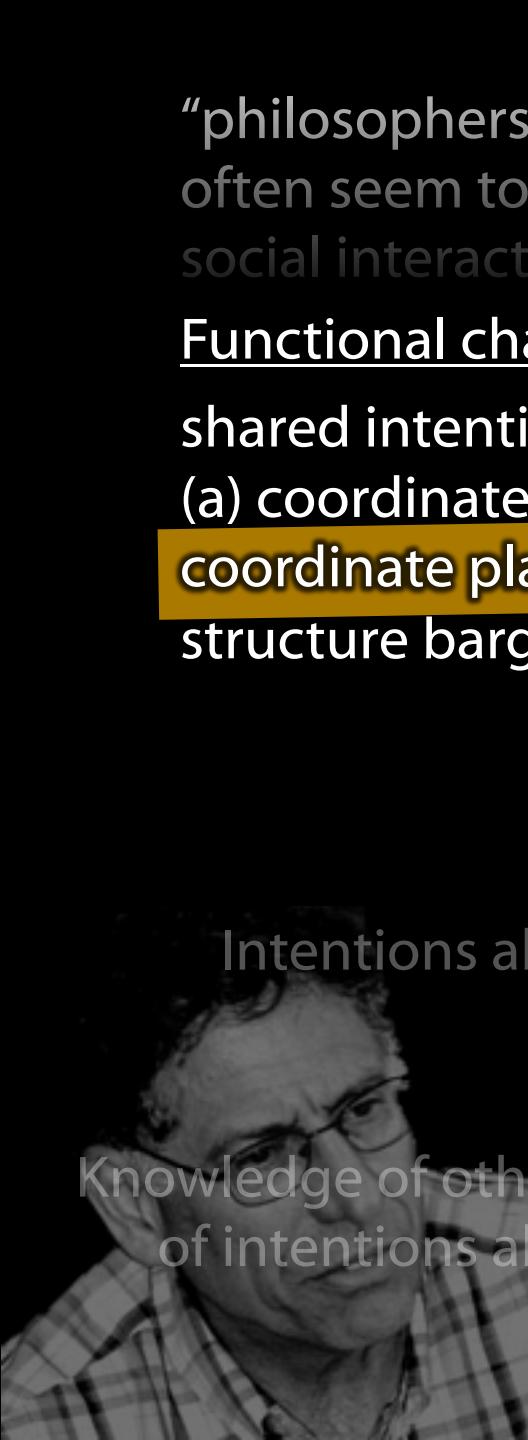
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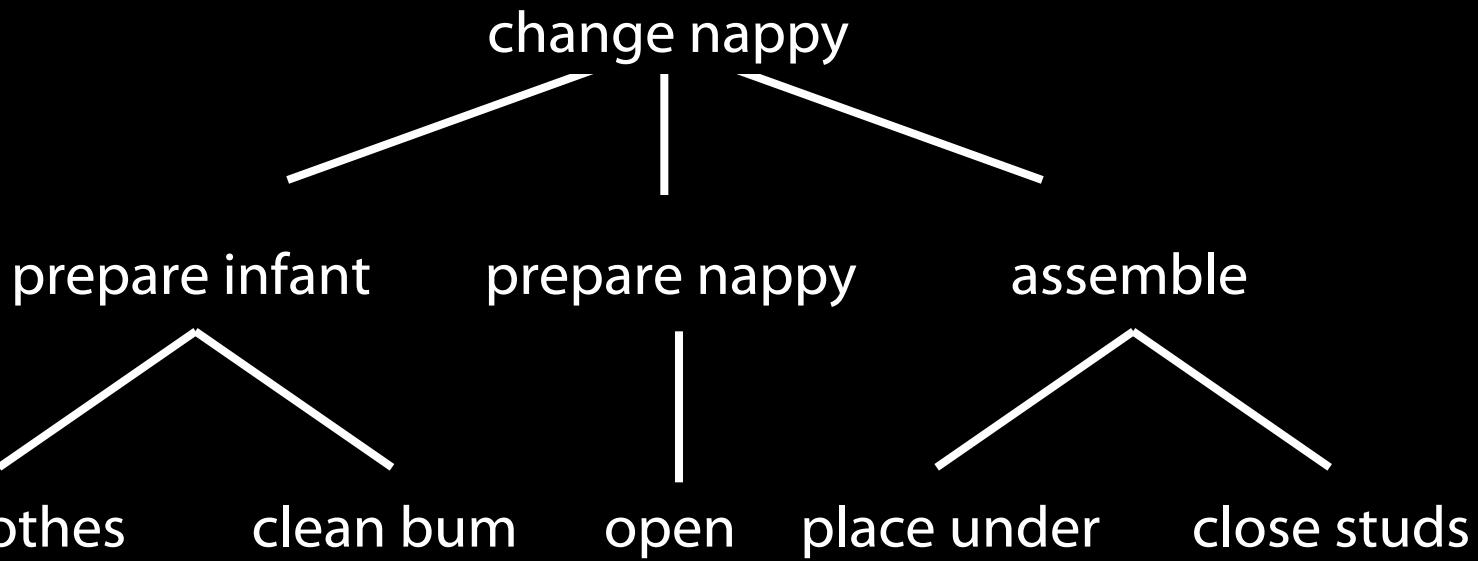
pretending to row a boat
together

change nappy

plans

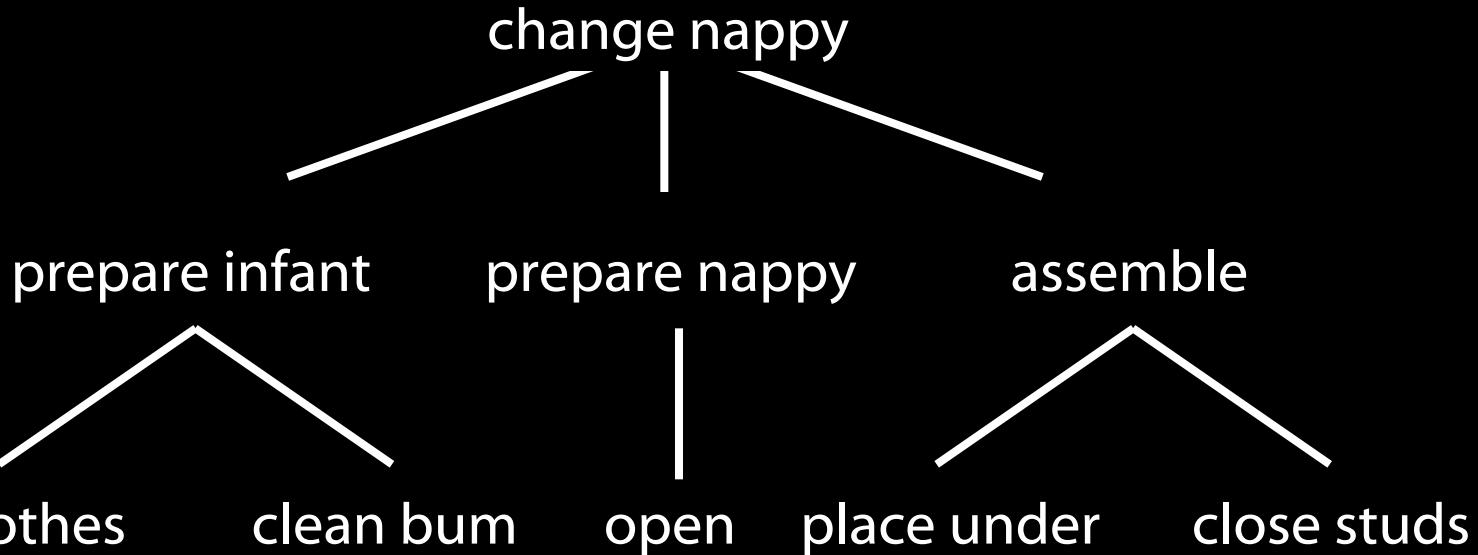


plans



goals

plans

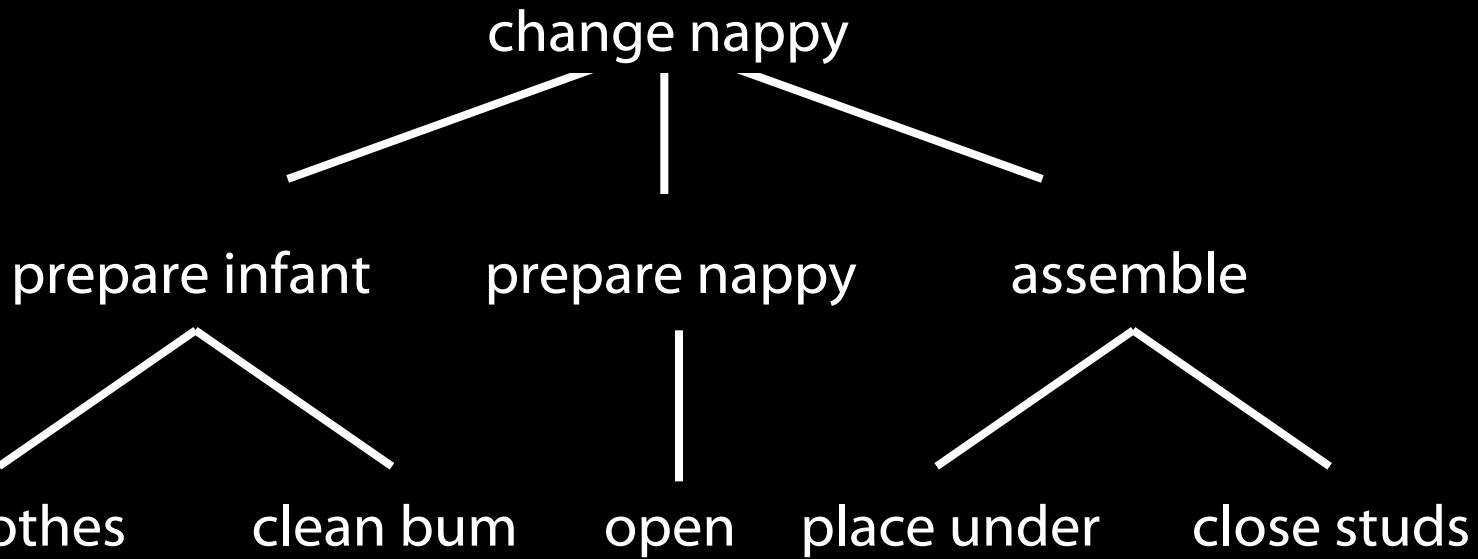


goals

motor action

. /reach X/ /grasp X/ /grasp Y/ /pull Y/ /scoop X/ /Y out of X/ ...

plans



goals

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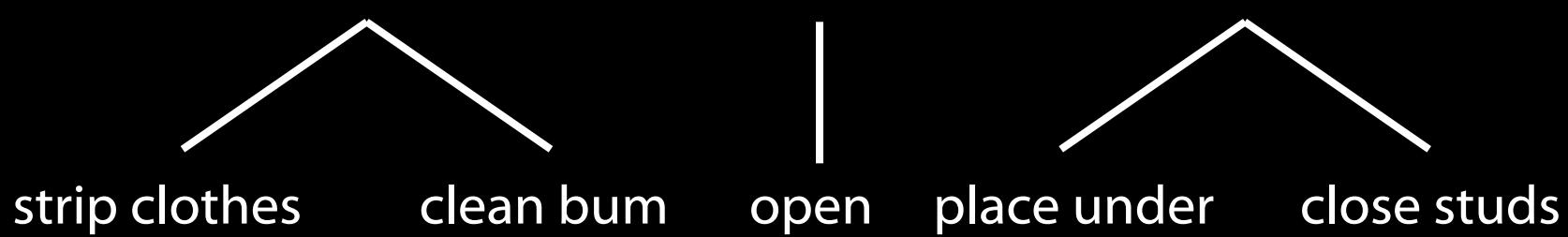
[reach-left-hand X] [left-wholehand-grasp X] [right-wholehand-grasp ...]

motor action

plans



goals



motor action

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[reach-left-hand X] [left-wholehand-grasp X] [right-wholehand-grasp ...

motion



mirroring for coordination?



“Why should the motor system encode the goals of actions performed by others? ... the interpretation of this finding was that they allow the observer to understand directly the goal of the actions of others.”

(Rizzolatti and Sinigaglia 2010)



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“...mirror-based understanding ... [observed] acts are mapped onto the vocabulary of the observer's own motor acts.”

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“The primary function of such a mapping [is] ... to allow the observed to ... understand the intentional meaning of another's action.”

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recognition of motor
intentional meaning

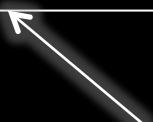


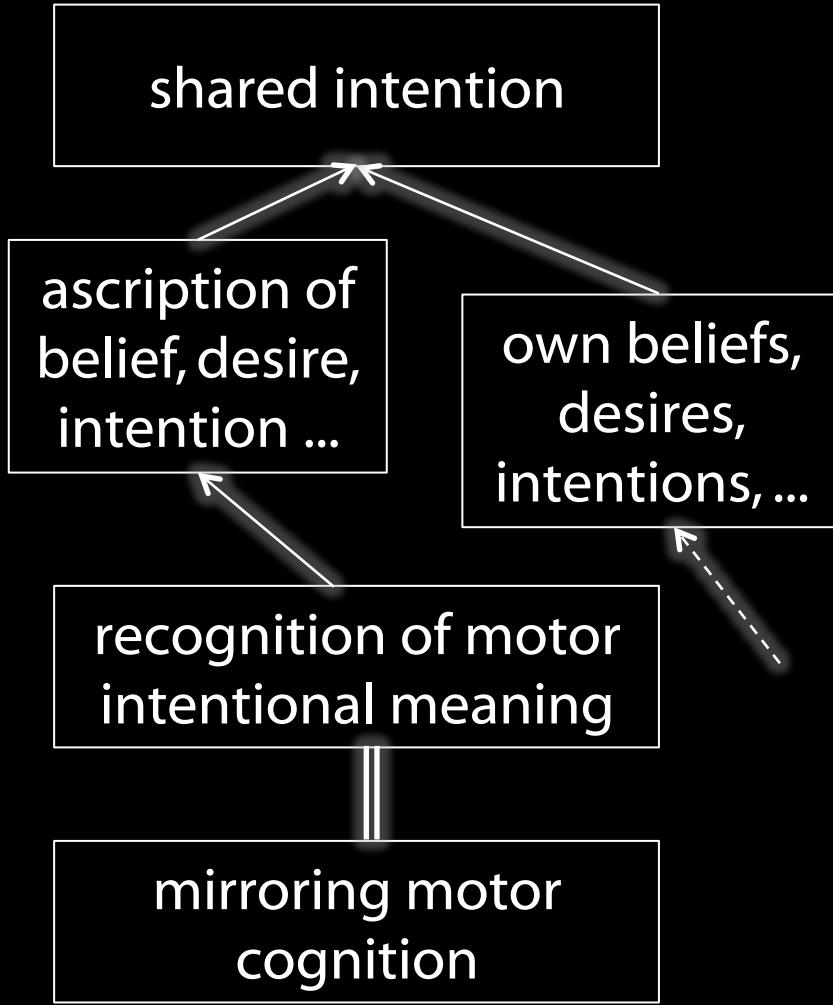
mirroring motor
cognition

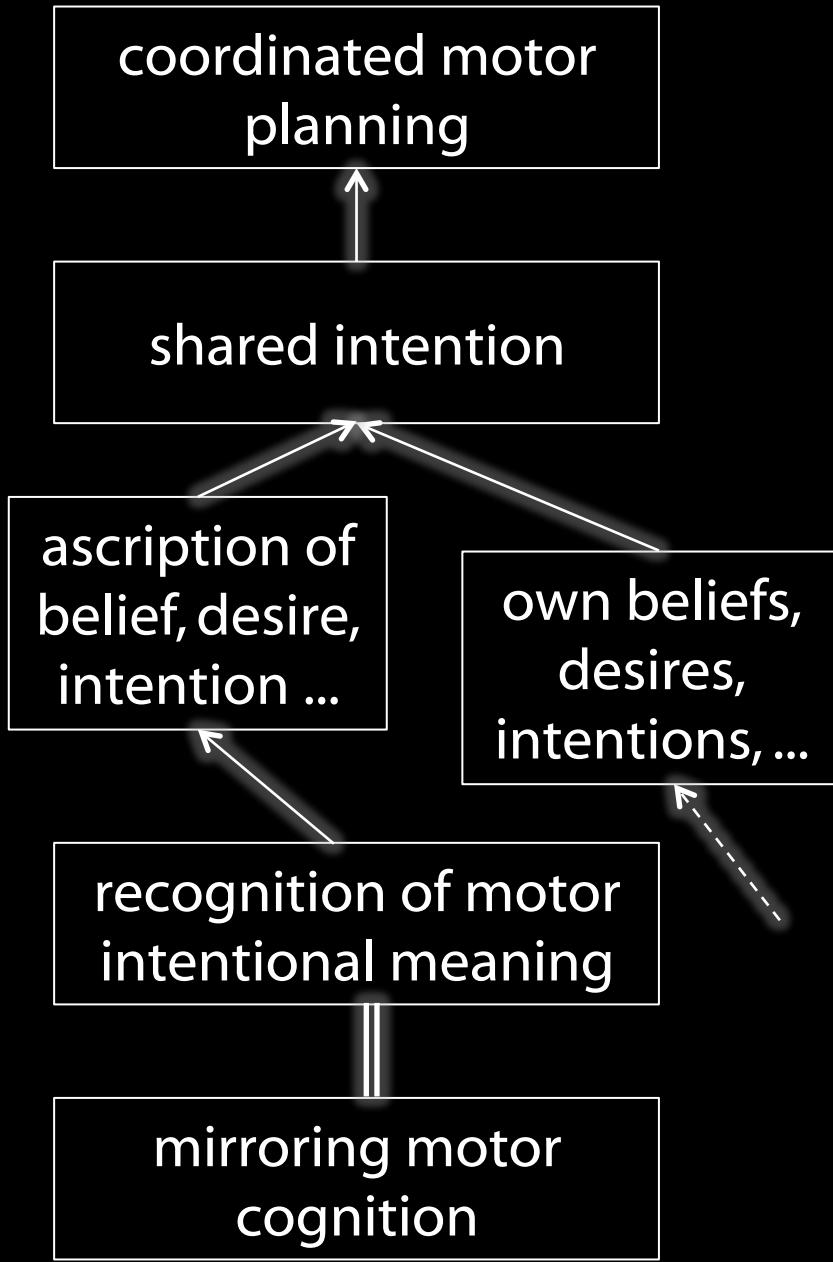
scription of
belief, desire,
intention ...

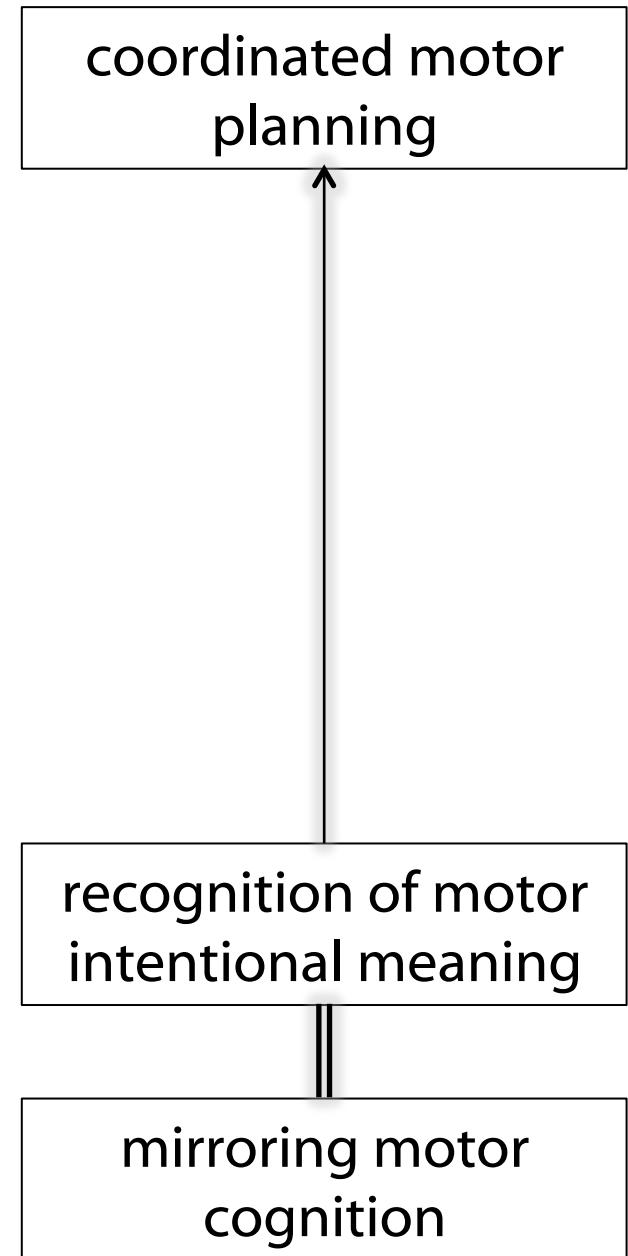
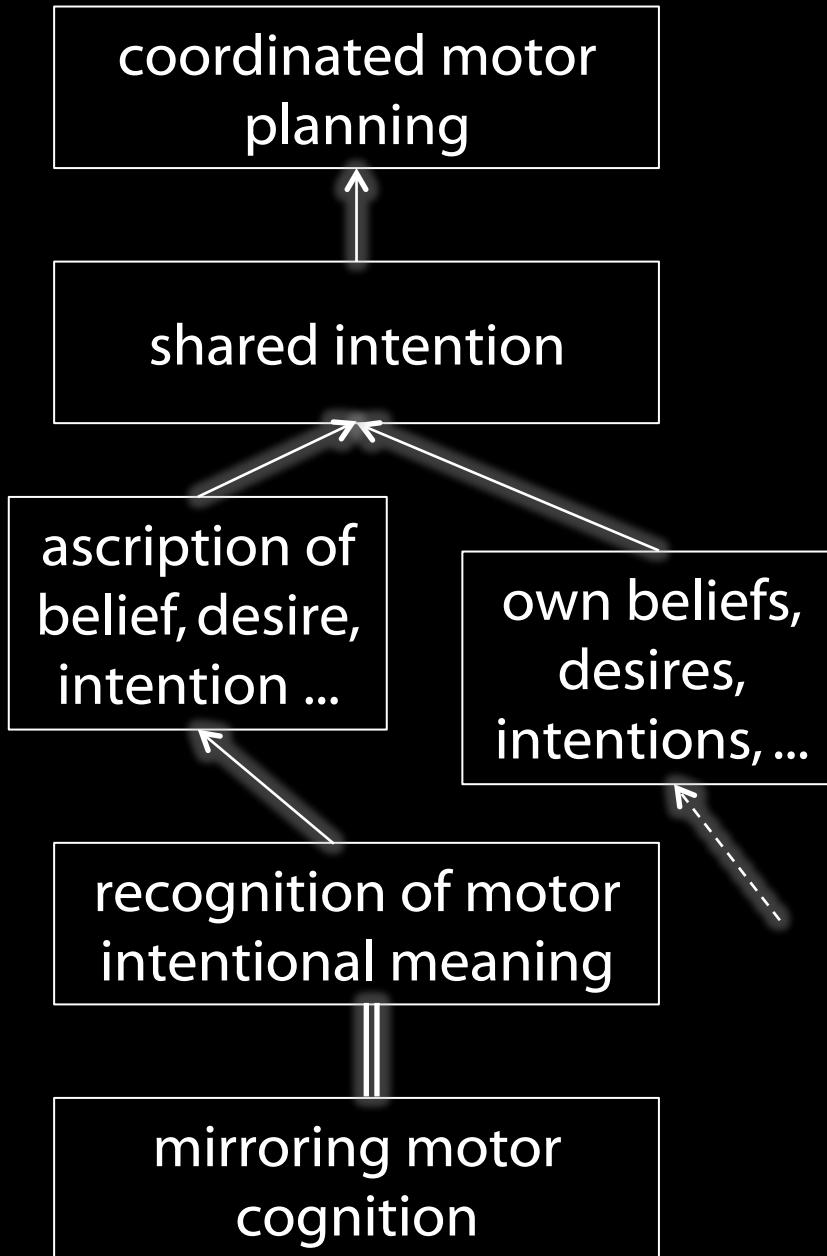
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cognition









case
co-representation
study

Shared Task Representations

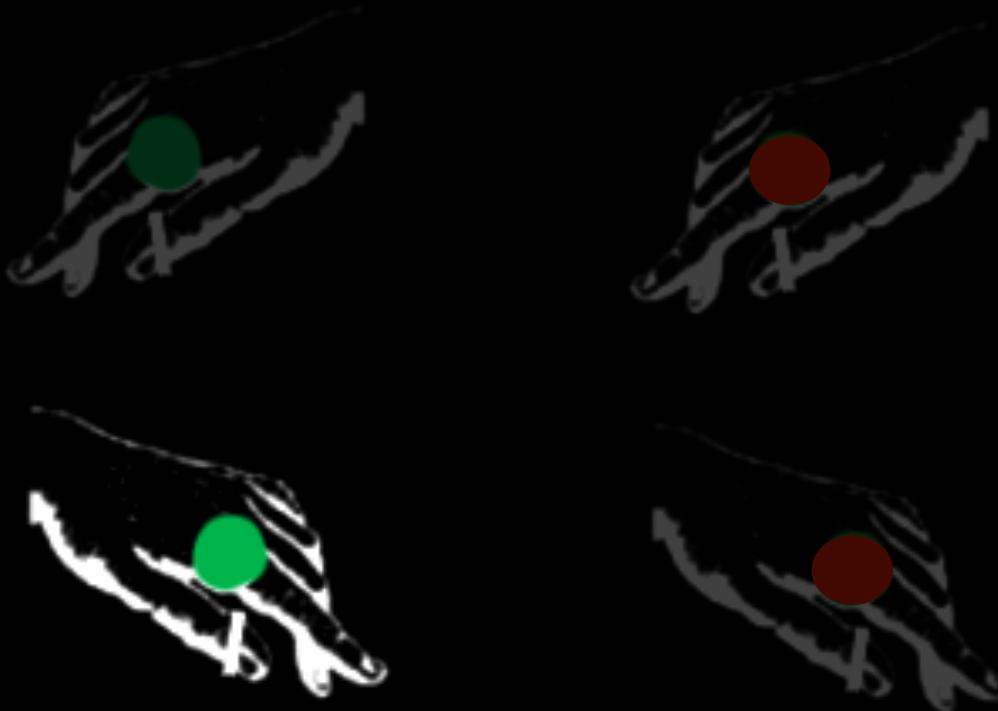
- (1) If a green ring appears, press the right button
 - (2) If a red ring appears, press the left button
- (Sebanz et al 2003)

Shared Task Representations

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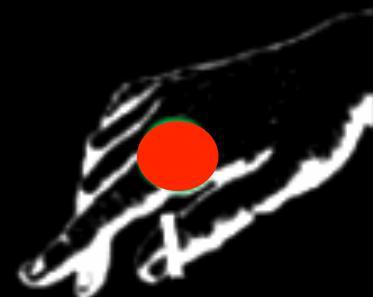


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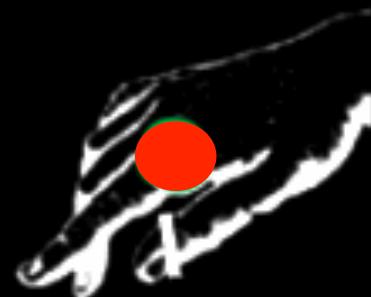


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role of Agent1

*If a finger
pointing left
appears, press
the left button*

role of Agent2

*If a green ring
appears, press
the right button*

*task
representations*

role of Agent1

*If a finger
pointing left
appears, press
the left button* → *action
plan*

role of Agent2

*If a green ring
appears, press
the right button* → *action
plan*

*task
representations* *action
initiation*

role of Agent2

*If a green ring
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*action
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role of Agent1

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*action
plan*



*left
button
press*

*task
representations*

*action
initiation*

action

role of Agent1

role of Agent2

*If a finger
pointing left
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*action
plan*

*If a green ring
appears, press
the right button*



*action
plan*

*inhibition by
knowledge*

*task
representations*

*action
initiation*

*left
button
press*

action

*my task is to
press the
right button*

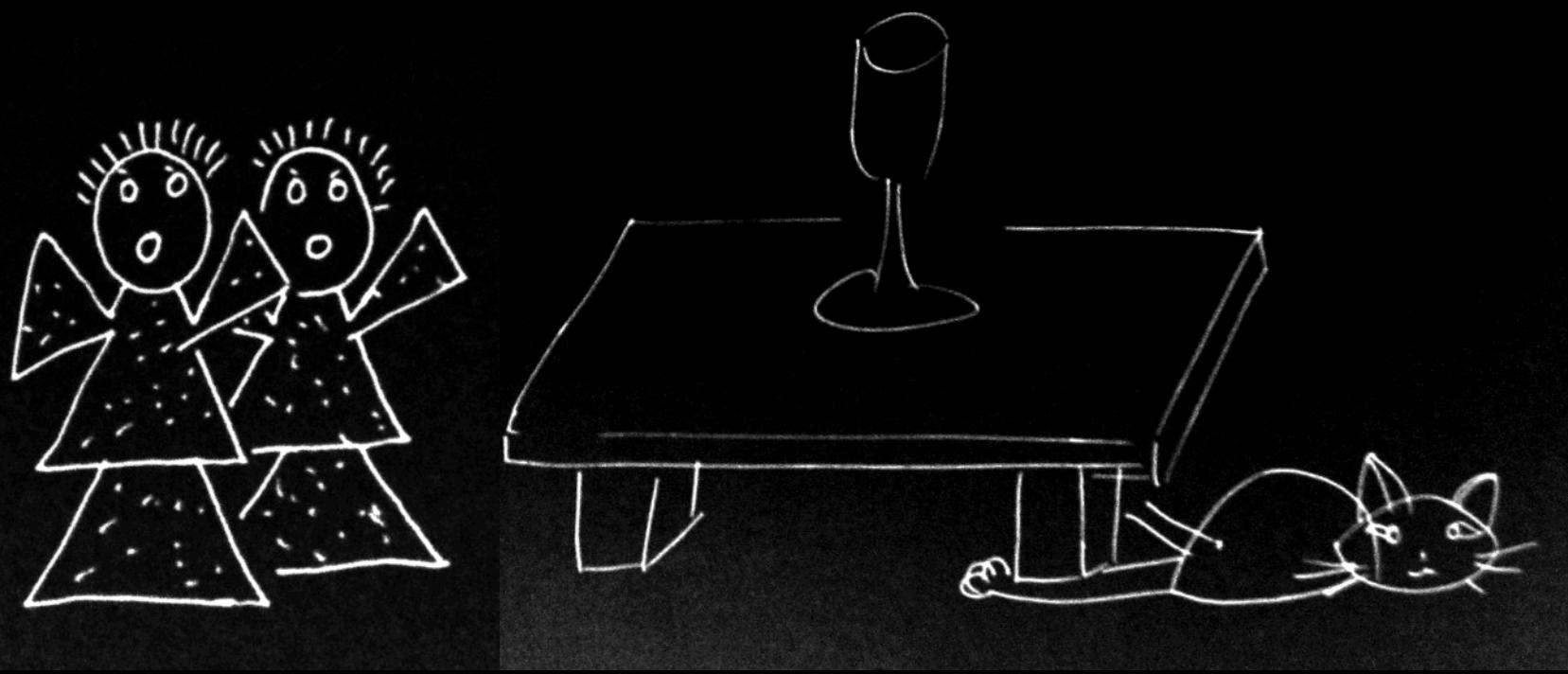


*[no
action]*

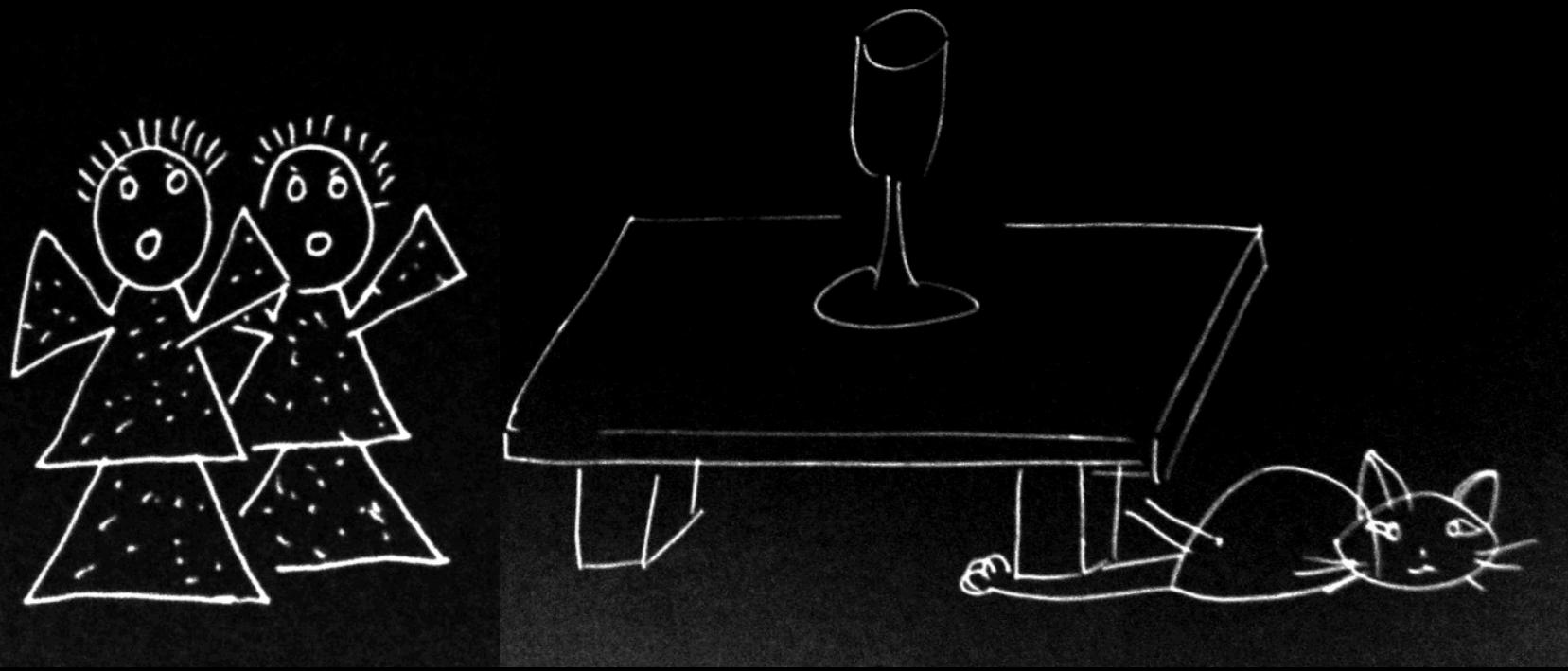
second
part
a puzzle

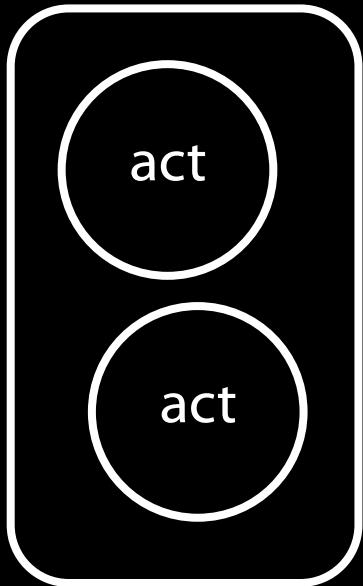
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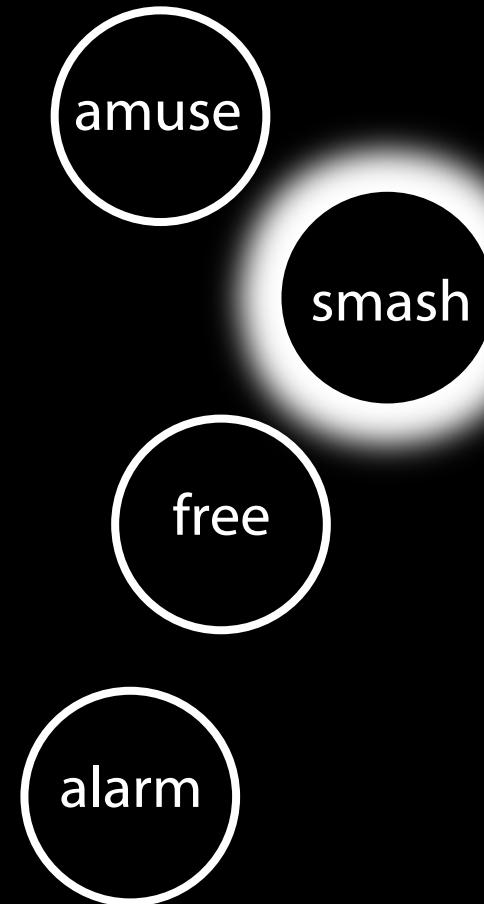
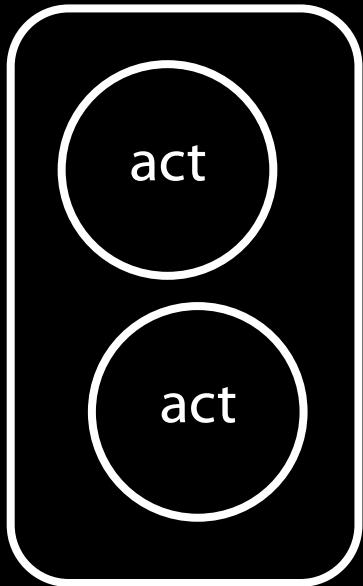


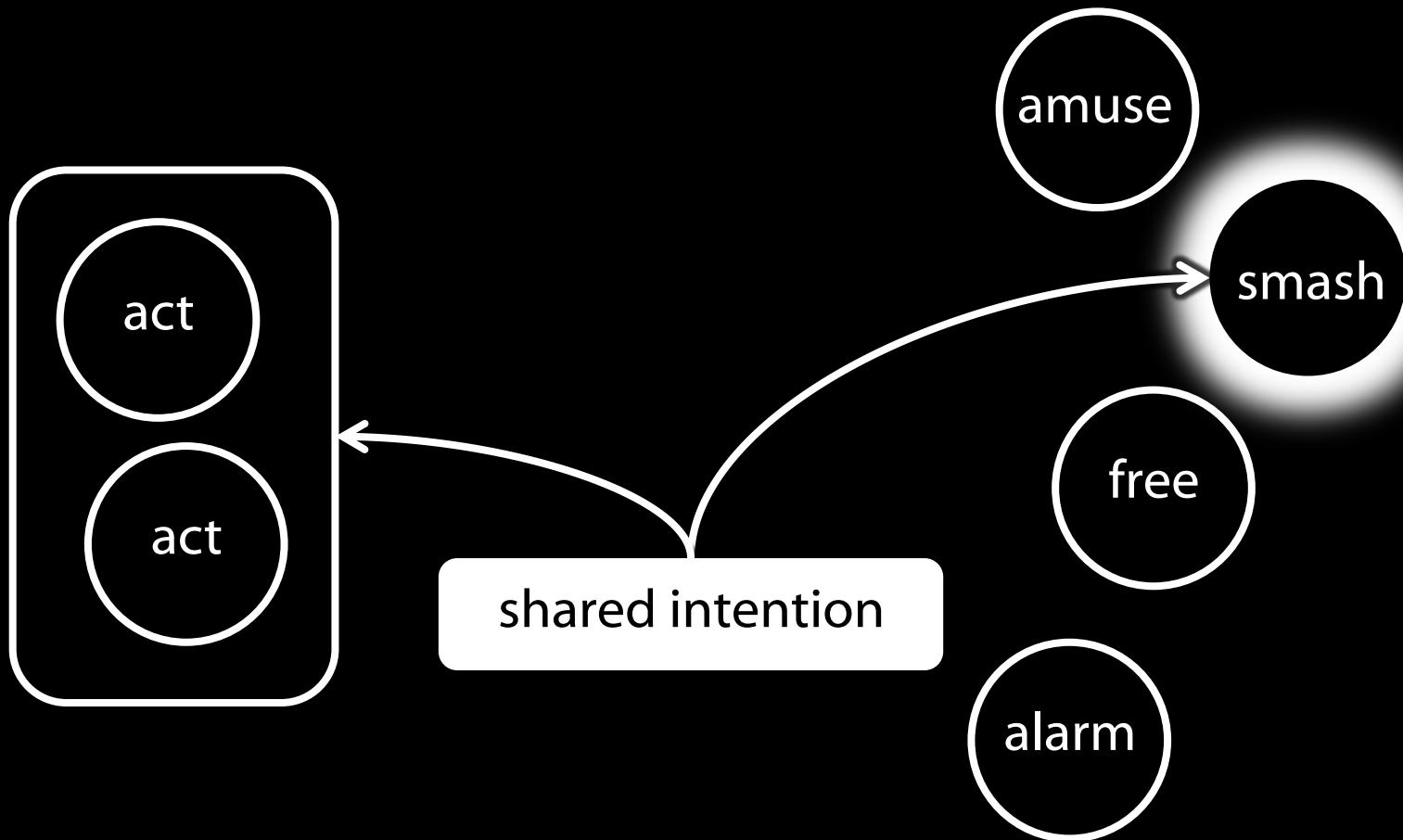
amuse

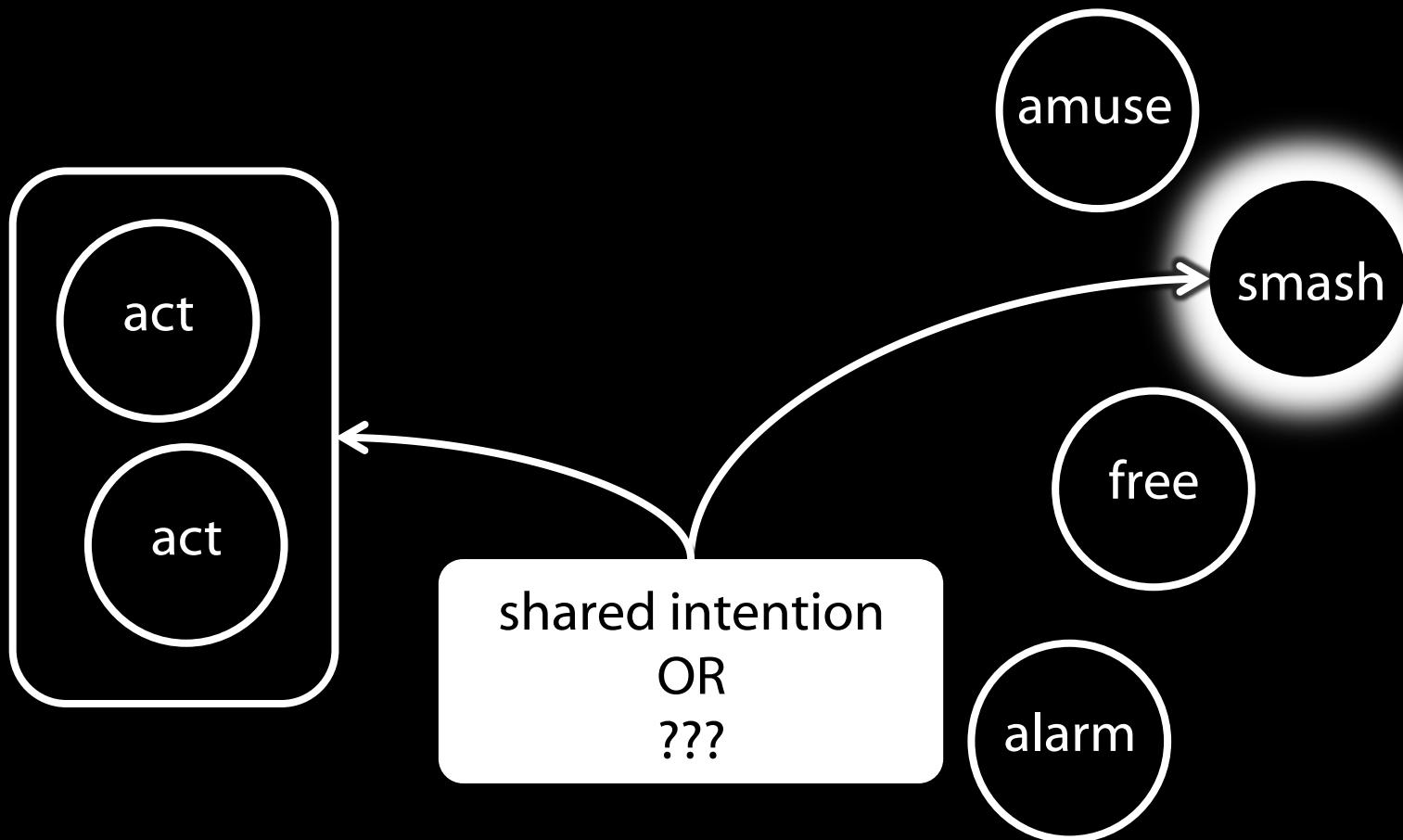
smash

free

alarm







G is a distributive goal: it is an outcome to which each agent's activities are individually directed and it is possible that: all agents succeed relative to this outcome.

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- (a) it is a distributive goal;
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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.





"participation in cooperative, cultural interactions ... leads children to construct uniquely powerful forms of cognitive representation."

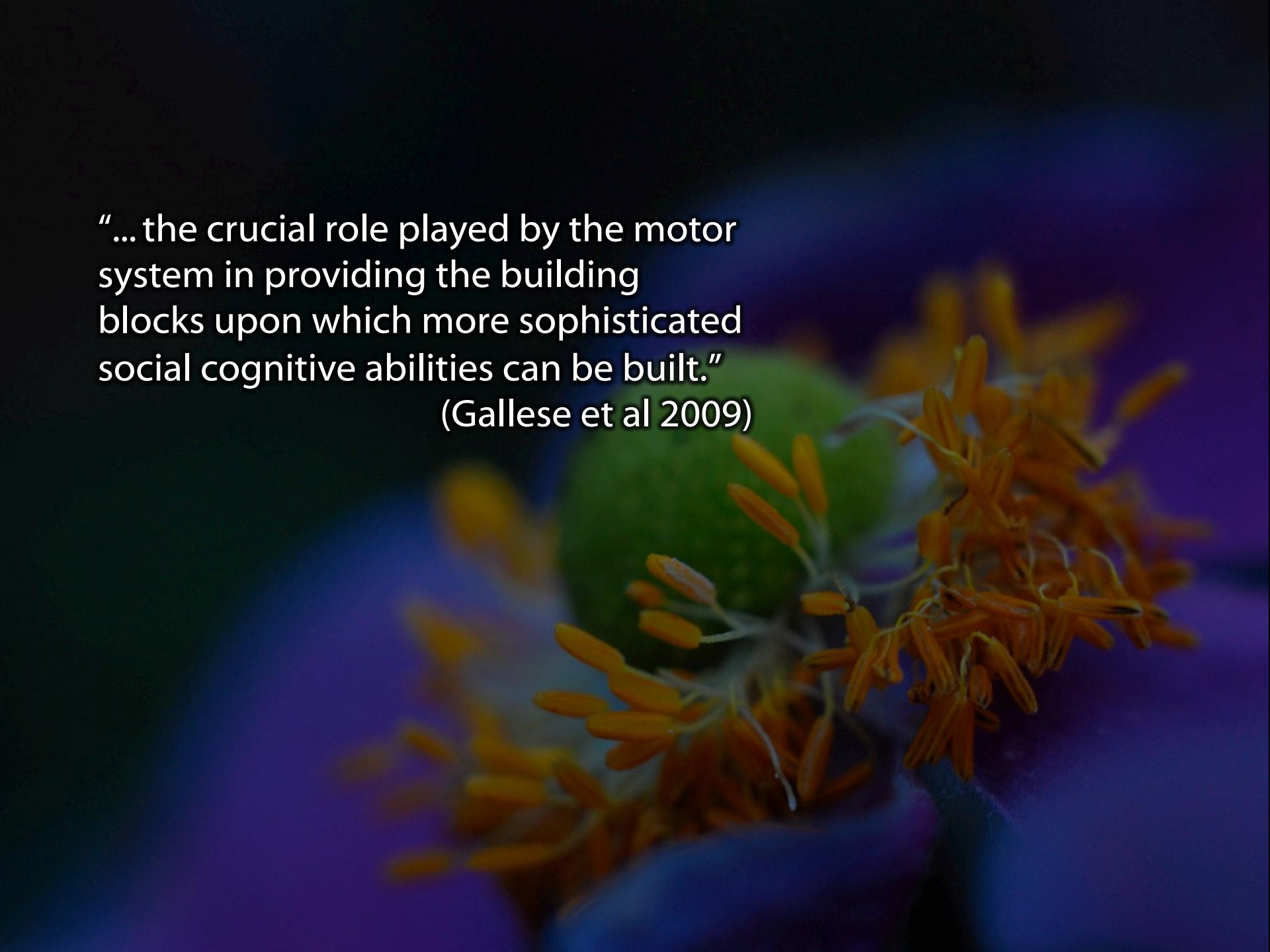
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“...the crucial role played by the motor system in providing the building blocks upon which more sophisticated social cognitive abilities can be built.”

(Gallese et al 2009)

'Ayesha and Beatrice
between them lifted the
table'





'Ayesha and Beatrice
between them lifted the
table'

'Left Leg and Right Leg
between them supported
the table'

'Ayesha and Beatrice
between them lifted the
table intentionally'



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. application

failed reach



point



source: Hare & Tomasello (2004)

The problem of opaque means

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”

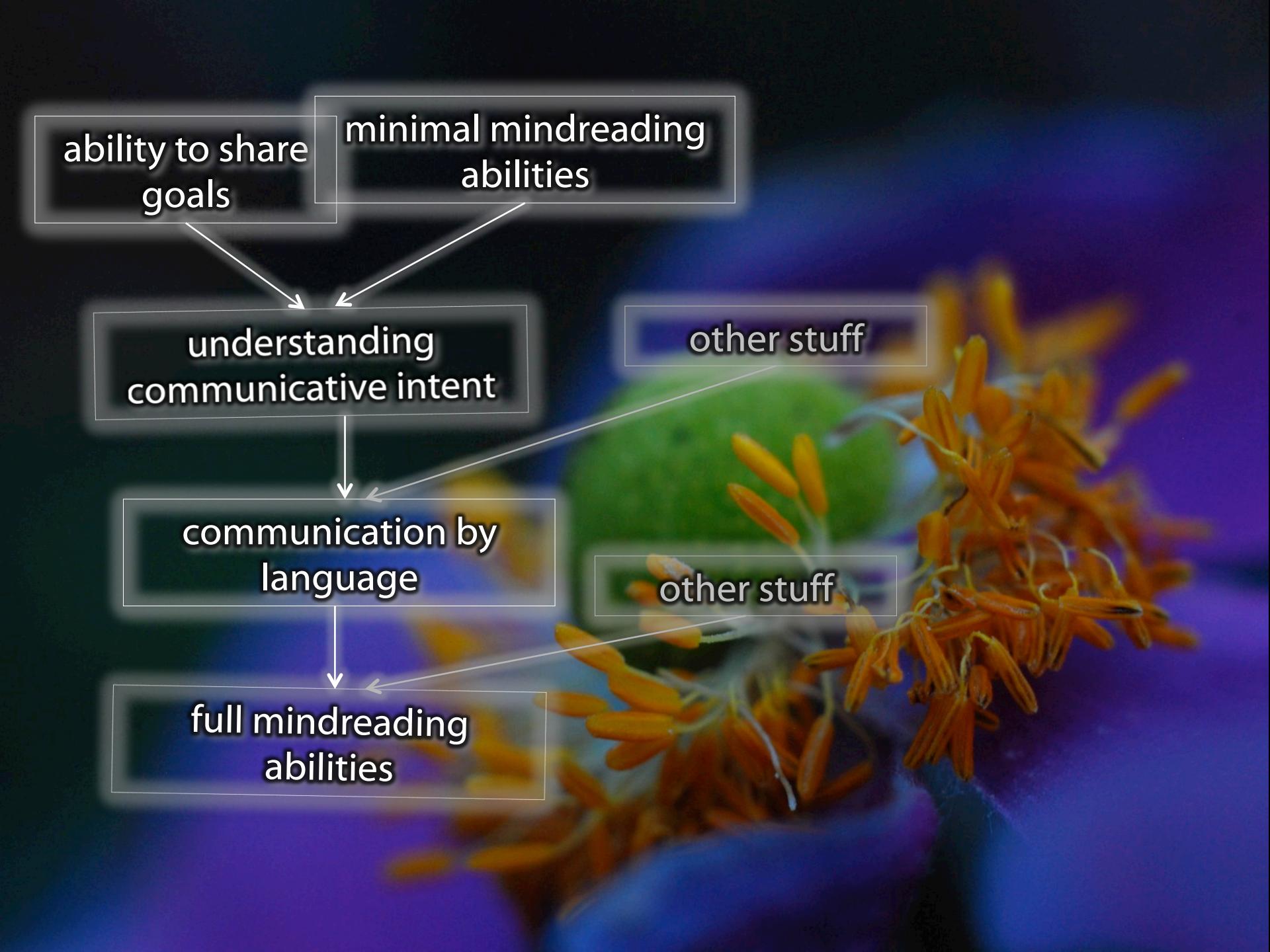
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Csibra's 'two stances':

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

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

Csibra (2003, p.456)



A close-up photograph of several orange flowers, possibly calendula, with green leaves visible in the background. The flowers have small, tubular petals and are arranged in a cluster. The background is dark and out of focus.

ability to share
goals

minimal mindreading
abilities

understanding
communicative intent

communication by
language

full mindreading
abilities

other stuff

other stuff



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awareness of joint-ness

at least one of the agents knows that they are not acting individually; she or they have 'a conception of themselves as contributors to a collective end.'

awareness of others' agency

at least one of the agents is aware of one or more of the others as an intentional agent.

awareness of others' states or commitments

at least one of the agents who are F-ing is aware of, or has individuating beliefs about, some of the others' intentions, beliefs or commitments concerning F.

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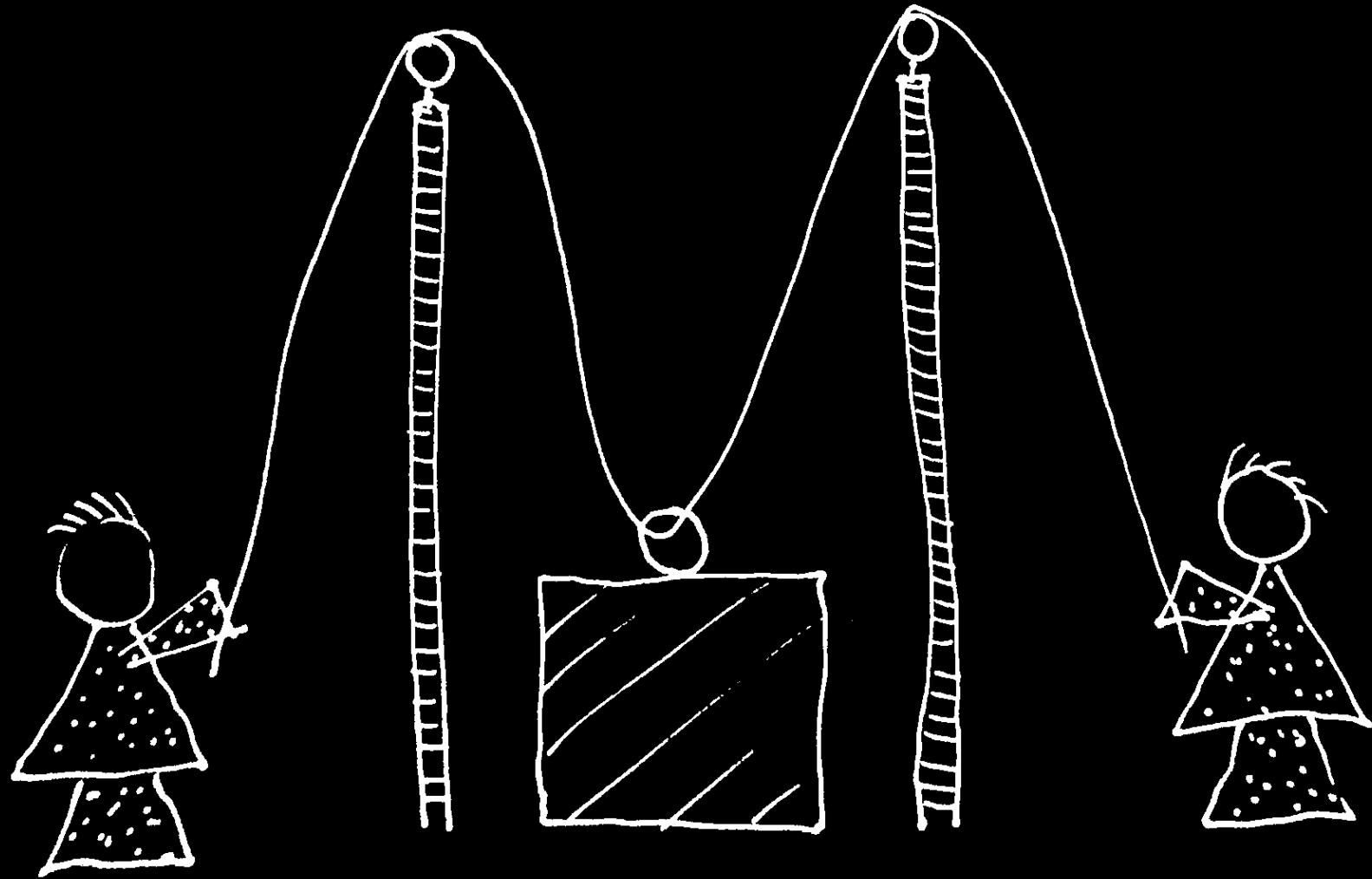
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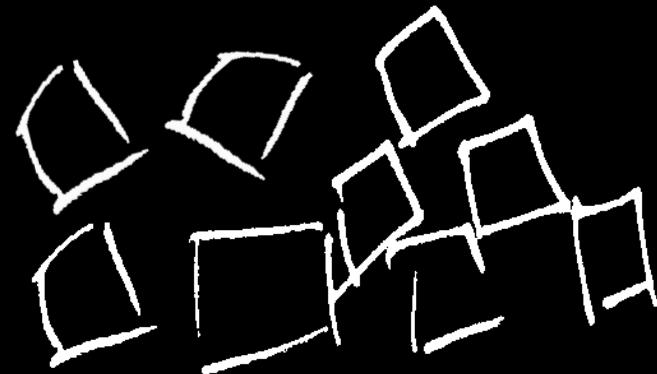
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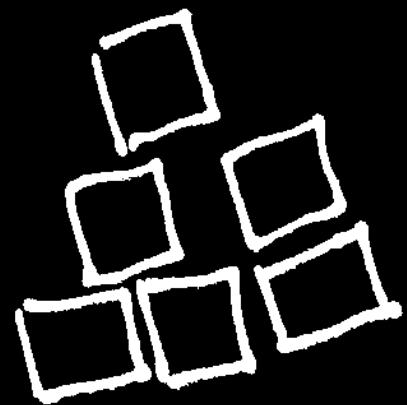
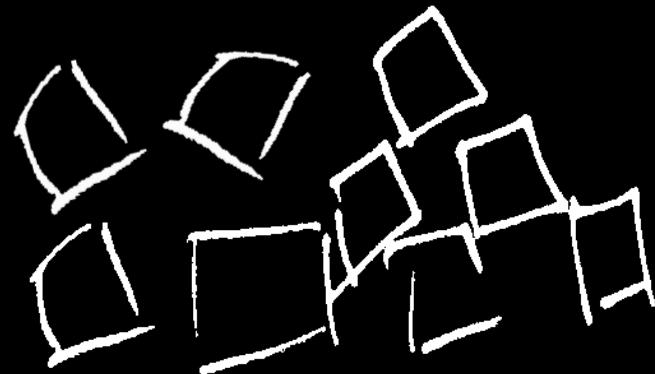
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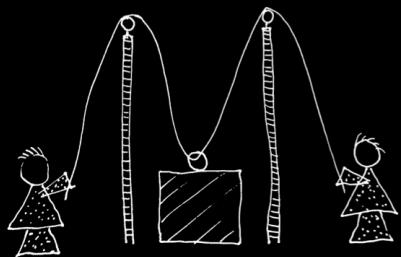


cf. Vesper et al (Neural Networks 2010)

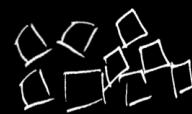








cf. Vesper et al (forthcoming)





'Ayesha and Beatrice
between them lifted the
table'





'Ayesha and Beatrice
between them lifted the
table'

'Left Leg and Right Leg
between them supported
the table'

'Ayesha and Beatrice
between them lifted the
table intentionally'



'Ayesha and Beatrice
between them lifted the
table'

'Left Leg and Right Leg
between them supported
the table'



'Ayesha and Beatrice
between them lifted the
table intentionally'

