Radcliffe seminar

Asking about children's questions

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Requesting information: A dual-process view

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- Non-humans are able to reliably identify predictive cues about the world.
- Some of them can also, as humans do, reliably identify predictive cues **about their own cognitive reliability in a given cognitive task**, such as perceiving, remembering or reporting.
- **Requesting information from others** belongs to the latter ability.
- **Nonhuman primates and human children can "ask questions (and respond to questions)."**

Requesting information presupposes

- **Assessing the information available in one's own mind, given specific contextual goals**

- A question has a specific epistemic target: a response that “completely, but just completely, answers the question.” (Belnap)

2 major question elicitors

- **Deficit in information**
  - Information for acting found **lacking**: no world prediction is possible
  - Information for acting found **insufficient in grain**
- **Inconsistency** between a belief one has and
  - another person's report, decision or associated behavior
  - a situation violating one's own expectations

- Hence, questioning, or information seeking, manifest a sensitivity to
  - The discrepancies between what is expected and what is observed/conveyed by speech
  - What one knows/does not know

The structure of questioning actions

- Assessing a discrepancy
- Motivation for reducing the discrepancy or information deficit
- Selection of a specific goal and phrasing of question
- Selection of an informer
- Once an answer has been elicited: Decision to stop or to resume questioning.

Does such sensitivity involve applying concepts such as knowledge, true, false or uncertain belief? NO:

- There is evidence that children can monitor their perception and their memory in implicit decisions
- While being unable to reliably report what they know or do not.

Experimental evidence for a dissociation

« Implicit evaluation »

- opting out from a memory task. (Balcomb & Gerken, 2008)
- opting out from a perceptual discrimination task. Bernard et al.(2014, 2015)
- Fixation patterns on a confidence scale for memory (Paulus, Proust & Sodian, 2013).
- Infants ask for help when they don't know Goupil et al. 2016)

« Explicit report » of knowledge

- Smarties task, Gopnik & Astington 1988
- partial perceptual knowledge, Rohwer et al. 2012
- lexical knowledge: Marazita & Merriman, 2004)
- Non-reliable confidence report about correct recall (Paulus, Proust & Sodian, 2013)

Goupil, Romand-Monnier & Kouider (2016)

- 2 yr-olds are able to request information in a strategic way as a function of what they remember, or when they never had the information.

Kim et al. (2016)

- 3 and 4 yr-olds are able to provide information in a strategic way as a function of what they know, although they are unable to accurately report when they know.

A dissociation between asking questions and disclaiming knowledge

The mechanisms involved in questioning do not depend on the mechanisms for verbally reporting one's own ignorance.

A dissociation in answering questions and claiming knowledge

Similarly, **accepting to inform about P** does not depend on the mechanisms for verbally reporting that one knows P.

Both questioning and informing involve monitoring what one knows or does not.

→studies about Informing can shed light on the issue of a possible dissociation between two types of knowledge awareness associated with questions.

Kim, Paulus, Sodian, Proust (2016): sensitivity to own ignorance

This study examines 3 and 4 year-olds‘ performances

- in an explicit mc task (do you know or not where the object is?) replicating Rohwer et al. 2012
- In an implicit mc task (Do you want or not to inform Max about where the object is?)

- in each task, three conditions:
  - Full knowledge: children saw one toy and watched its being hidden in an opaque box
  - Partial knowledge condition: children saw two toys and the empty box & were told that one of them would be hidden in the box, but did not see which one.
  - Ignorance condition: children did not see any object, and were merely told that a toy would be hidden in the box behind the screen. Then the screen opened, revealing the opaque box.

Explicit knowledge report Rohwer et al.(2012)

Mean Percent Correct (Standard Deviation) on the Three Different Epistemic Tasks in Each Age Group in Experiment 1

Condition	2- to 3-year-olds $n = 16$	4-year-olds $n = 16$	5-year-olds $n = 20$	6-year-olds $n = 21$	7-year-olds $n = 19$
Total ignorance	96.9 (.25)	84.4 (.60)	80 (.68)	95.3 (.30)	100 (.00)
Partial exposure	21.9 (.63)	31.3 (.89)	35 (.92)	92.9 (.48)	94.8 (.32)
Complete knowledge	87.5 (.45)	96.9 (.25)	100 (.00)	100 (.00)	100 (.00)

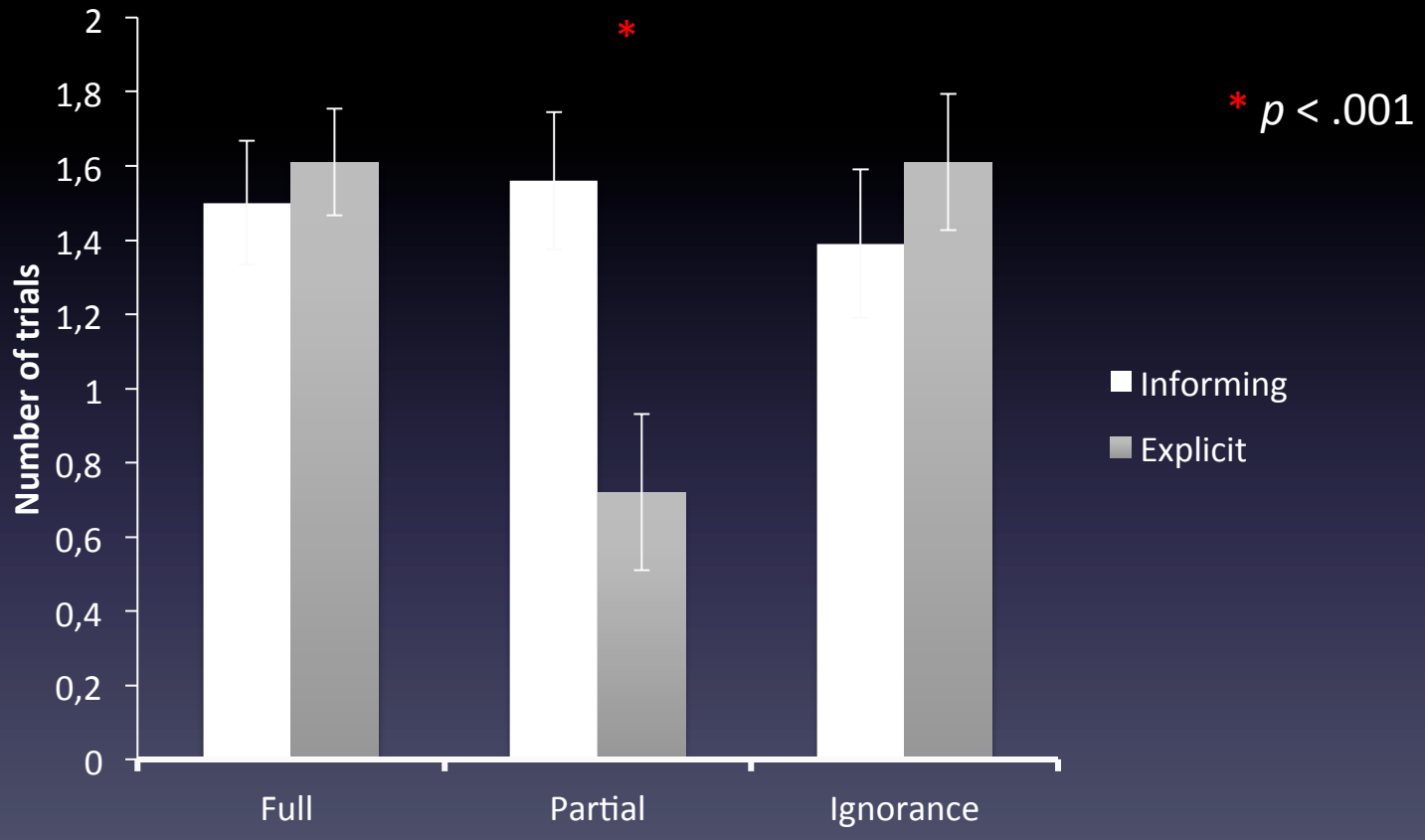
On this basis,

- One might hypothesize that children **correctly** attribute knowledge to themselves **only** when they have acquired a full-blown concept-based theory of mind.
- However ..

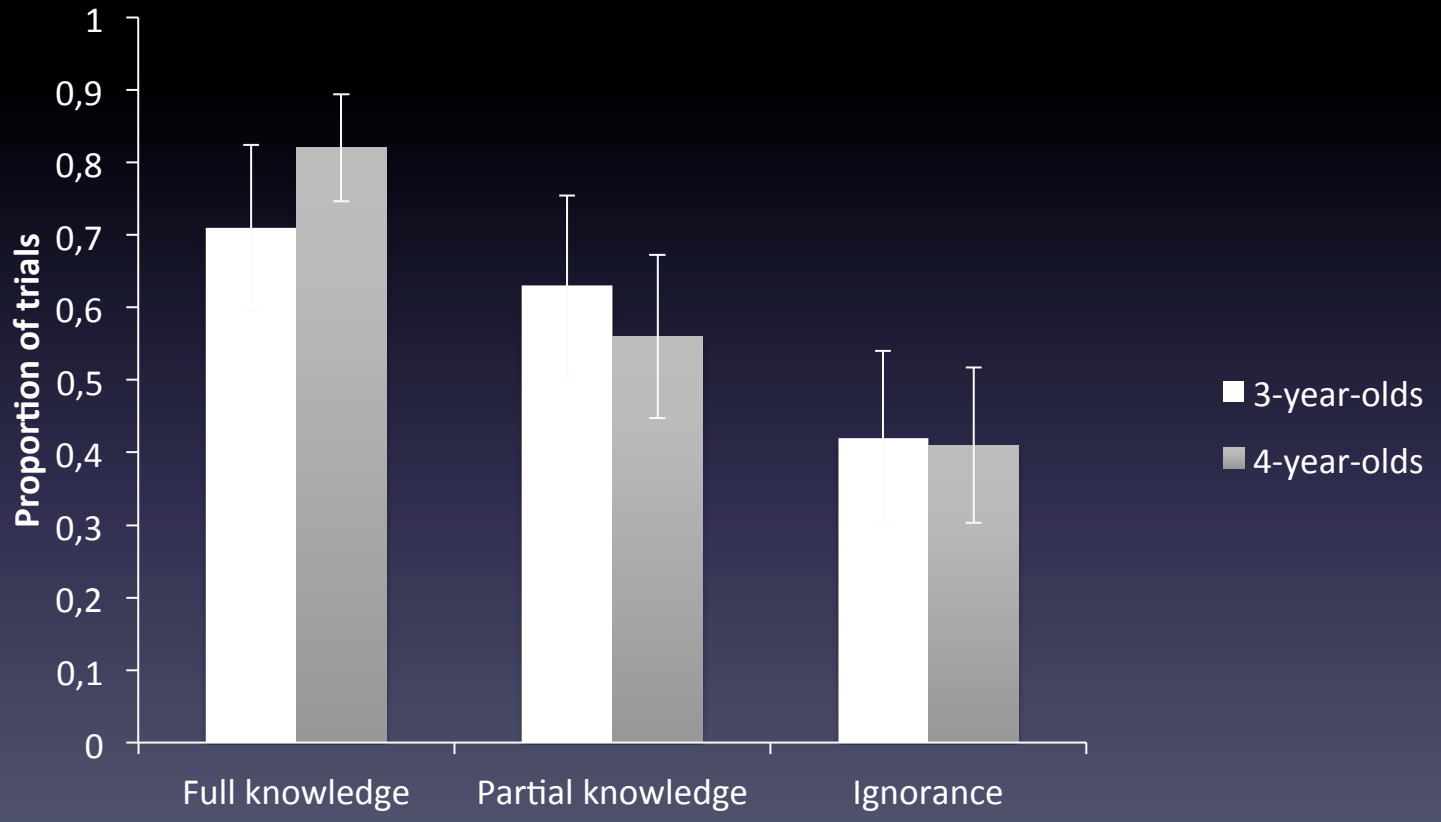
We added an informing task

- The exact same procedure as in the explicit task except that children were asked whether or not they would choose to inform anot
the box was blocked in all co

Informing/knowledge self-attribution in 4 yr-olds: accurate responses



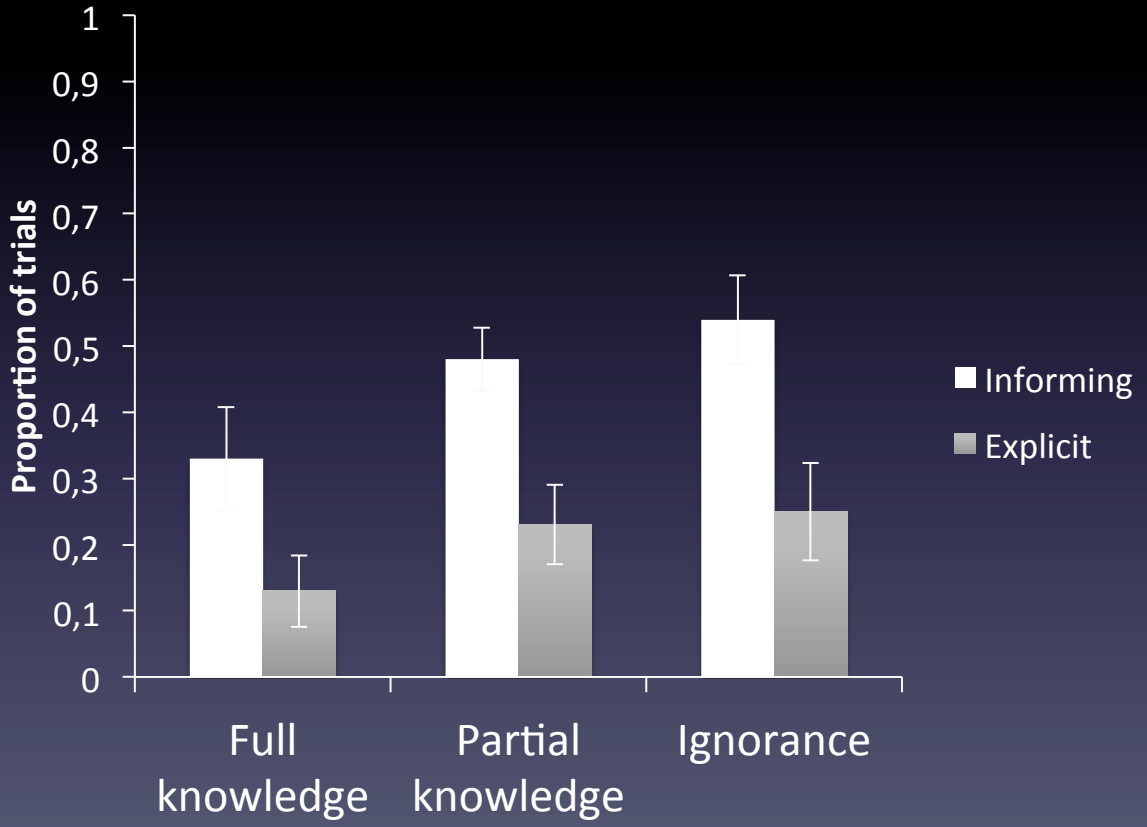
Decisions to inform in 3 and 4 yr-olds (correct or not)



Uncertainty gestures

- In addition, we recorded the gestures produced in each condition of the reporting/informing tasks.
- We found **a linear increase in gesture production** from full to partial and to ignorance conditions, with a steeper slope in the informing than in the reporting task.

Uncertainty gestures in 3 and 4 Year olds



- Children over-reported their knowledge in the explicit verbal judgment task
- When asked to inform another person
  - they were more accurate in conveying their ignorance by declining to inform
  - They also produced gestures of uncertainty as a function of the information they had.

Evidence compatible with a **dissociation informing/reporting**

- 3 and 4 yr-olds are able to monitor their knowledge and control their epistemic decision when informing another person.
- They are, however, unable to **reliably report** whether "they know where the toy is" before 6-7 years of age

Two types of explanation

1. Additional executive demands in verbal tasks?

2. Different types of representational processes involved?

A Dual-store view of MC

- One system has the function of expressing (not reporting) evaluative attitudes (in humans and nonhumans)

- Another has the function of expressing and reporting propositional attitudes, ie justifying one's own decisions (in humans only)

Type of representation to use depends on the constraints applying to mental actions

- Reactive (Impulsive and routine) metacognition have an evaluative, feeling-based representational structure.

- Strategic metacognition takes advantage of transmitted concepts, such as knowledge, plausibility (and the associated deductions).

(Proust, 2015)

mc feelings

- Express a relation, not a state of affairs
- they indicate a subjectively relevant condition and motivate an action (« pushmi-pullyu », Millikan 1995)
- Are evaluative and graded

→Nonpropositional

→Do not conceptualize, but categorize affordances

Cussins (2012), Proust (2013, 2015, in print), Scarantino (2003),

The semantic structure of evaluative attitudes (affordance sensings)

- Affordance$_a$ [Place=here],[Time= Now/soon],
- [Valence$_a$],
- [Intensity$_a$ (on a scale 0 to 1)],
- [motivation to act of degree$_d$ according to action program$_a$].
- All the constituents are associatively related to perceptual cues in the affordance sensing
- a subset may activate the full representation

What noetic feelings represent

- Noetic feelings are evaluative nonconceptual representations
- They react to the presence , in the system, of epistemic affordances
- Epistemic affordances are **subjectively** valenced (pleasant, aversive).
- They predispose to perform a given mental action according to their gradient of valence and intensity

(Proust, 2014, 2015, in press)

Conclusion

If questioning & informing are elicited by epistemic feelings, they do not need to be guided by a metarepresentation of the question/answer activity.

Conclusion

It is more parsimonious to explain questioning and informing behaviours *in their nascent forms* as the expression of a general, non-modular ability to predict and control access to information.