

Shared Agency and Motor Representation

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Shared Agency

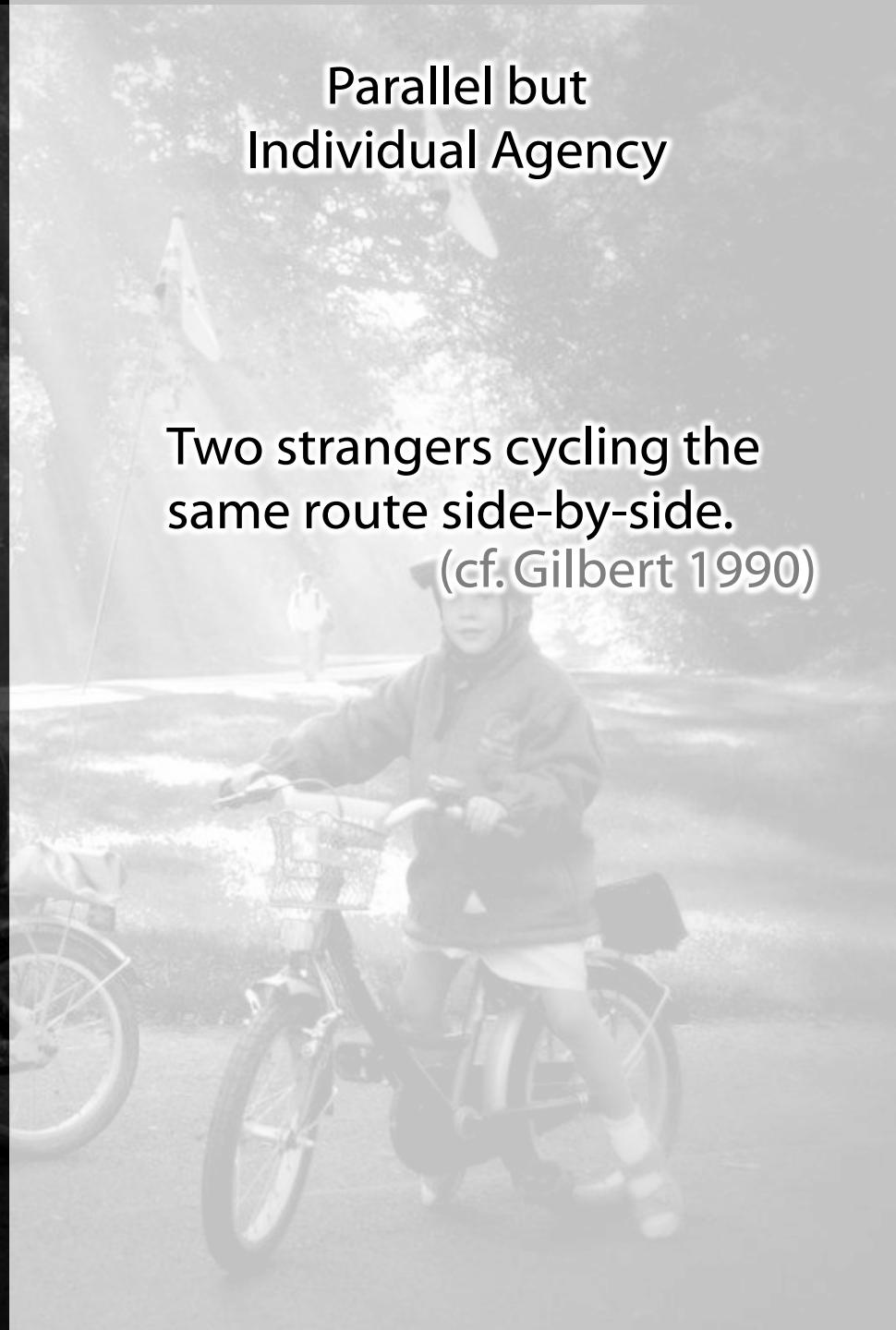
Two sisters cycling to school together.



Parallel but Individual Agency

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

(cf. Gilbert 1990)



Shared Agency

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Members of a flash mob simultaneously open their newspapers noisily

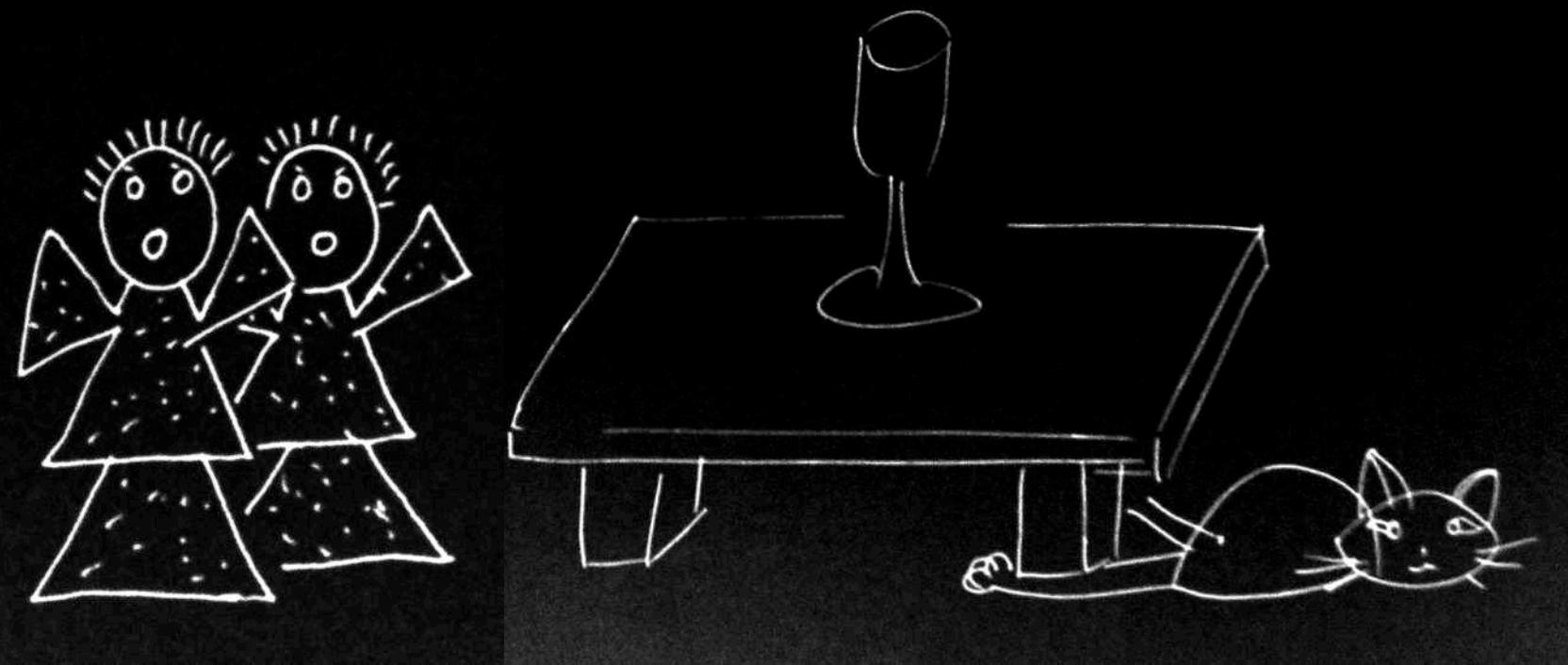
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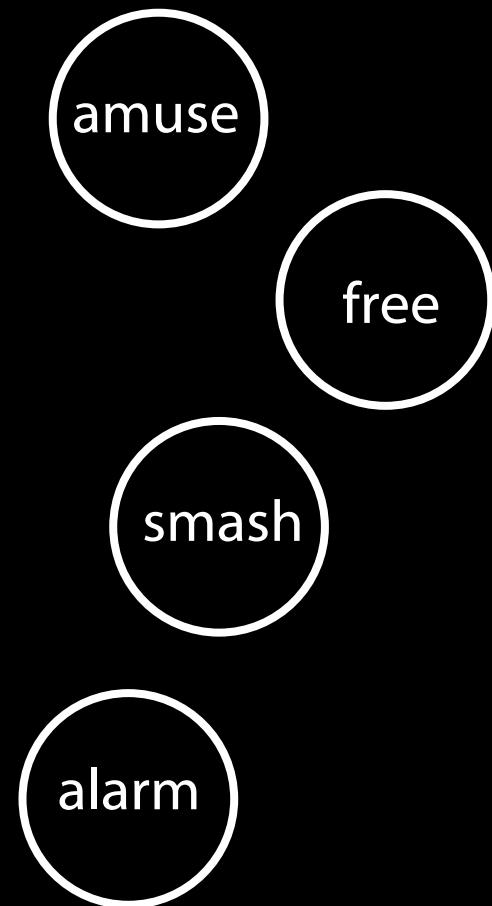
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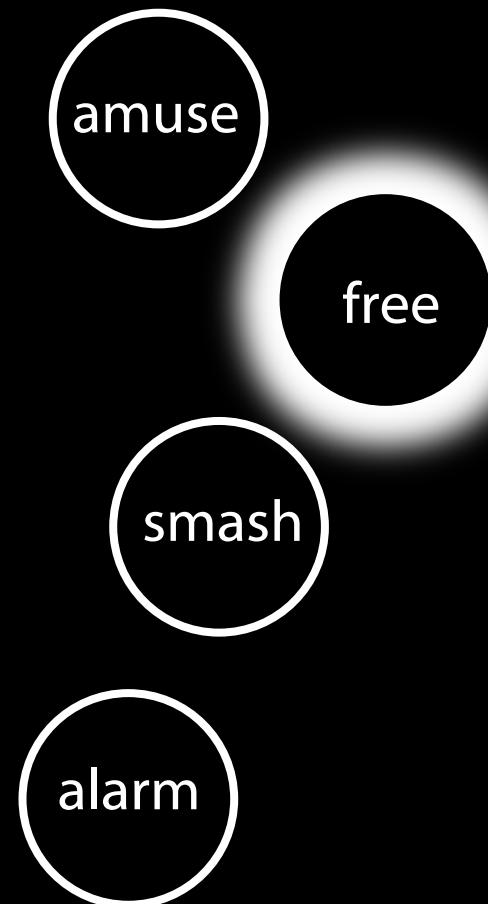
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joint
action

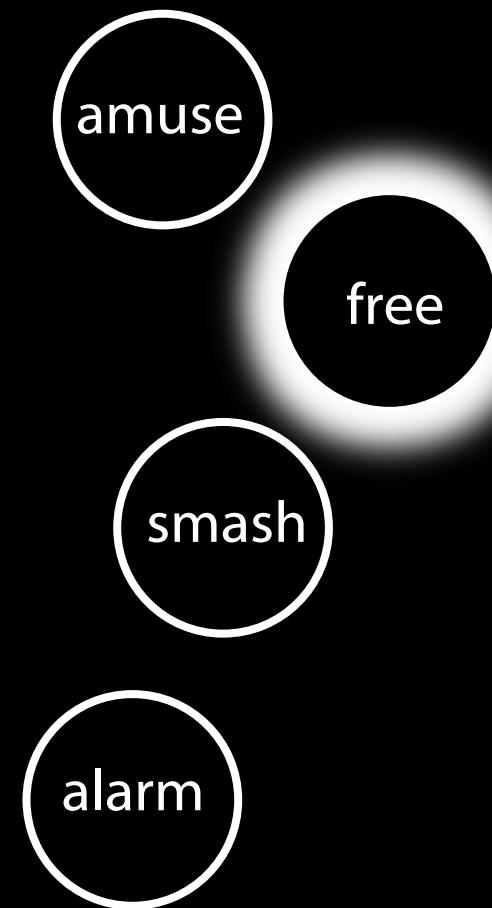
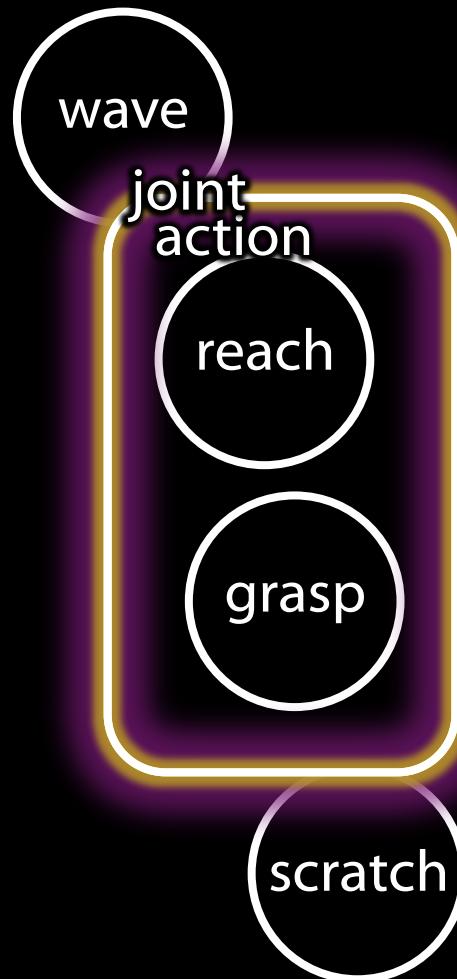


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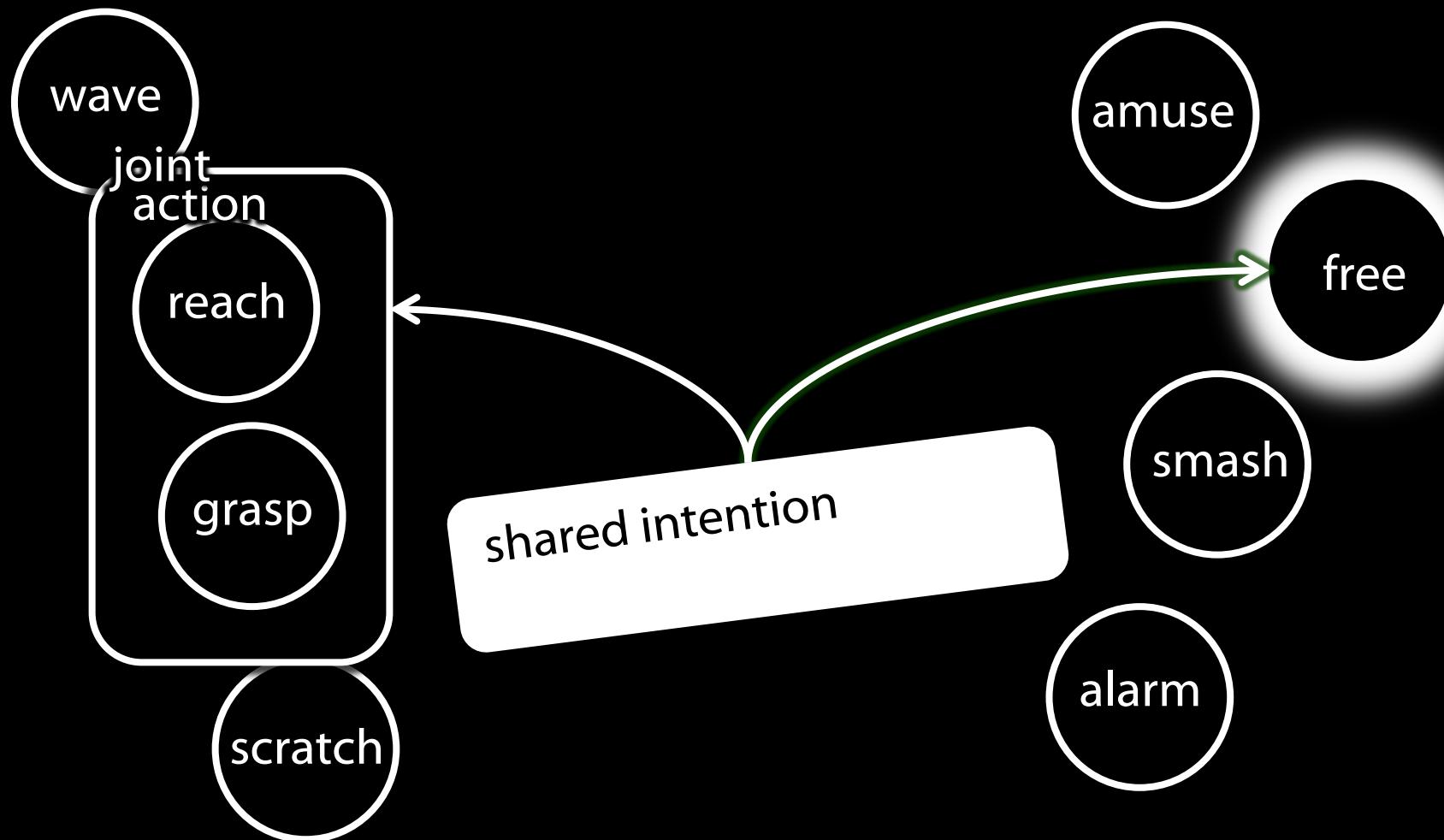
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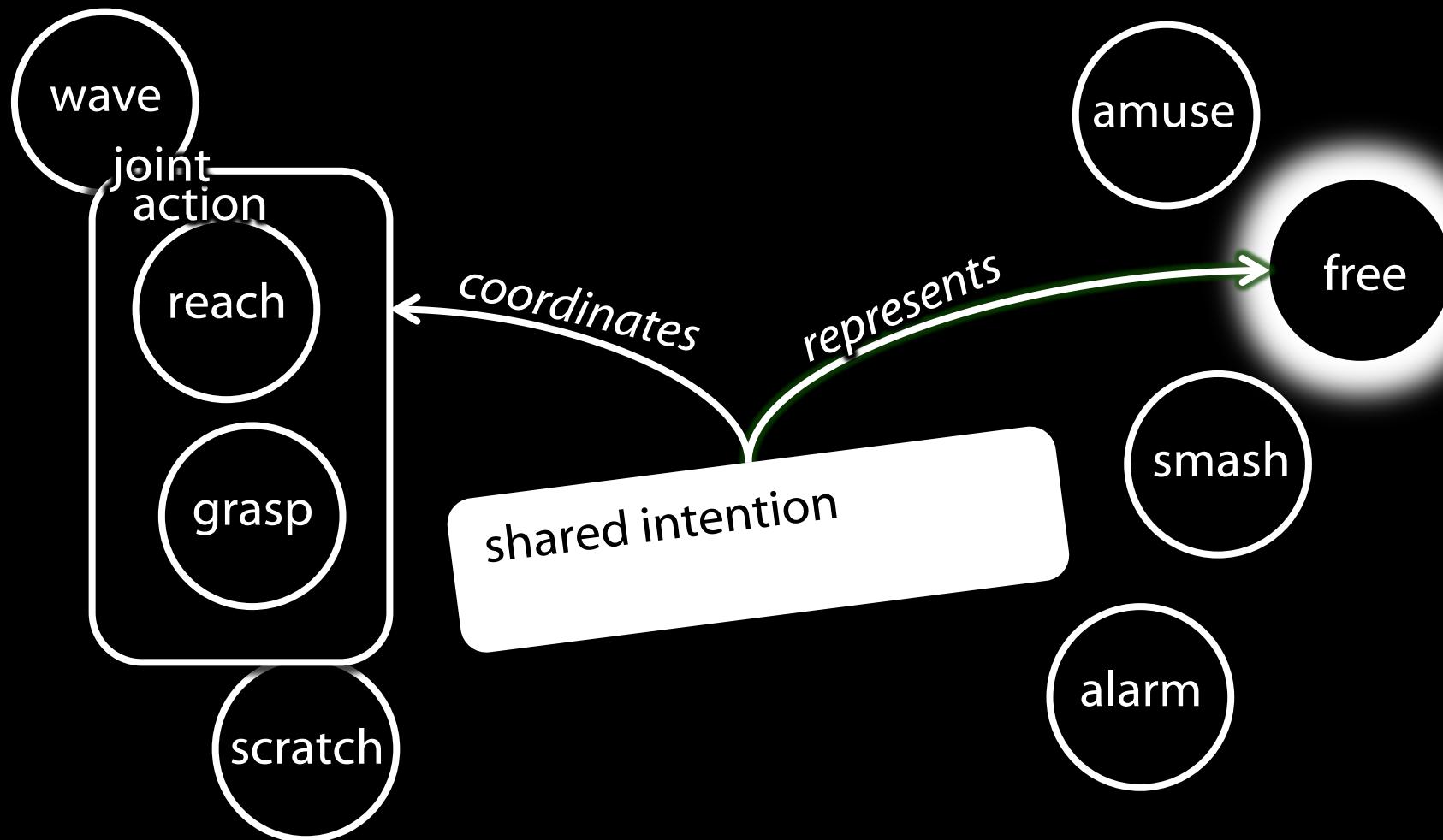
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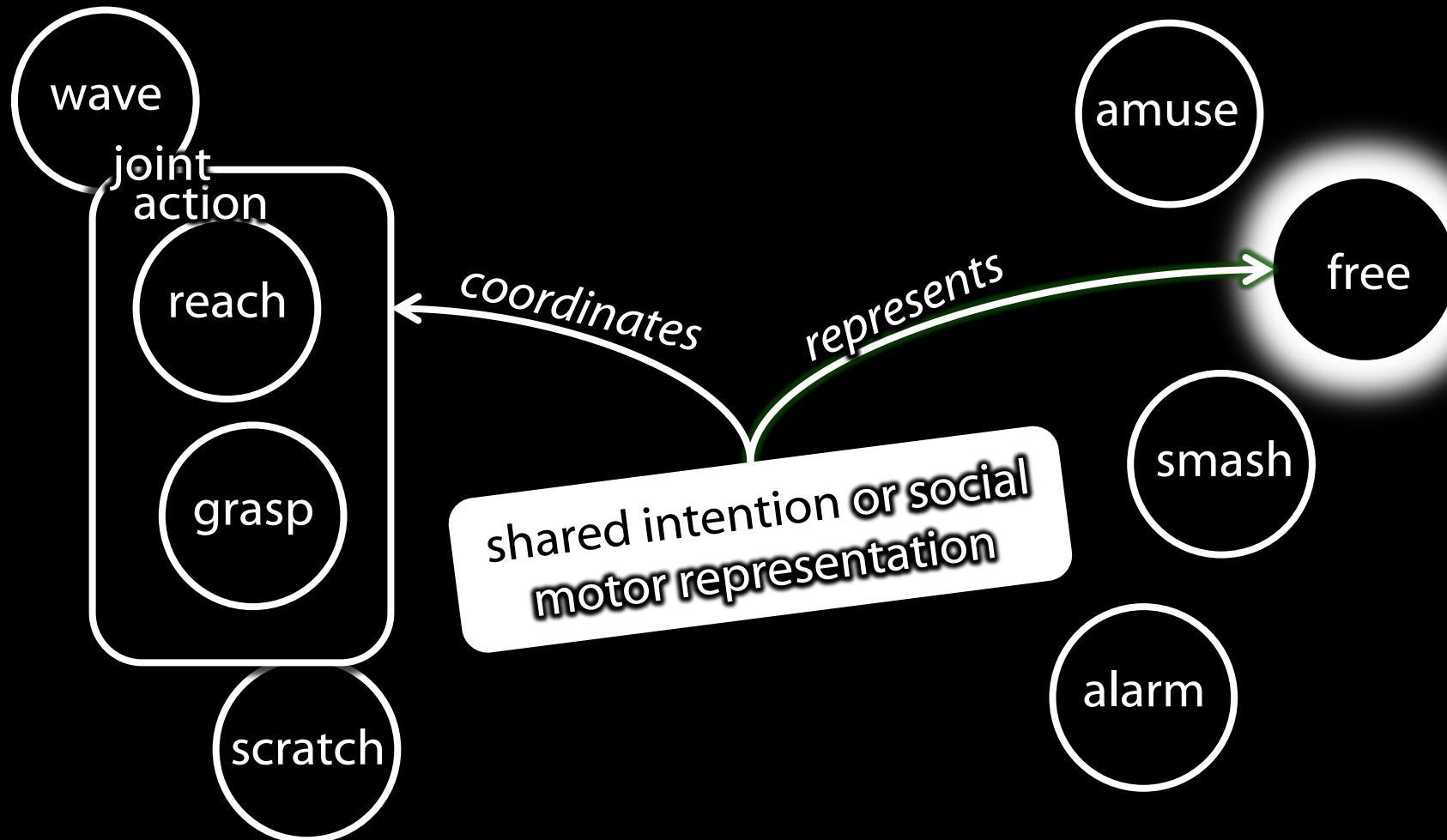
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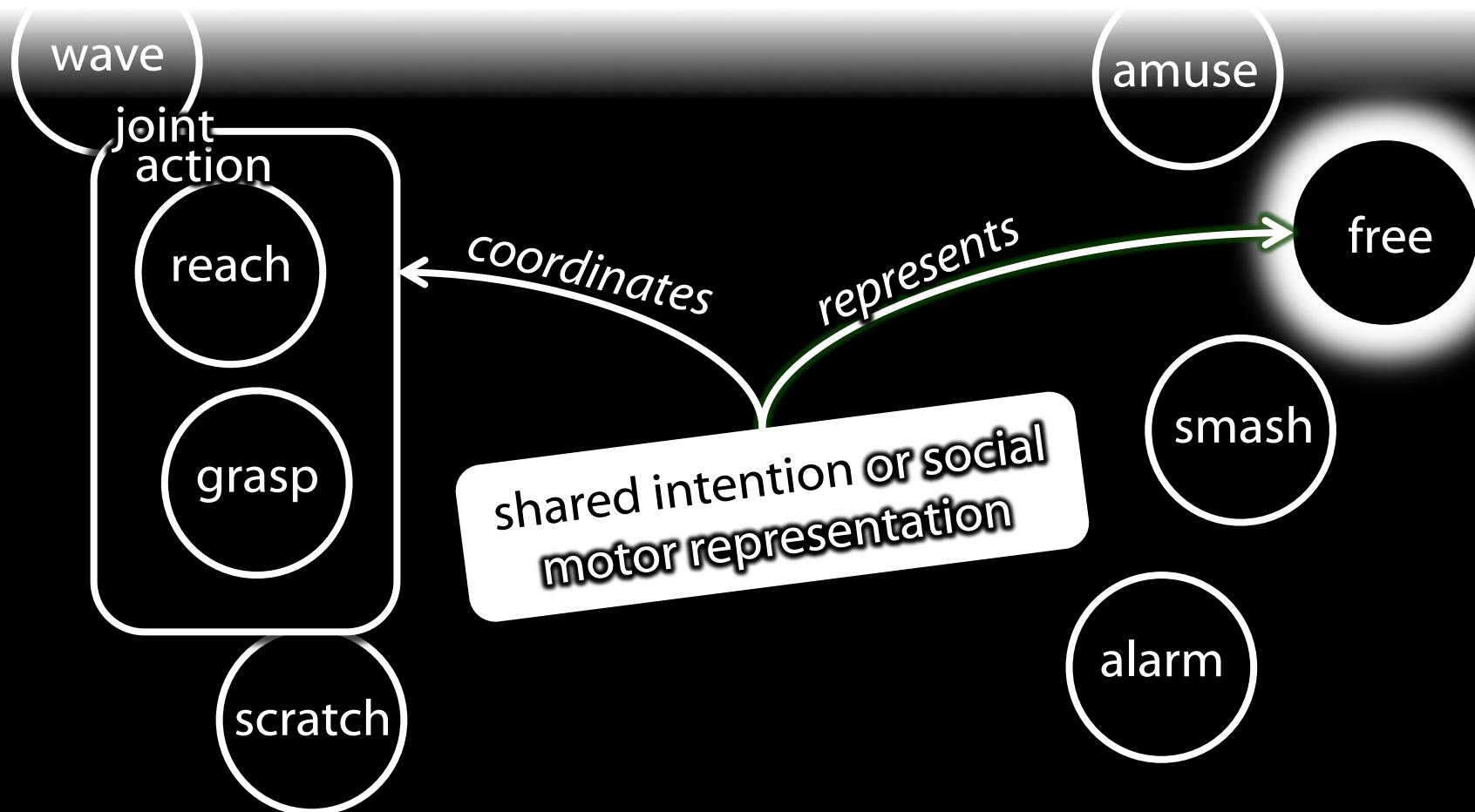


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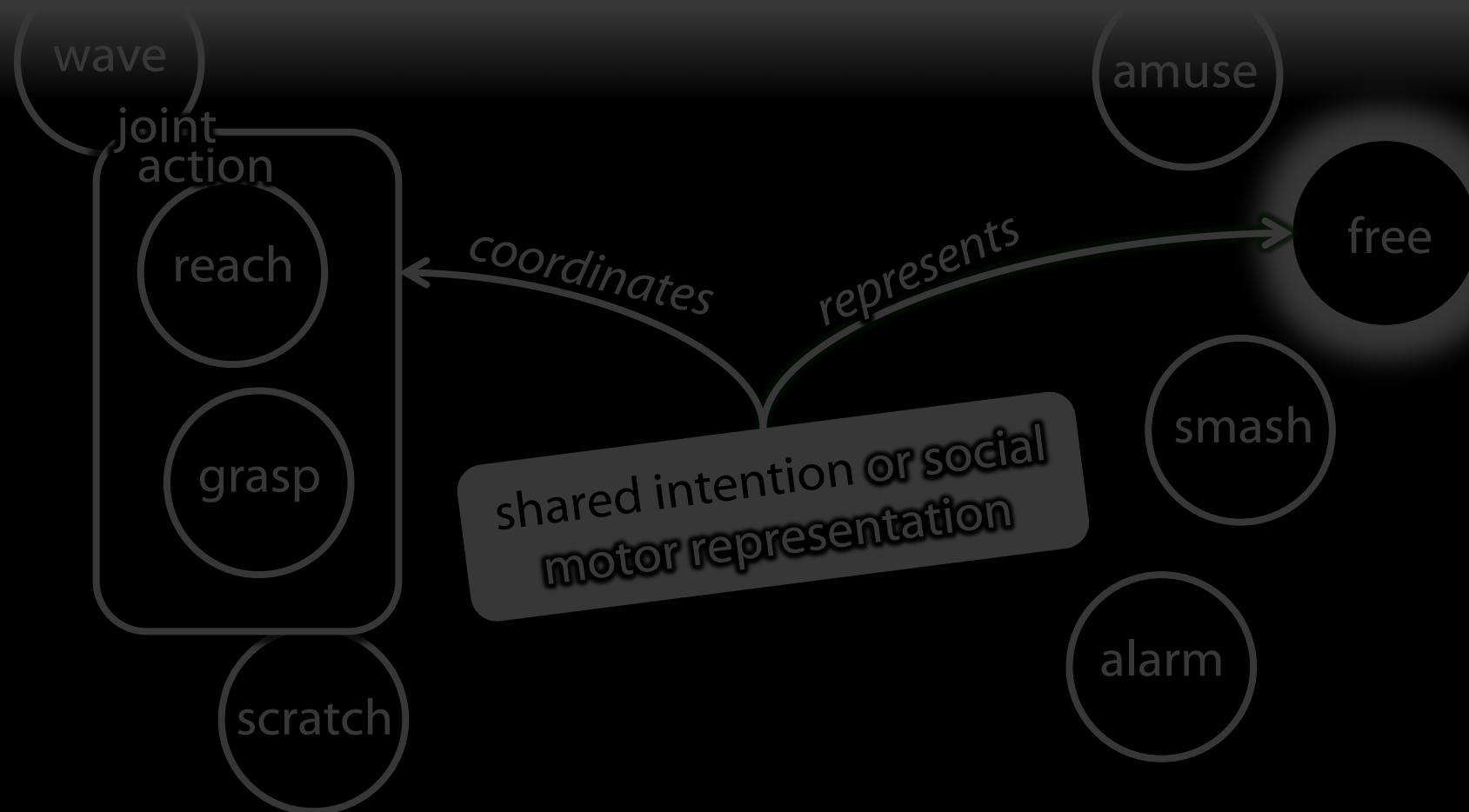
'the key property of joint action lies in its internal component [...] in the participants' having a "collective" or "shared" intention.'

(Alonso 2009, pp. 444-5)



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

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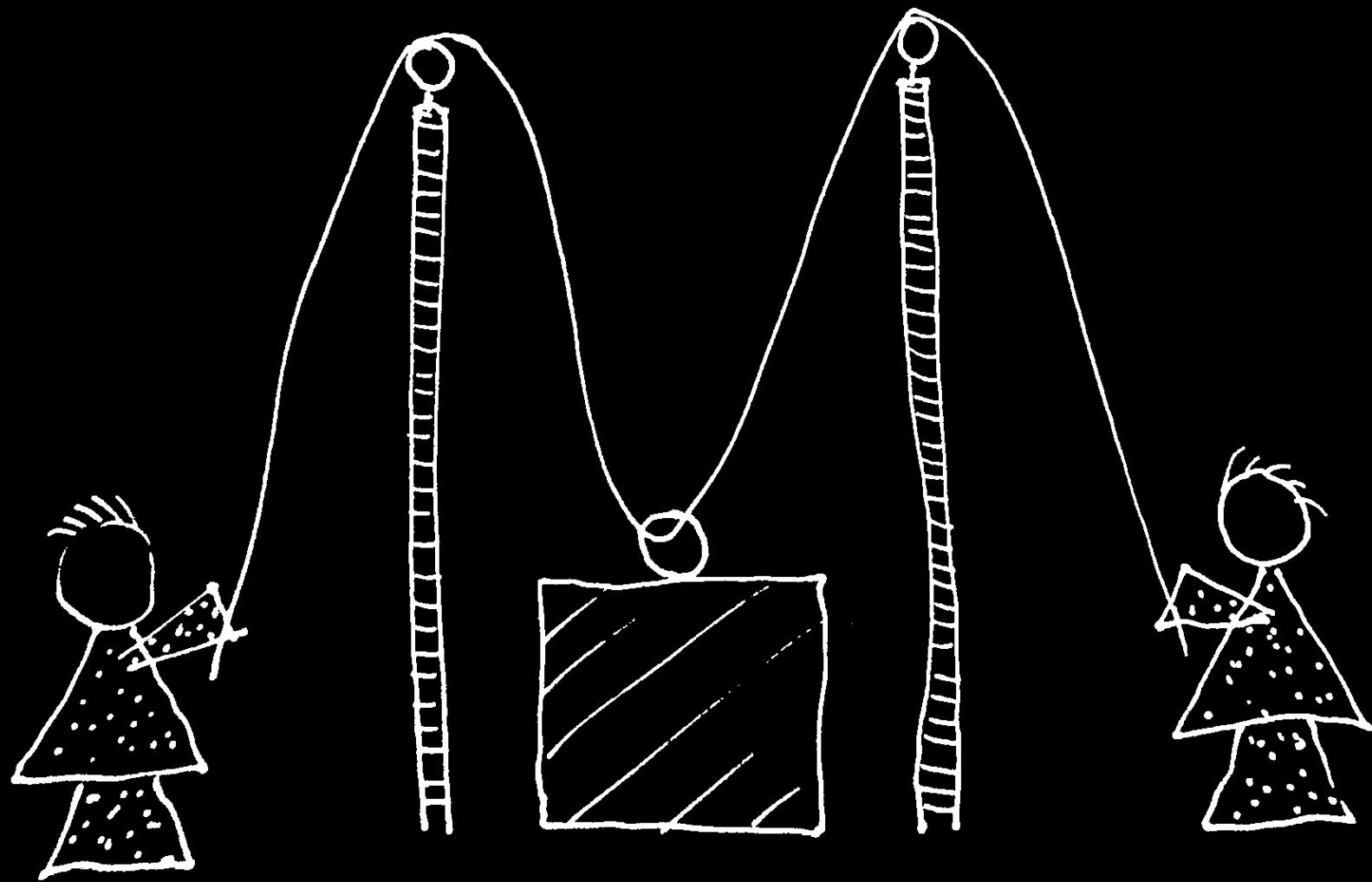
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- (a) it is a distributive goal;
- (b) the actions are coordinated; and
- (c) coordination of this type would normally facilitate occurrences of outcomes of this type.

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agent-neutral

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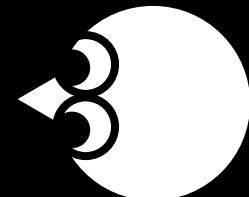
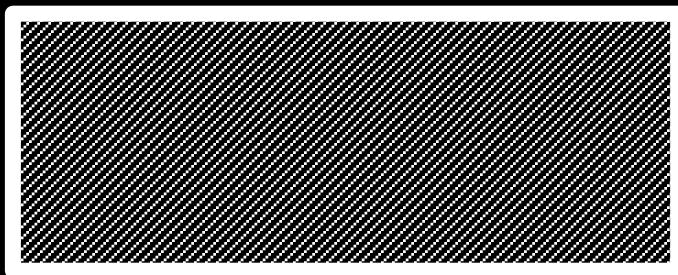
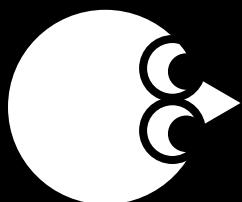
planning
for outcomes whose realisation would normally involve
one's own and another's (or others') actions.

reciprocal, parallel
agent-neutral

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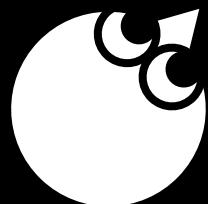
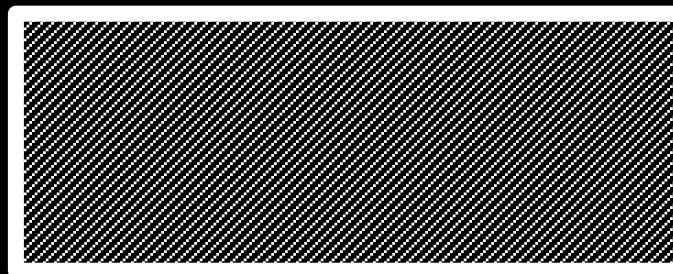
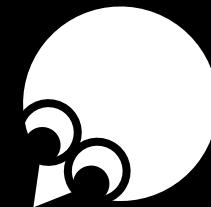
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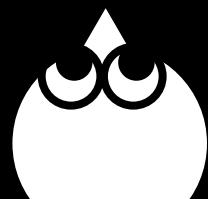
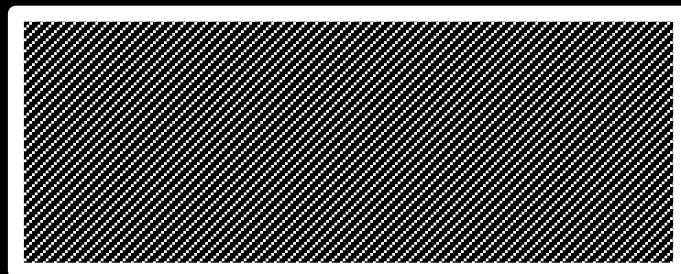
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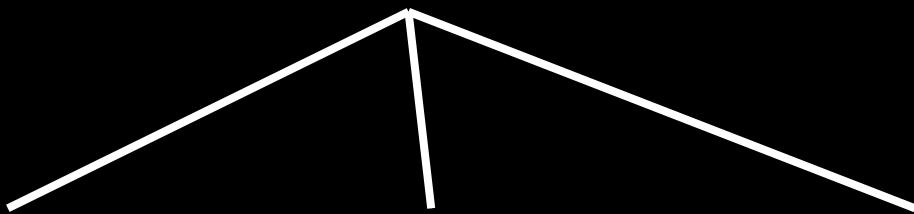
agent-neutral

motor

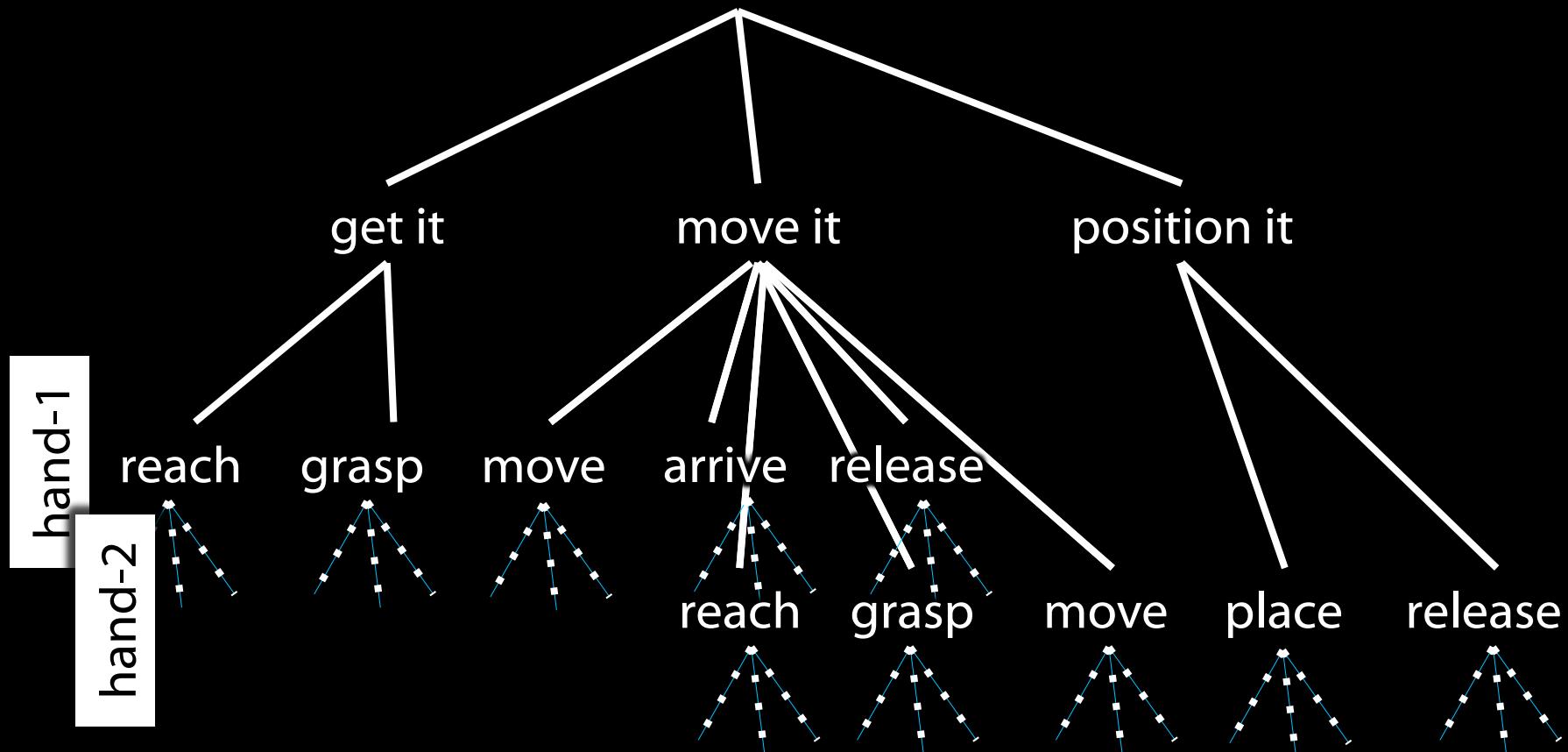
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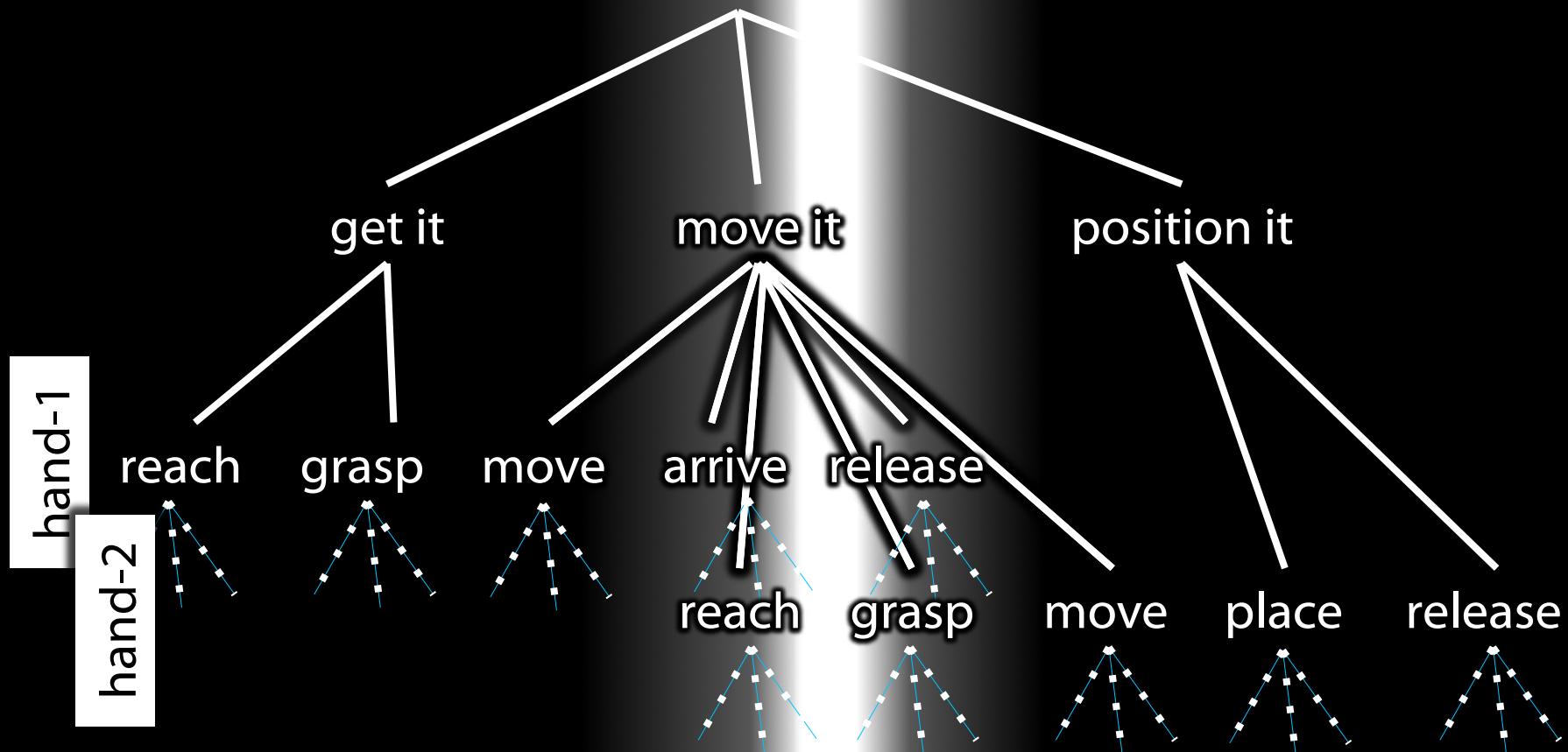
Move it from there to here



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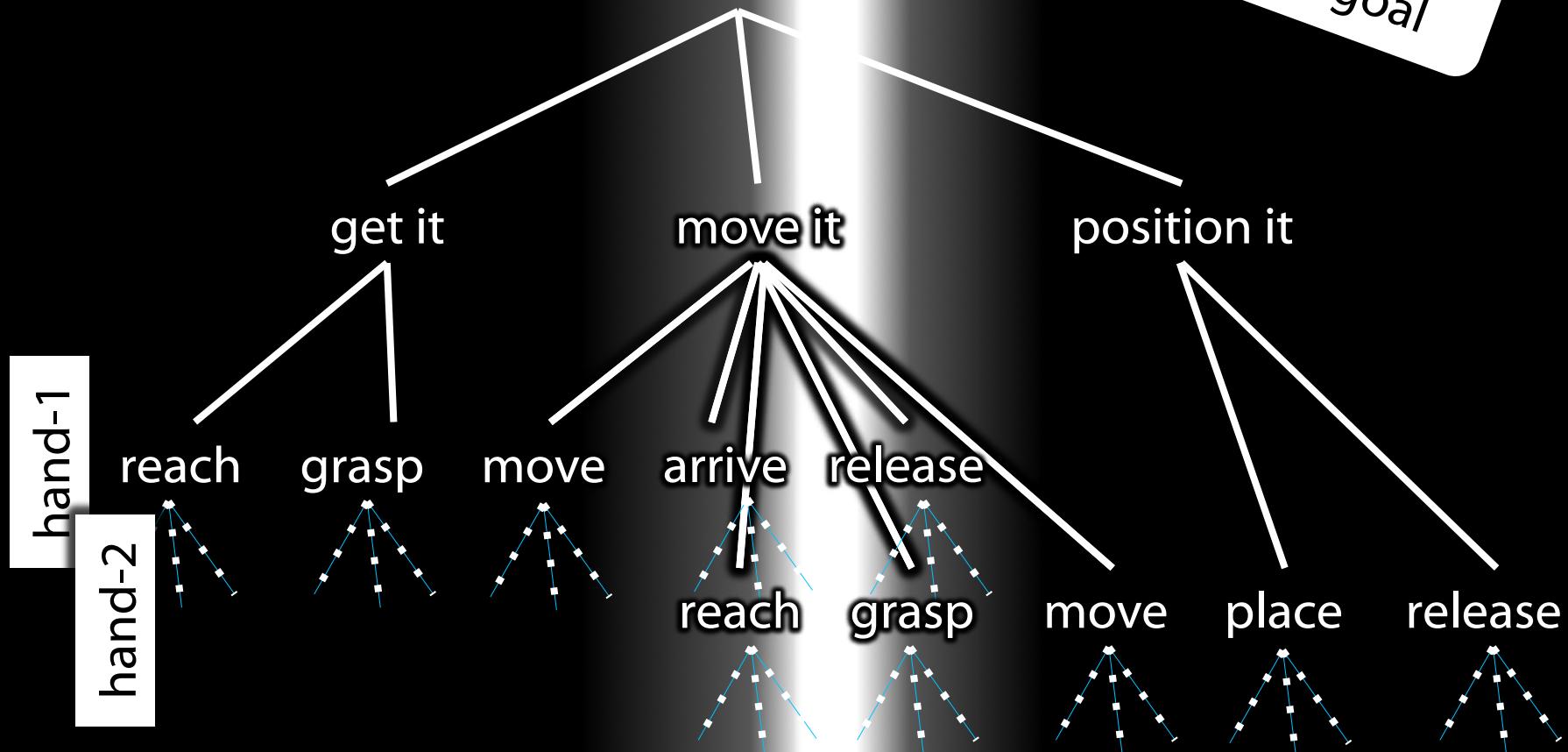


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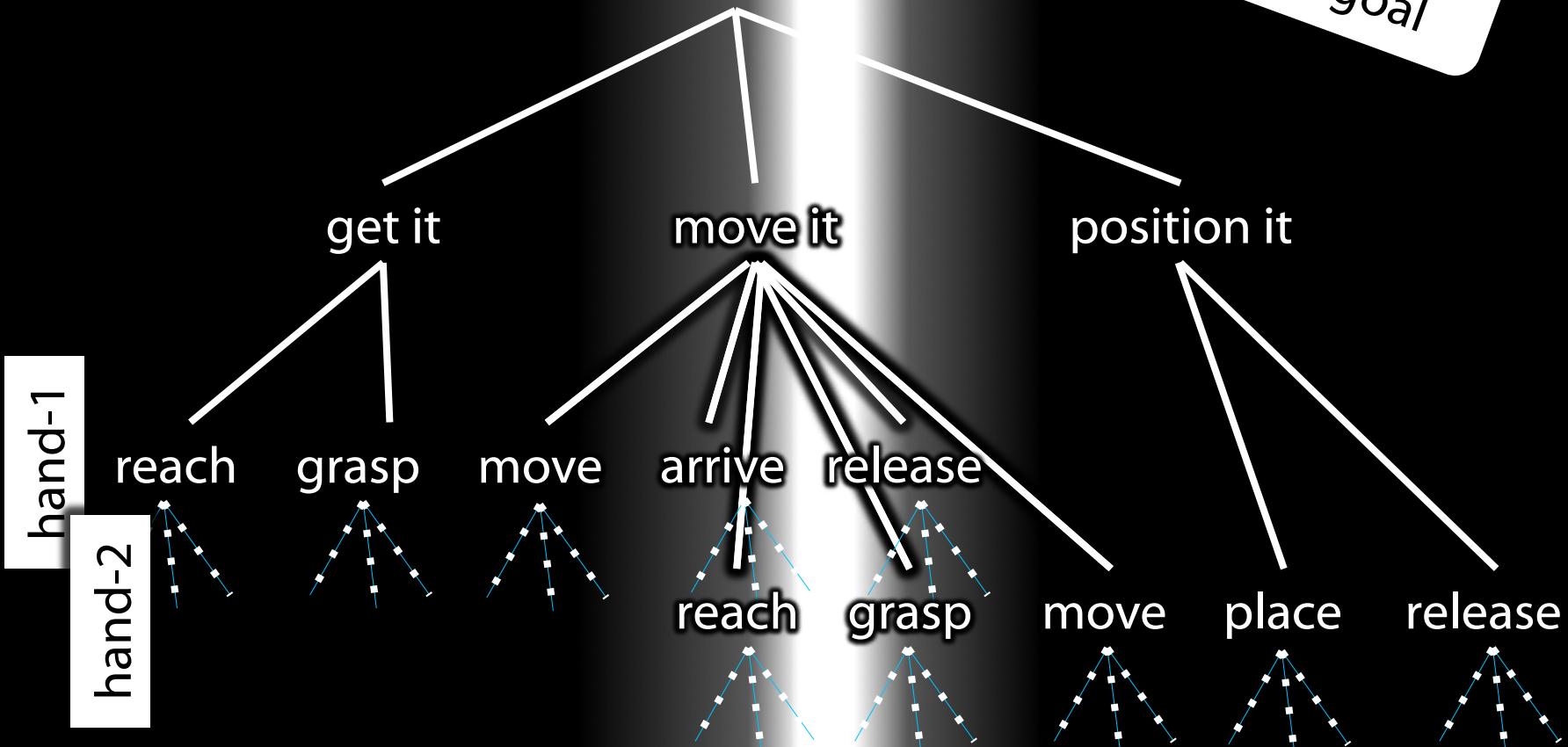
*joint action:
same goal*

Move it from there to here



Move it from there to here

*joint action:
same goal*



*similar timing
problem*

Move it from there to here

joint action:
same goal

get it

move it

position it

hand-1

reach

grasp

move

arrive

release

hand-2

reach

grasp

move

place

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similar timing
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same
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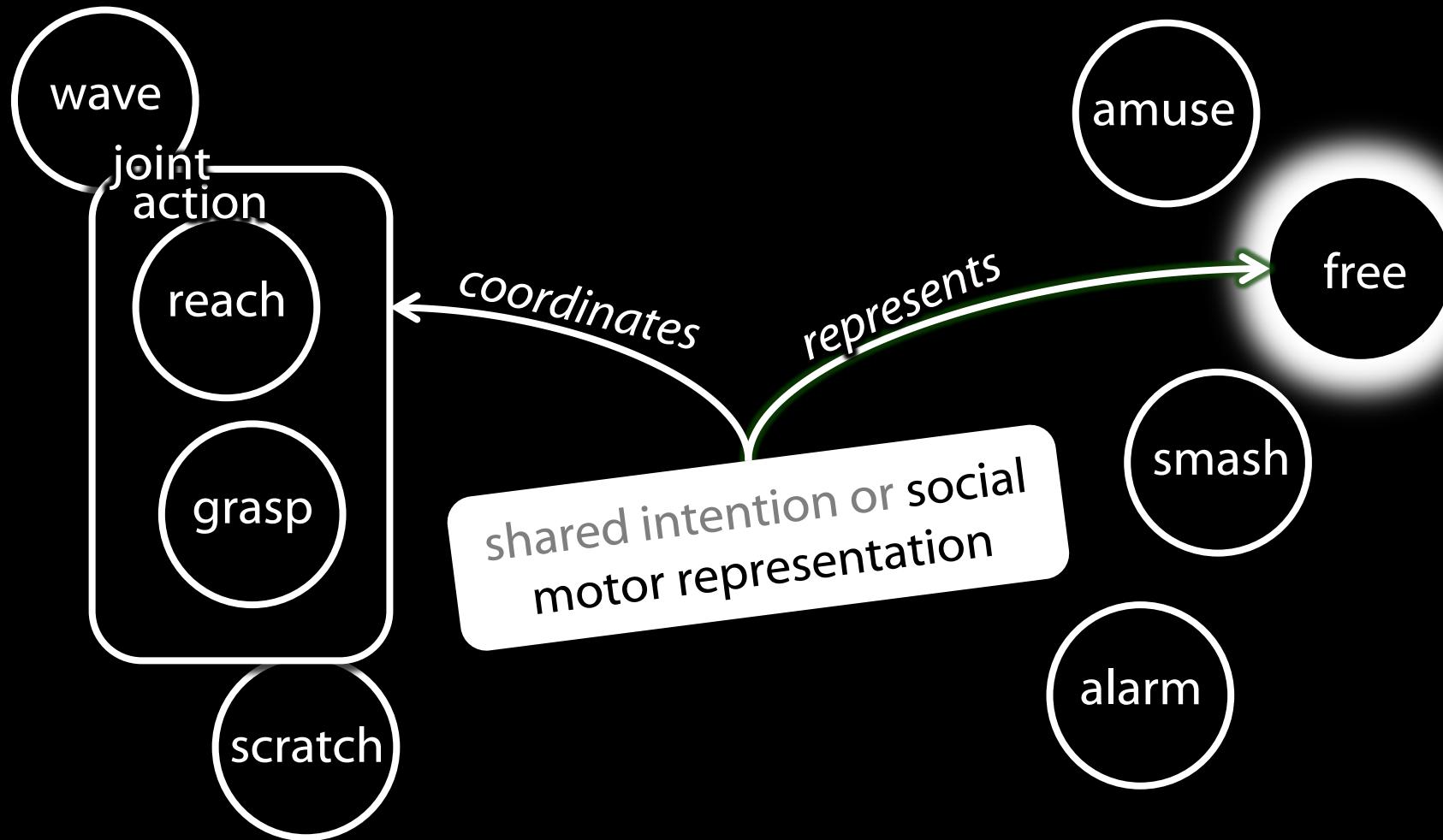
shared motor action

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- 1. we each have a motor representation of G;
- 2. we are each disposed to inhibit some (not all) of the resulting planning or actions;
- 3. we each expect that if G occurs, we will all be agents of it; and
- 4. (1) and (2) because (3)

What is the relation between a purposive ^{joint} action and the goal or goals to which it is directed?





< different content >

< different format >



Head southeast on Rue Cujas toward Rue Victor Cousin. Turn right onto Rue Saint-Jacques....

Take RER B and get out at the Luxembourg station, from there it's less than 5 minutes walk.



< different content >

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The Interface Problem

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Some joint actions involve
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- i. represent outcomes;
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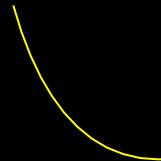
Follow that route

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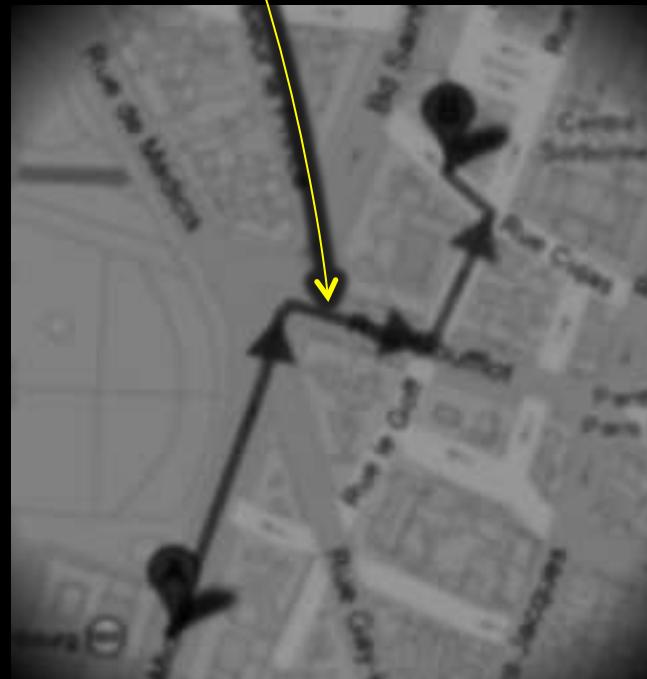


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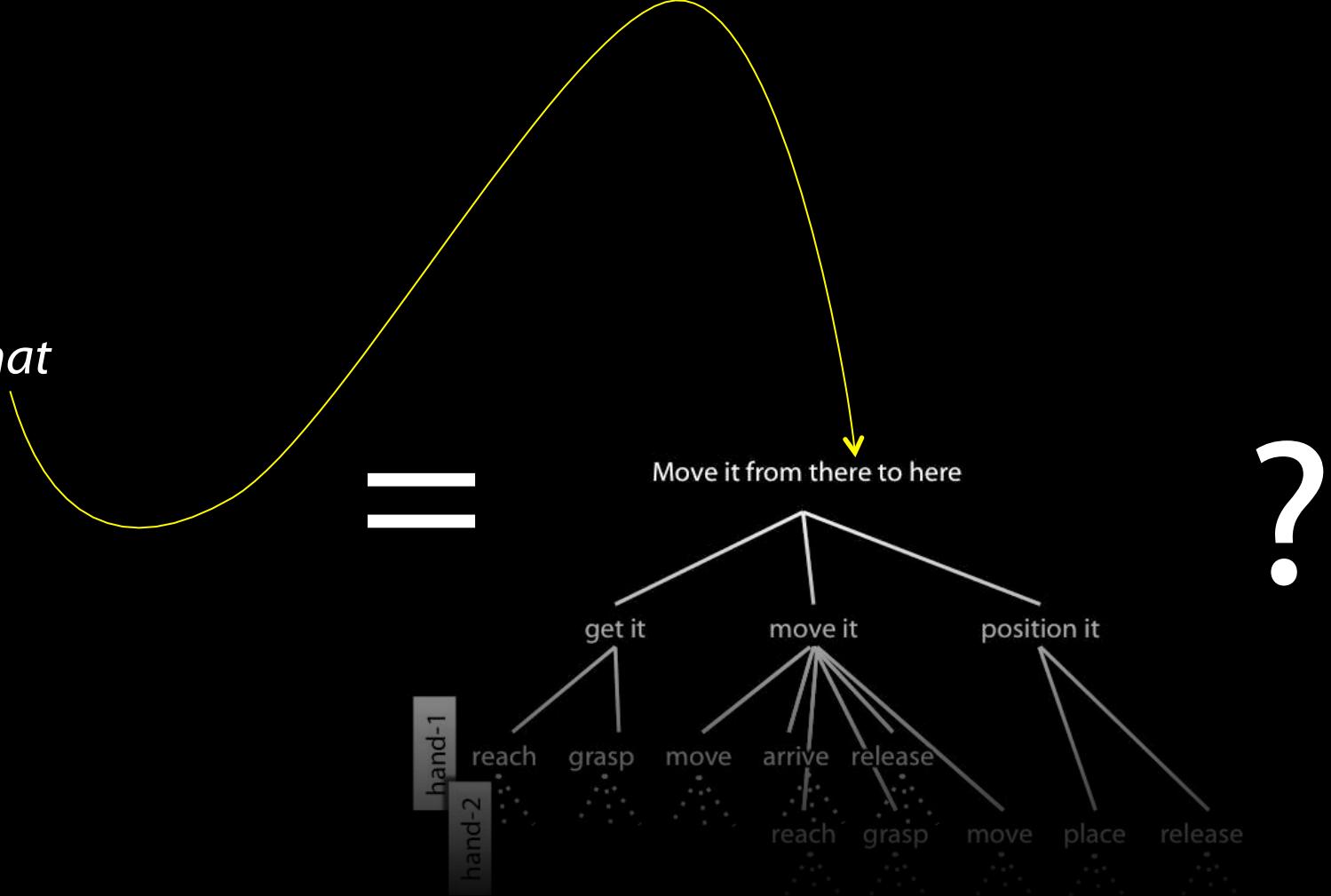


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Do that



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Planning Others' Actions (slides from Natalie Sebanz)

Kourtis et al., subm.



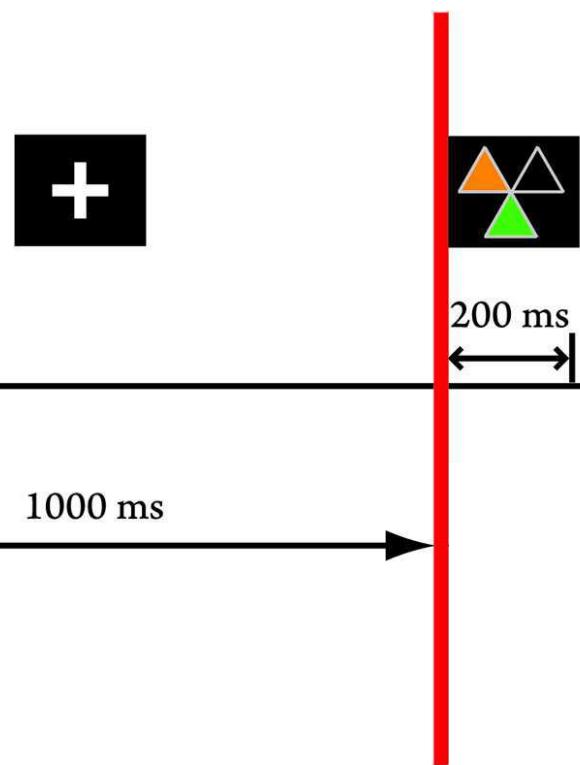
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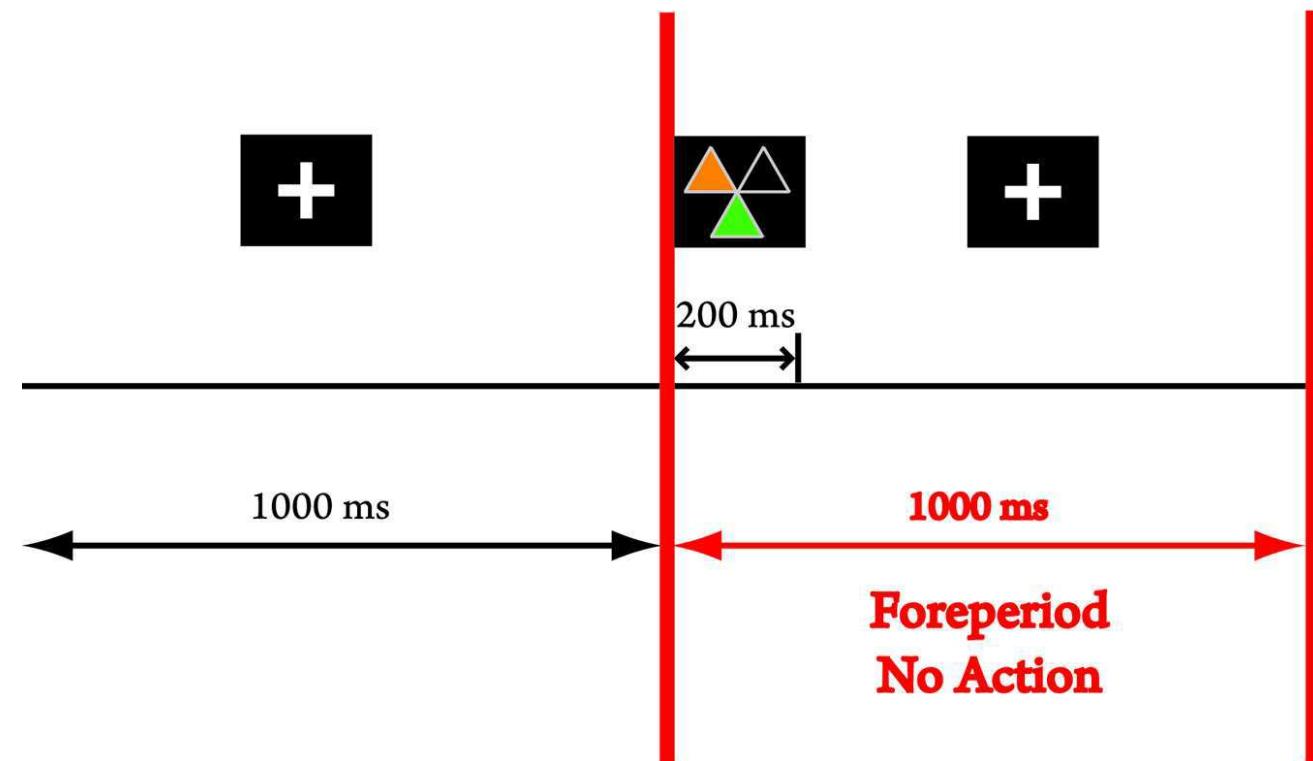
Cue Stimulus



Kourtis et al., subm.



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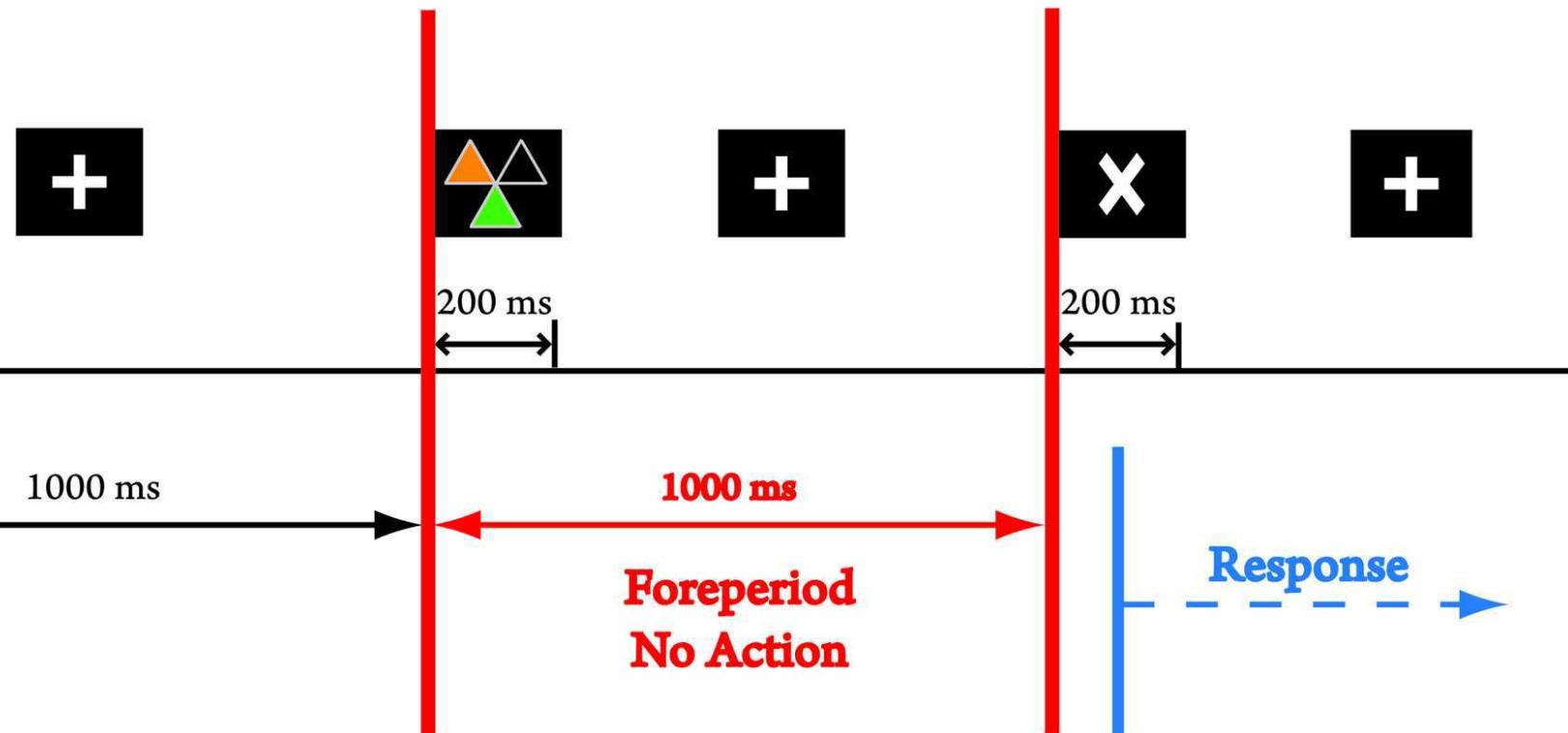


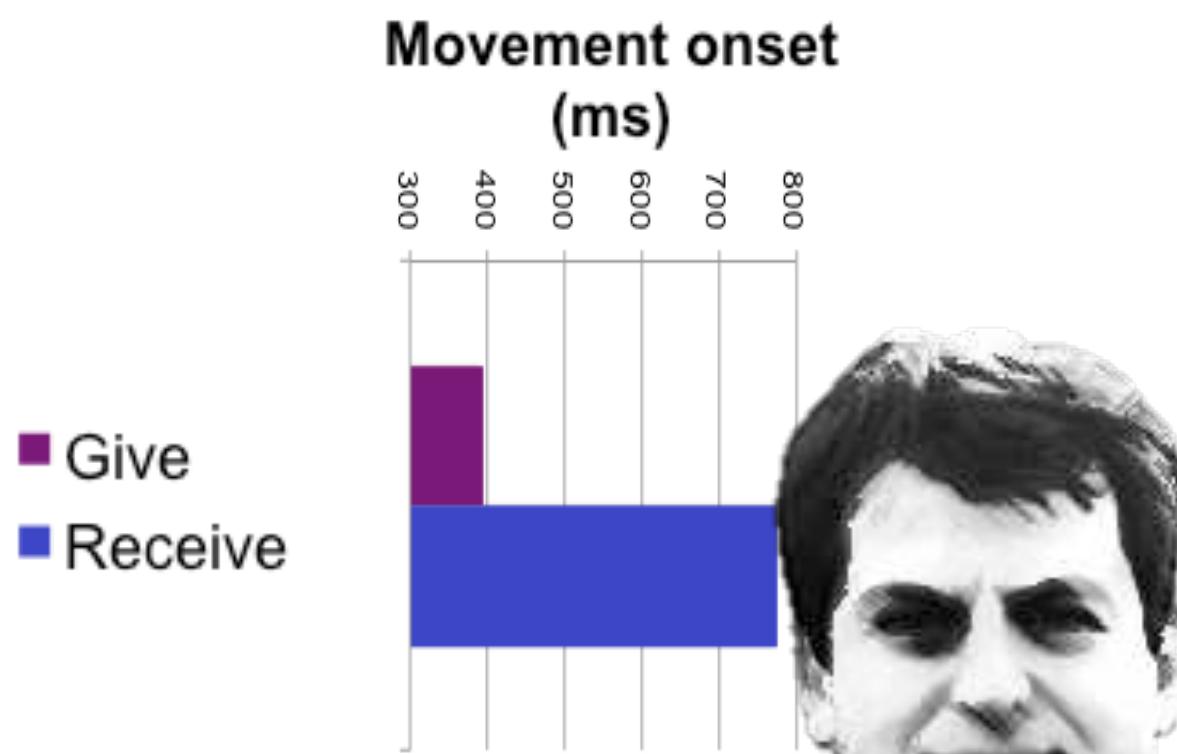
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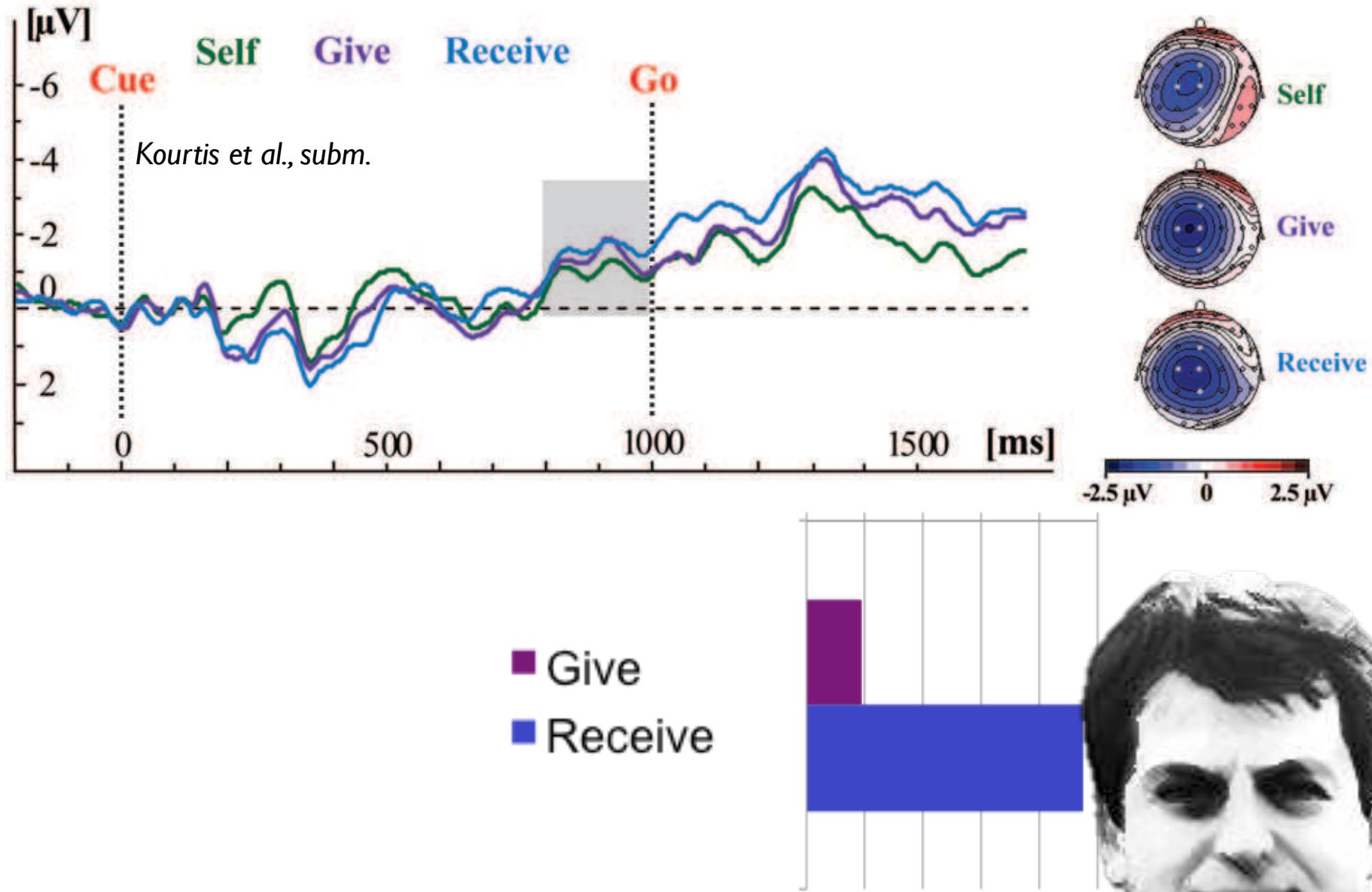


Cue Stimulus

Imperative Stimulus



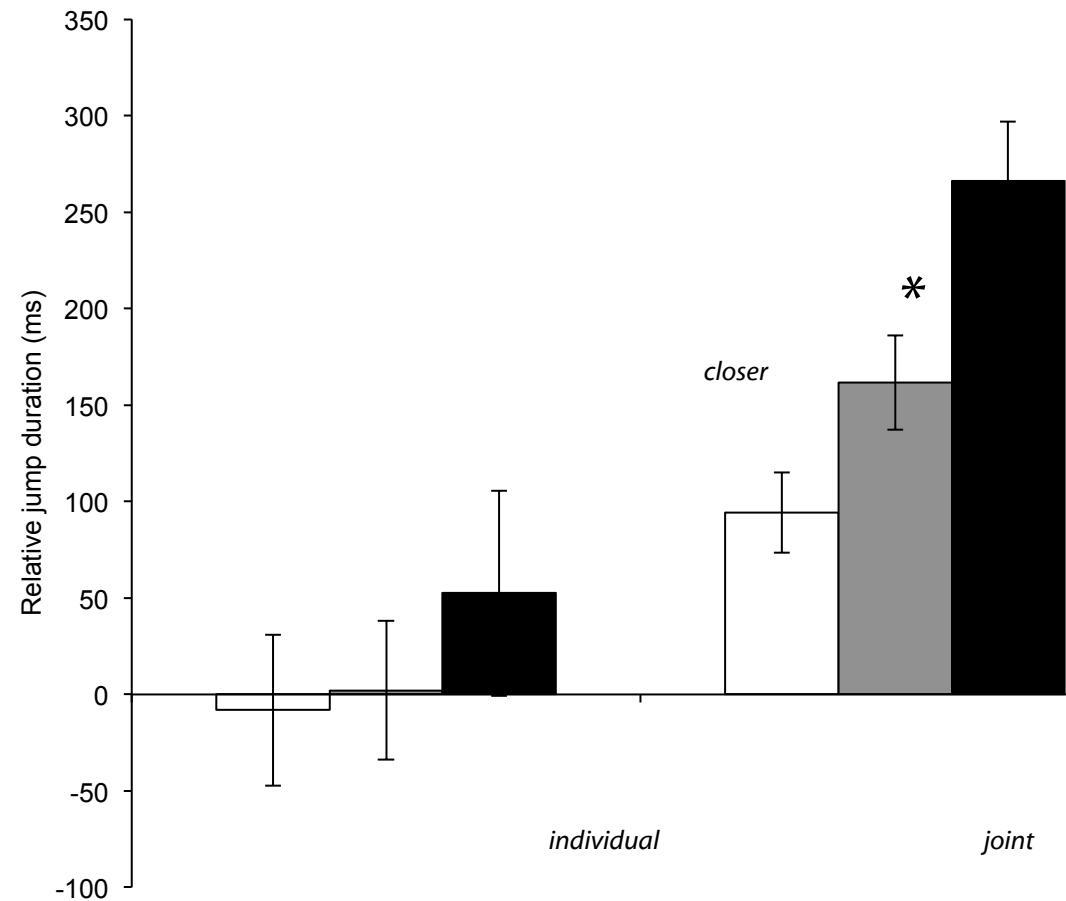
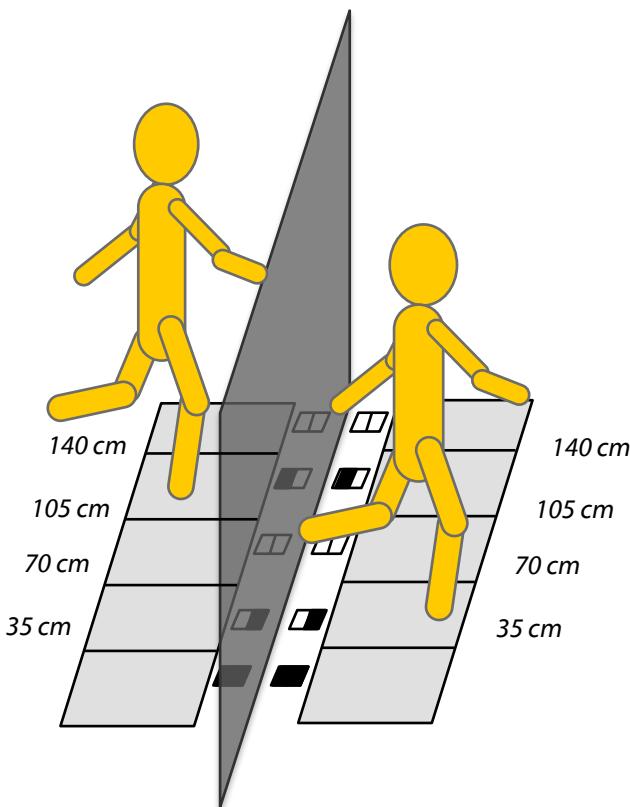






Planning others' actions can inform planning for one's own (slides from Cordula Vesper)

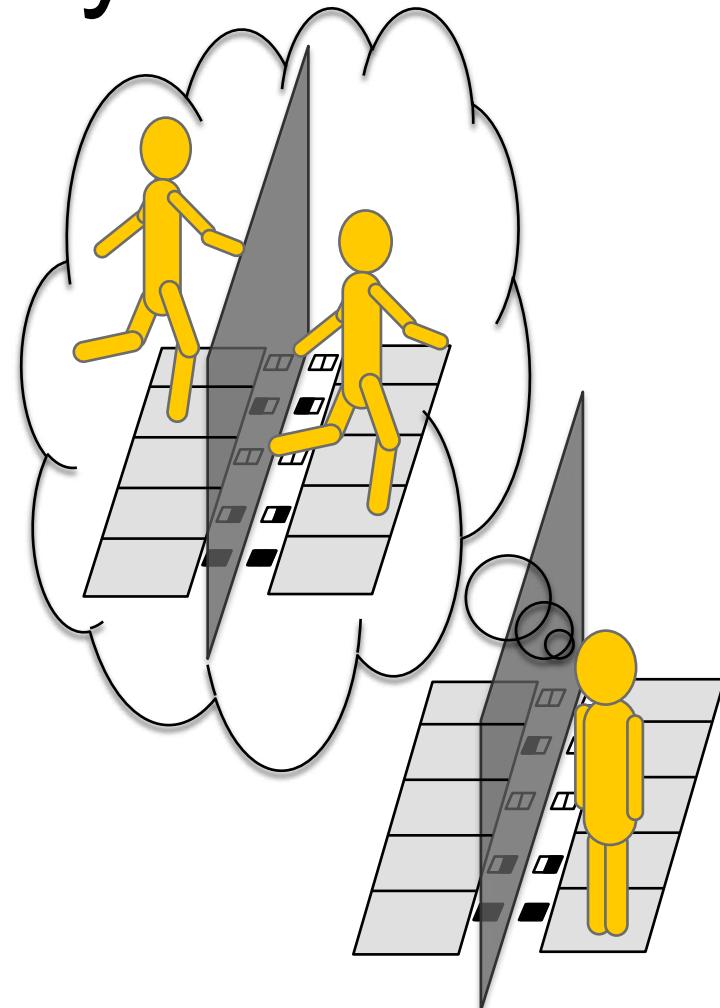
Joint jumping task (performance): „Land at the same time!“



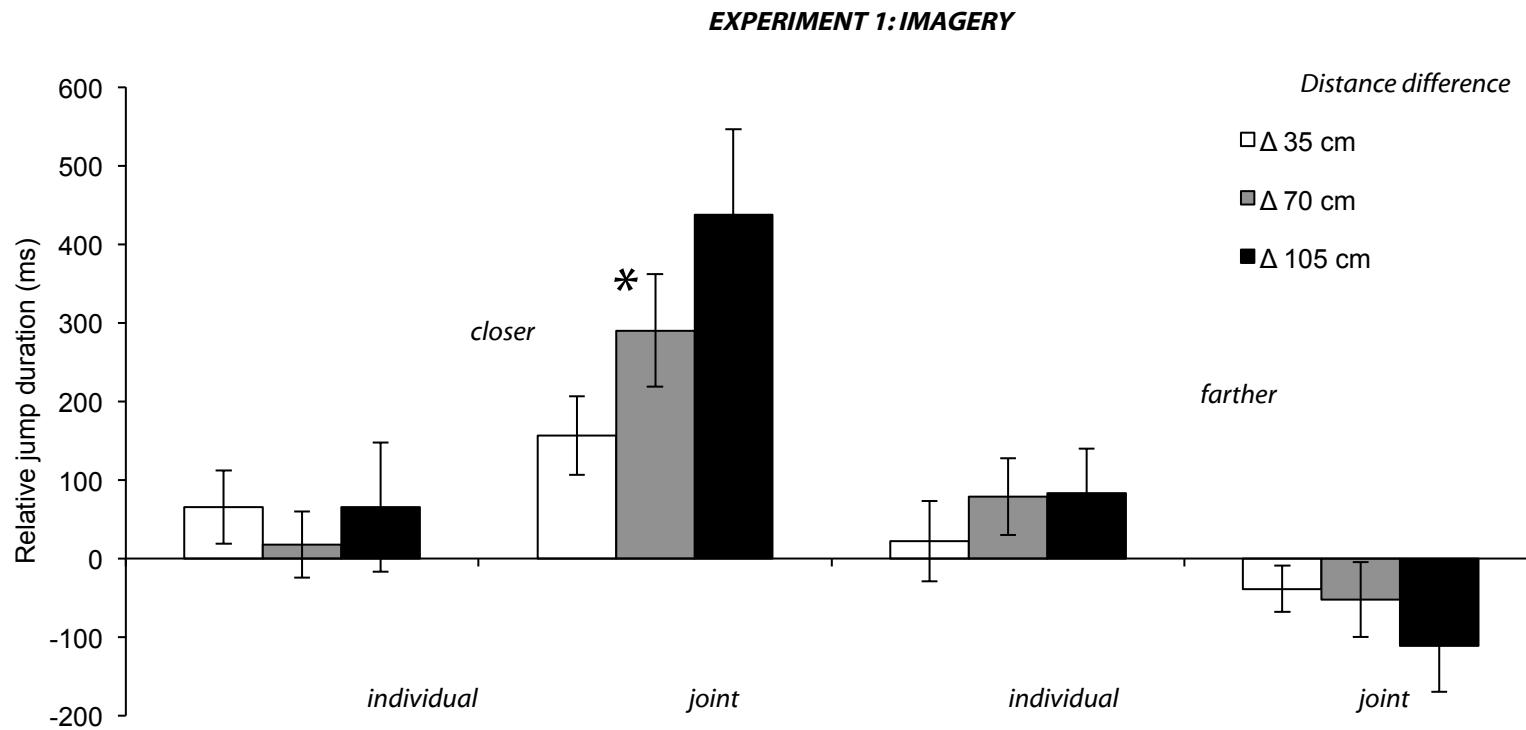
Imagery

Joint jumping imagery

- Task: “Imagine to jump while landing at the same time as another person on the other side of the occluder!”
- Measurement: Self-reported duration of imagined jump



Imagery



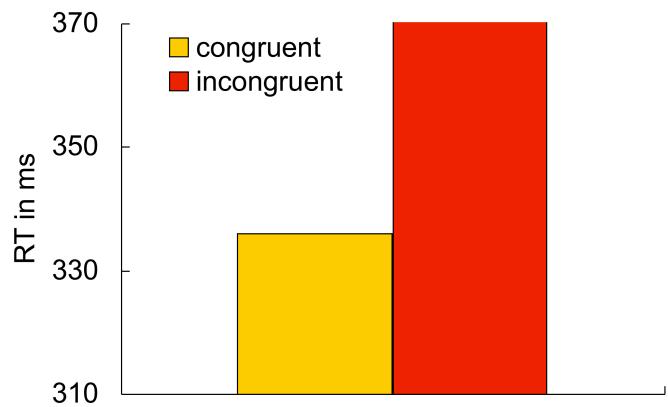
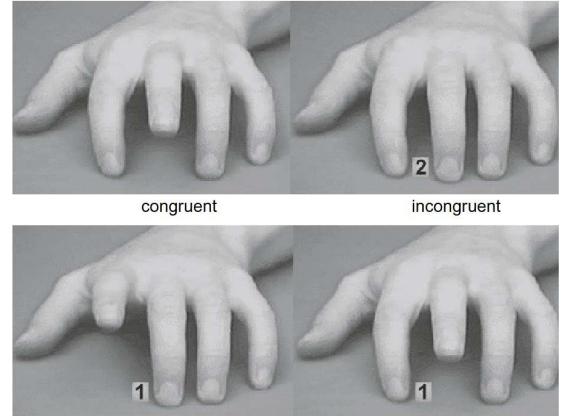


**In some joint actions, the agents have a single representation of the whole outcome
(slides from Natalie Sebanz)**

Group-level action planning?

Experimental paradigm is based on the phenomenon of ‘perception-action matching’: Observing an action creates a tendency to perform this action. That is, individual action plans are activated based on the observation of individual actions.

As a consequence, performing an action that is similar to the observed action is easy while performing an action that is opposite to the observed action is more difficult (e.g., Brass et al., 2001).

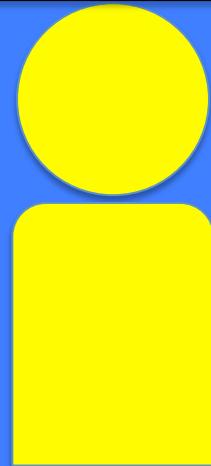
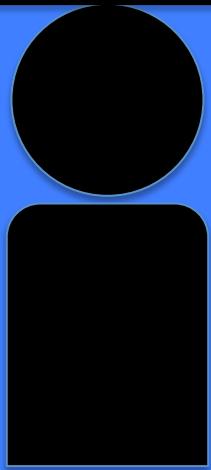
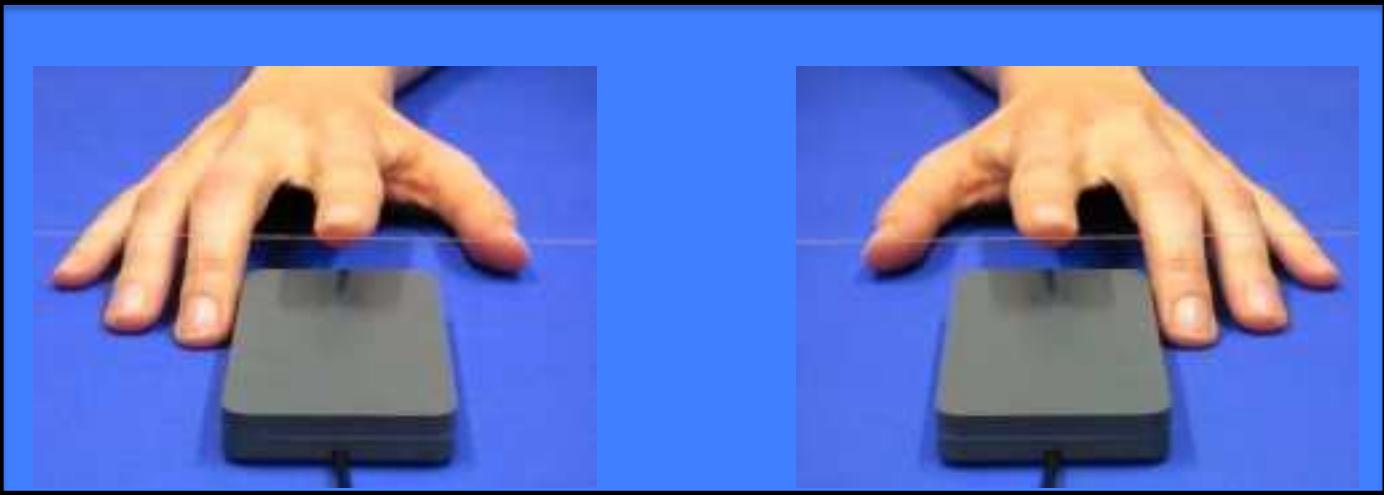


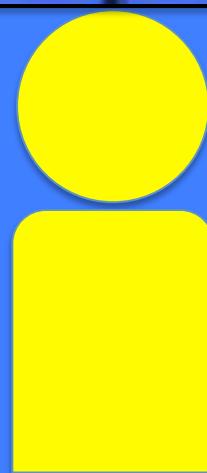
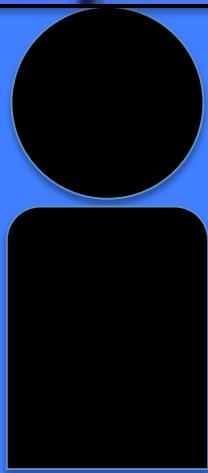
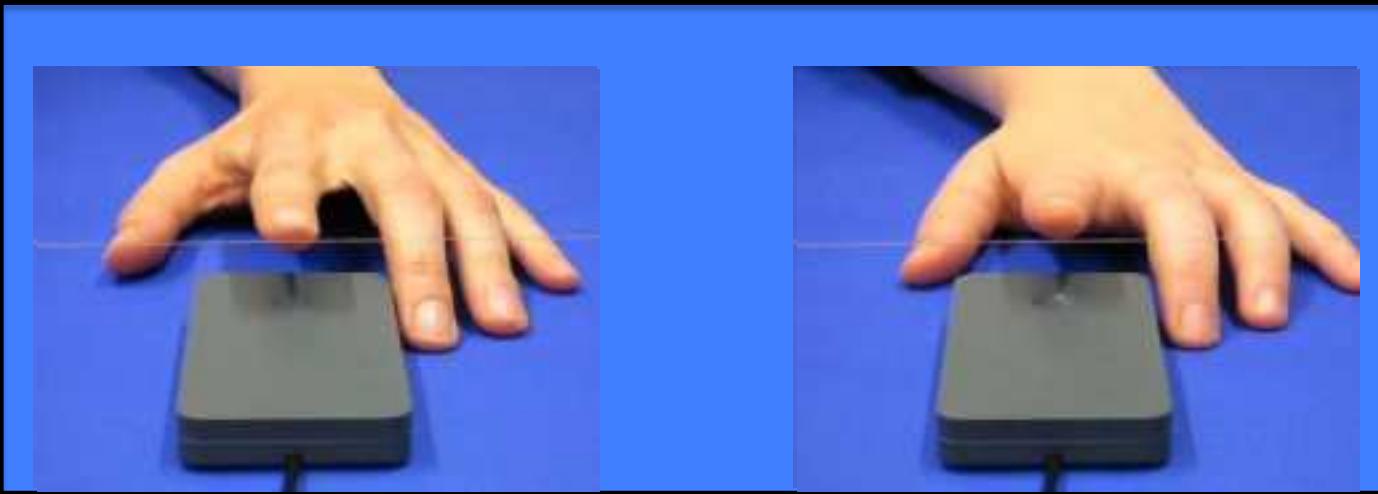
Group-level action planning?



If co-actors form group-level action plans, then observing joint action should create a tendency to perform joint actions (perception-action matching at an inter-group level).

It should be more difficult to perform joint actions when observing individual actions.





Participant's task is to press a key when the right hand is moving.

Congruent condition: Confederate moves when left hand is moving and when both hands are moving.



C



P



C





P





C



P

Participant's task is to press a key when the right hand is moving.

Incongruent condition: Confederate moves when left hand is moving and when right hand is moving, but not when both hands are moving.



C



P



C





C



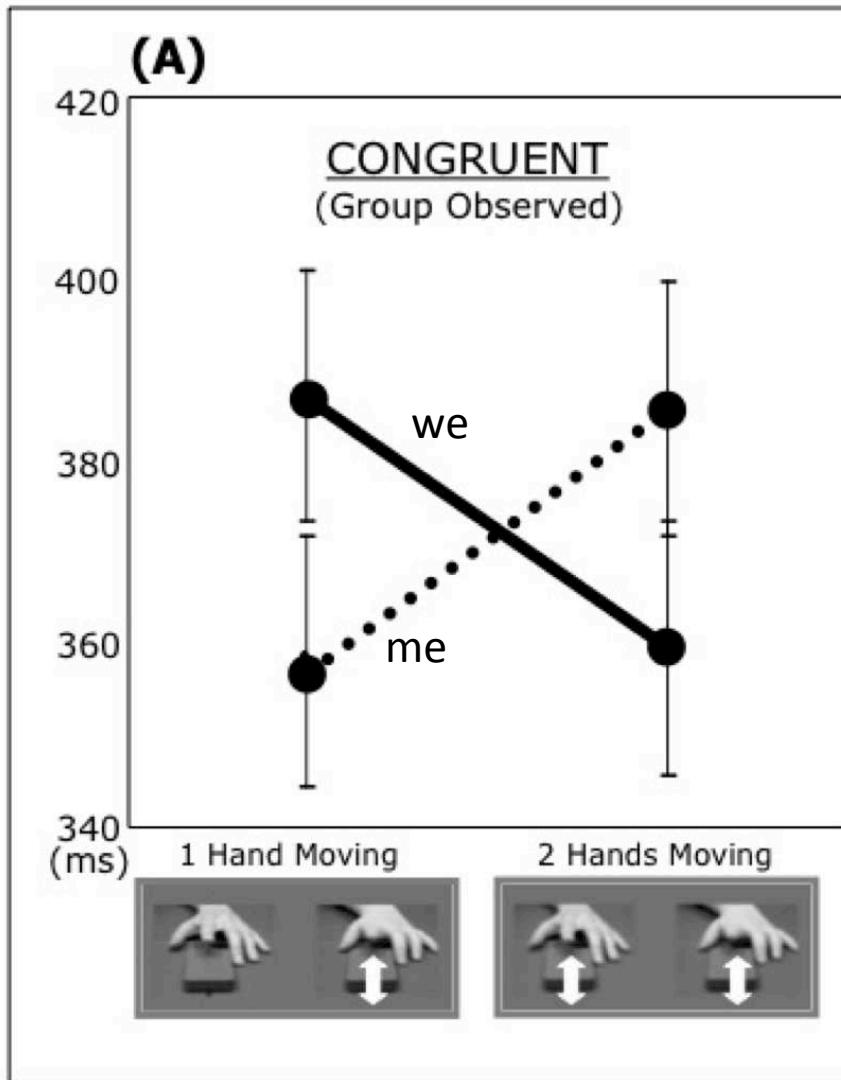
P

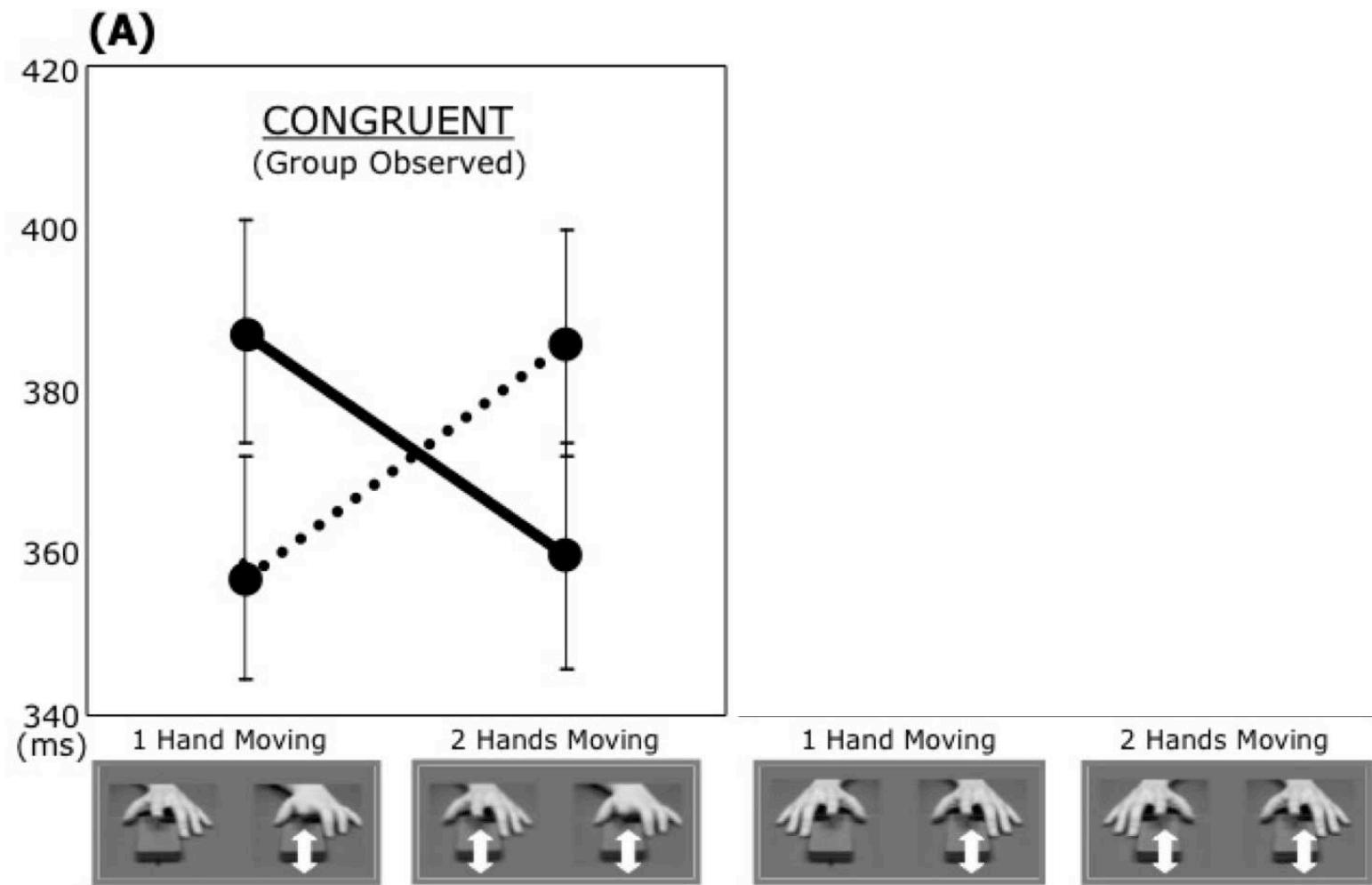


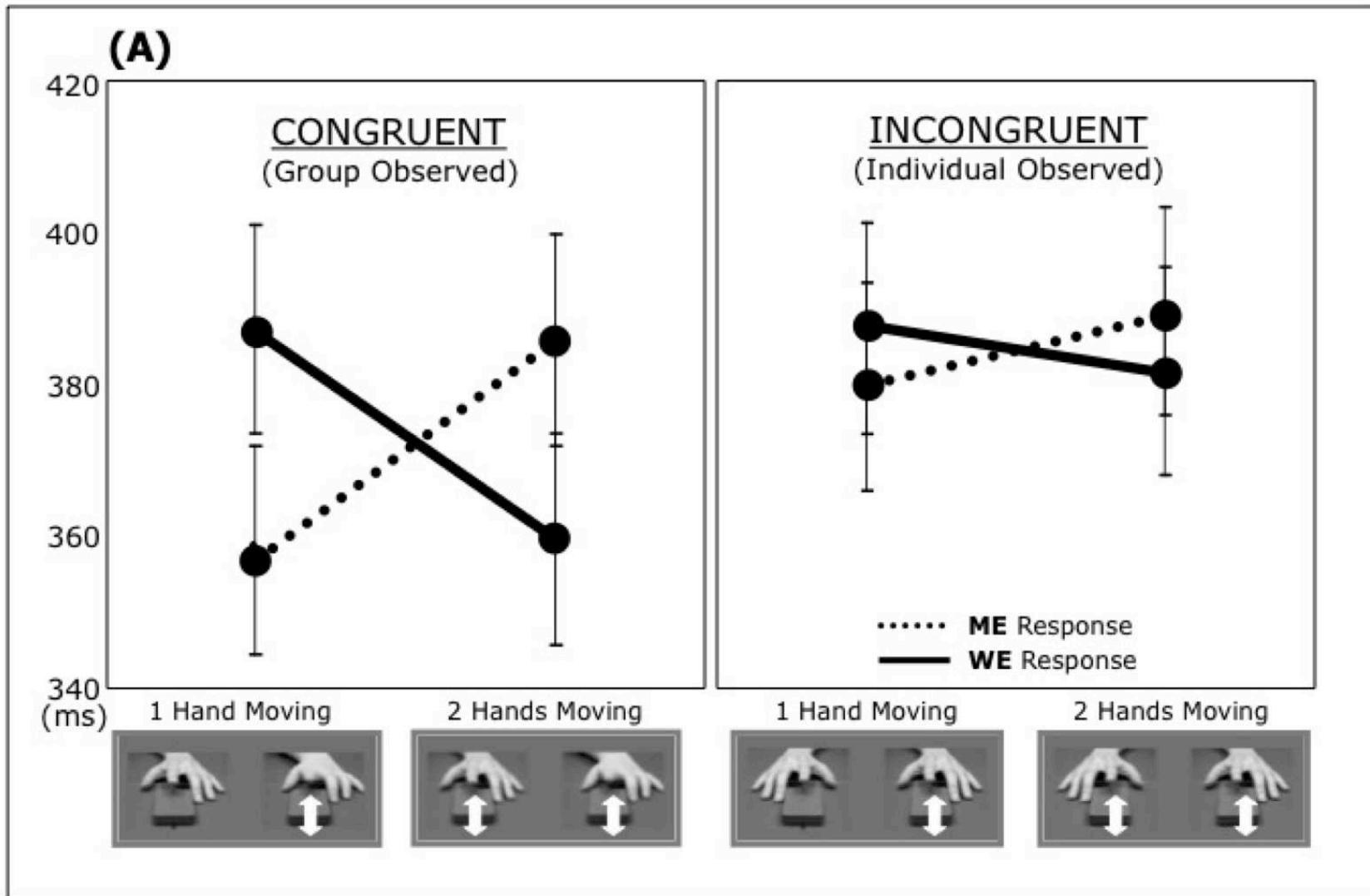


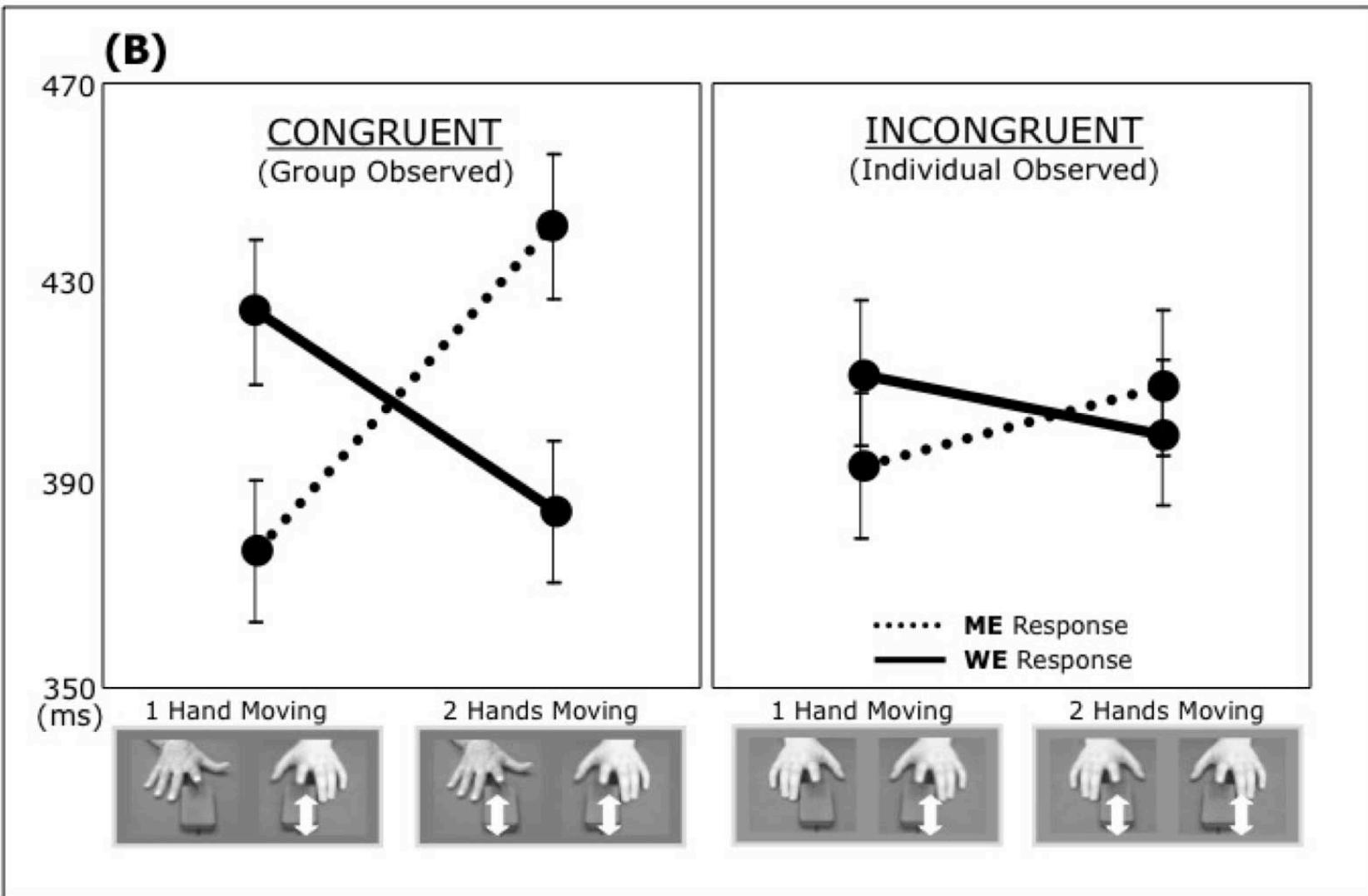
P











Evidence for...

Perception-action matching at an inter-group level.

Observing actions being performed simultaneously by two agents activates a corresponding action plan. This action plan specifies an agent's own action in relation to their co-actor's action (possibly in terms of perceptual events). Performing an individual action in response to an observed joint action is difficult, because the joint action plan activated through joint action observation needs to be replaced by an individual action plan.



A black and white portrait of Michael Bratman, a man with glasses and short hair, wearing a plaid shirt, looking slightly to the right.

Sufficient conditions

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)

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lb; you intend [likewise] ...

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

(Bratman 1993:View 4)



What is the relation between a purposive ^{joint}action and the goal or goals to which it is directed?