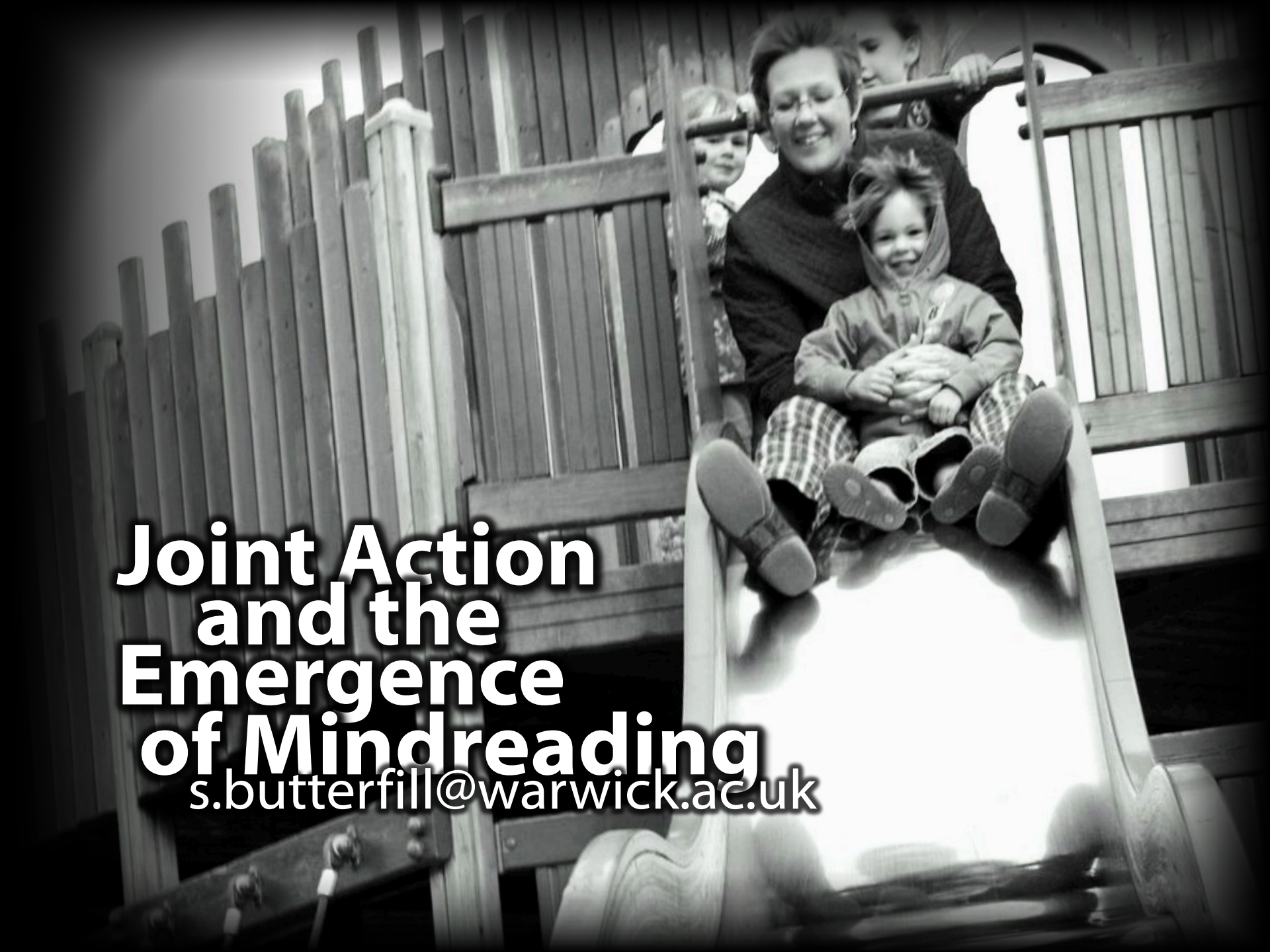

Joint Action and the Emergence of Mindreading

s.butterfill@warwick.ac.uk

challenge

Explain the emergence, in evolution or development, of sophisticated forms of theory of mind cognition.

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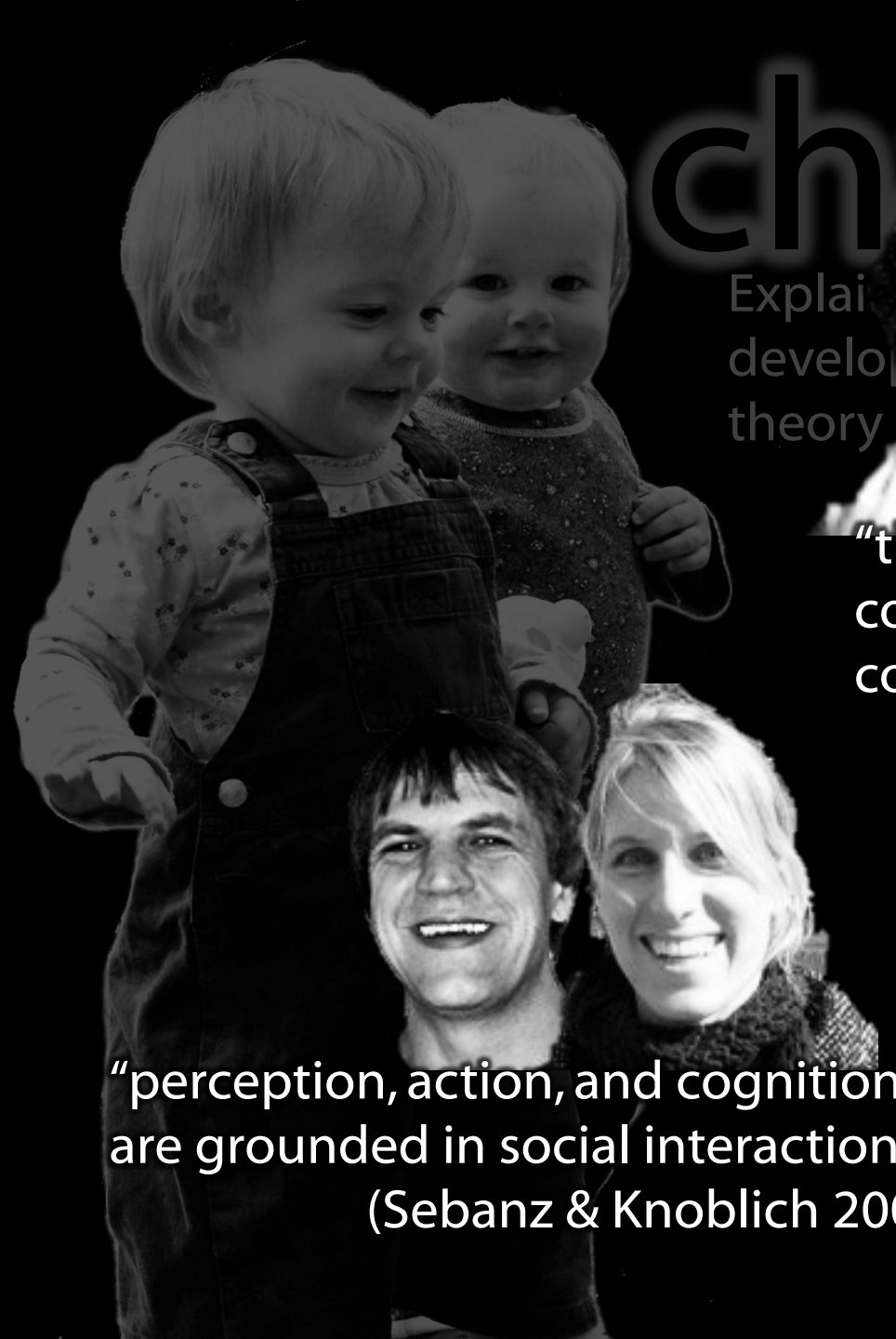
challenge

Explai on or
develop ms of
theory



"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)

challenge

Explain the emergence, in evolution or development, of sophisticated forms of theory of mind cognition.

conjecture

The existence of abilities to engage in joint action partially explains how sophisticated forms of theory of mind cognition emerge in evolution or development (or both)

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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 cube on a large trampoline together

(Warneken, Chen & Tomasello 2006)

pretending to row a boat together

painting a house together
(Bratman 1992)

lifting a heavy sofa together
(Velleman 1997)

preparing a hollandaise sauce together
(Searle 1990)

going to Chicago together
(Kutz 2000)

walking together
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first objection
Sophisticated forms of theory of mind cognition emerge before joint action

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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(a) conceptual sophistication

- takes years to develop

- development tied to acquisition of executive function and language

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- working memory

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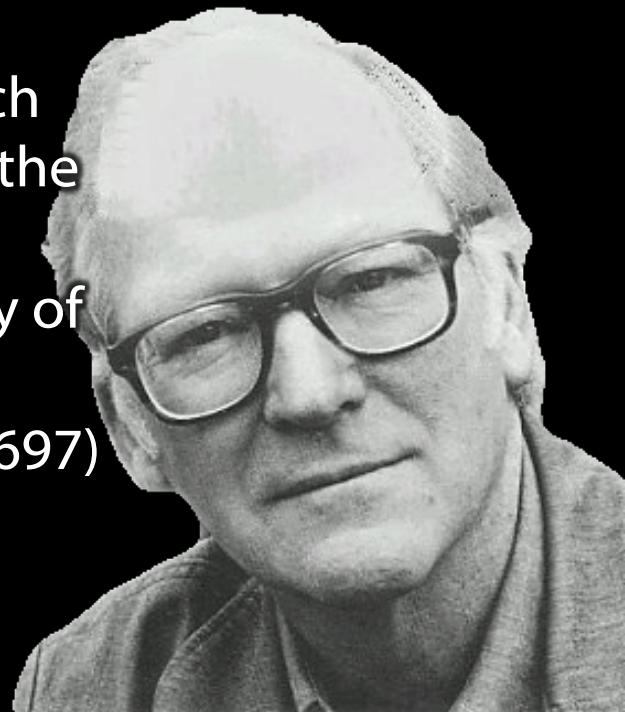
“We are stuck with our two main ways of describing and explaining things, one which treats objects and events as mindless, and the other which treats objects and events as having propositional attitudes. I see no way of bridging the gap”

(Davidson 2003: 697)



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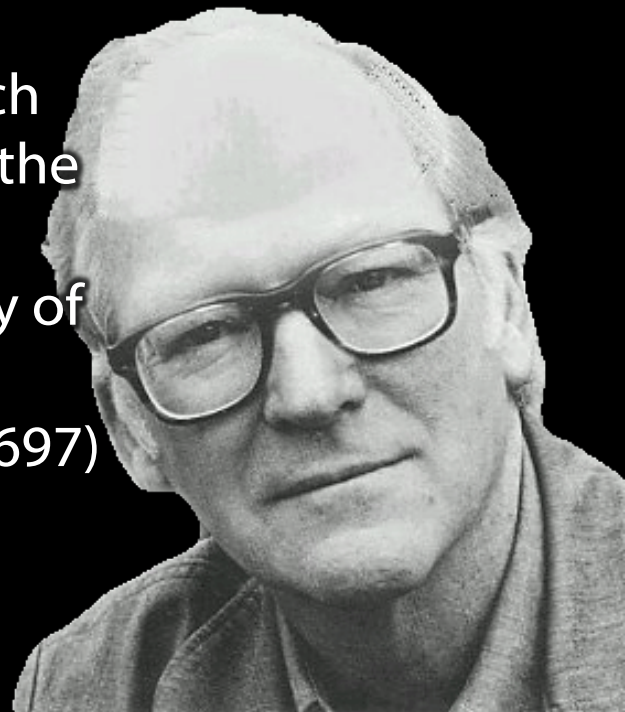

Propositional attitude

Relational attitude

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e.g. believes that ...
e.g. intends that ...
e.g. knows that ...

Relational attitude

e.g. excited by ...
e.g. encountered ...
e.g. wants apple juice

Propositional attitude	Relational attitude
e.g. believes that ... e.g. intends that ... e.g. knows that ...	e.g. excited by ... e.g. encountered ... e.g. wants apple juice
arbitrarily nestable contents	no contents
uncodifiably complex effects on action	parameter-setting effects on action
permit mistakes about identity and existence	enable tracking limited range of true and false beliefs

Wellman & Phillips 2001
Apperly & Butterfill 2009

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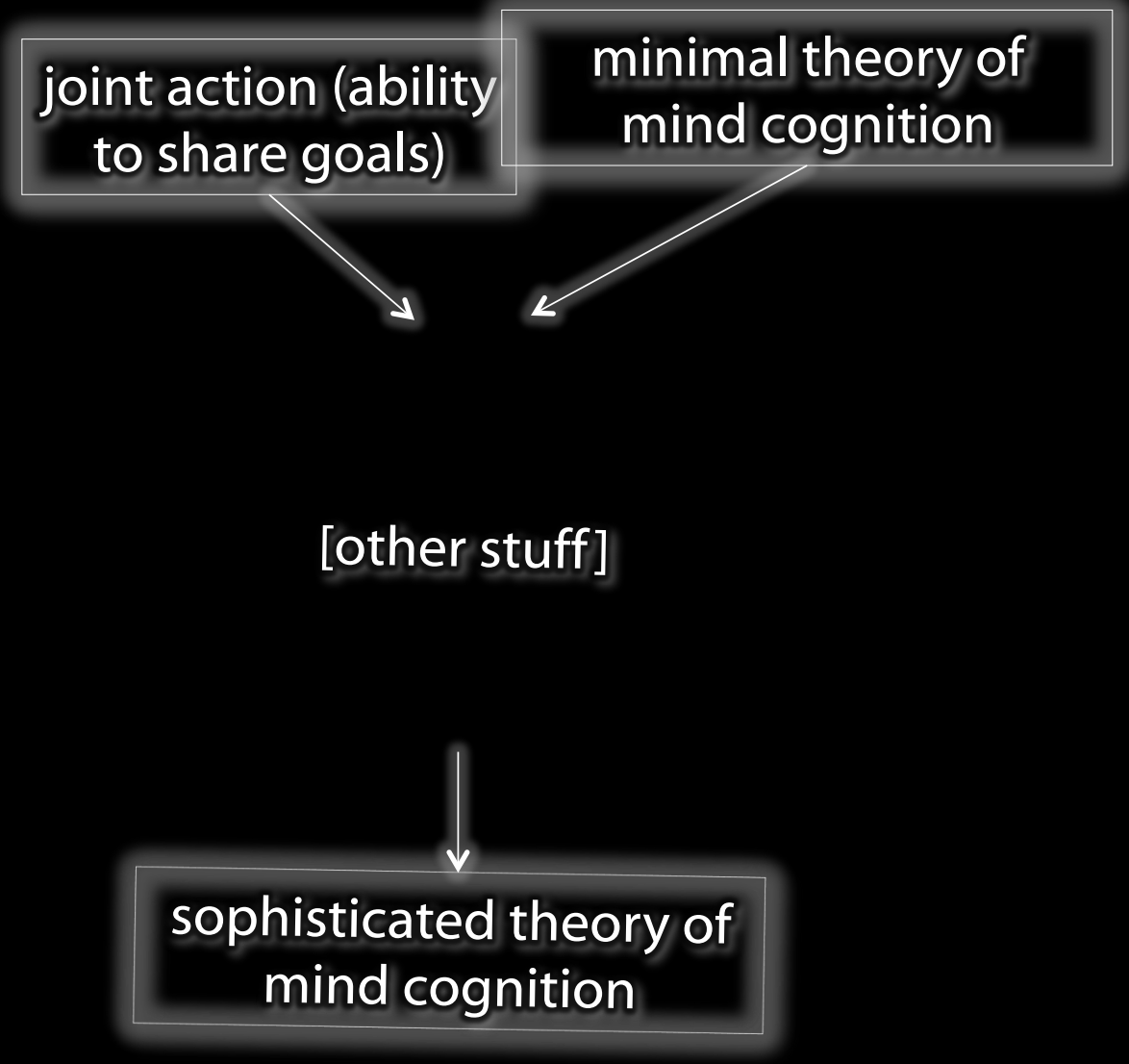
joint action (ability to share goals)
minimal theory of mind cognition
[other stuff]
sophisticated theory of mind cognition

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2nd objection
Joint action presupposes sophisticated theory of mind cognition

shared intention

‘I take a collective action to involve a collective [shared] intention.’ (Gilbert 2006, p. 5)

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‘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)

“the partners ... have to be aware that they are pursuing a joint goal, which both jointly intend”
(Wareneken, Graefenhain & Tomasello 2011)

What is shared intention?

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Functional characterisation

Substantial account

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Functional characterisation

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

Substantial account

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Functional characterisation

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

Substantial account

We have a shared intention that we J if

"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)

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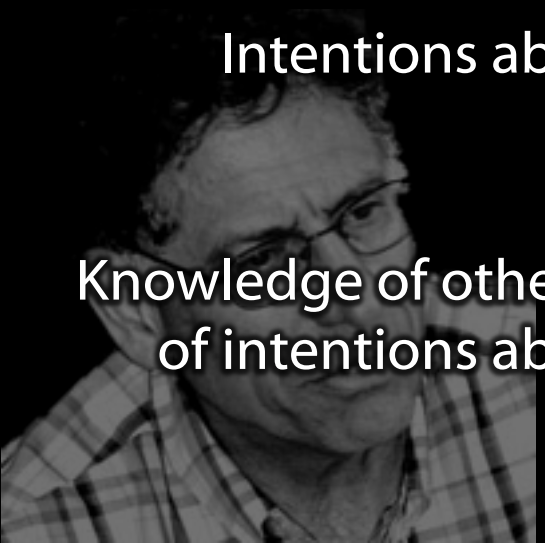

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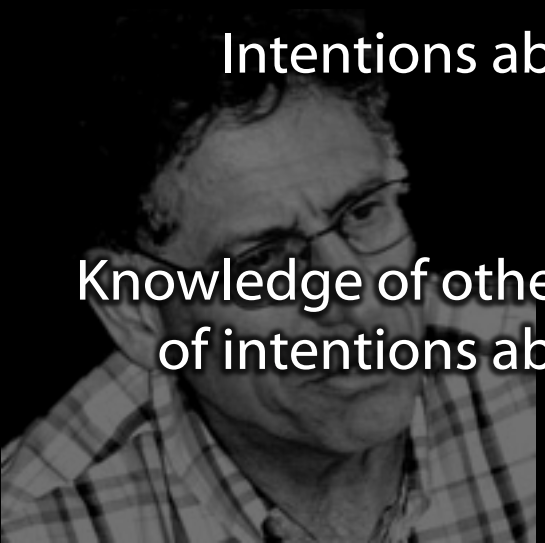

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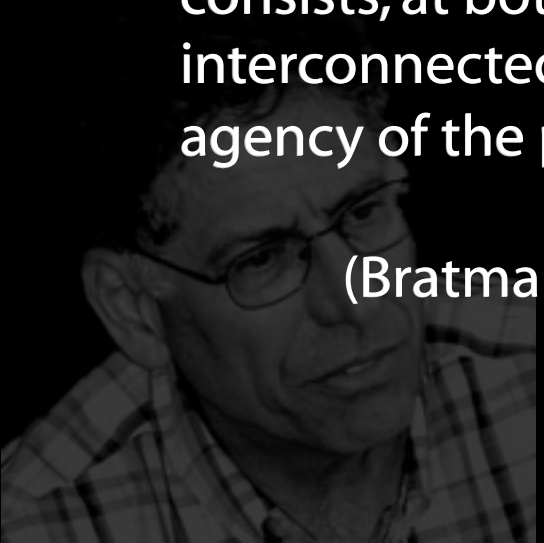
'shared intentional agency consists, at bottom, in interconnected planning agency of the participants.'

(Bratman 2011, p. 11)



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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 how sophisticated theory of mind cognition emerges.

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(not why)

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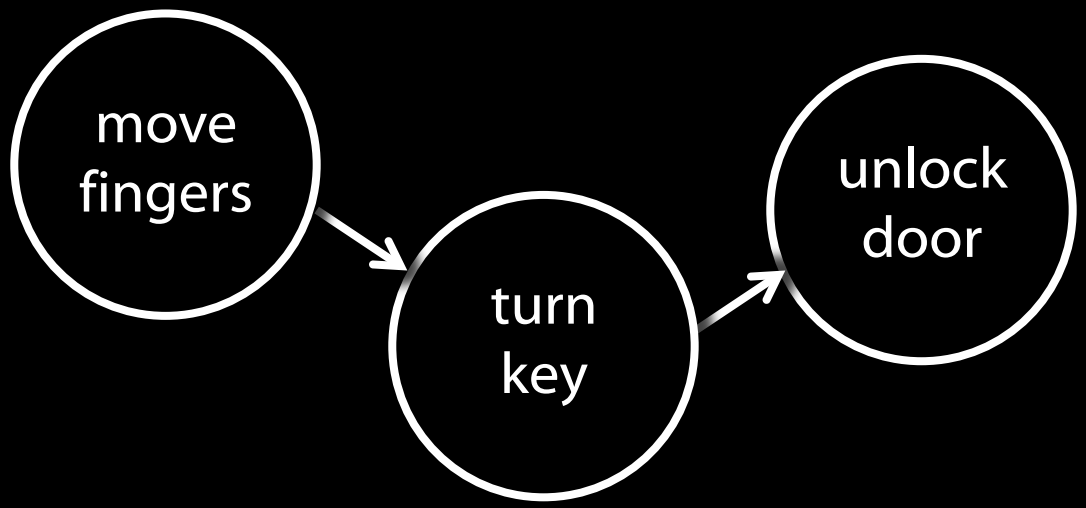

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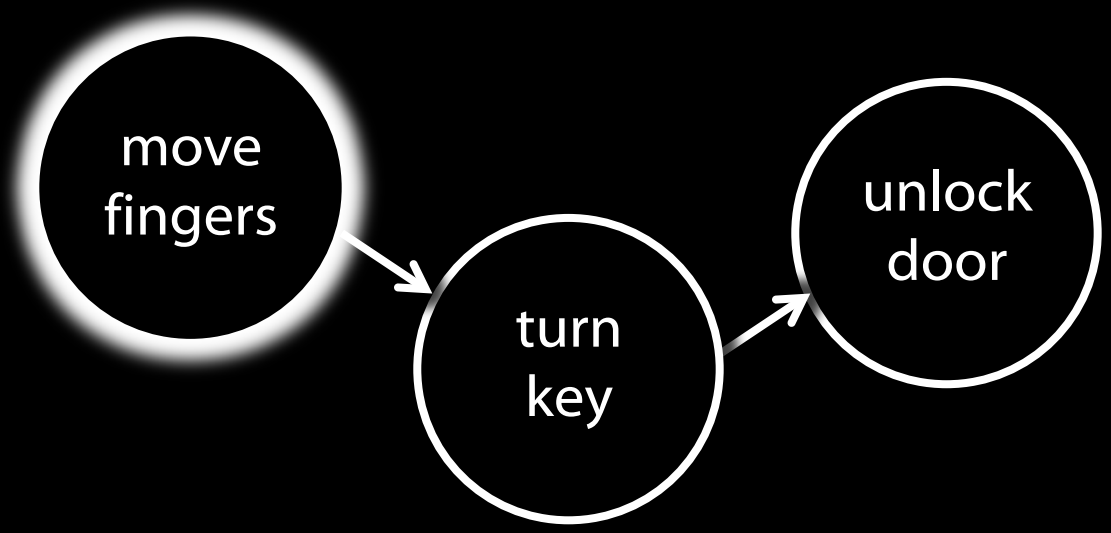

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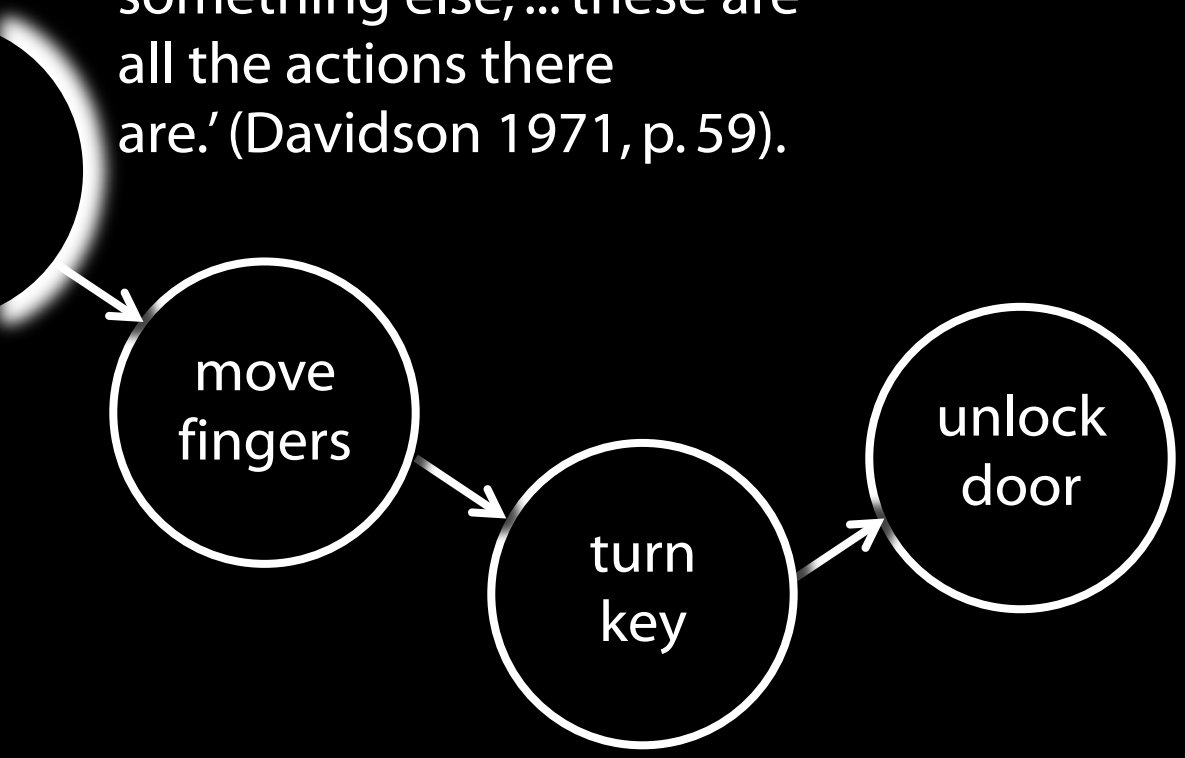

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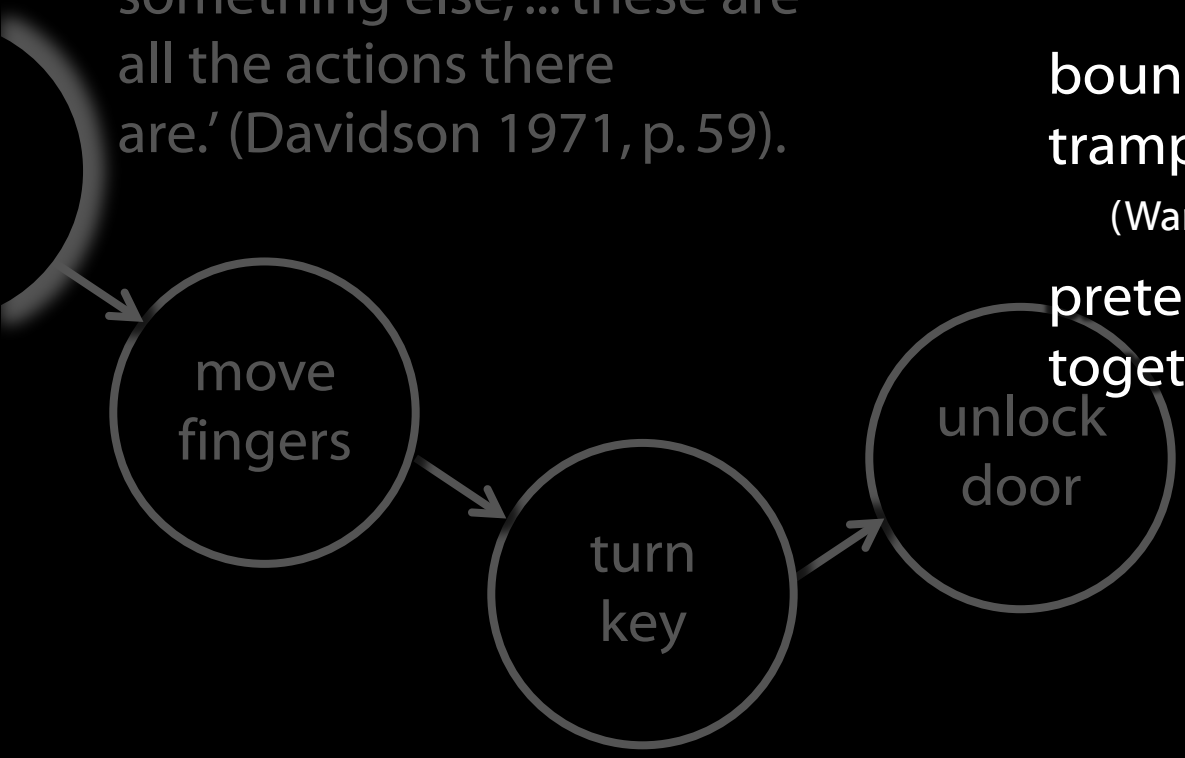

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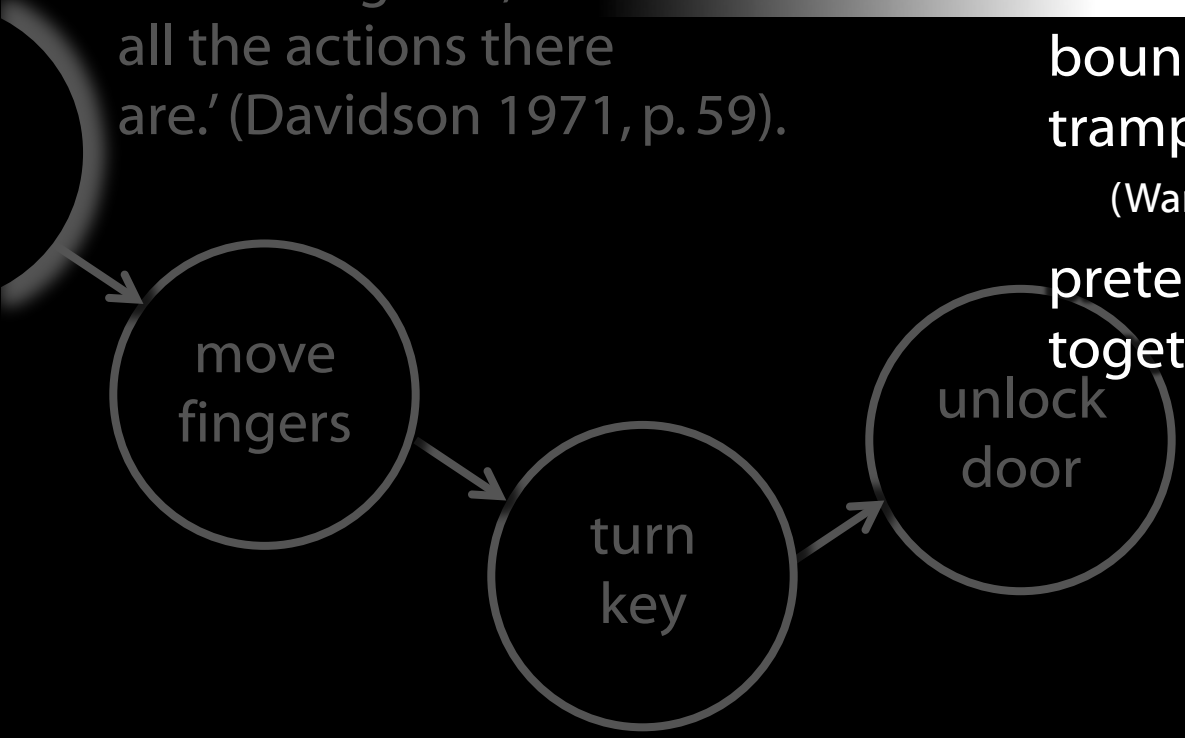

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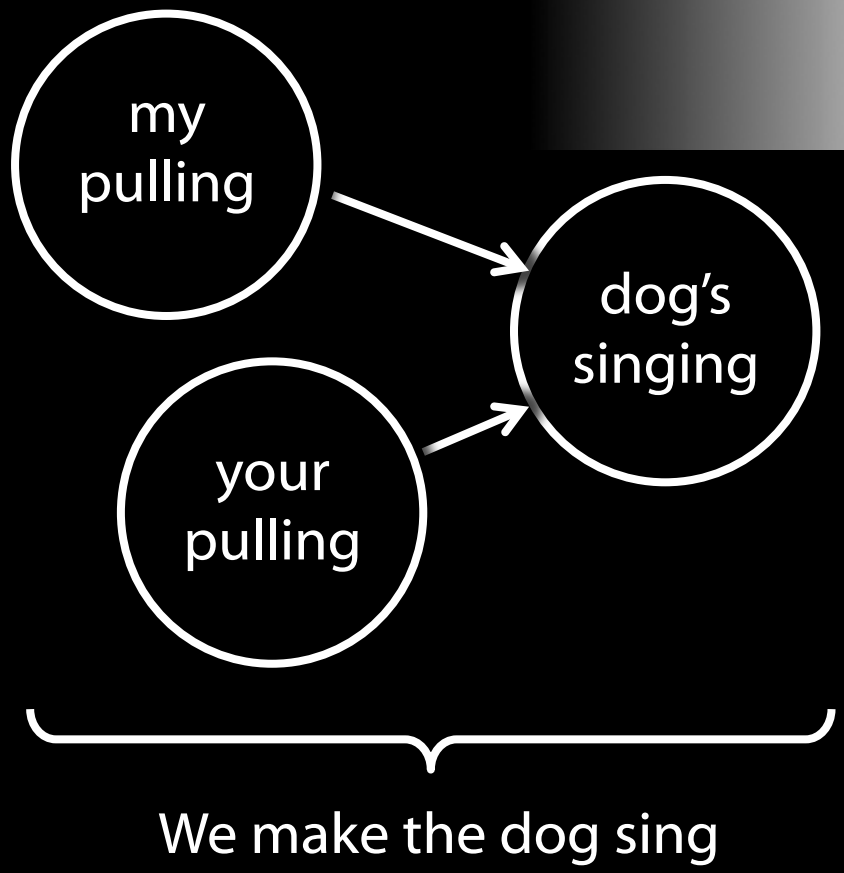

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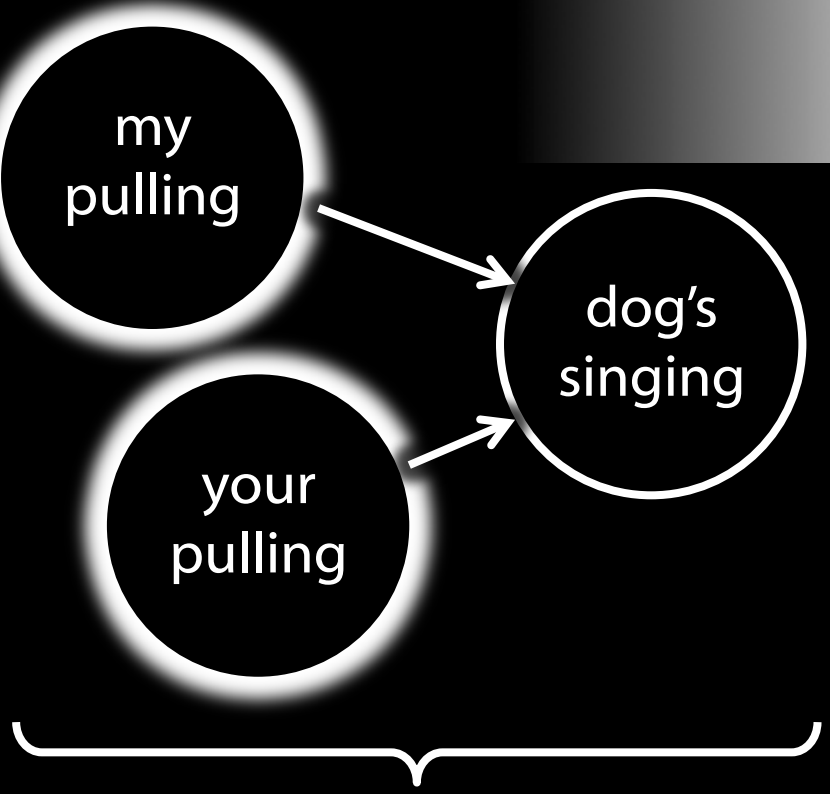

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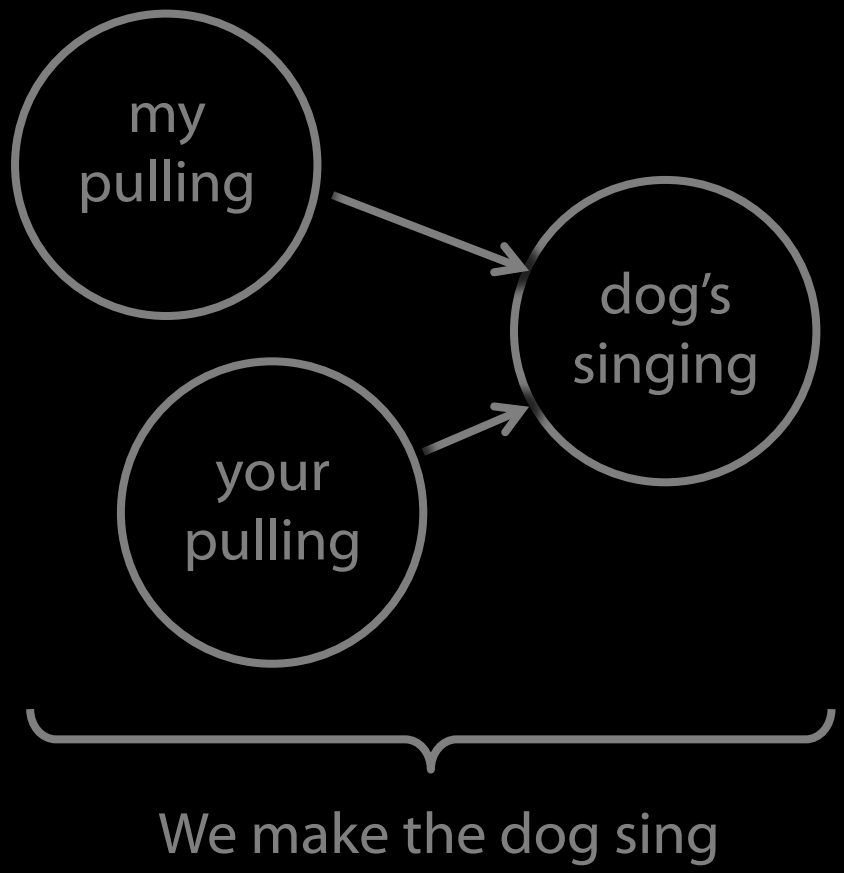

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too narrow

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too narrow

2 Bodily movements 'are all the actions there are' (Davidson 1971, p. 59)

3 In supposedly paradigm cases of joint action, there are no bodily movements with more than one agent.

Therefore:

4 Supposedly paradigm cases are not joint actions.

up the toys together
(Behne et al 2005)

eratively pulling handles in sequence to make a dog-puppet sing
(Brownell et al 2006)

bouncing a cube on a large trampoline together
(Warneken, Chen & Tomasello 2006)

pretending to row a boat together

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

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

Grounding

events $D_1, \ldots D_n$ *ground* E, if:

$D_1, \ldots D_n$ and E occur;

$D_1, \ldots D_n$ are each (perhaps improper) parts of E; and

every event that is a proper part of E but does not overlap $D_1, \ldots D_n$ is caused by some or all of $D_1, \ldots D_n$.

Agency

For an individual to be among the agents of an event is for there to be actions $a_1, \ldots a_n$ which ground this event where the individual is an agent of one or more of these actions.

(Adapted from Pietroski 1998)

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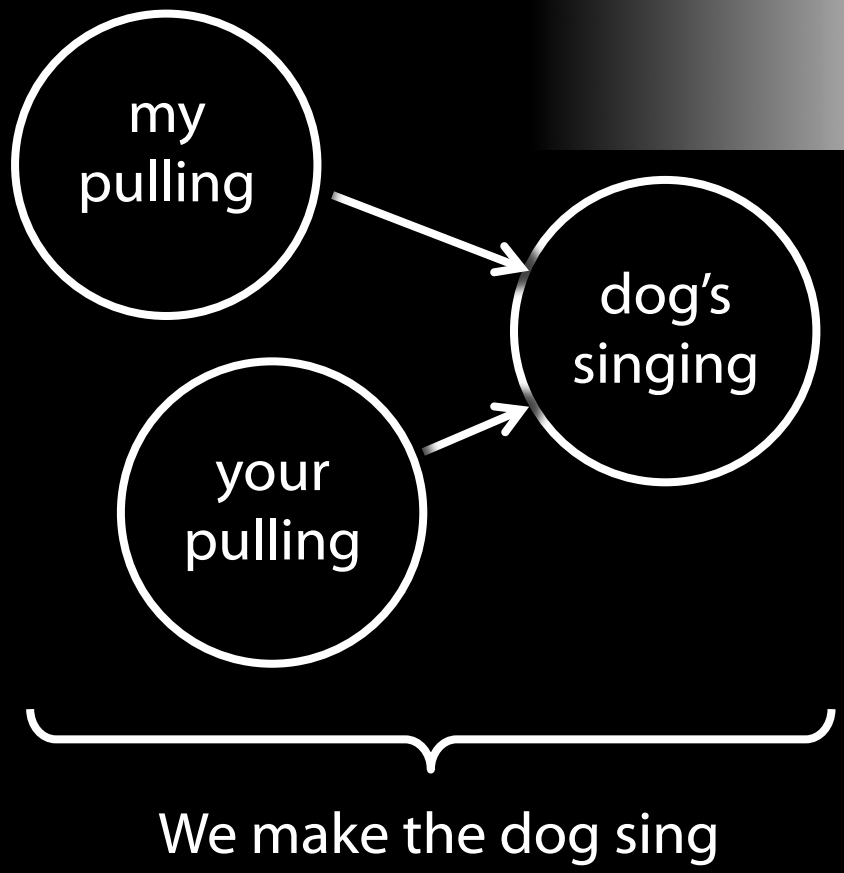

tidying up the toys together
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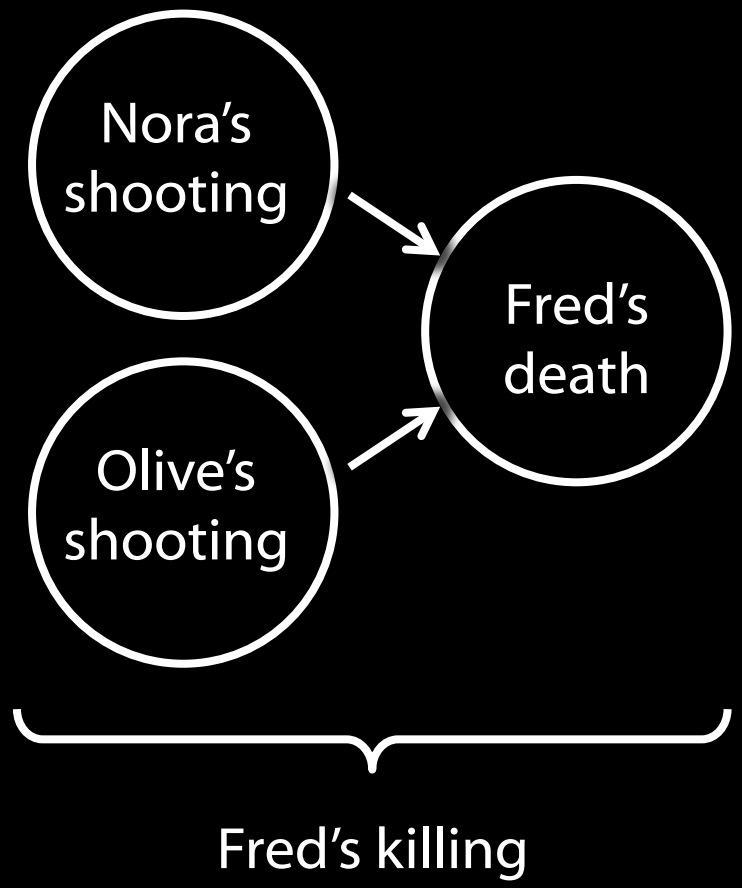

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too broad

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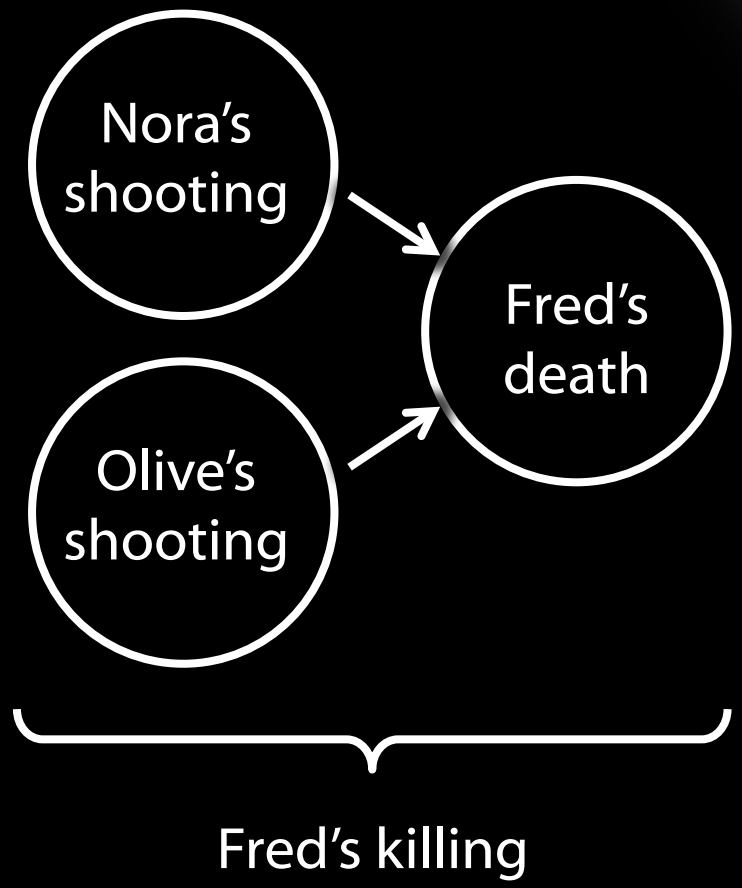

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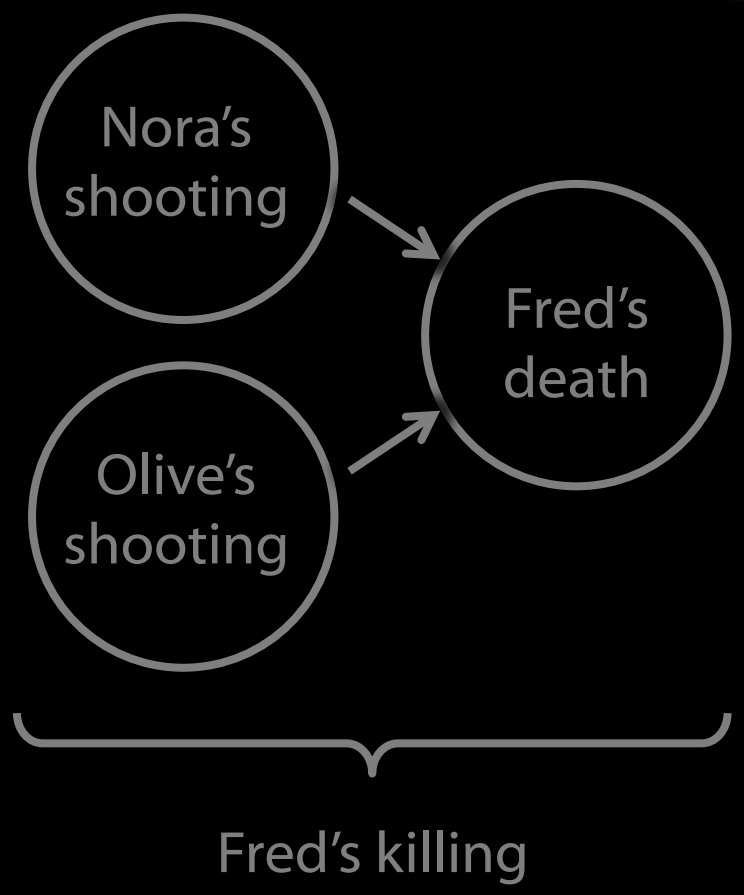

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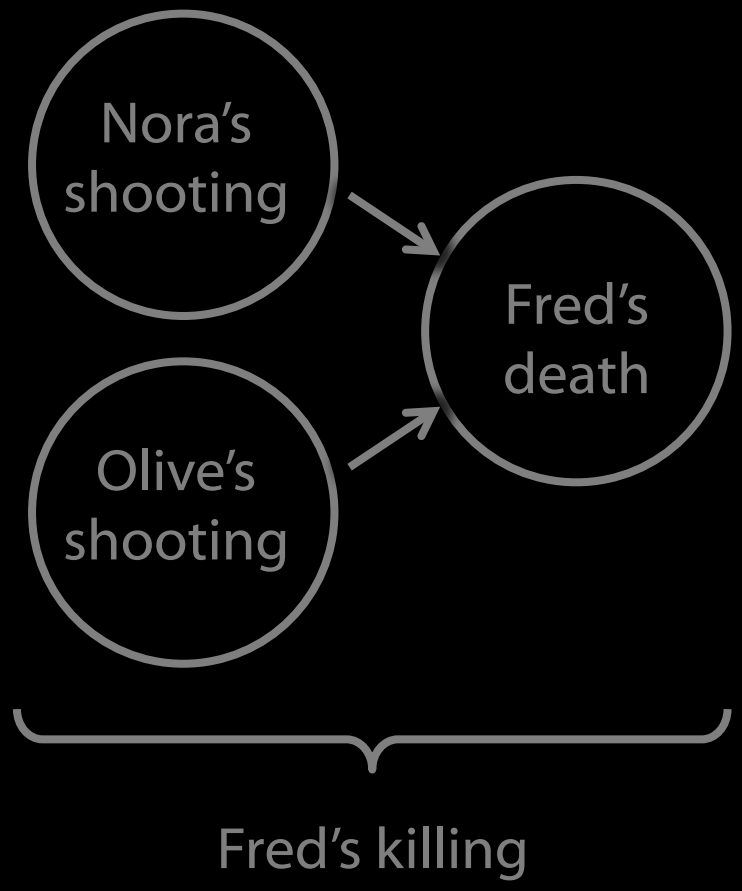

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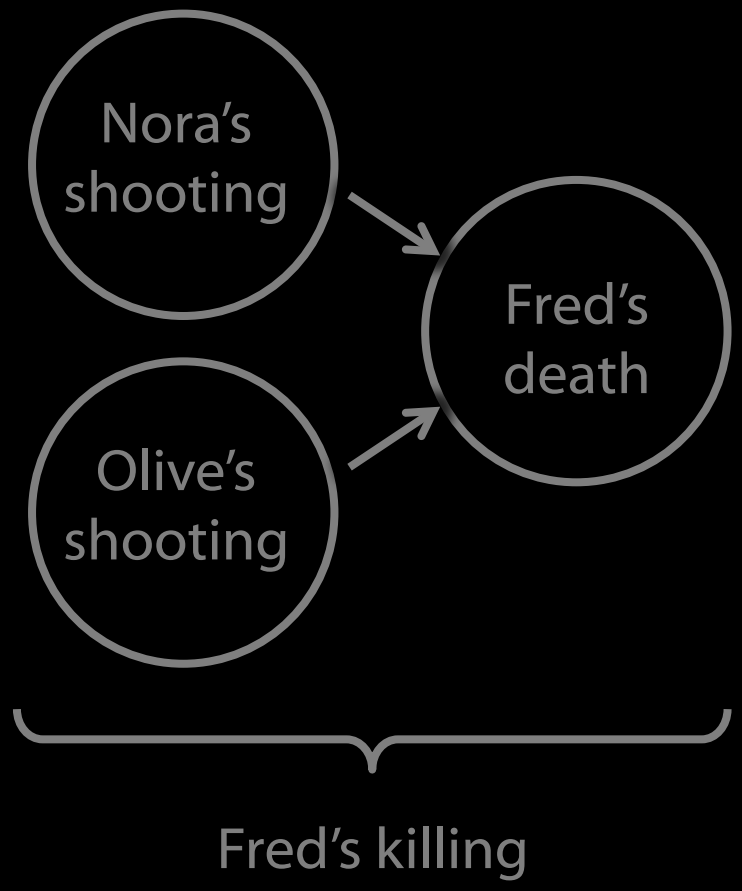

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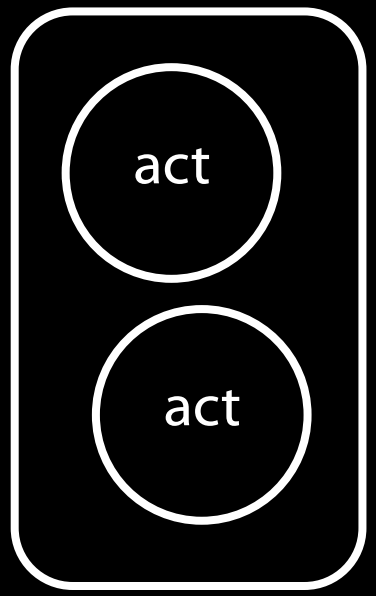

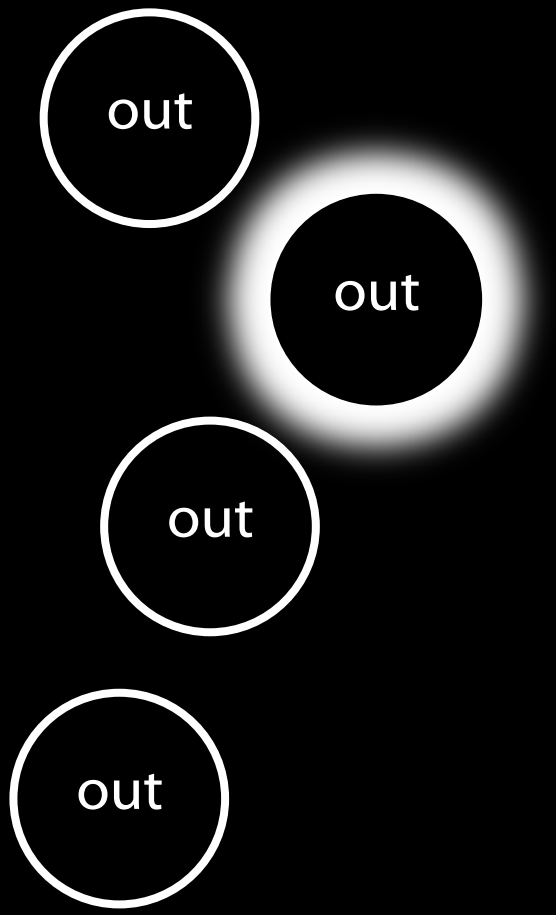

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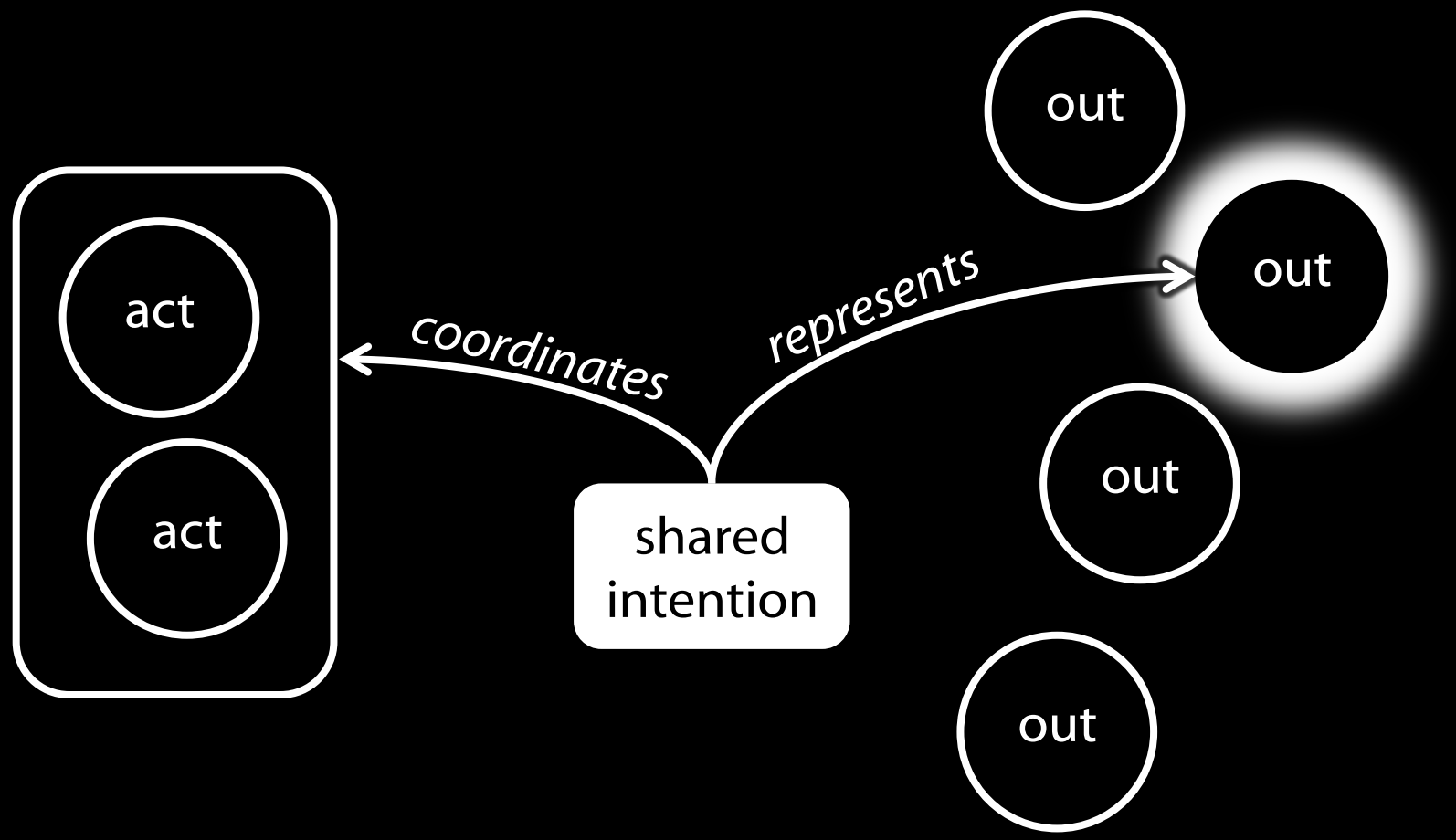

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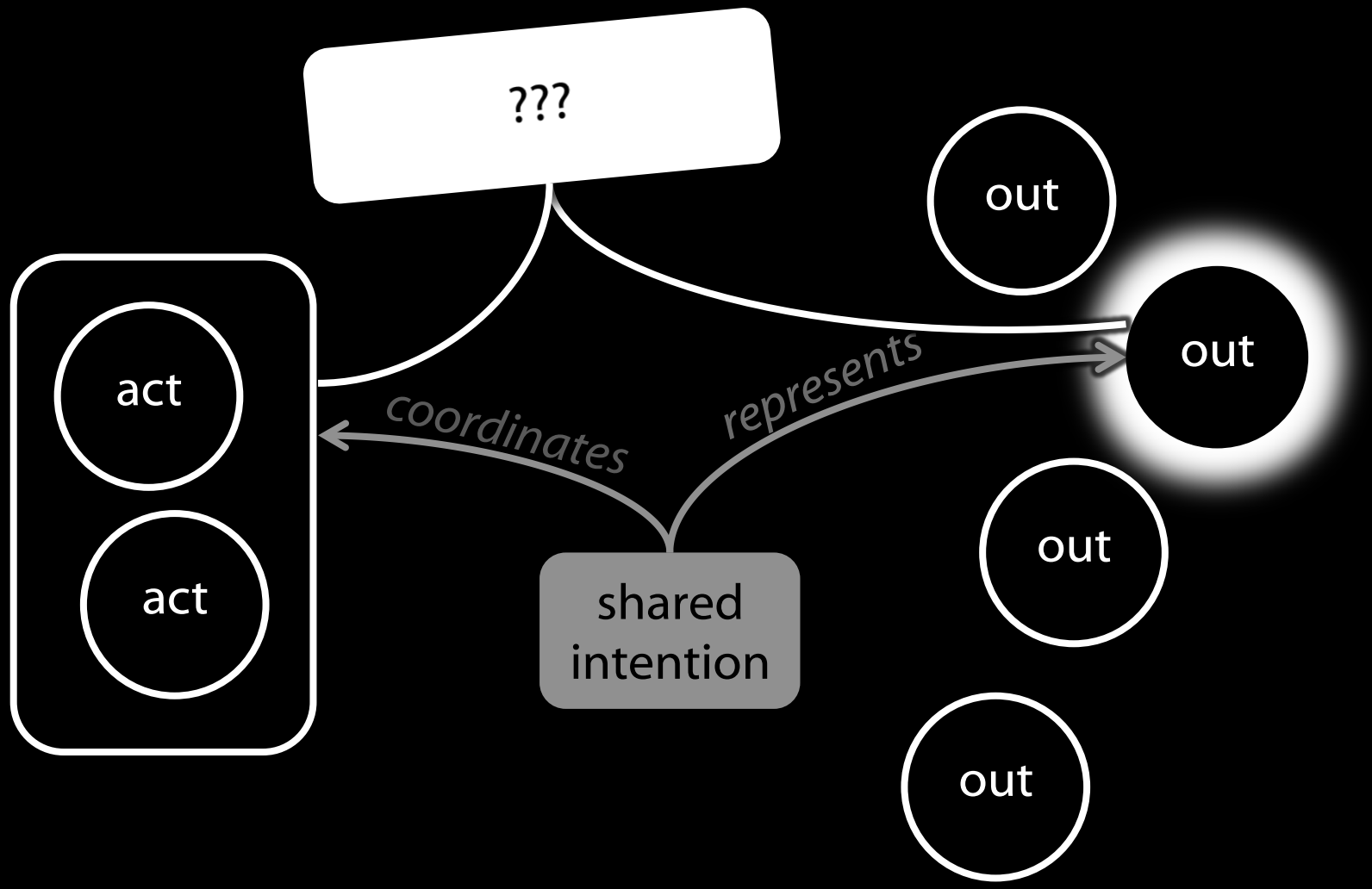

Detour
Goals are not intentions

What is the relation between an action and the goal (or goals) to which it is directed?

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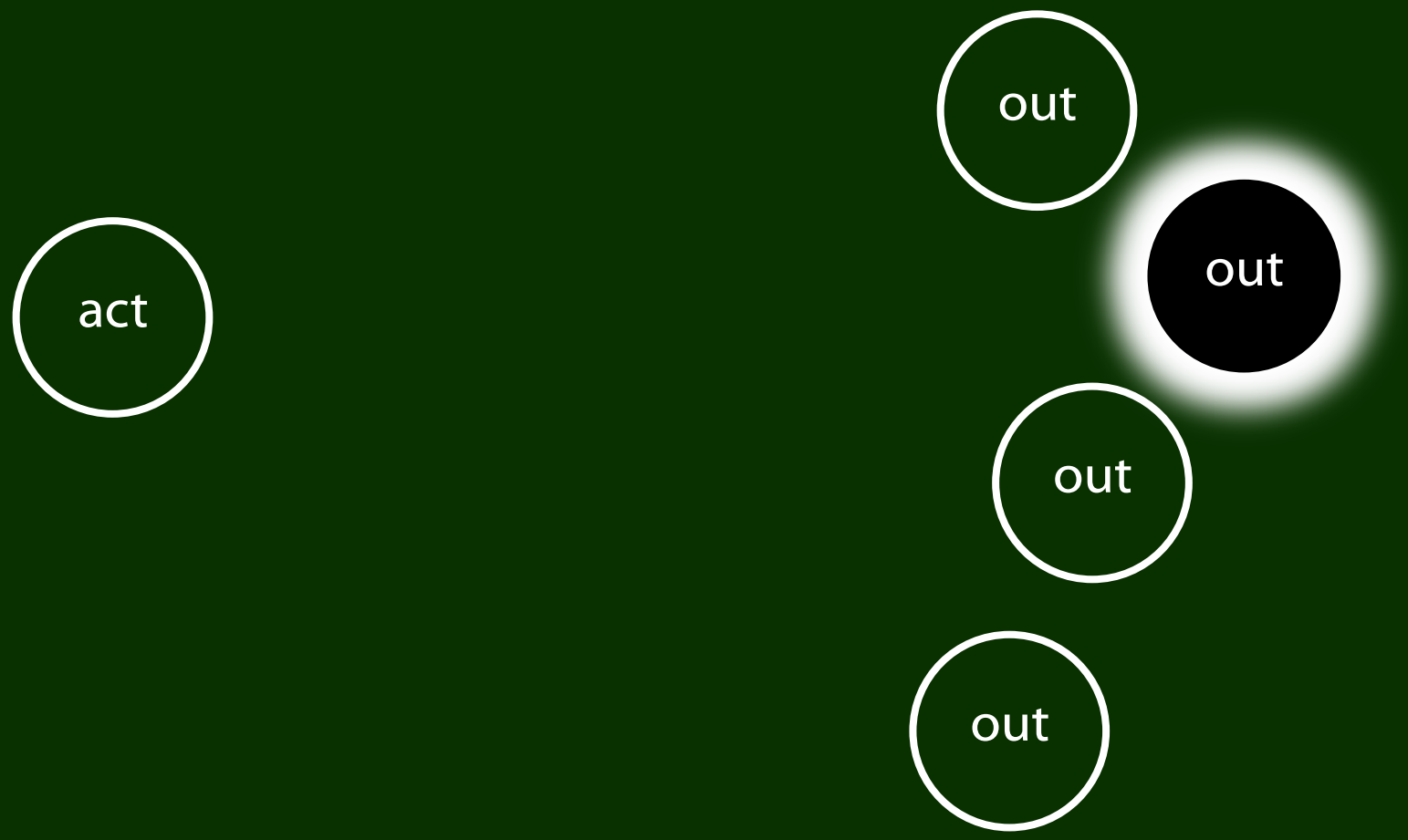

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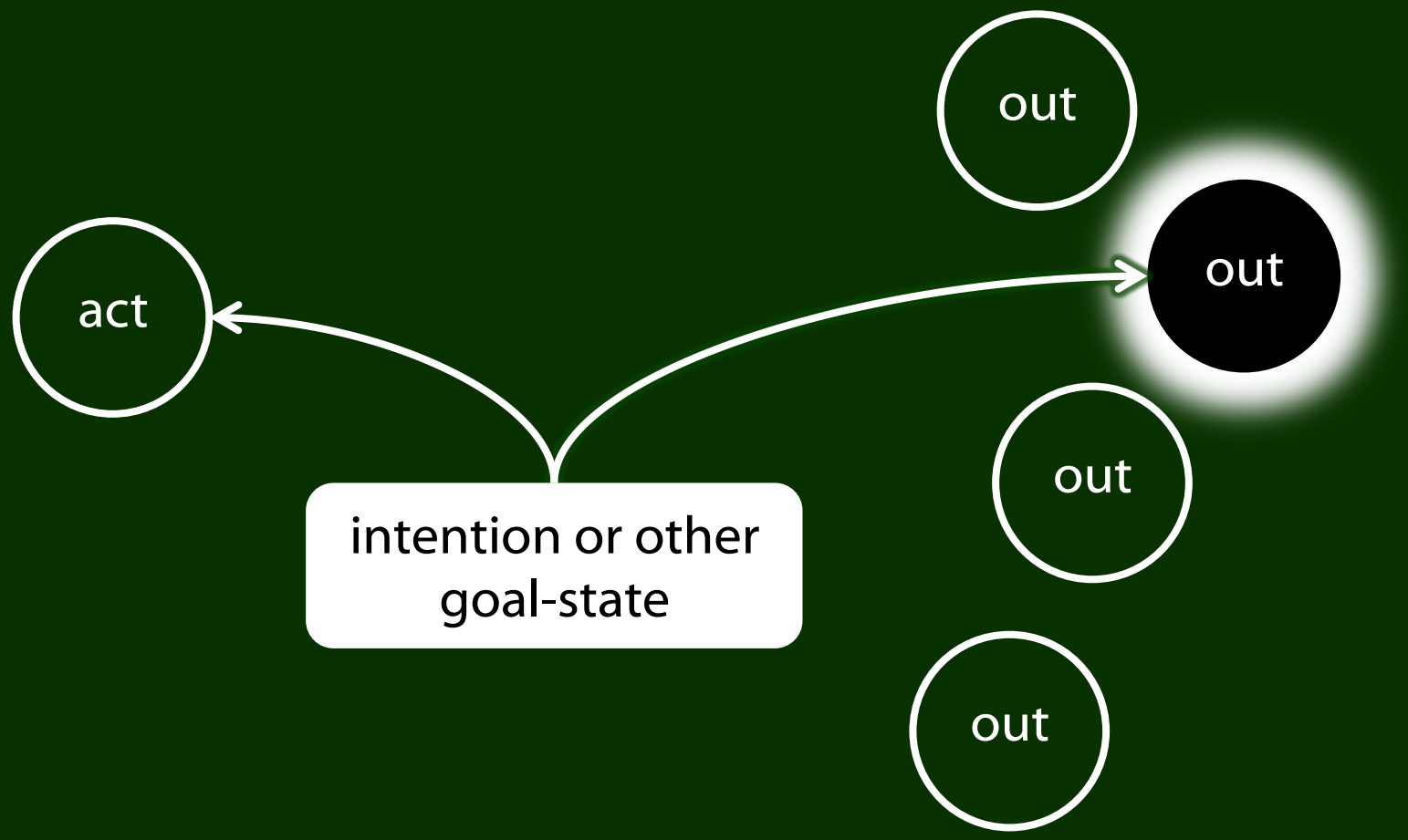

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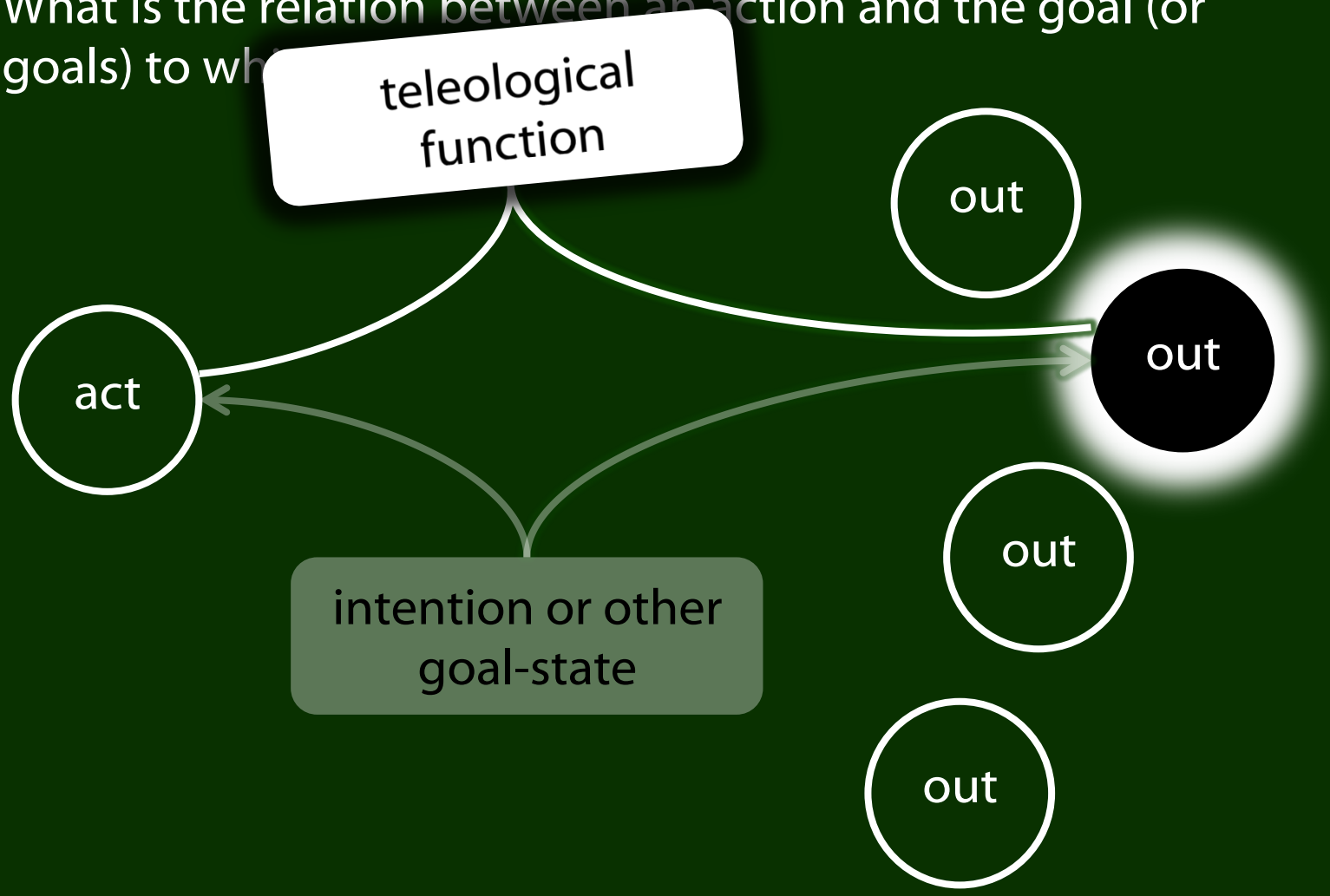
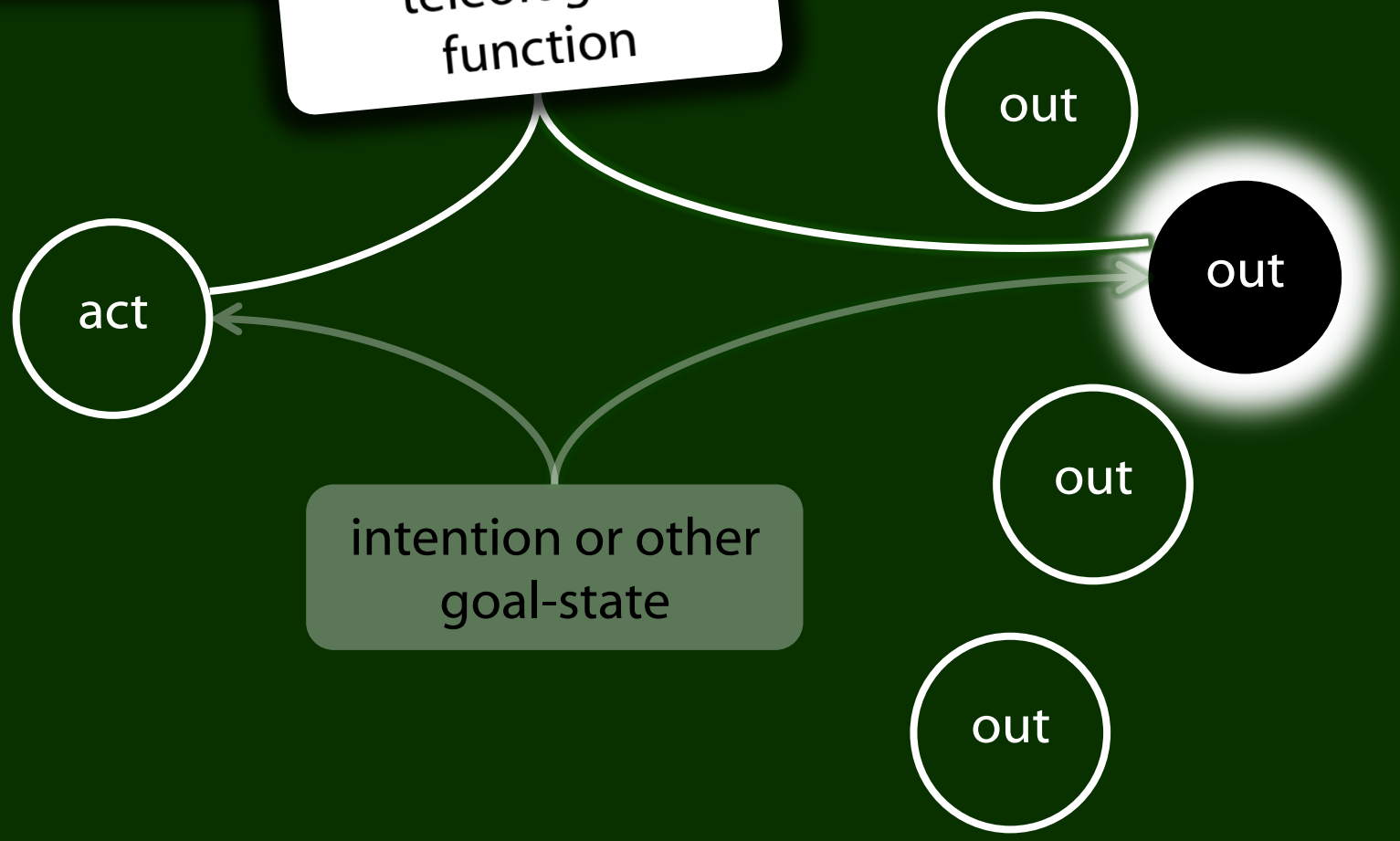


(i) in the past, actions of this type have caused outcomes of this type; (ii) this action happens now in part because (i).

ction and the goal (or



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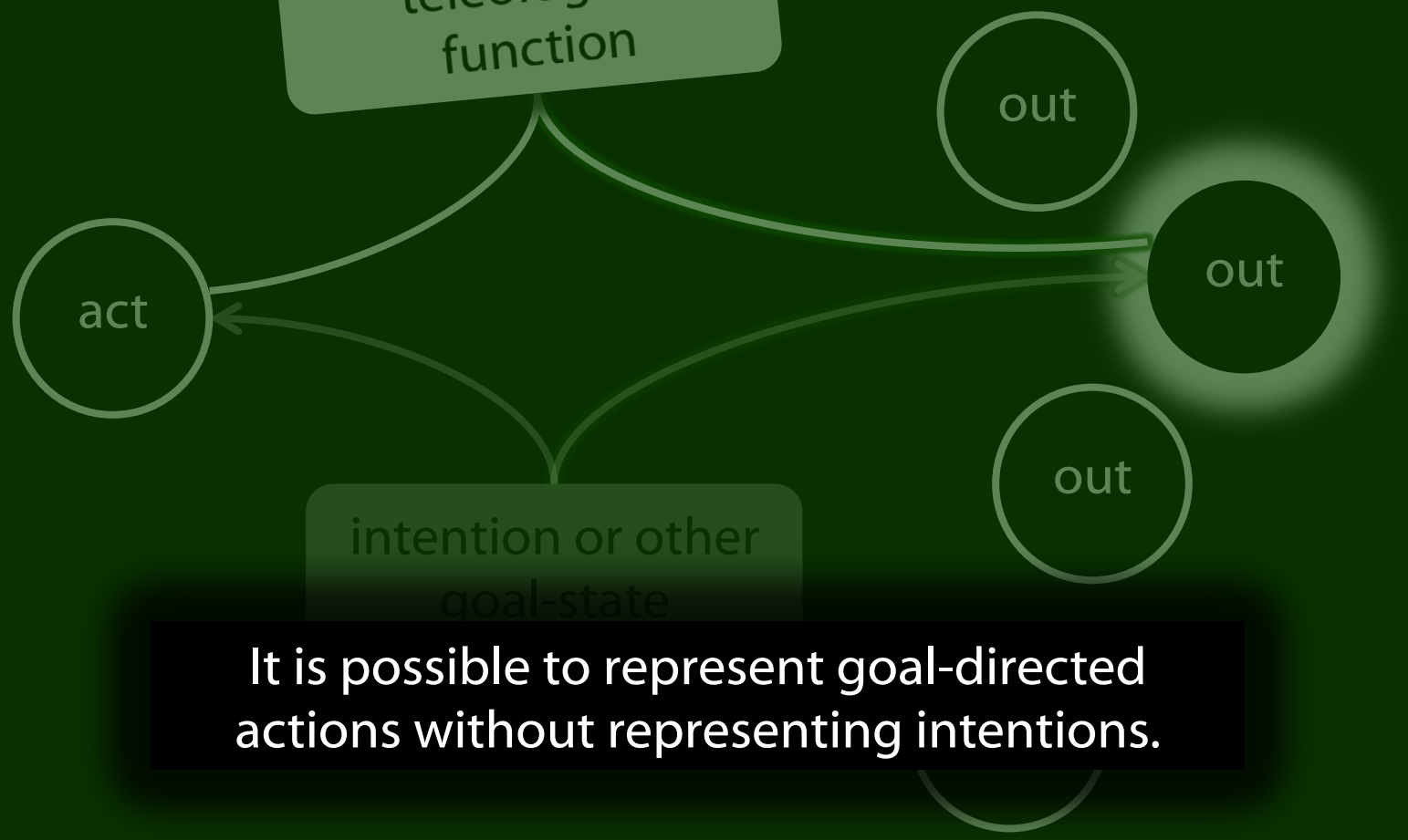

It is possible to represent goal-directed actions without representing intentions.

End Detour

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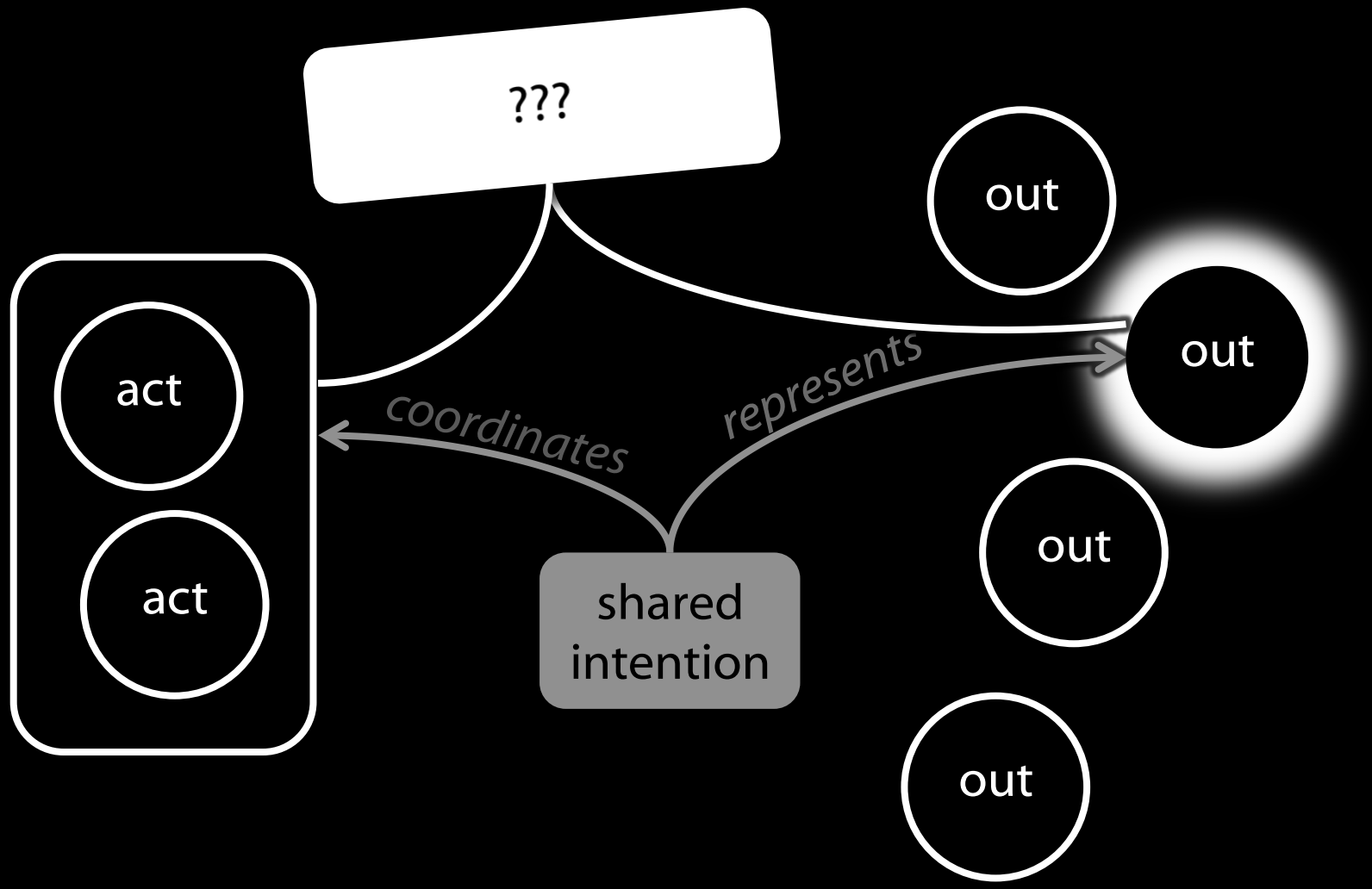

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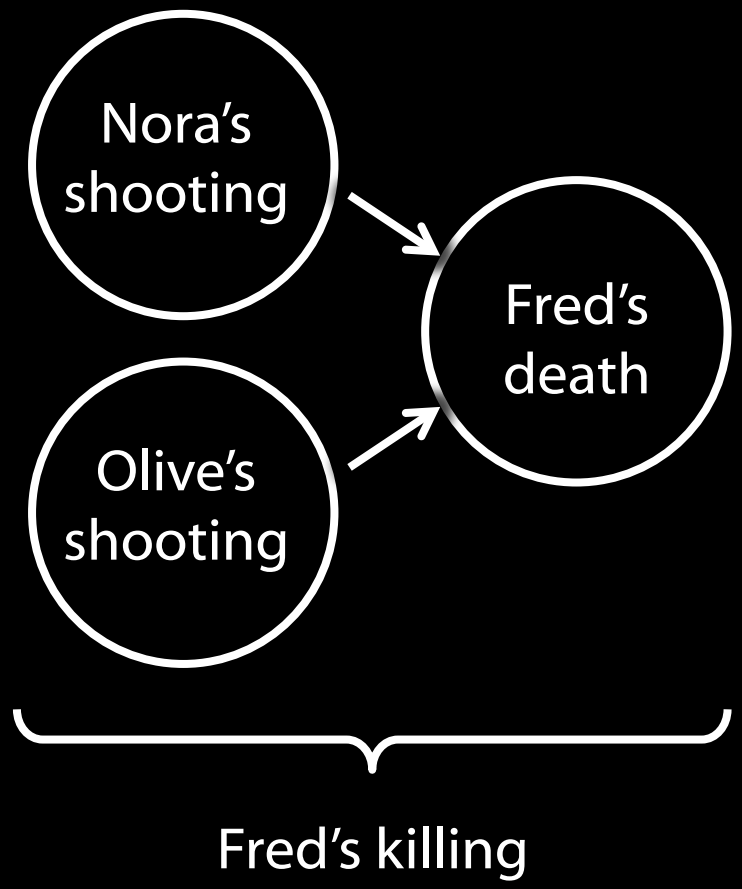

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(a) it is a distributive goal;

(b) the actions are coordinated; and

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

"we need a principled way of distinguishing genuine joint actions from mere joint happenings or joint doings."

(Pacherie 2011, 175)

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Joint

Not joint

Joint

Jack and Sue walk together

Not joint

Jack and Sue walk alongside each other

(Gilbert 1990)

Joint	Not joint
Jack and Sue walk together	Jack and Sue walk alongside each other (Gilbert 1990)
We collectively perform a dance by running to a shelter at the same time	We each individually run to a shelter at the same time (in response to a sudden shower). (Searle 1990, 92)

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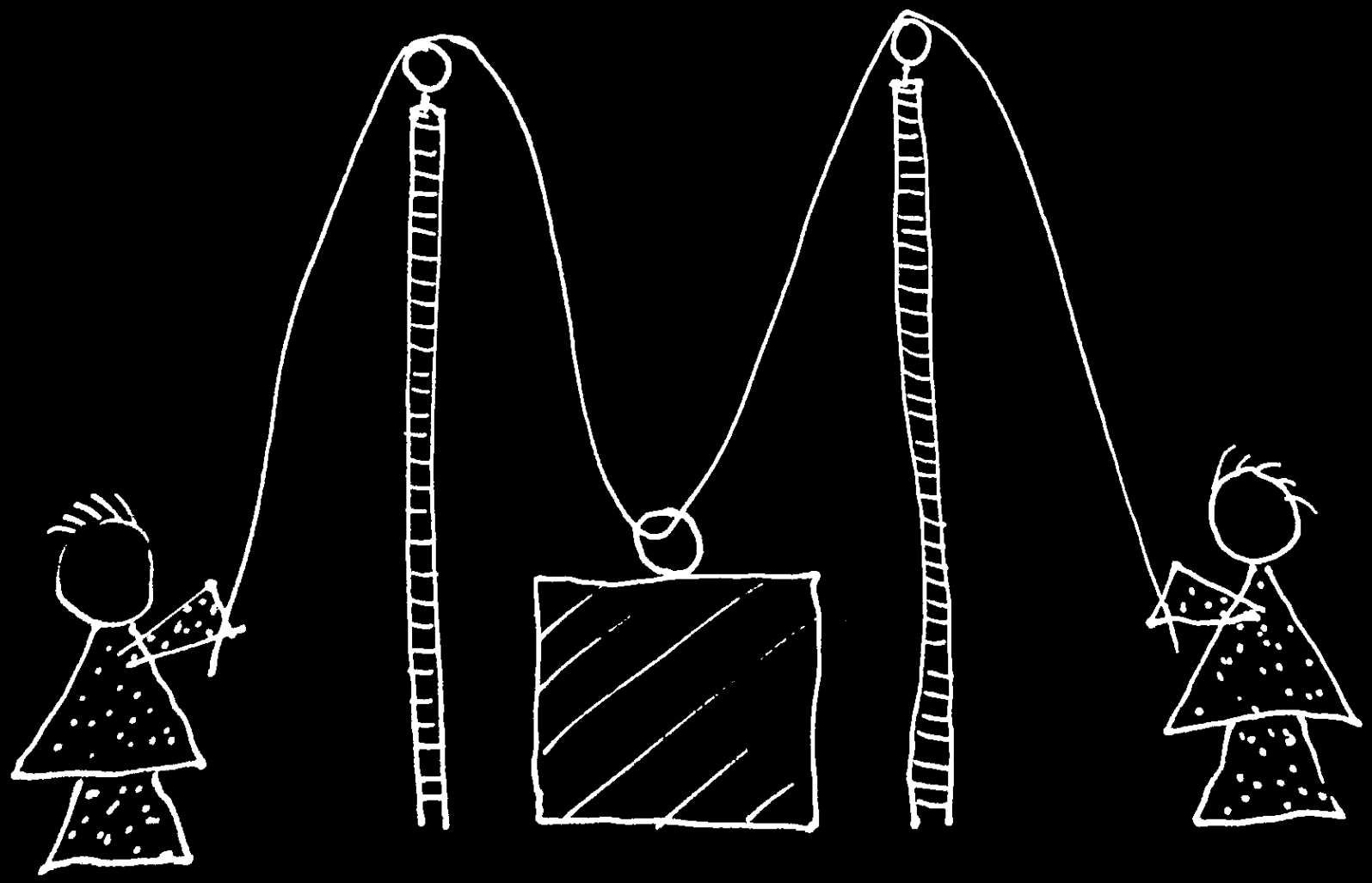
sting
sting
sting
sting
sting
sting
sting
sting
death of fly



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

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

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challenge

Explain the emergence, in evolution or development, of sophisticated forms of theory of mind cognition.

conjecture

The existence of abilities to engage in joint action partially explains how sophisticated forms of theory of mind cognition emerge in evolution or development (or both)

2nd objection

Joint action presupposes sophisticated theory of mind cognition

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3rd objection

But how ~~does~~ could it work?

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

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"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 & Tomsello 2007)

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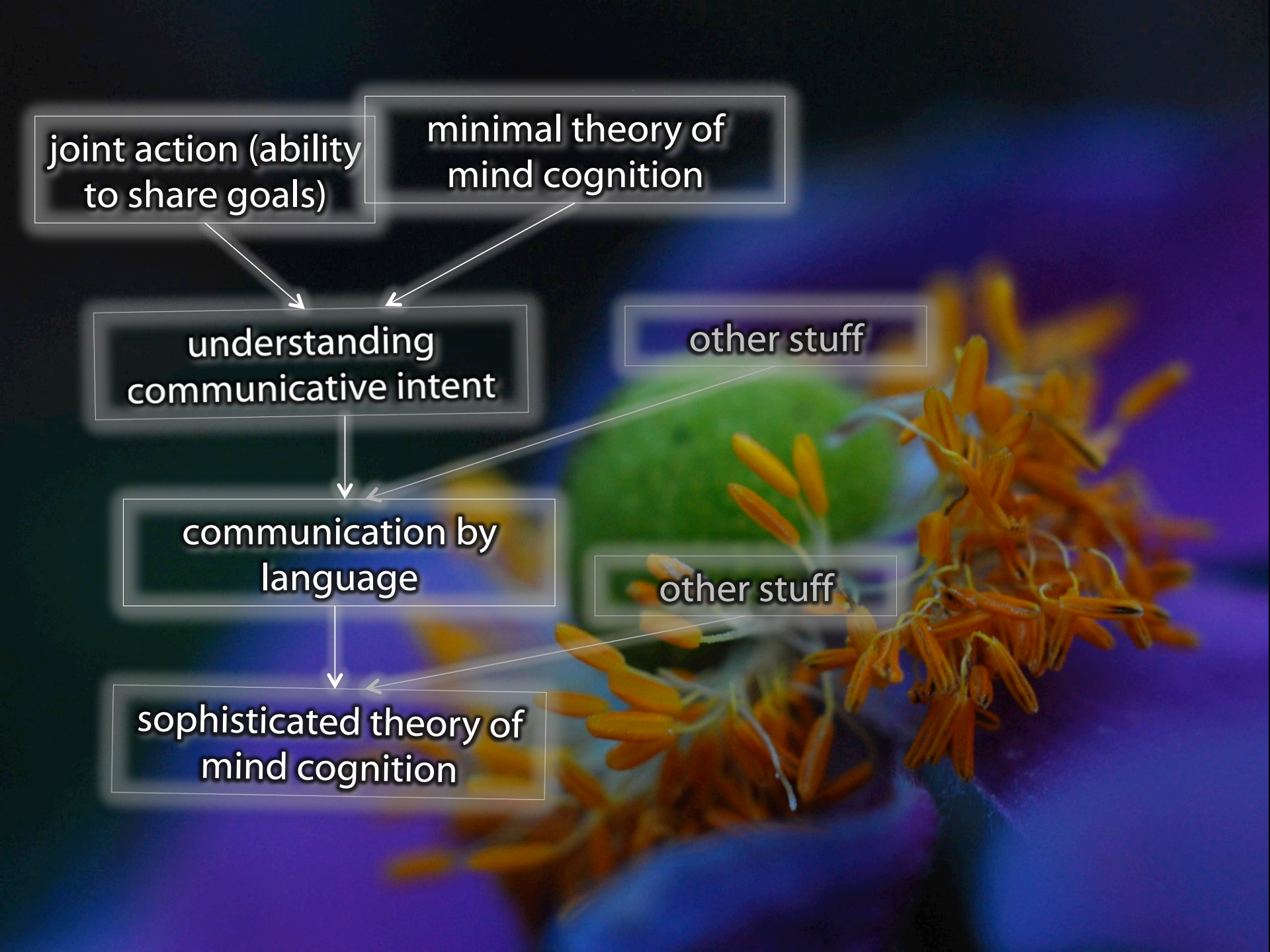
joint action (ability to share goals)
minimal theory of mind cognition
understanding communicative intent
other stuff
communication by language
other stuff
sophisticated theory of mind cognition