# Shared Agency and Motor Representation s.butterfill@warwick.ac.uk

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Parallel but Individual Agency

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Two strangers cycling the same route side-by-side. (cf. Gilbert 1990)

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<u>G is a distributive goal</u>: 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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## reciprocal, parallel agent-neutral motor planning for outcomes whose rea

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Move it from there to here
















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







#### < different content >

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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### Follow that route



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#### Planning Others' Actions (slides from Natalie Sebanz)

Kourtis et al., subm.



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NoGo

Individual Action







Kourtis et al., subm.







#### 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: Selfreported duration of imagined jump



## Imagery

**EXPERIMENT 1: 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.











### С



















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

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











### С









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Tsai, Sebanz, & Knoblich, 2011, Cognition



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# 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.

