



# **Interacting Mindreaders**

s.butterfill@warwick.ac.uk — butterfillS@ceu.hu

reciprocity

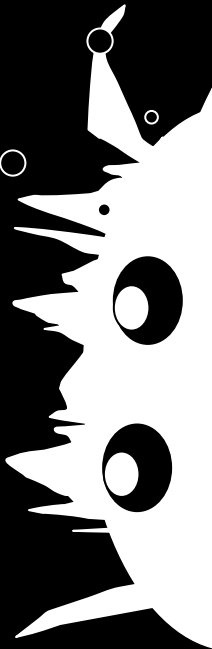


She thinks ...

reciprocity



He thinks ...



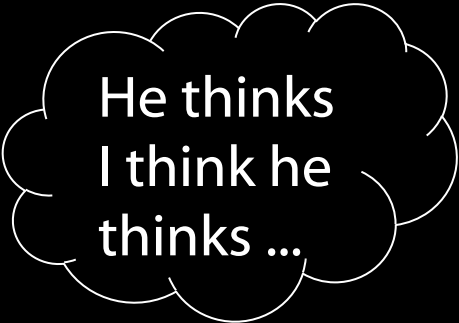
She thinks  
I think ...

She thinks ...

reciprocity



He thinks ...



He thinks  
I think he  
thinks ...

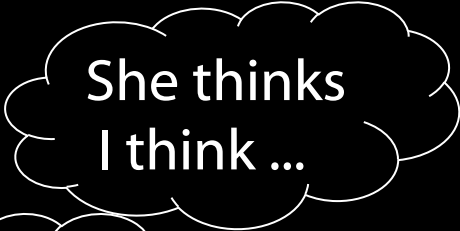


He thinks ...

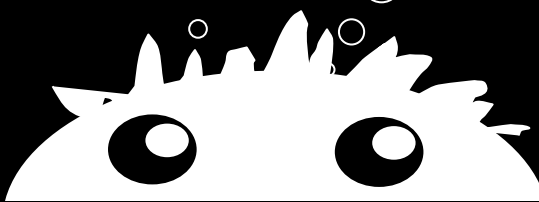
reciprocity



She thinks ...



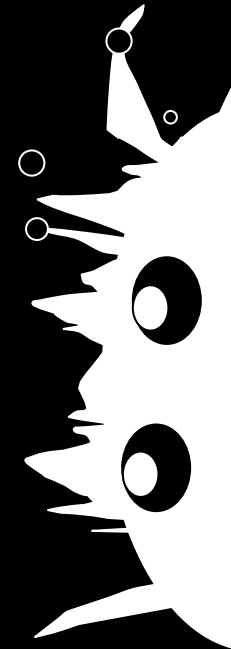
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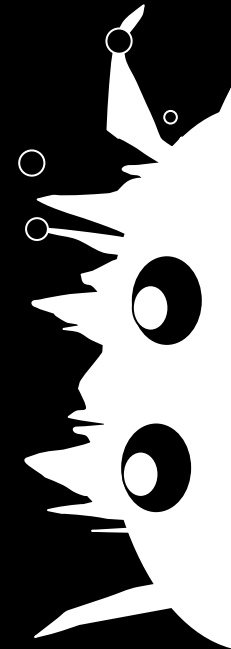
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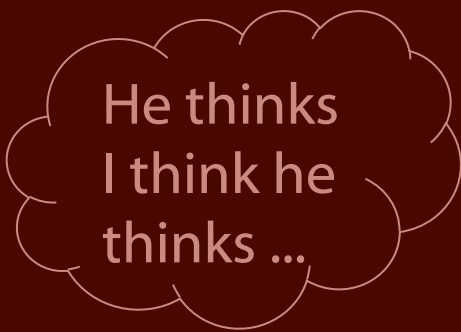


She thinks  
I think she  
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She thinks  
I think ...

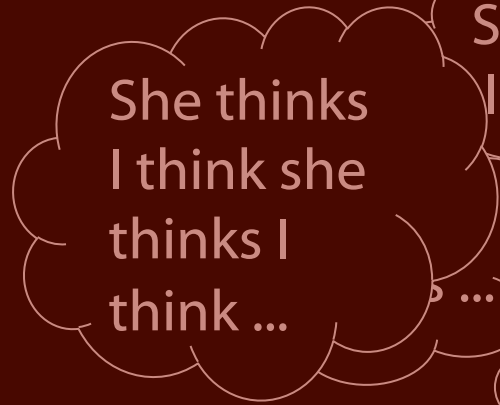
reciprocity



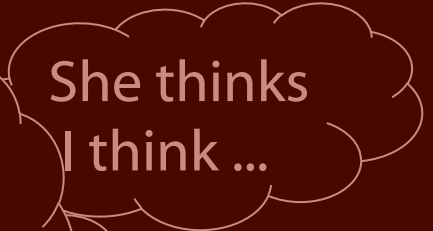
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I think he  
thinks ...



He thinks ...



She thinks  
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think ...



She thinks  
I think ...

reciprocity  
without escalation?

goal ascription



evidence for  
goal ascription

'an action can be explained by a goal state if, and only if, it is seen as the most justifiable action towards that goal state that is available within the constraints of reality.'

(Csibra &  
Gergely 1998)

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4. the occurrence of outcome  $G$  is desirable;
5. there is no other outcome,  $G'$ , the occurrence of which would be at least comparably desirable and where (2) and (3) both hold of  $G'$  and  $a$
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the problem of opaque means

failed reach



point



*source:* Hare & Tomasello (2004)

the problem of opaque means

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sometimes makes available a route to  
knowledge of the goals of her actions  
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**Your-goal-is-my-goal**

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1. You are willing to engage in some joint action or other with me
2. I am not about to change the single goal to which my actions will be directed.

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## Applications

- pram



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## Applications

- pram
- tools
- communication

failed reach



point



*source:* Hare & Tomasello (2004)

failed reach



point



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“to understand pointing, the subject needs to understand more than the individual goal-directed behaviour. She needs to understand that ... the other attempts to communicate to her ... and ... the communicative intention behind the gesture”

(Moll & Tomasello 2007)

failed reach



point



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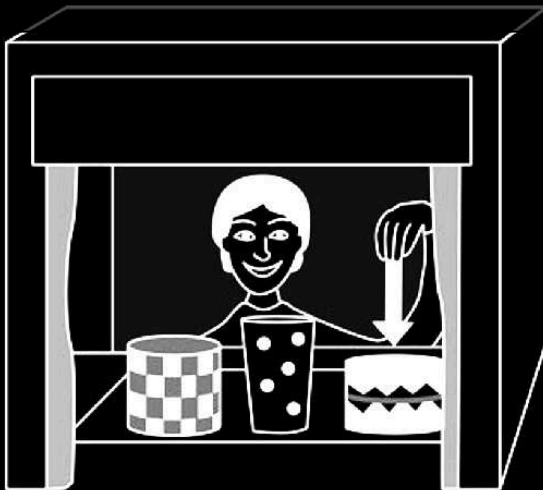
failed reach



point



*source: Hare & Tomasello (2004)*



*source: Leekam et al (2010)*

“the adult’s social cues conveyed her communicative intent, which in turn encouraged the child to ‘see through the sign.’”

(Leekam, Solomon & Teoh 2010:118)



*source: Leekam et al (2010)*





```
graph TD; A[understanding goals] --> B[understanding distributive goals]; B --> C["(mis)understanding communicative intent"]
```

(mis)understanding  
communicative intent

understanding  
distributive goals

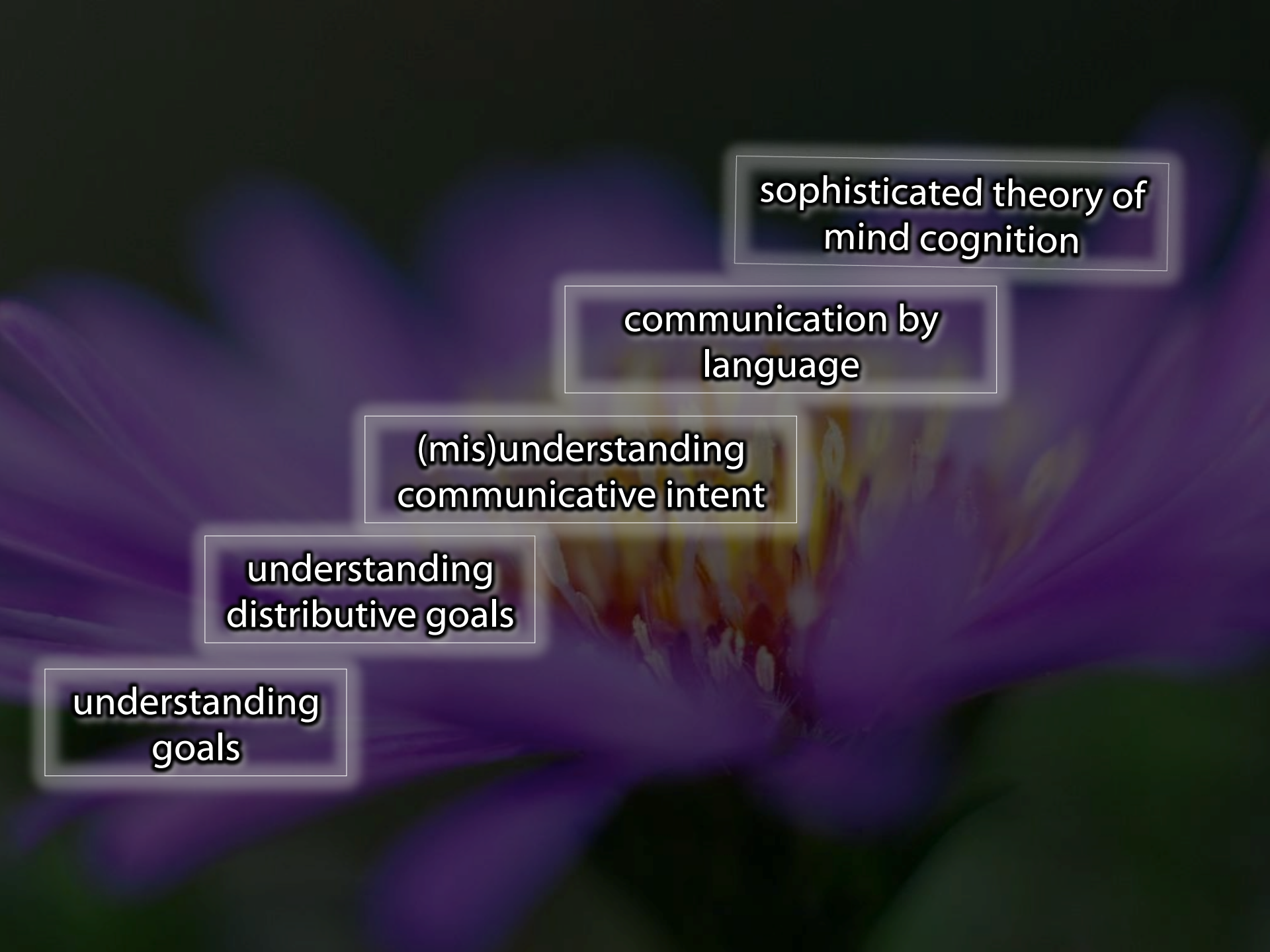
understanding  
goals

Csibra's 'two stances':

Teleological and referential action interpretation 'rely on different kinds of action understanding'

These are initially two distinct 'action interpretation systems' and they come together later in development

Csibra (2003, p. 456)



sophisticated theory of  
mind cognition

communication by  
language

(mis)understanding  
communicative intent

understanding  
distributive goals

understanding  
goals



The problem of false belief

# contents

actual

believed

North

owl

cat

South

cat

owl



"the unique aspects of human  
cognition ... were driven by, or even  
constituted by, social co-operation"  
(Moll & Tomasello 2007)



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

A diagram consisting of three rectangular boxes arranged in a staircase pattern, ascending from the bottom-left towards the top-right. Each box contains text. The background is a solid dark gray.

understanding  
communicative intent

understanding  
distributive goals

understanding  
goals



sophisticated theory of  
mind cognition

communication by  
language

(mis)understanding  
communicative intent

understanding  
distributive goals

understanding  
goals

joint action (ability  
to share goals)

minimal theory of  
mind cognition

understanding  
communicative intent

other stuff

communication by  
language

other stuff

sophisticated theory of  
mind cognition







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a question