

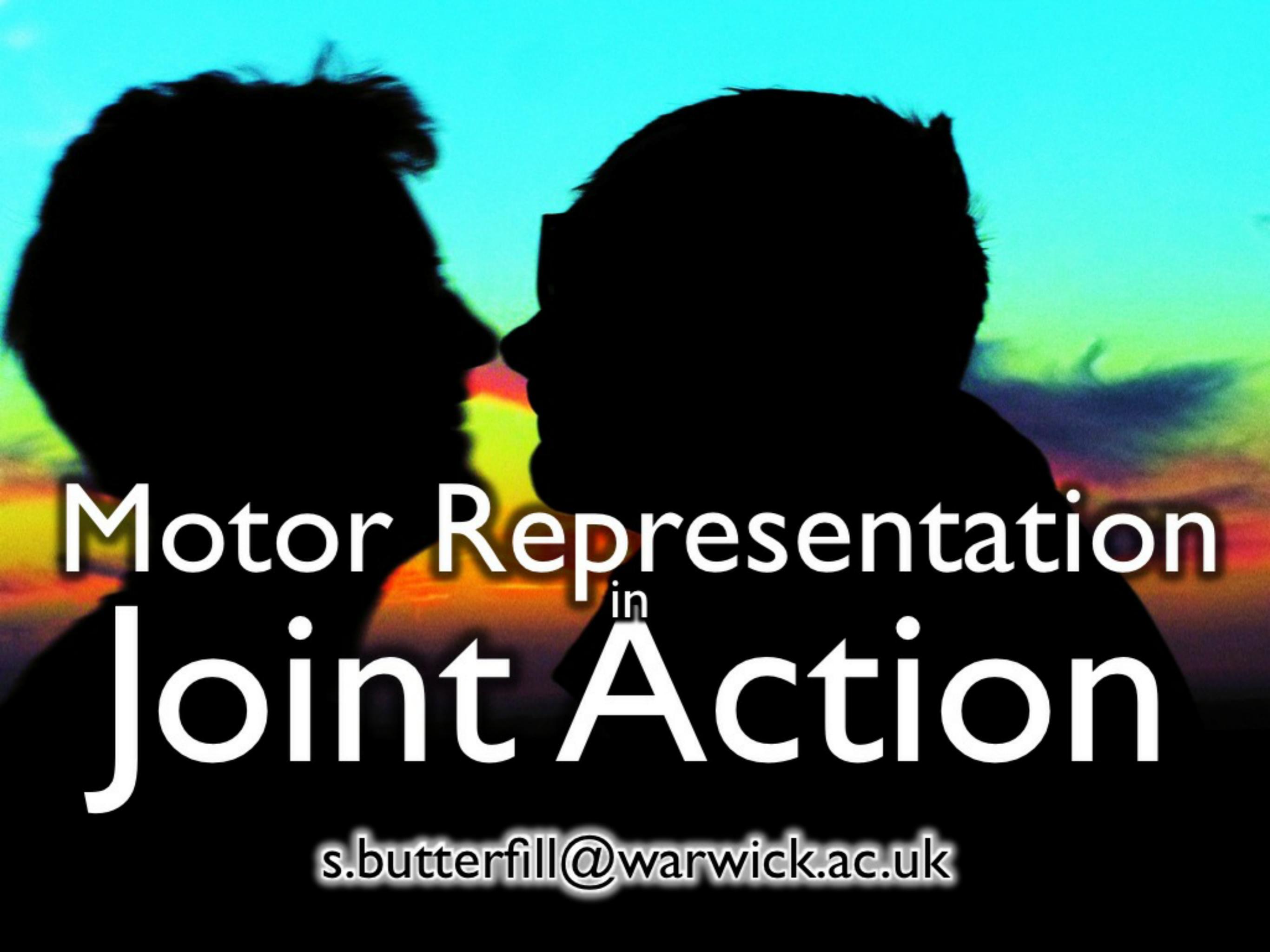
Press the right key for the next slide (or swipe left)

also ...

Press the left key to go backwards (or swipe right)

Press n to toggle whether notes are shown (no equivalent if you don't have a keyboard)

Press m or double tap to see a menu of slides

The background features two black silhouettes of people facing each other. They are set against a vibrant, abstract background composed of horizontal bands of color, including shades of blue, green, yellow, orange, and red.

Motor Representation in Joint Action

s.butterfill@warwick.ac.uk



challenge

Explain the emergence of sophisticated
human activities including referential
communication and mindreading.



‘participation in cooperative ... interactions ... leads children to construct uniquely powerful forms of cognitive representation.’

(Moll & Tomasello 2007)



‘participation in cooperative ... interactions ... leads children to construct uniquely powerful forms of cognitive representation.’

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‘perception, action, and cognition are grounded in social interaction’

(Knoblich & Sebanz 2006)



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'participation in cooperative ... interactions ... leads children to construct uniquely powerful forms of cognitive representation.'

(Moll & Tomasello 2007)



'human cognitive abilities ... [are] built upon social interaction'

(Sinigaglia and Sparaci 2008)

What kinds of social interaction?

What kinds of social interaction? joint action

What kinds of social interaction? joint action

Joint Action

Two sisters cycling to school together.



Joint Action

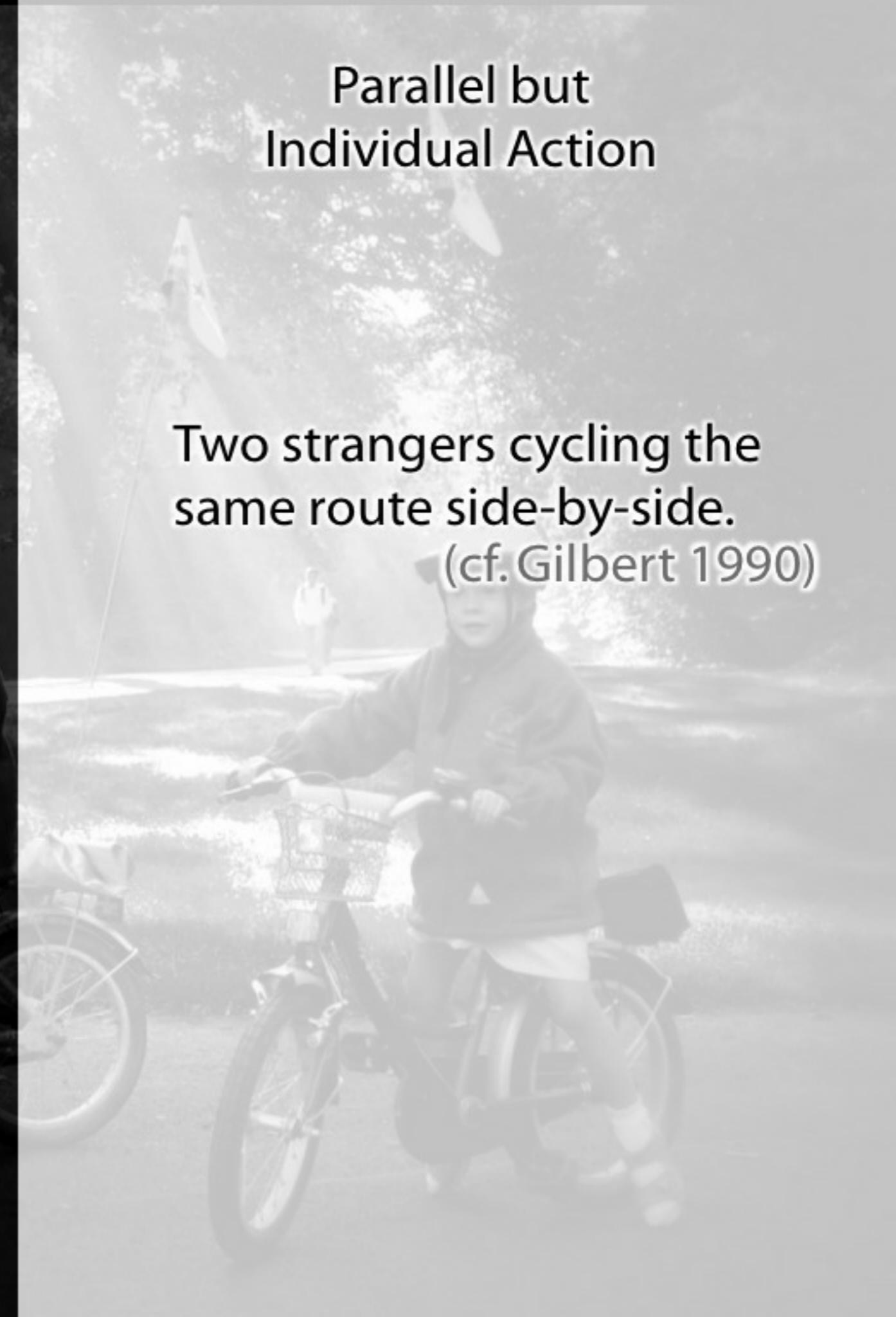
Two sisters cycling to school together.



Parallel but Individual Action

Two strangers cycling the same route side-by-side.

(cf. Gilbert 1990)



Joint Action

Two sisters cycling to school together.

Members of a flash mob simultaneously open their newspapers noisily

Parallel but Individual Action

Two strangers cycling the same route side-by-side.

(cf. Gilbert 1990)

Onlookers simultaneously open their newspapers noisily

(cf. Searle 1990:92)



challenge

Explain the emergence of sophisticated
human activities including referential
communication and mindreading.

A black and white photograph of two young children, a boy and a girl, standing close together. The boy, on the left, has light-colored hair and is wearing a patterned long-sleeved shirt under dark overalls. The girl, on the right, also has light-colored hair and is wearing a dark top with small white dots. They are both looking towards the right side of the frame.

challenge

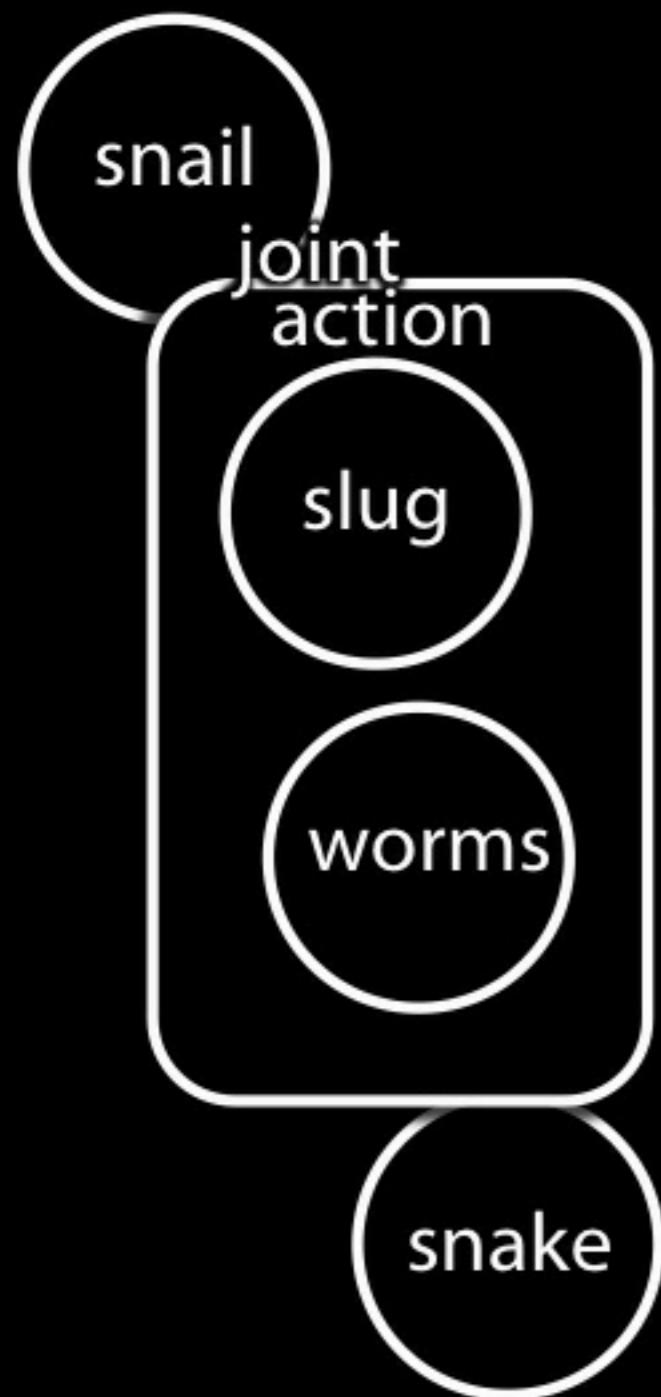
Explain the emergence of sophisticated
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communication and mindreading.

conjecture

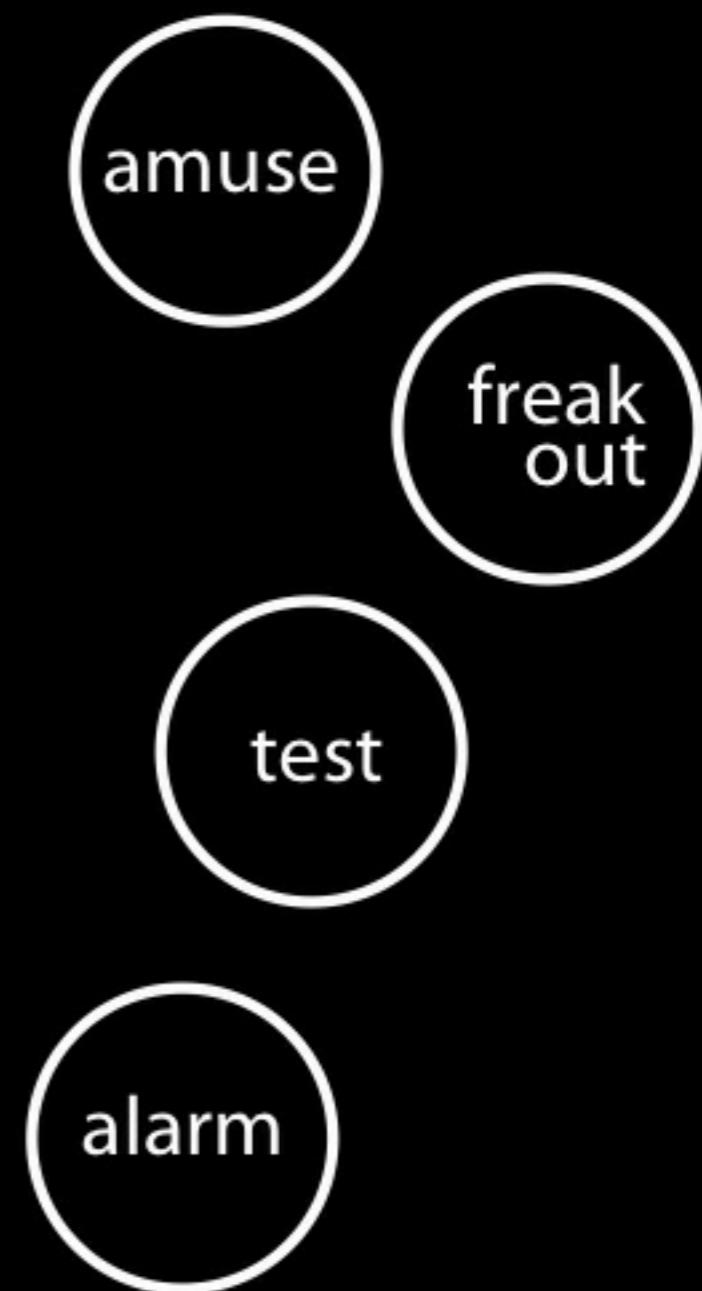
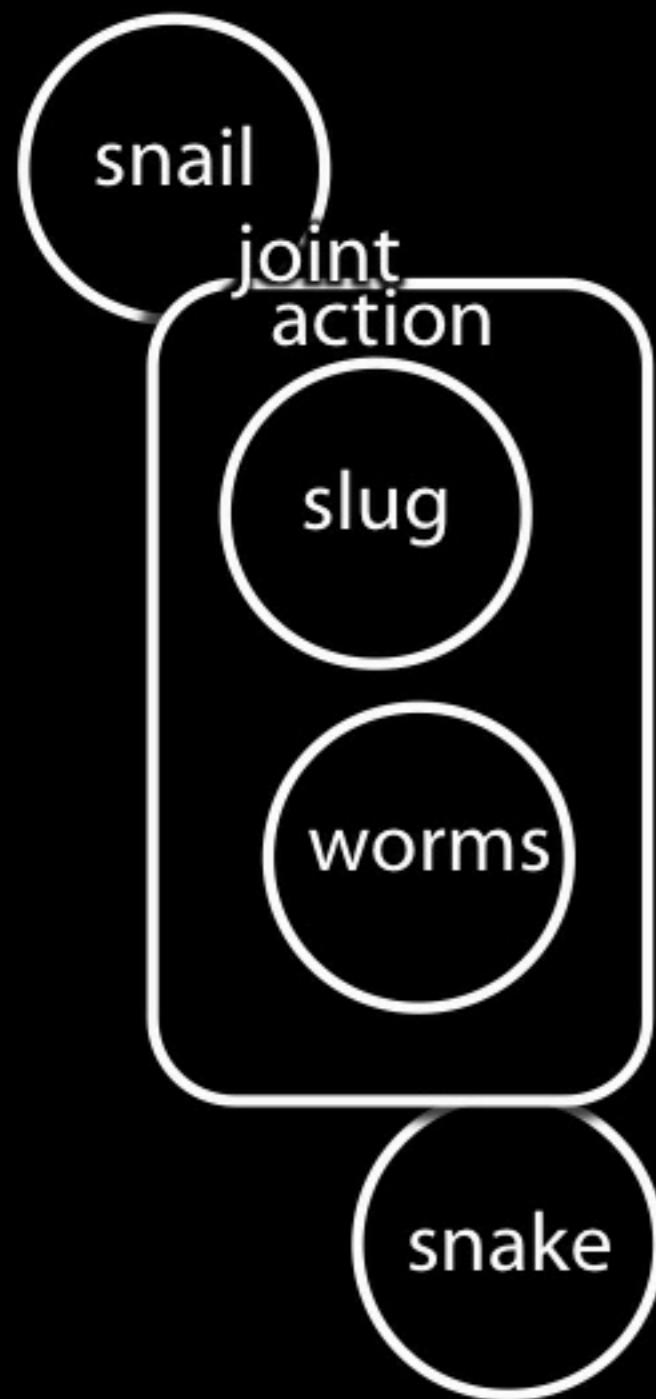
Joint action plays a role in explaining how
sophisticated human activities emerge.

In virtue of what are joint actions collectively directed to outcomes?

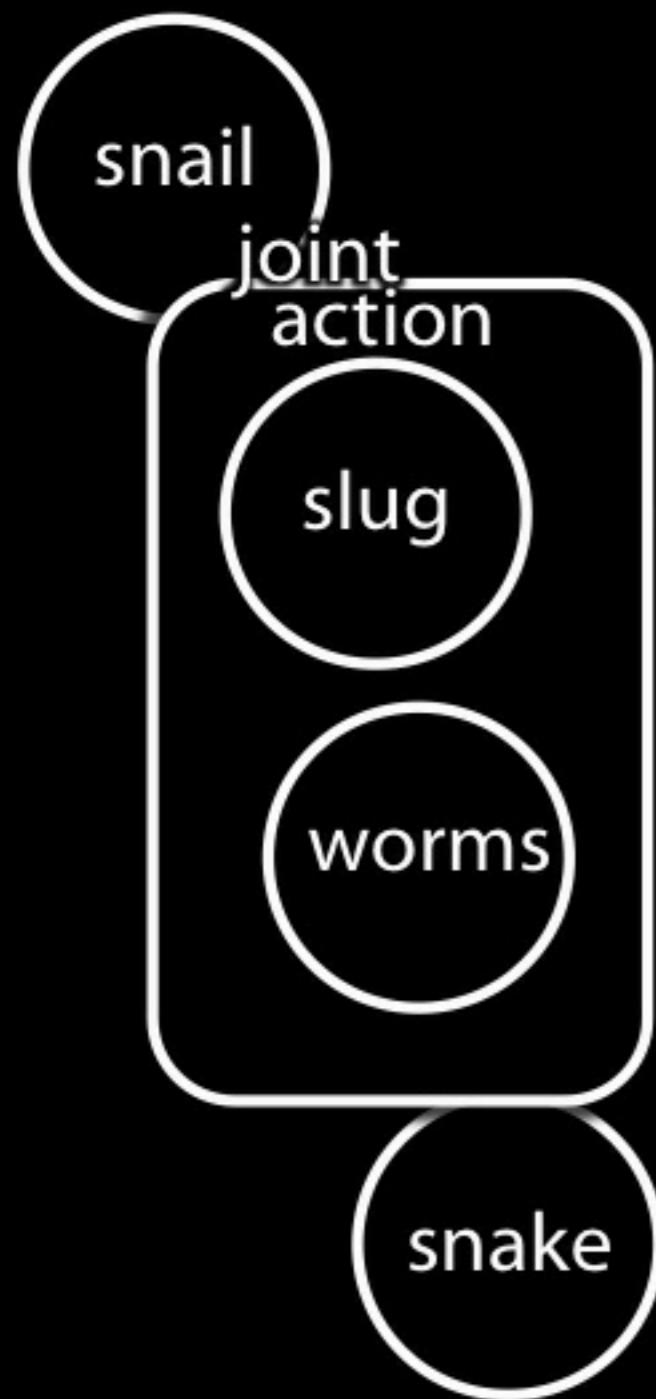
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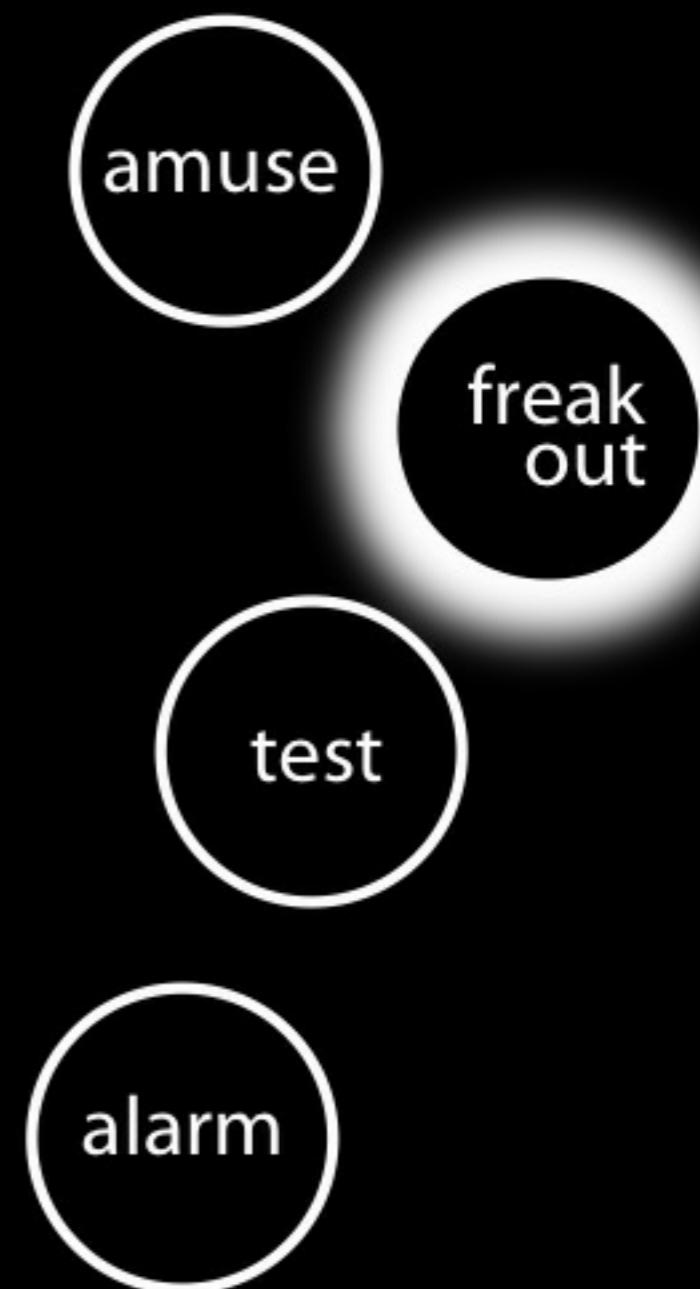
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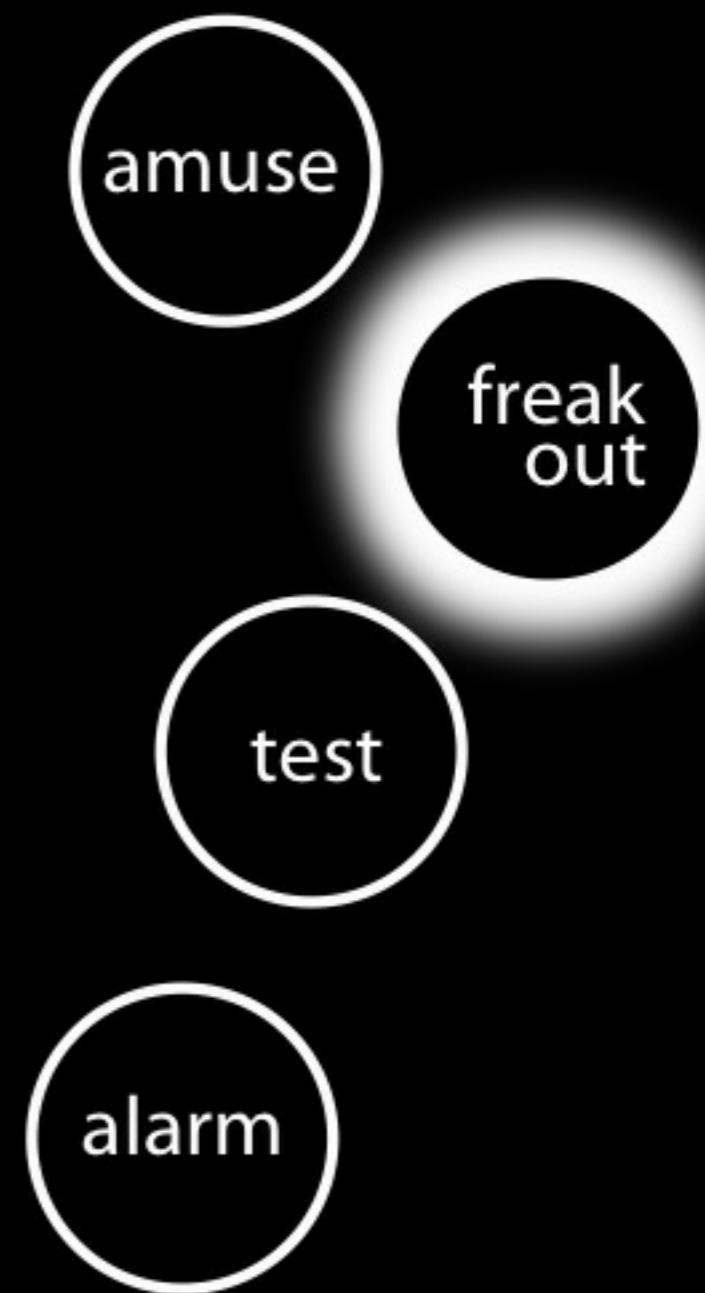
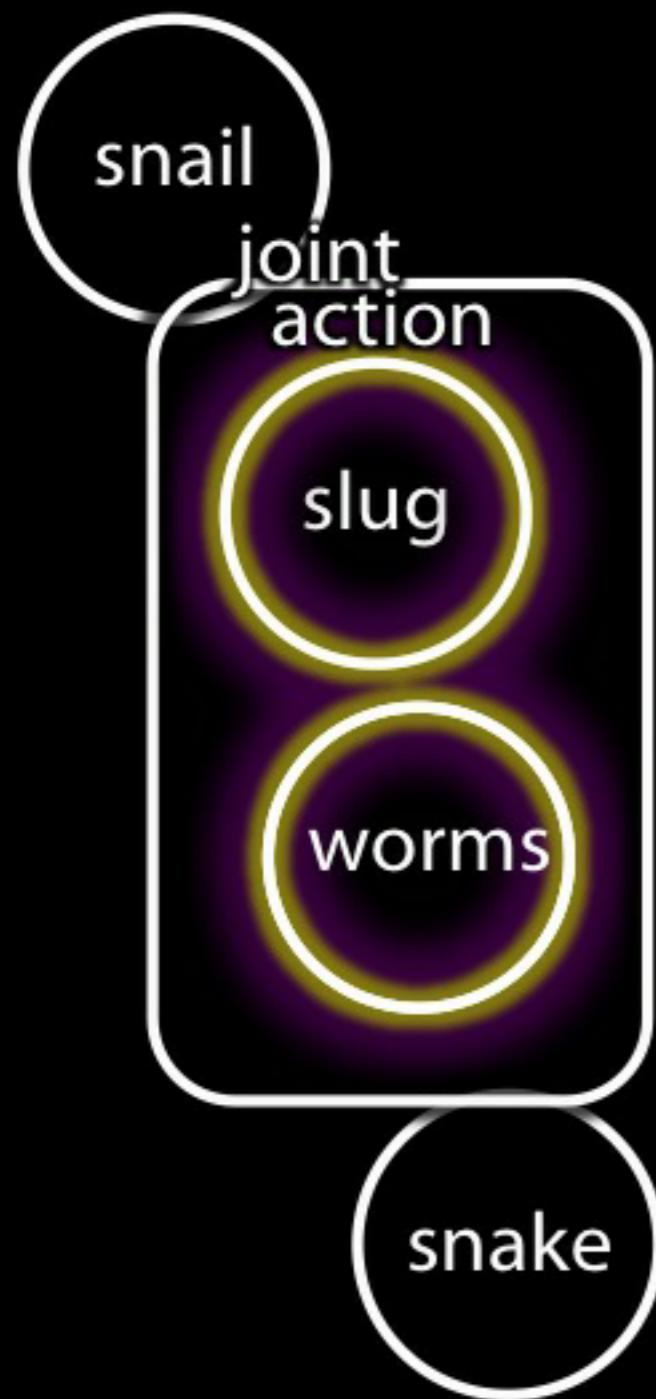
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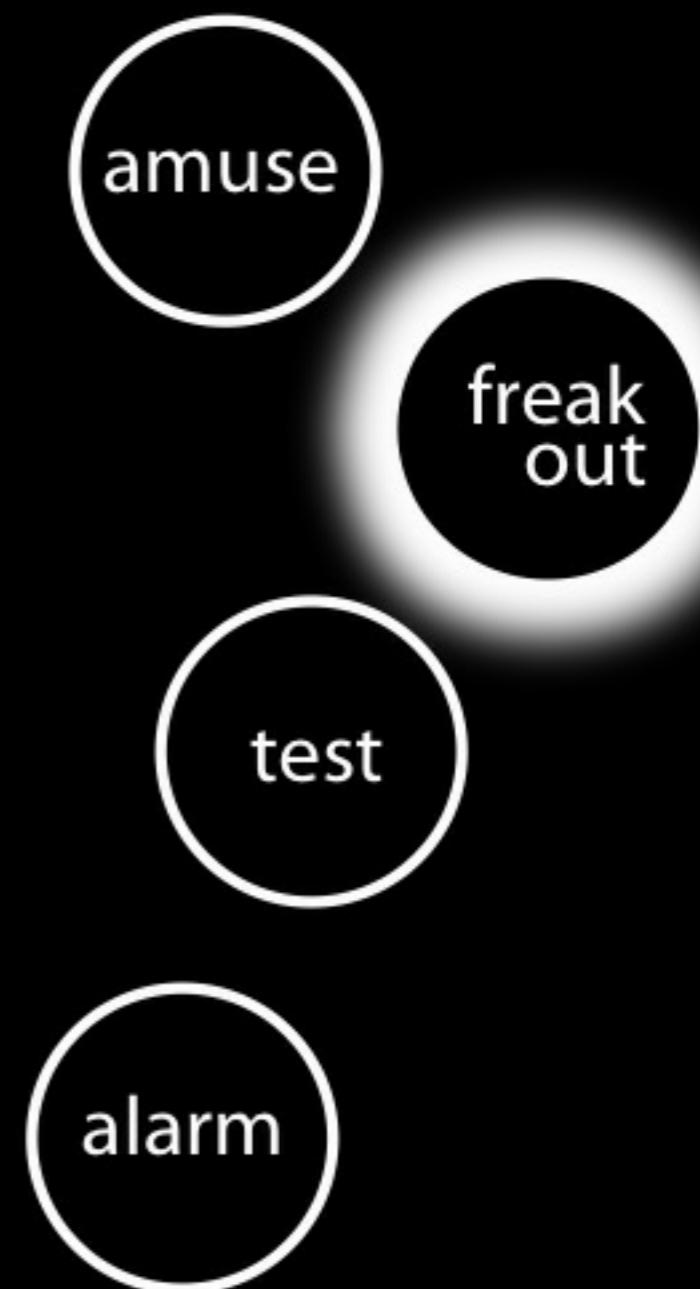
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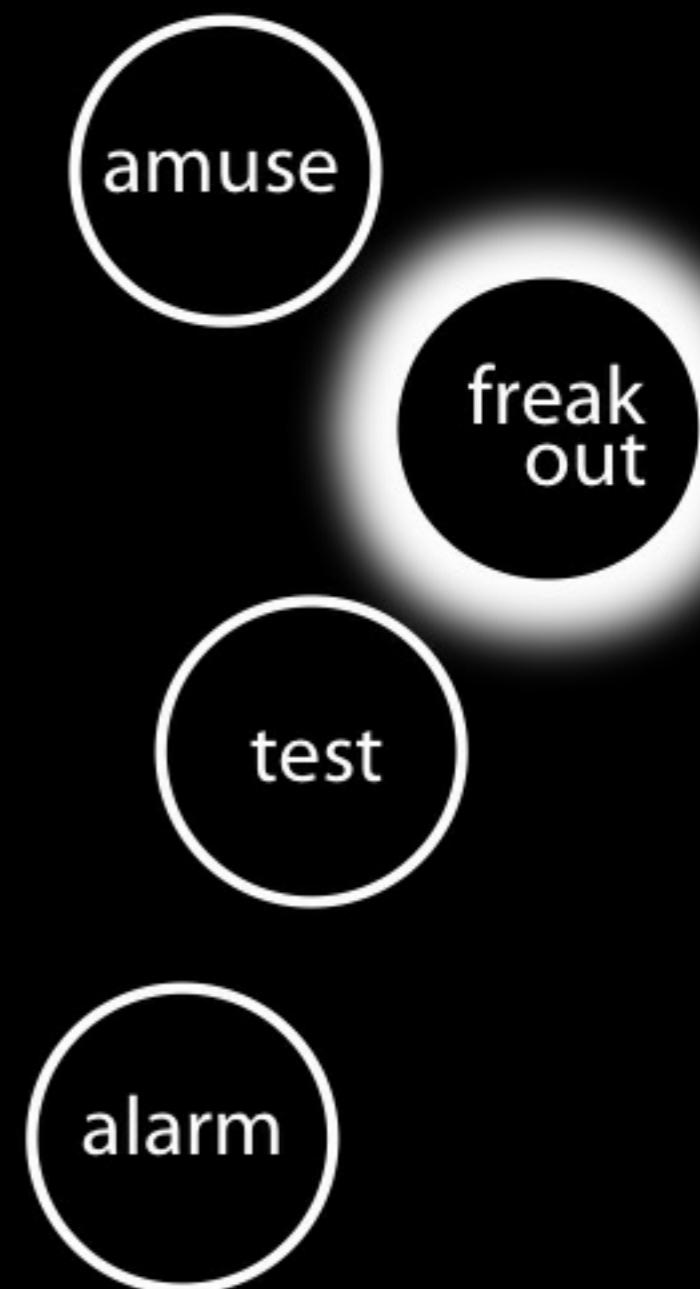
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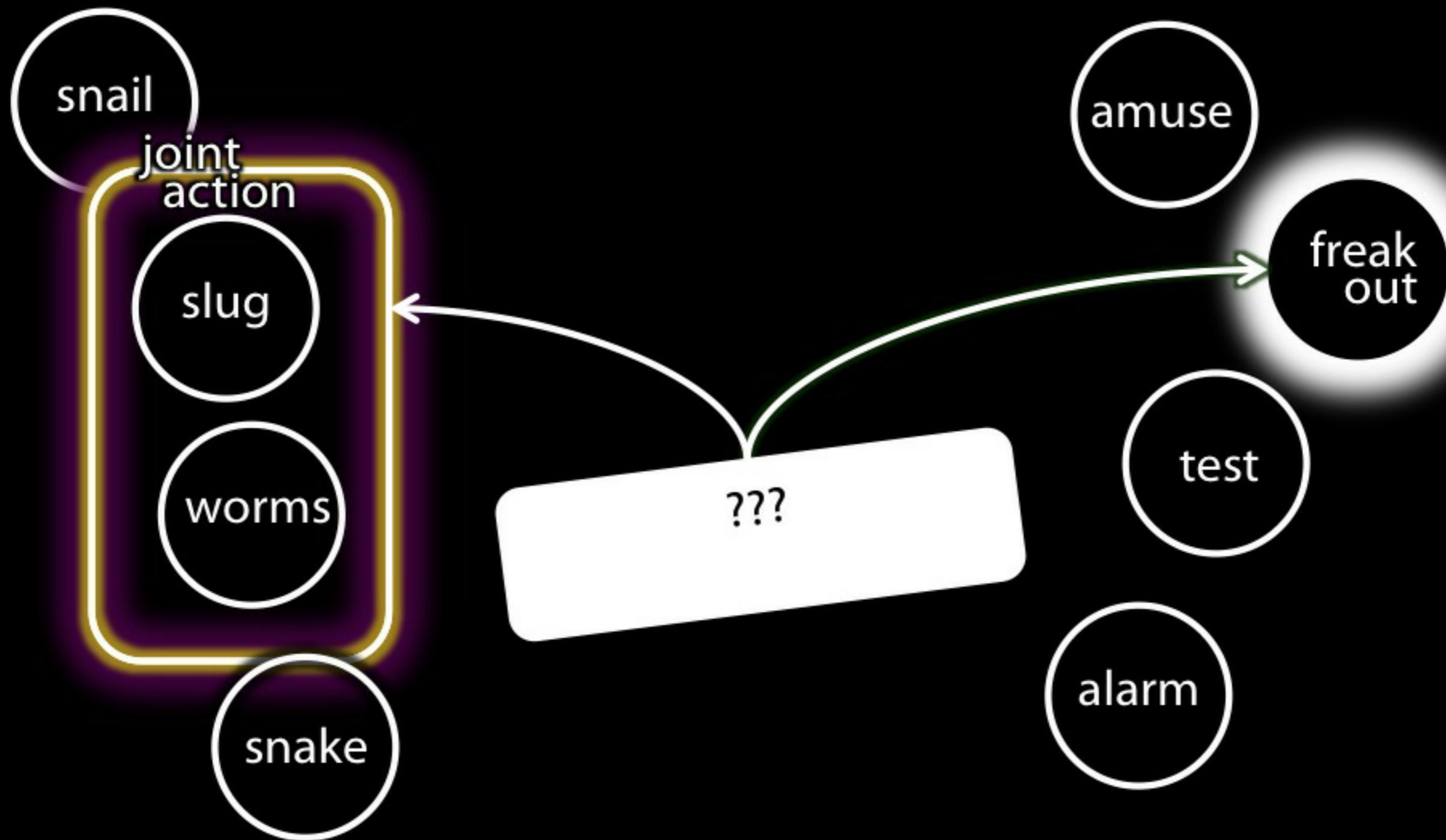
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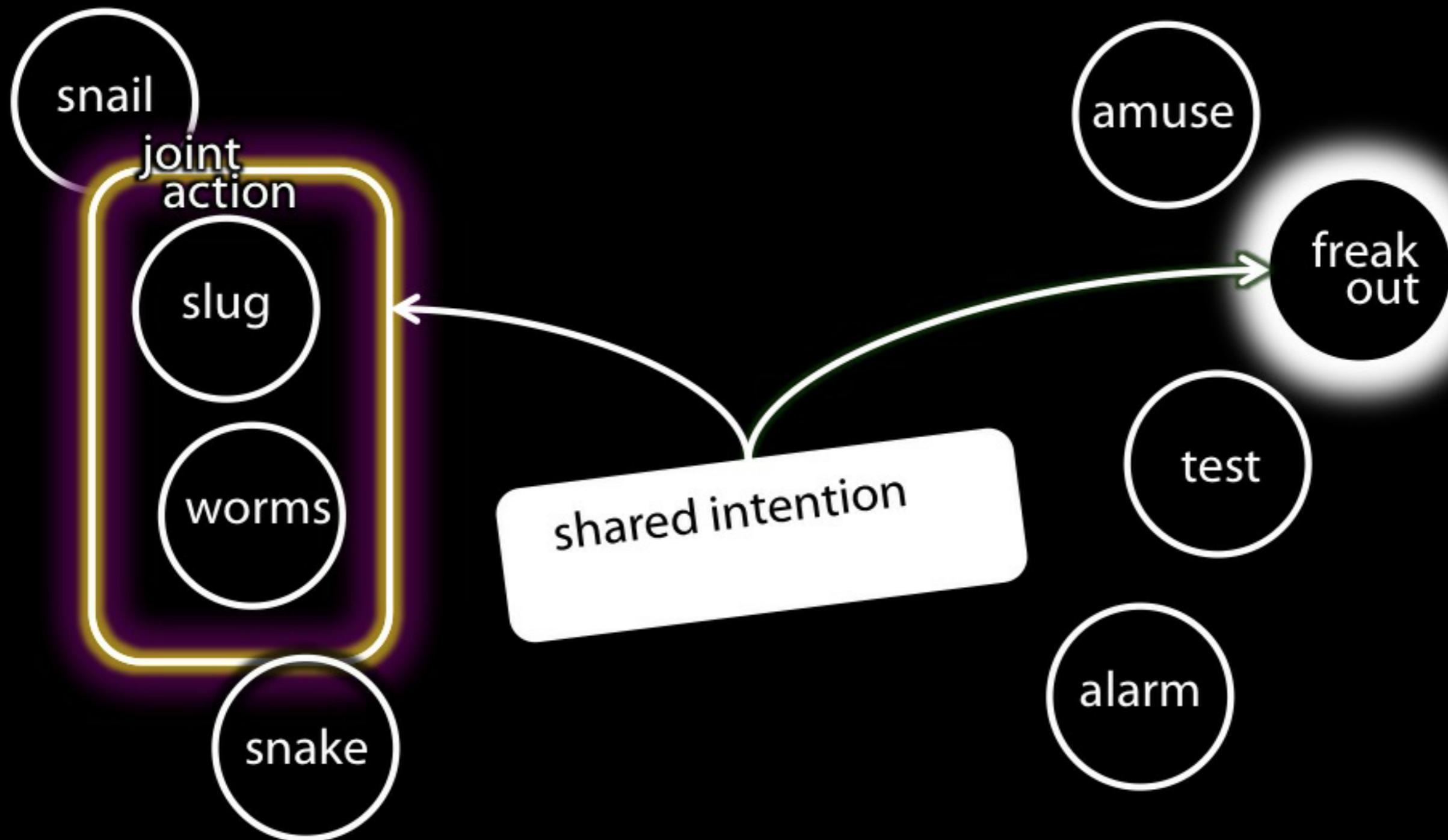
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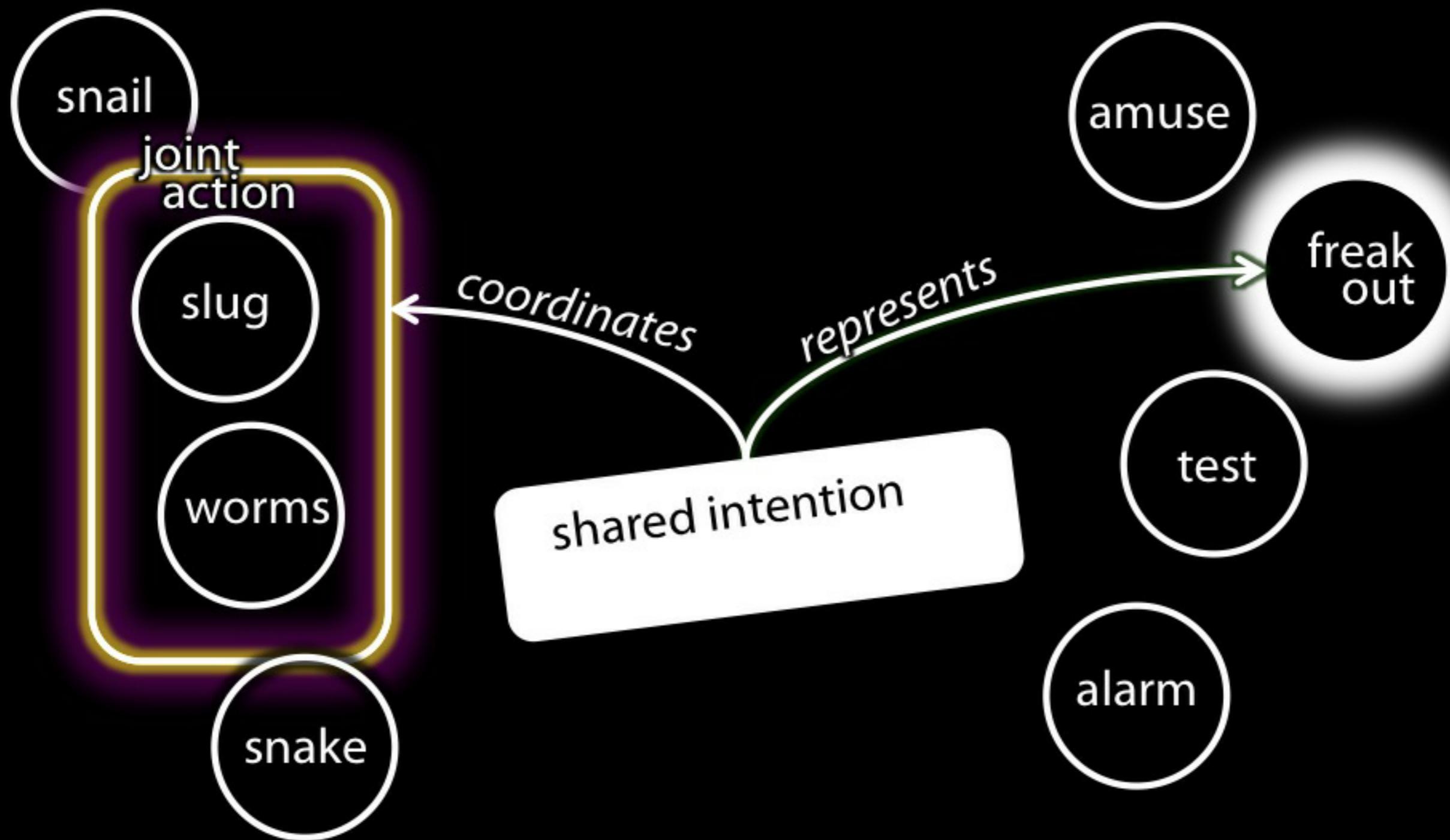
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shared intention



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

(Bratman 2011, p. 11)



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‘shared intentional agency
consists, at bottom, in
interconnected planning

facts about your plans
feature in my plans &
conversely



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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 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)

'shared intentional agency
consists, at bottom, in
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Intentions about intentions

facts about your plans
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Intentions about intentions



Knowledge of others' knowledge
of intentions about intentions



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

(Bratman 1993:View 4)

that ... she
intends ...

... she
intends ...

He knows
that I intend
that ... he
intends ...

She knows
that I intend
that ... she
intends ...

He intends
that I ...
intend ...

She intends
that ... I ...

I intend ...

I intend ...

A black and white photograph of two young children, a boy and a girl, standing close together. The boy, on the left, has light-colored hair and is wearing a patterned long-sleeved shirt under dark overalls. The girl, on the right, also has light-colored hair and is wearing a dark top with small white dots. They are both looking towards the right side of the frame.

challenge

Explain the emergence of sophisticated
human activities including referential
communication and mindreading.

conjecture

Joint action plays a role in explaining how
sophisticated human activities emerge.

A black and white photograph of two young children, a boy and a girl, standing close together and looking at each other. The boy has light-colored hair and is wearing a patterned shirt under dark overalls. The girl has dark hair and is wearing a dark top with small white dots. They appear to be interacting or playing together.

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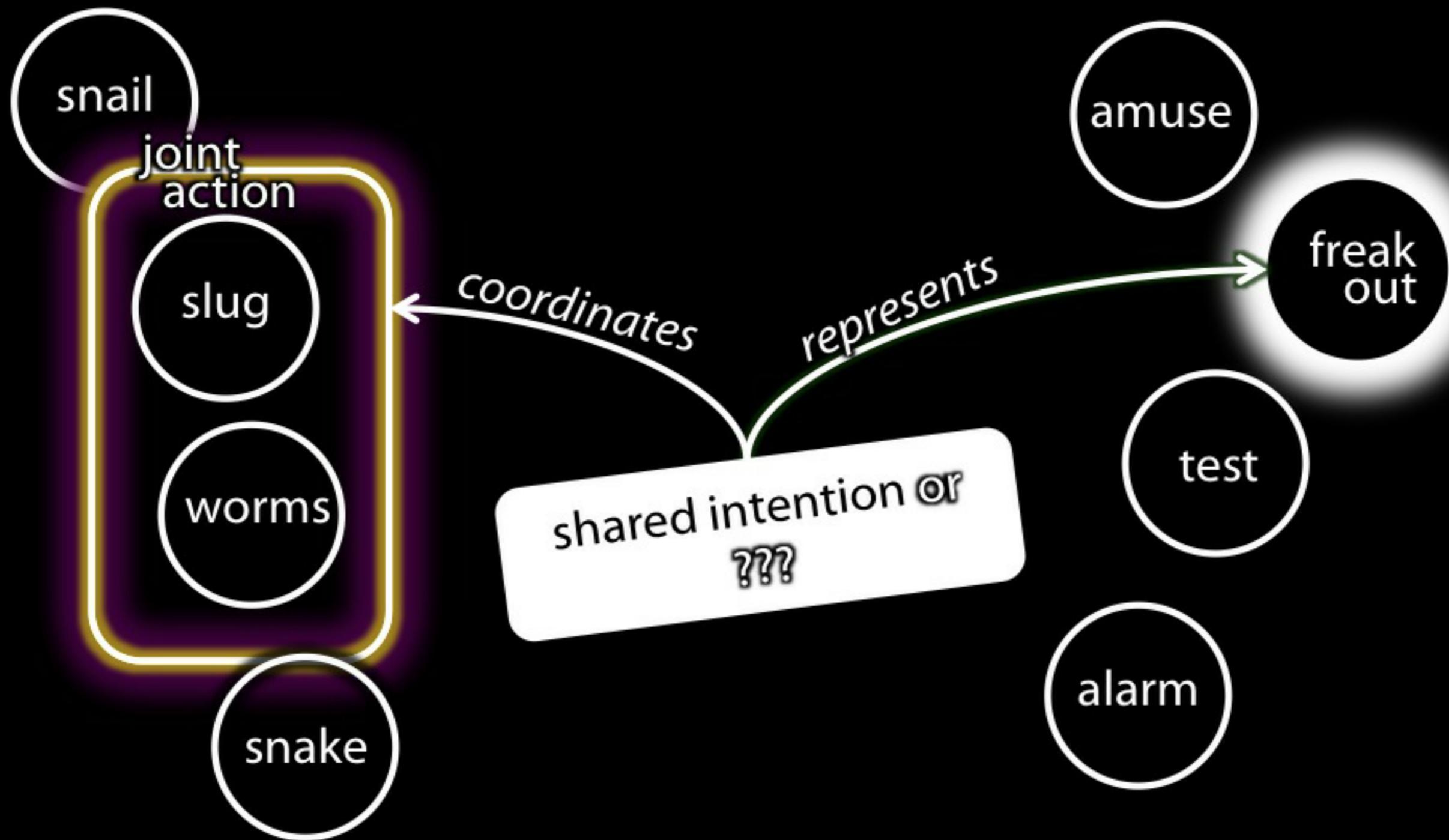
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Joint action presupposes mindreading at the
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In virtue of what are joint actions collectively directed to outcomes?

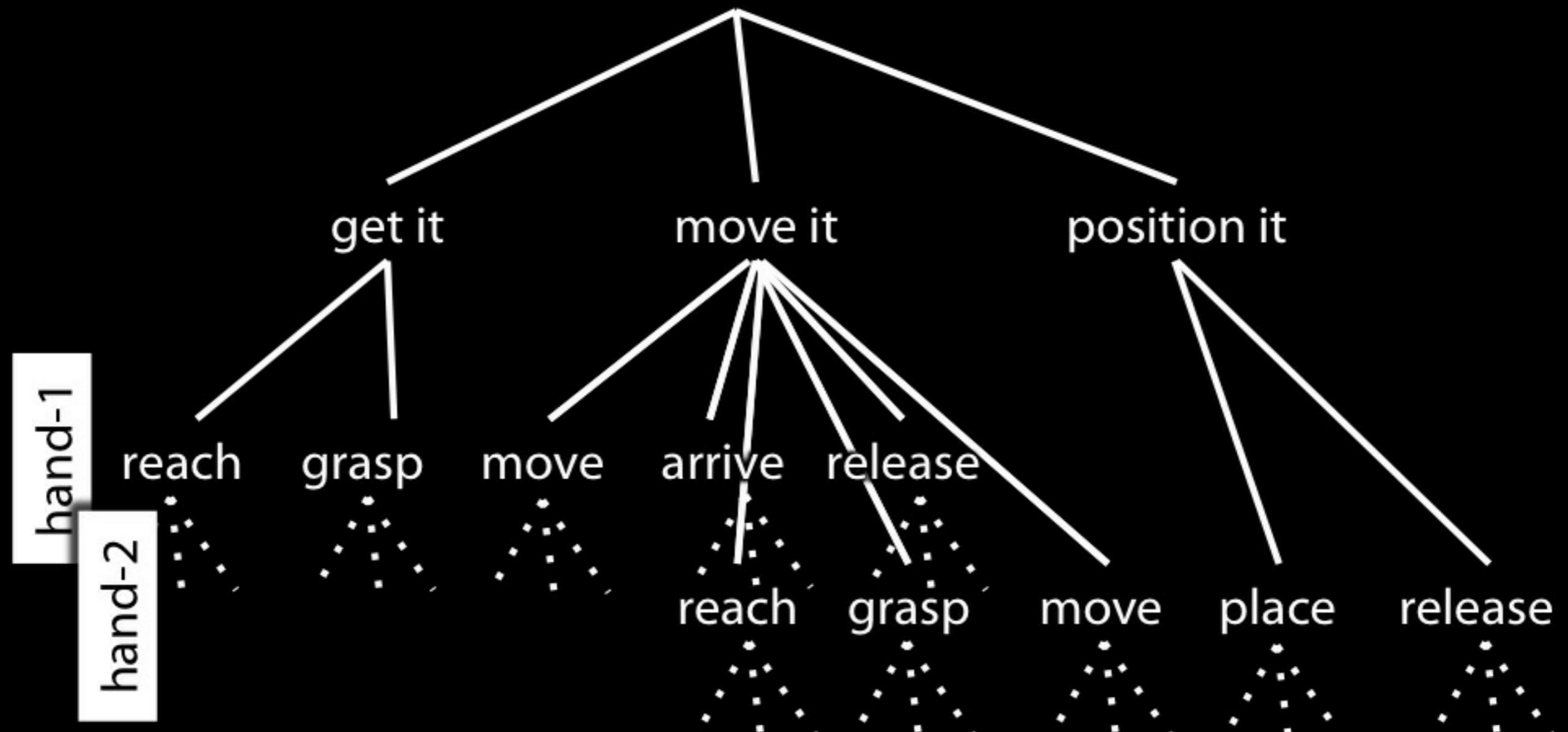


motor representation

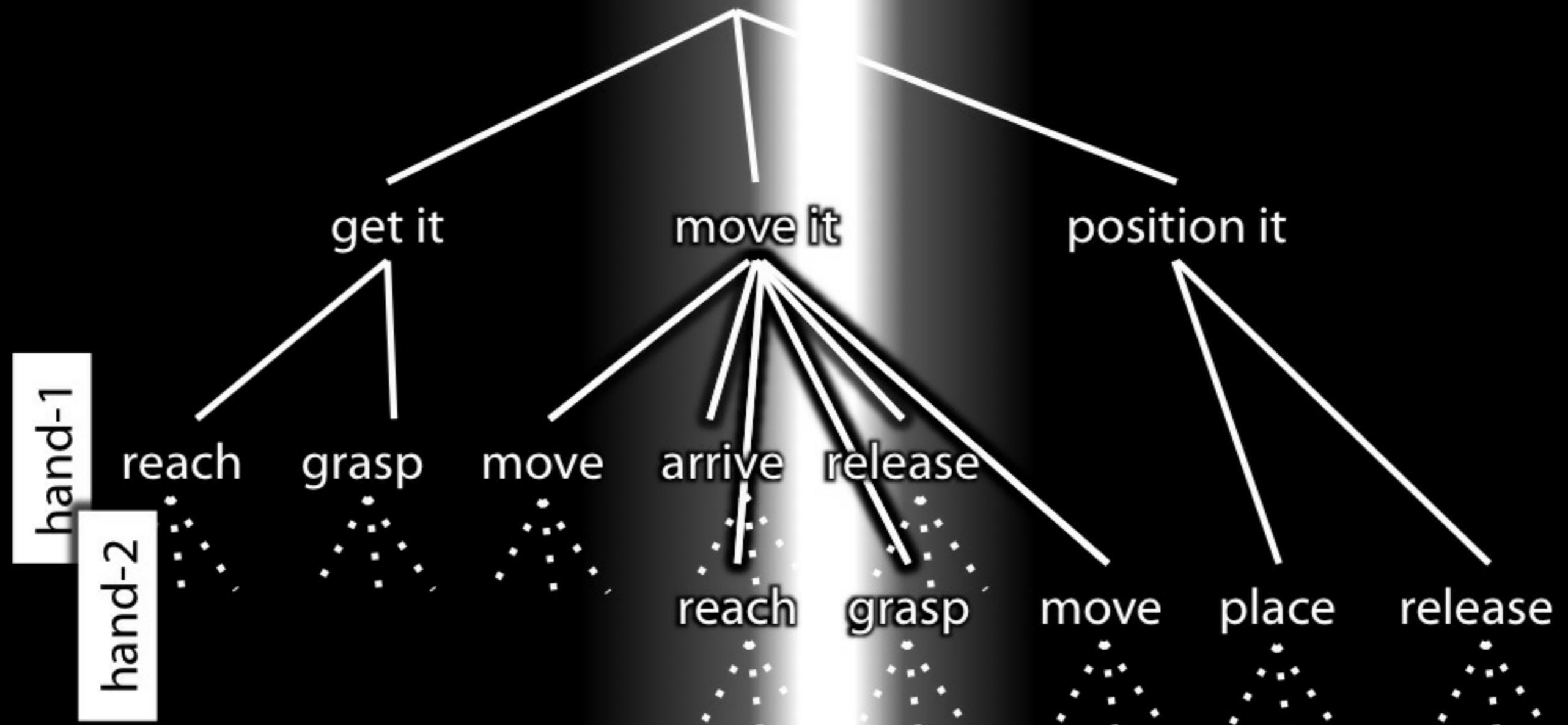
Move it from there to here



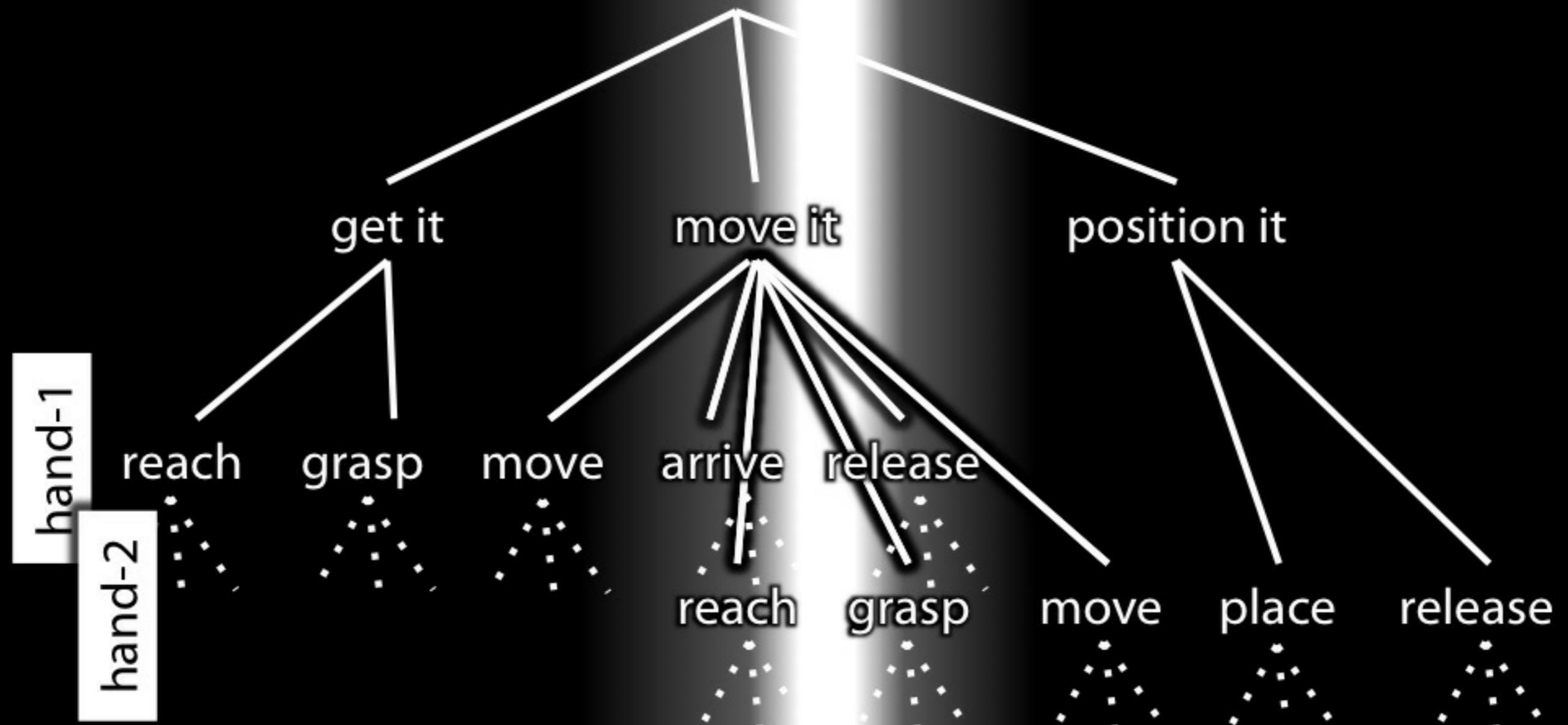
Move it from there to here



Move it from there to here



Move it from there to here



in observing others act
motor planning for others' actions occurs

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--- even when several others act jointly --- Manera et al (2013)

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--- even when several others act jointly --- Manera et al (2013)
and enables us to anticipate their actions. Costantini et al (2013)

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Costantini et al (2013)

In joint action
it can also occur

Kourtis et al (2010; 2012)

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Vesper et al (2012);
Novembre et al (2013)

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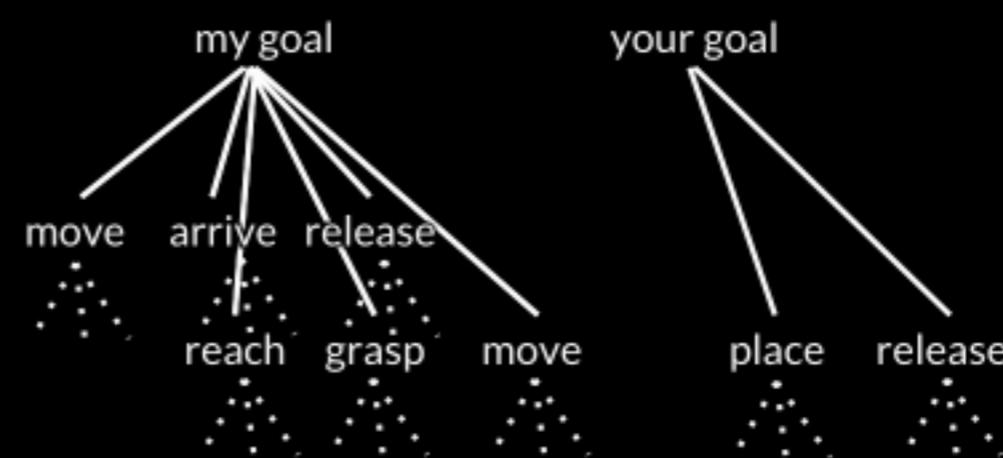
In competitive action
we sometimes plan the others' action and then our own. Sartori et al (2011)

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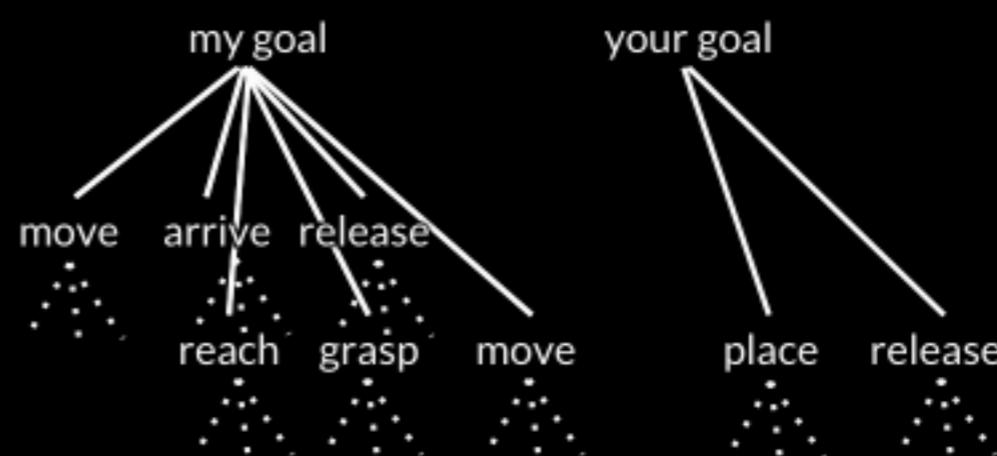
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But in joint action, sometimes
there is one goal that we each represent

Tsai et al (2011);
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Meyer et al 2013



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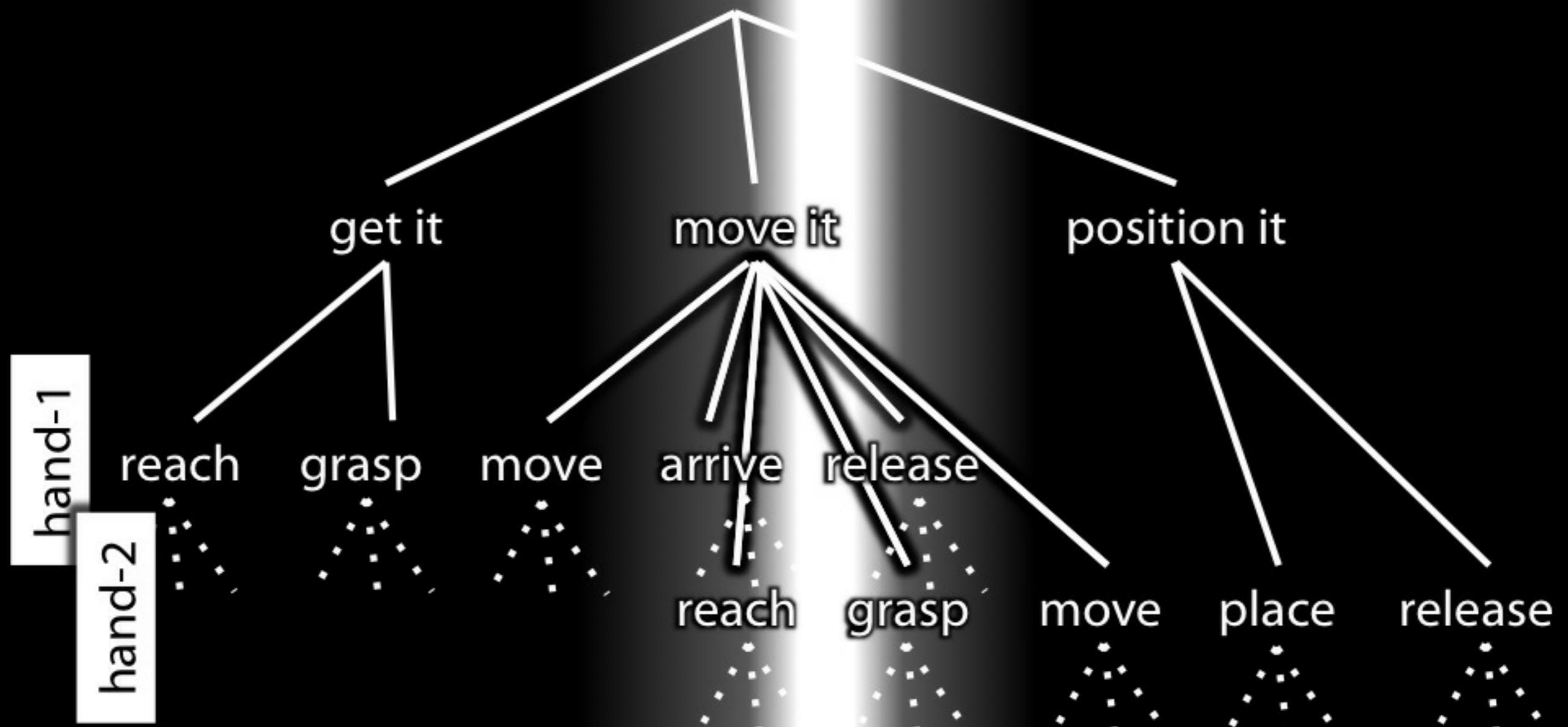
Meyer et al 2013



agent-neutral

agent-neutral

Move it from there to here



Move it from there to here

*joint action:
same goal*

get it

move it

position it

hand-1

reach

grasp

move

arrive

release

reach

grasp

move

place

release

hand-2

reach

grasp

move

arrive

release

reach

grasp

move

place

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hand-2

*similar timing
problem*

Move it from there to here

*joint action;
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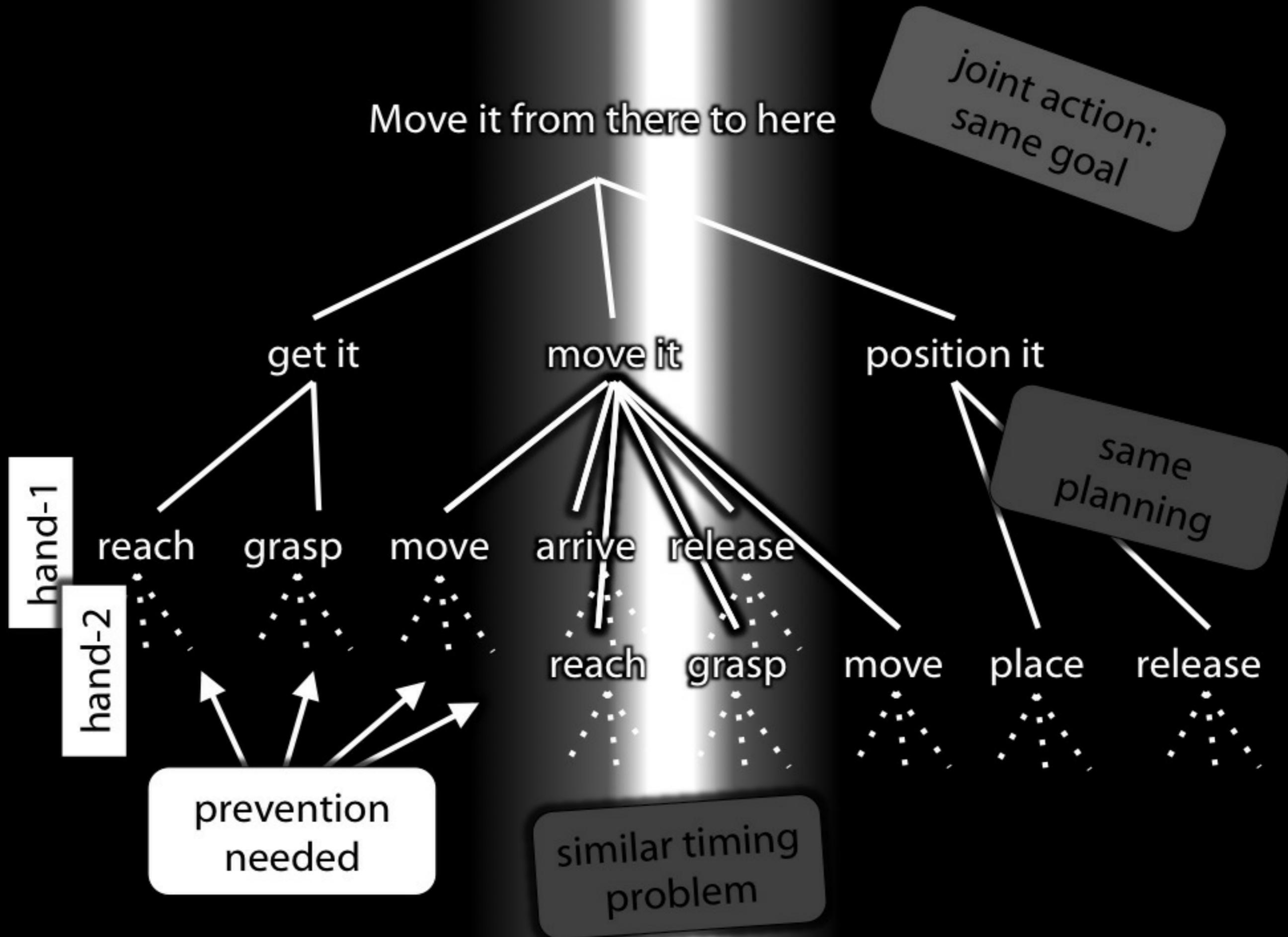
move

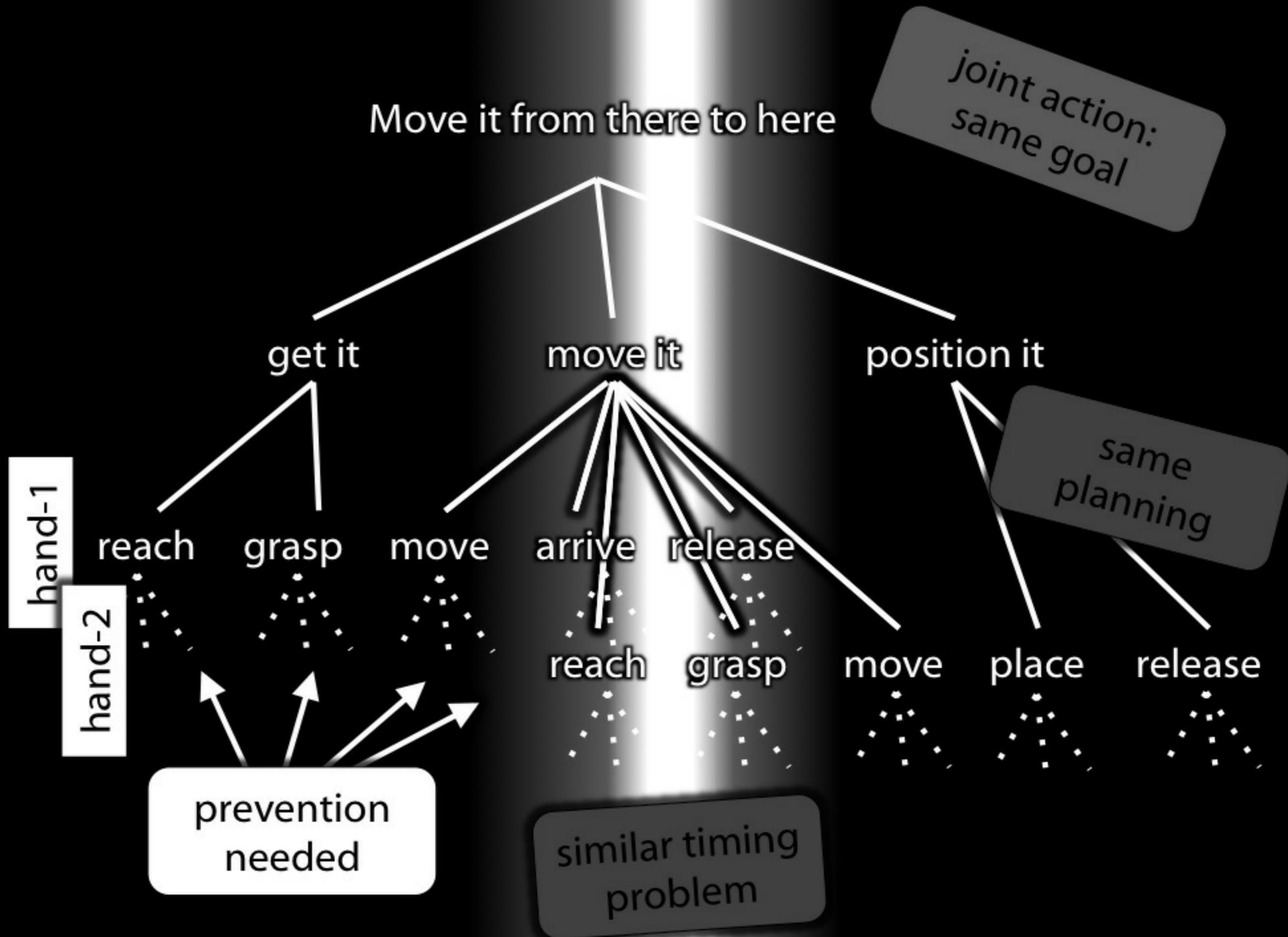
place

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*similar timing
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'shared intentional
[i.e. collective] agency
consists, at bottom, in
interconnected planning'

facts about your plans
feature in my plans &
conversely

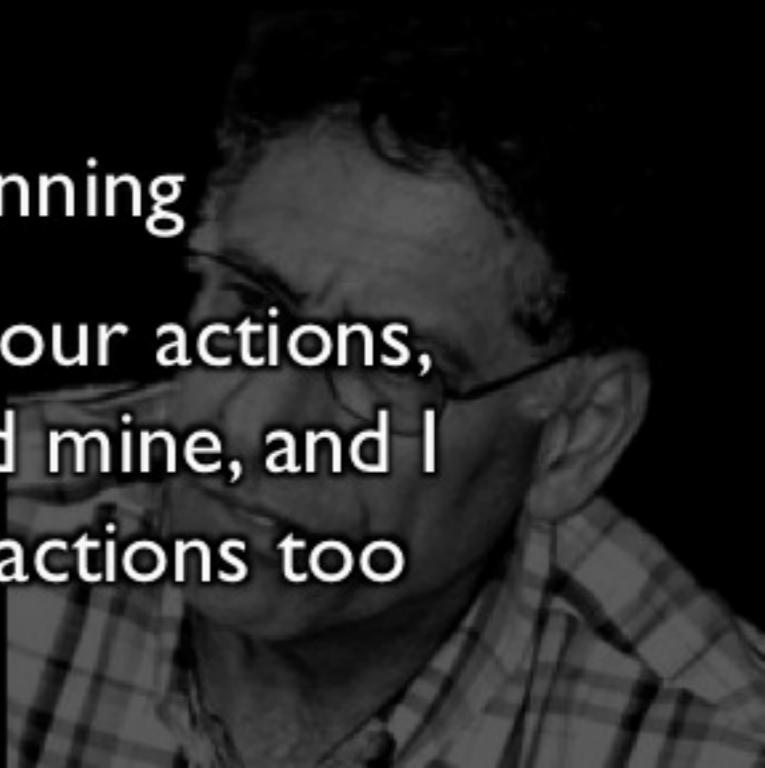


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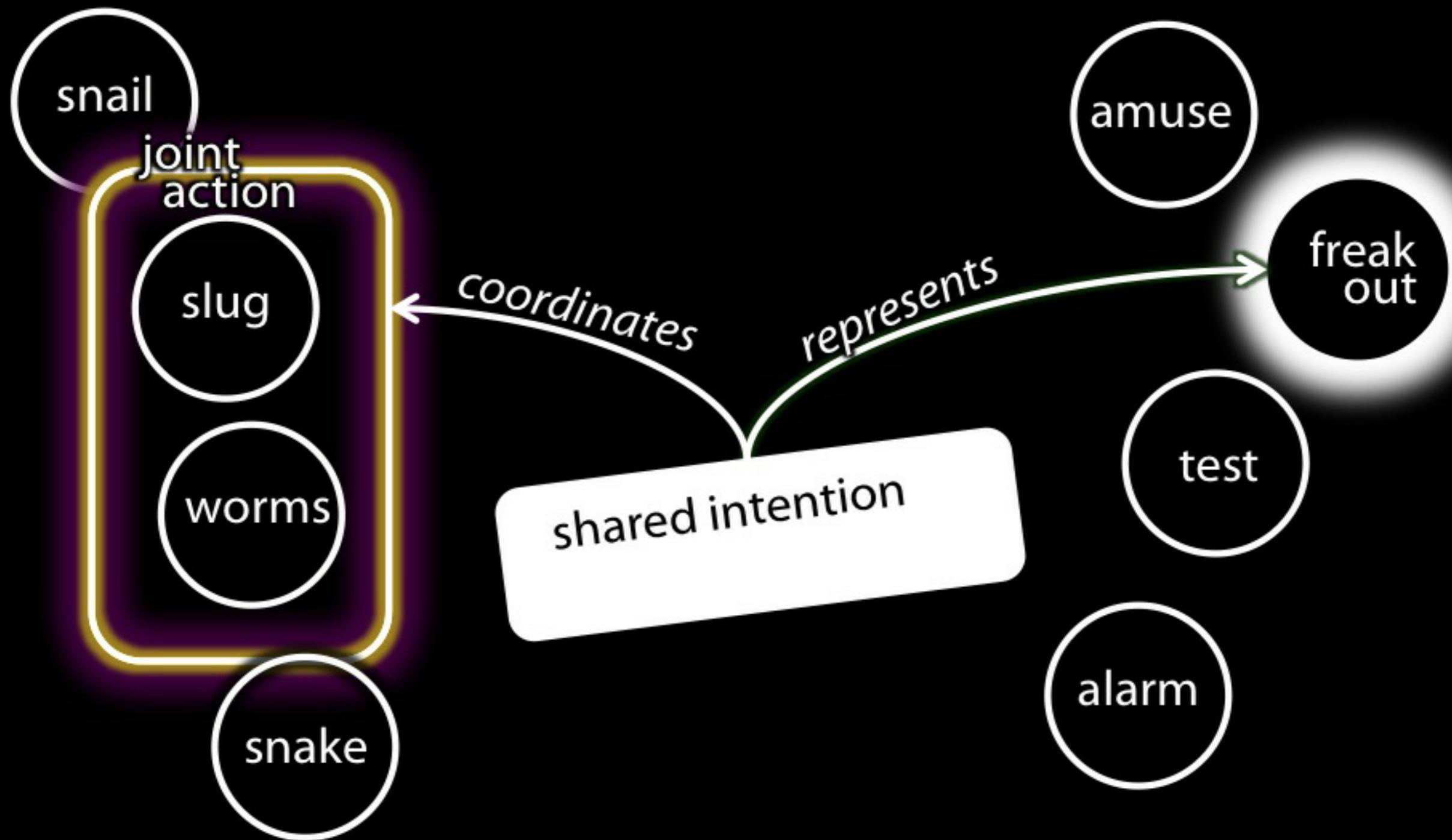
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parallel planning

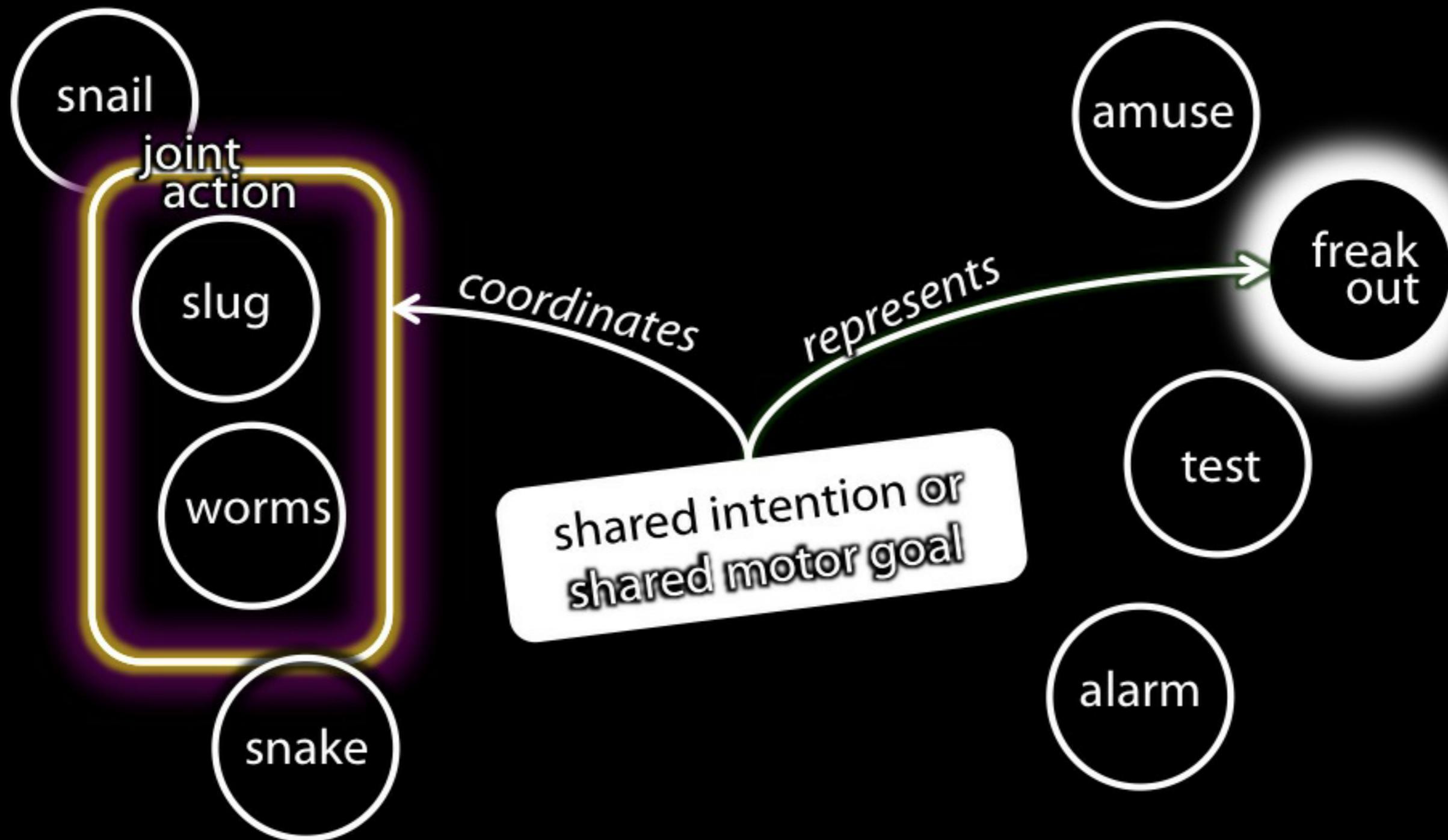
You plan our actions,
yours and mine, and I
plan our actions too



In virtue of what are joint actions collectively directed to outcomes?



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challenge

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Joint action plays a role in explaining how sophisticated human activities emerge.

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Joint action presupposes mindreading at the limits of human abilities.

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Motor Representation in Joint Action

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