Joint Action and the Emergence of Mindreading s.butterfill@warwick.ac.uk

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Explai develo

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on or

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 \mathbf{O}

"perception, action, and cognition are grounded in social interaction" (Sebanz & Knoblich 2008)

mindreading.

CONJECTURE The existence of abilities to engage in joint

action partially explains how sophisticated forms of mindreading emerge in evolution or development (or both)

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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 (Gilbert 1990)

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

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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

Jack and Sue walk together

We collectively perform a dance by running to a shelter at the same time

Not joint

Jack and Sue walk alongside each other (Gilbert 1990)

We each individually run to a shelter at the same time (in response to a sudden shower).

(Searle 1990, p. 92)

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Challenge Explain the emergence, in evolution or

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3rd objection But how does could it work?

joint action (ability to share goals)

minimal theory of mind cognition

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minimal theory of mind cognition

understanding communicative intent

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> communication by language

other stuff

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communication by language other stuff

other stuff

sophisticated mindreading



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2nd objection Joint action presupposes sophisticated mindreading

shared intention

'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)

'the partners ... have to be aware that they are pursuing a joint goal, which both jointly intend' (Wareneken, Graefenhain & Tomasello 2011) 'I take a collective action to involve a collective [shared] intention.' (Gilbert 2006, p. 5)

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Why shared intention?
























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

(Bratman 2011, p. 11)

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(not why)

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development, of sophisticated forms of mindreading.

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

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first objection

Sophisticated forms of mindreading emerge before joint action

18-month-olds point to inform, and predict actions based on false beliefs

(Knudsen & Liszkowski 2011)

(Onishi & Baillargeon 2005; Southgate et al 2007)

18-month-olds point to inform, and predict actions based on false beliefs

Scrub-jays selectively recache their food in ways that deprive competitors of knowledge of its location (Knudsen & Liszkowski 2011)

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In standard false belief tasks,"[t]he subject is aware that he/she and another person witness certain state of affairs x. Then, in the absence of the other person the subject witnesses an unexpected change in the state of affairs from x to y" Wimmer & Perner (1983, p. 106)





Yellow Green



Yellow Green



Yellow Green


















Onishi & Baillargeon (2005)















□ yellow-box □ green-box













□ yellow-box □ green-box







Onishi & Baillargeon (2005)



Onishi & Baillargeon (2005)







I'll leave my toy here [target container]

I'll leave my toy here [target container]

















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- (a) conceptual sophistication
- takes years to develop

- development tied to acquisition of executive function and language

- development facilitated by training and siblings

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(b) scarce cognitive resources

- attention
- working memory

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What could someone represent that would enable her to track, at least within limits, others' perceptions, knowledge states and beliefs including false beliefs? What could someone represent that would enable her to track, at least within limits, others' perceptions, knowledge states and beliefs including false beliefs?

"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)

What could someone represent that would enable her to track, at least within limits, others' perceptions, knowledge states and beliefs including false beliefs?

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Propositional attitude

Relational attitude
Propositional attitude

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

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

arbitrarily nestable contents

uncodifiably complex effects on action

permit mistakes about identity and existence **Relational attitude**

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

no contents

parameter-setting effects on action

enable tracking limited range of true and false beliefs

> Wellman & Phillips 2001 Apperly & Butterfill 2009

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