

## Joint Action & the Emergence of Mindreading

### Lecture 1: Problems

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### Challenge Explain the emergence, in evolution or development, of sophisticated forms of mindreading.

*Mindreading* is the representation of mental states as the mental states of a particular subject.

*Sophisticated* mindreading involves propositional attitudes such as belief, desire and intention and the construction of reason-giving, causal explanations of action.

‘In saying that an individual has a *theory of mind*, we mean that the individual imputes mental states to himself and to others ... the system can be used to make predictions ... about ... behavior’<sup>29</sup>

In a standard *false belief task*, ‘[t]he subject is aware that he/she and another person witness a 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.’<sup>40</sup> The task is designed to measure the subject’s sensitivity to the probability that Maxi will falsely believe x to obtain.

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

‘the unique aspects of human cognition ... were driven by, or even constituted by, social cooperation. ... [R]egular participation in cooperative, cultural interactions during ontogeny leads children to construct uniquely powerful forms of cognitive representation.’<sup>25</sup>

‘perception, action, and cognition are grounded in social interaction’<sup>18</sup>

### What is joint action?

Paradigm cases in philosophy include two people painting a house together,<sup>5</sup> lifting a heavy sofa together,<sup>38</sup> preparing a hollandaise sauce together,<sup>33</sup> going to Chicago together,<sup>21</sup> and walking together.<sup>14</sup>

In developmental psychology paradigm cases of joint action include two people tidying up the toys together,<sup>4</sup> cooperatively pulling handles in sequence to make a dog-puppet sing,<sup>7</sup> and bouncing a block on a large trampoline together.<sup>37</sup>

Other paradigm cases from research in cognitive psychology include two people lifting a two-handed basket,<sup>19</sup> putting a stick through a ring,<sup>30</sup> and swinging their legs in phase.<sup>32</sup>

**Third Objection** How does it work?

(See Lecture 5.)

**Second Objection** Joint action presupposes sophisticated mindreading.

‘I take a collective action to involve a collective intention.’<sup>13</sup>

‘The sine qua non of collaborative action is a joint goal [shared intention] and a joint commitment’<sup>36</sup>

‘the key property of joint action lies in its internal component ... in the participants’ having a “collective” or “shared” intention.’<sup>1</sup>

‘Shared intentionality is the foundation upon which joint action is built.’<sup>10</sup>

‘it is precisely the meshing and sharing of psychological states ... that holds the key to understanding how humans have achieved their sophisticated and numerous forms of joint activity’<sup>9</sup>

### What is shared intention?

The functional role of shared intentions is to: (i) coordinate activities; (ii) coordinate planning; and (iii) provide a framework to structure bargaining.<sup>6</sup>

For you and I to have a shared intention that we J it is sufficient that: ‘(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 that we J in

accordance with and because of la, lb, and meshing subplans of la and lb; (3) 1 and 2 are common knowledge between us'.<sup>6</sup>

'each agent does not just intend that the group perform the [...] joint action. Rather, each agent intends as well that the group perform this joint action in accordance with subplans (of the intentions in favor of the joint action) that mesh'<sup>5</sup>

## First Objection Sophisticated forms of mindreading emerge before joint action.

### Theory of mind abilities are widespread

Children in their second year use pointing to provide information to others<sup>22</sup> in ways that reflect their partners' ignorance<sup>23</sup> and false beliefs;<sup>20</sup> provide more information to ignorant than knowledgeable partners when making requests;<sup>26</sup> predict actions of agents with false beliefs about the locations of objects;<sup>27,35</sup> and select different ways of helping others depending on whether their beliefs are true or false.<sup>8</sup>

Scrub-jays selectively re-cache their food in ways that prevent competitors from knowing its location.<sup>11</sup>

Chimpanzees select routes to approach food which conceal them from a competitor's view,<sup>16</sup> and retrieve food using strategies that optimise their return given what a dominant competitor has

seen.<sup>15</sup>

### Mindreading abilities

A *mindreading ability* is an ability that exists in part because exercising it brings benefits obtaining which depends on exploiting or influencing facts about others' mental states.

An ability to *track* perceptions or beliefs (say) is a mindreading ability which involves exploiting or influencing facts about these states.

### Theory of mind cognition is hard

Conceptually demanding:

- Acquisition takes several years<sup>40,39</sup>
- Tied to the development of executive function<sup>28,31</sup> and language<sup>3</sup>
- Development facilitated by explicit training<sup>34</sup> and siblings<sup>12,17</sup>

Cognitively demanding:

- Requires attention and working memory in fully competent adults<sup>2,24</sup>

### Plan for the five lectures

- Lecture 1: Problems [this lecture]
- Lecture 2: Minimal Theory of Mind
- Lecture 3: Which Joint Actions Ground Social Cognition?

- Lecture 4: Intention and Motor Representation in Joint Action
- Lecture 5: Interacting Mindreaders

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