Social cognition during adolescence

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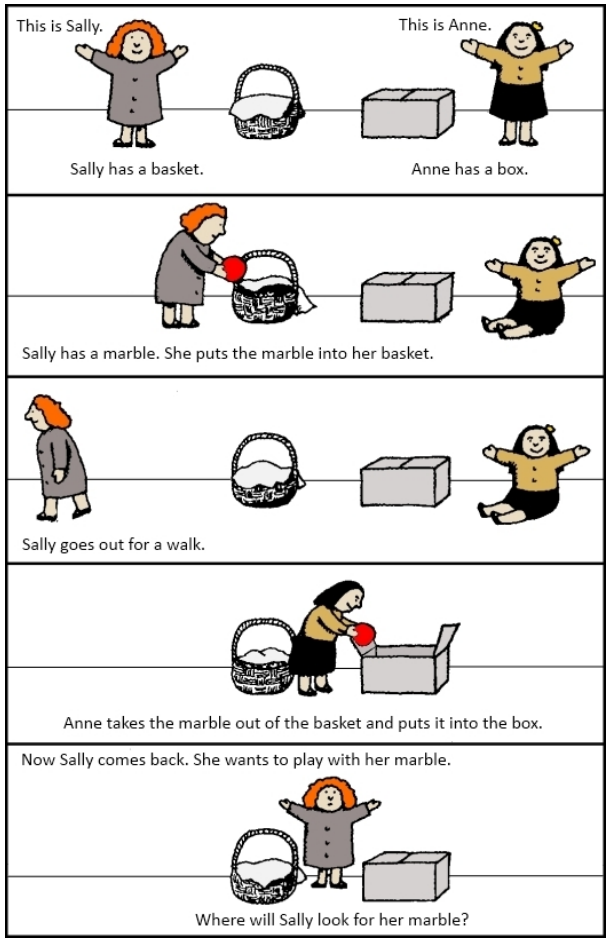
Why adolescence?

But why?!?

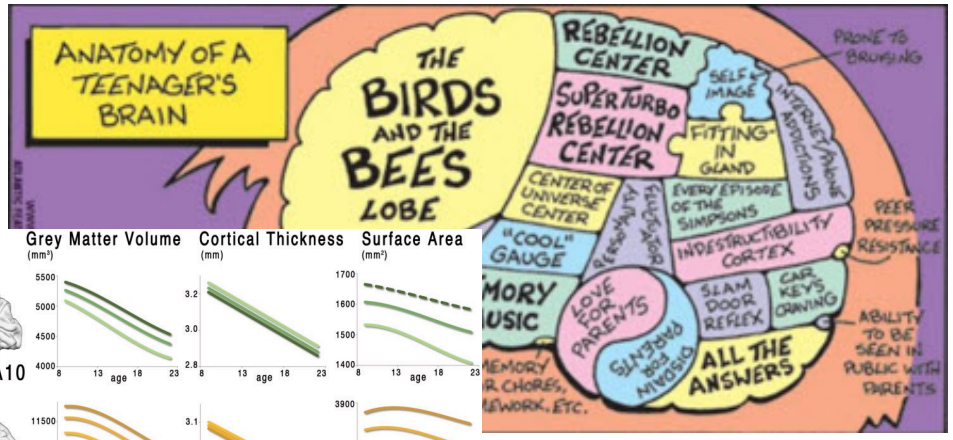
Prof. Annette Karmiloff-Smith:

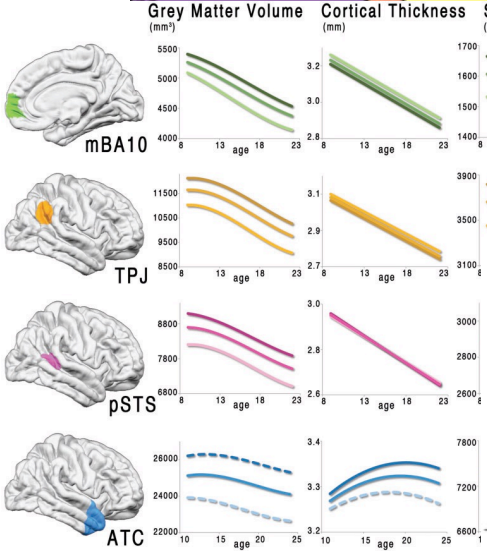
“Dear Iroise
Just loved your talk and the way you handled the question period yesterday and do hope to welcome you to the dept.”

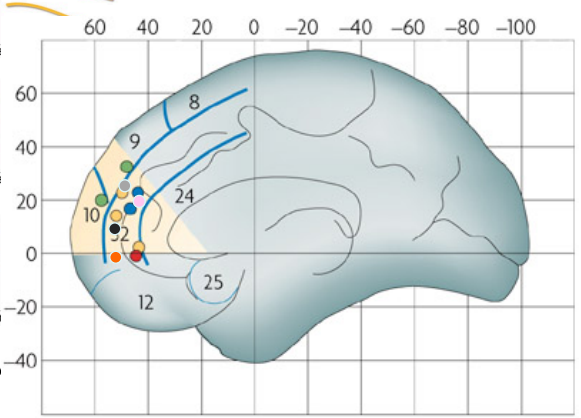
Why adolescence?



vs.





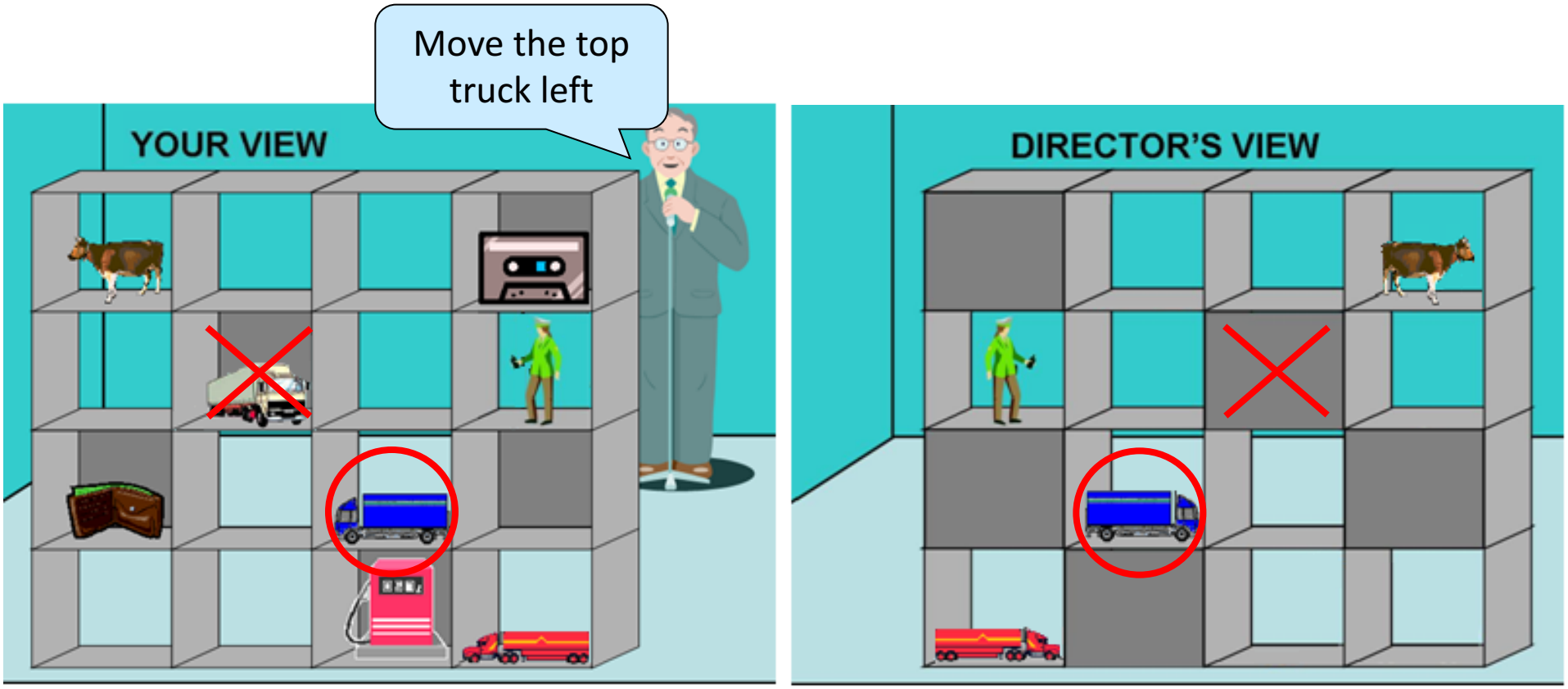


Mills et al. *SC*

Nature Reviews | Neuroscience

Blakemore *Nature Rev Neuroscience* 2008

Theory of mind use



Theory of mind use

ELSEVIER

COGNITION

Cognition 89 (2003) 25–41

www.elsevier.com/locate/COGNIT

Limits on theory of mind use in adults

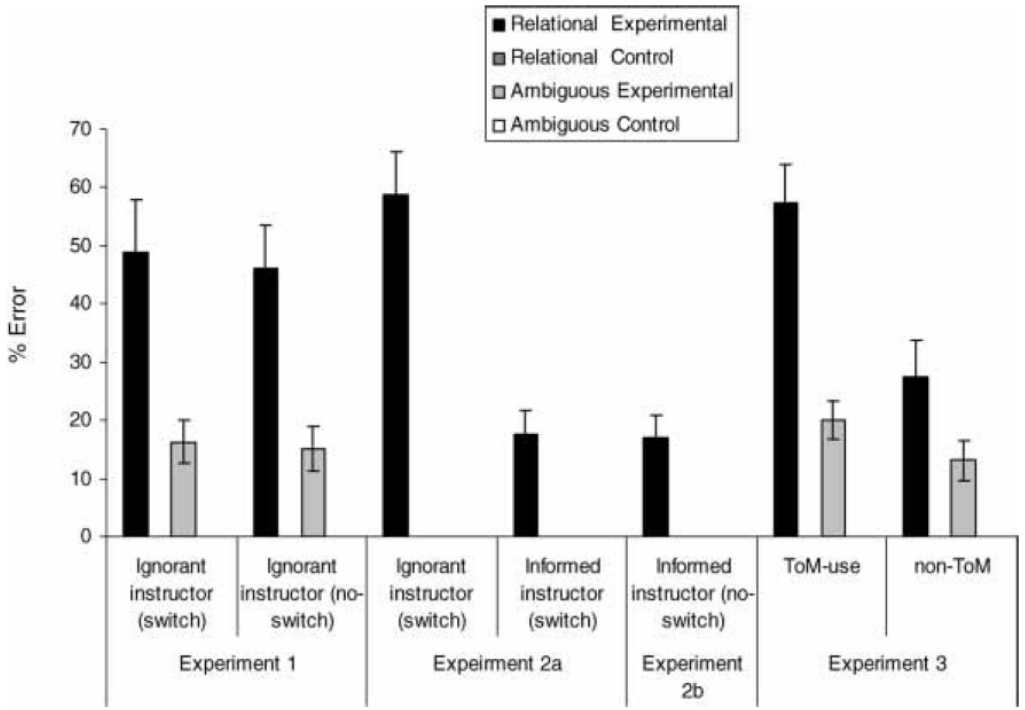
Boaz Keysar[a,*], Shuhong Lin[a], Dale J. Barr[b]

[a]*The University of Chicago, Chicago, IL, USA*
[b]*The University of California, Riverside, CA, USA*

Received 14 September 2002; accepted 28 February 2003

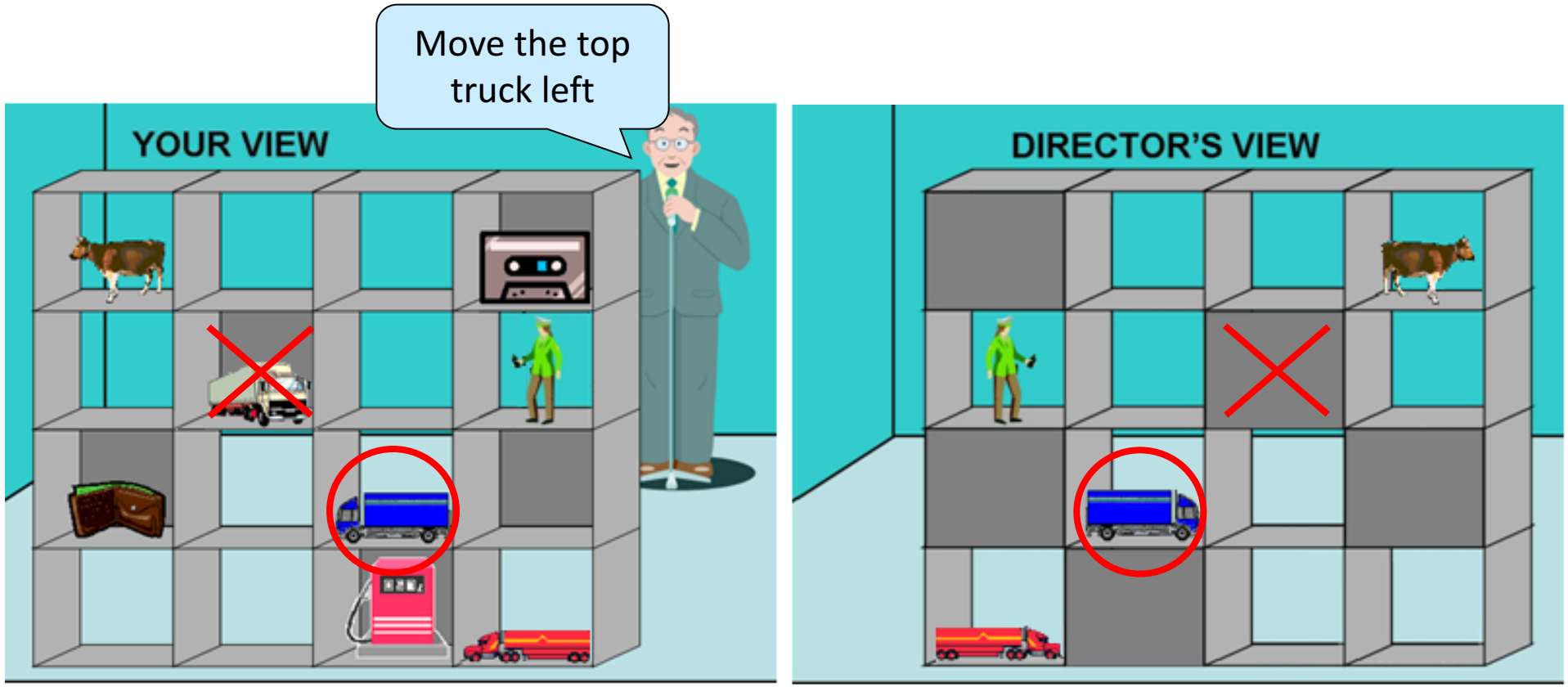
- More fixations and longer fixation on the occluded object.
- 23% first reach towards occluded object (17% moves of the object), 0% in control condition

Keysar et al. *Psychological Science* 2000



Apperly et al. *QJEP* 2010

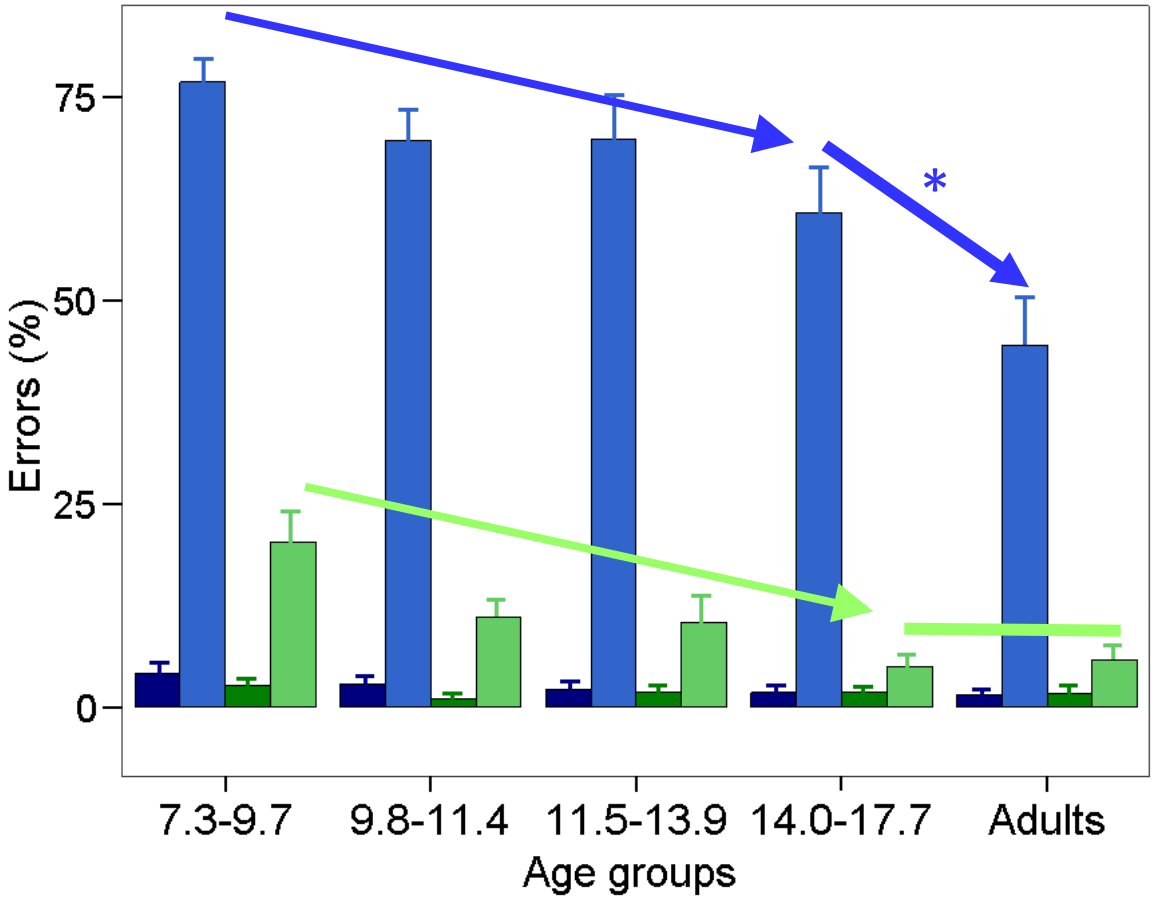
Development of perspective taking in a communicative context



Control condition without the director. Rule = ignore objects in slots with grey back panel.

Dumontheil, Apperly & Blakemore *Developmental Science* 2010

Development of perspective taking in a communicative context



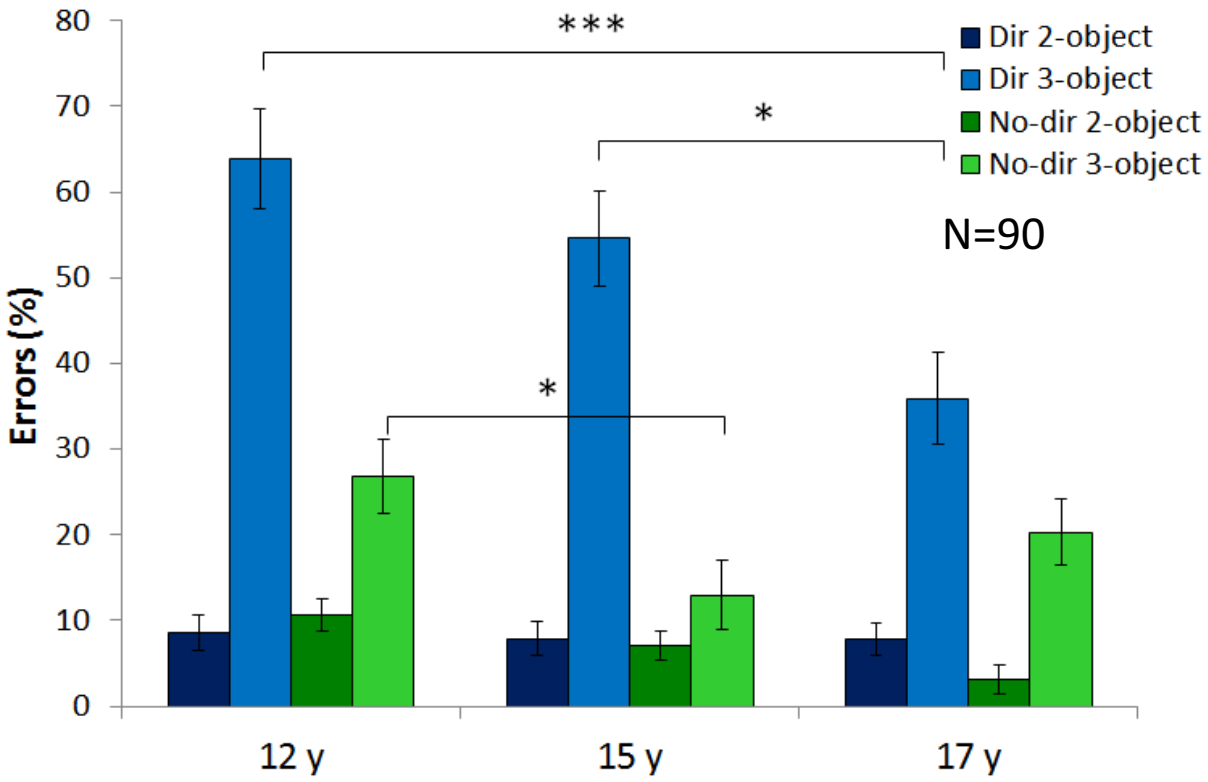
- Director control
- Director experimental
- No-director control
- No-director experimental

Mean + SE

N=178, 7-27 years old, female

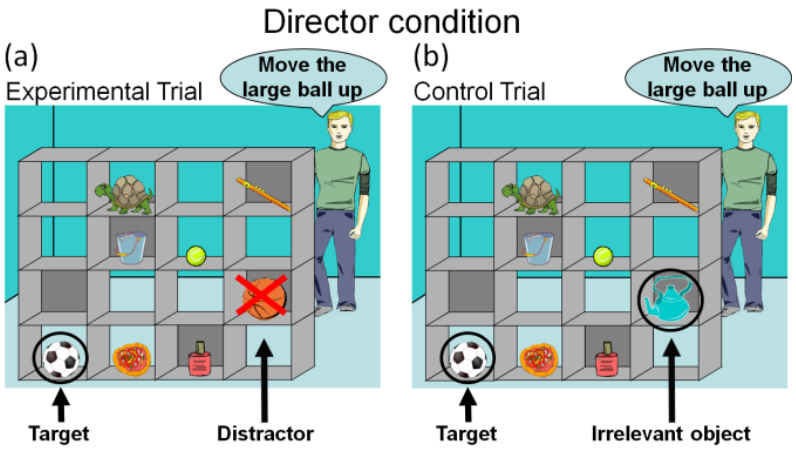
Dumontheil, Apperly & Blakemore *Developmental Science* 2010

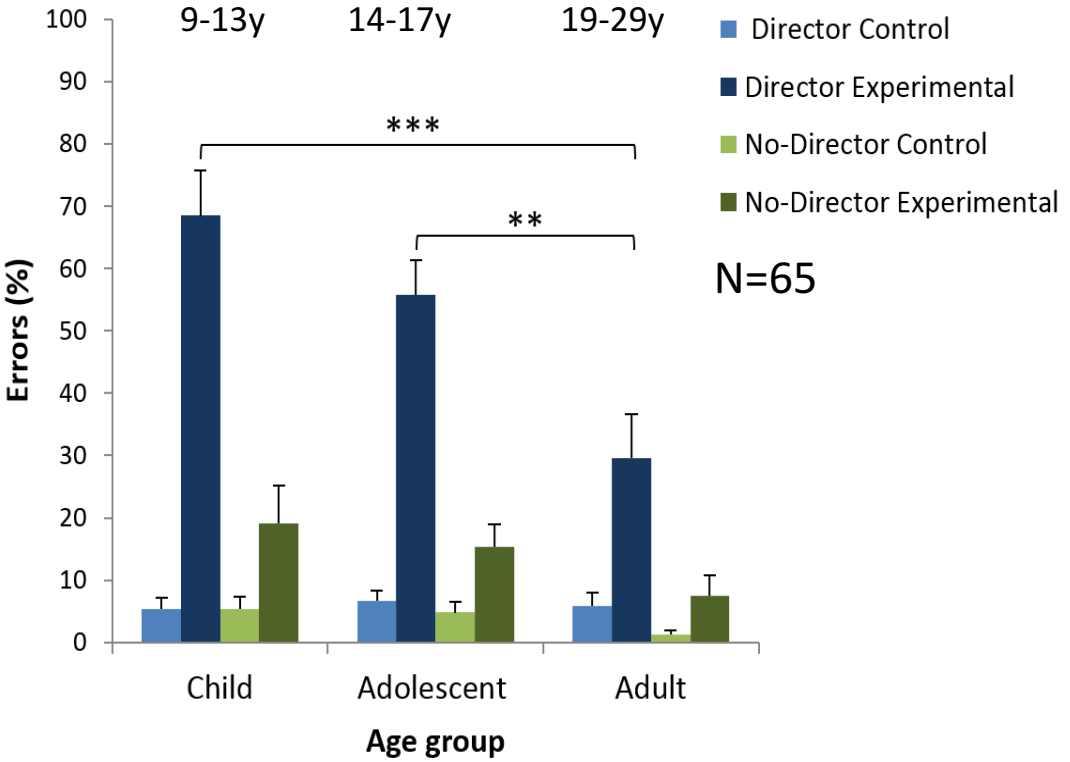
Development of perspective taking in a communicative context



Humphrey & Dumontheil *Dev Neuropsychol* 2016

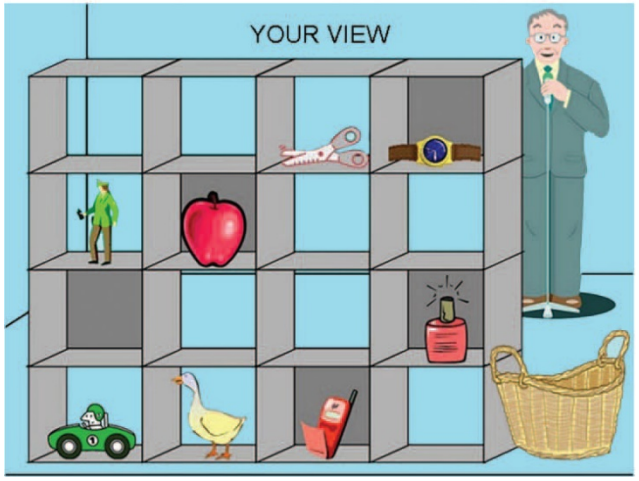
Development of perspective taking in a communicative context

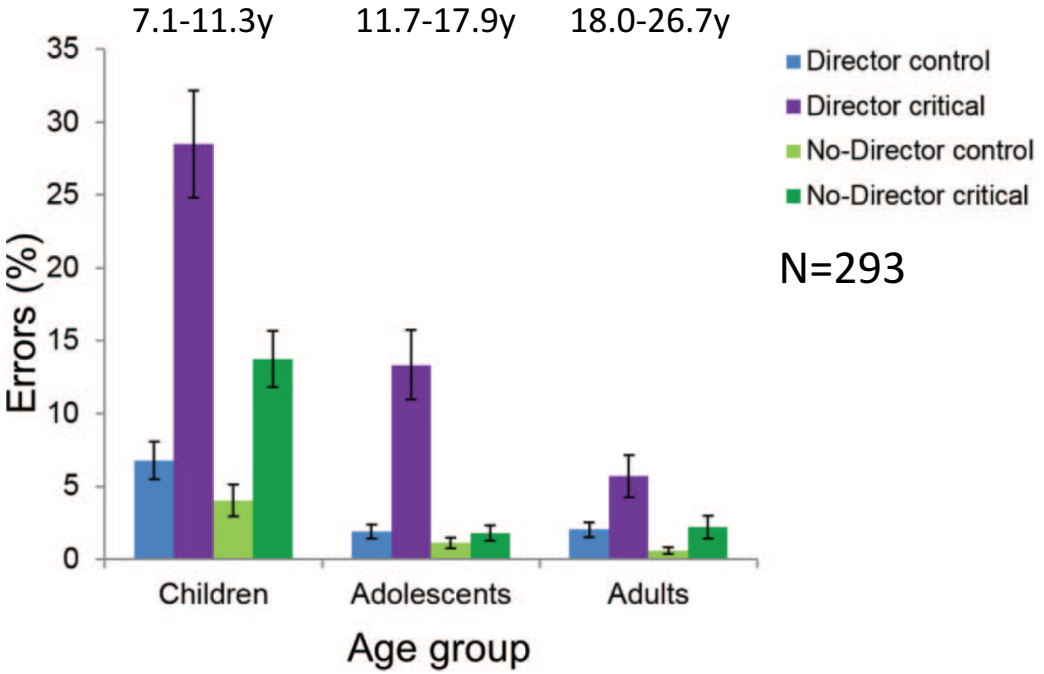




Symeonidou, Dumontheil, Chow, Breheny *JECP* 2016

Development of perspective taking in a communicative context

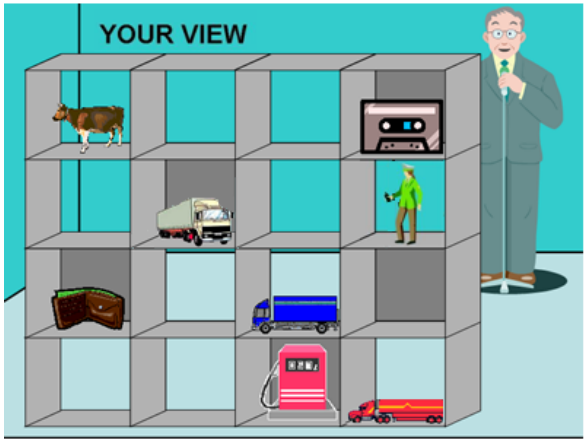




Tamnes, Overbye, Ferschmann, Fjell, Walhovd, Blakemore & Dumontheil *Dev Psychology* 2018

Perspective taking predicts trust and social reciprocity behaviour in adolescents

50 adolescents (50% female) between 13 and 18 years old



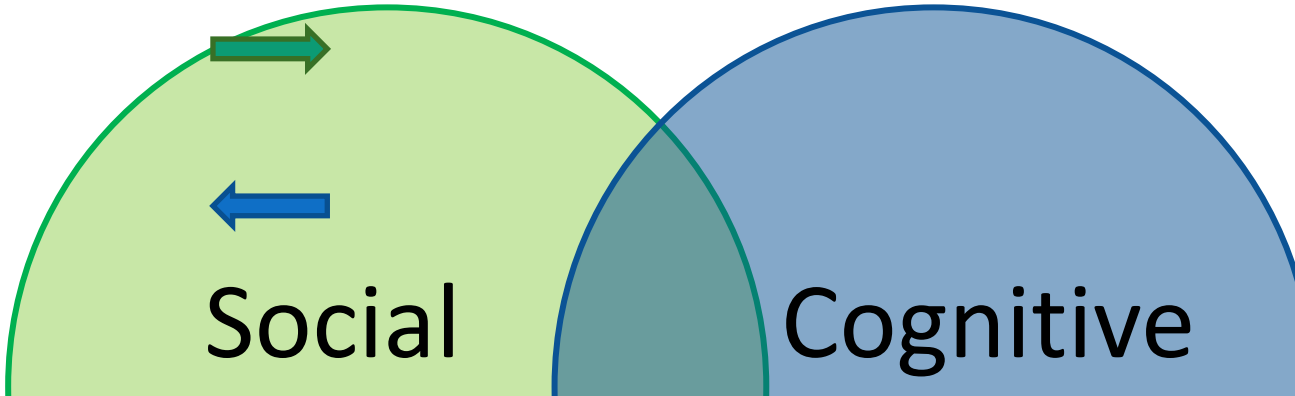
- Low perspective-takers (N=27, Director errors 70.8%)
  High perspective takers (N=23, Director errors 8.0%)

Multi-round financial trust game, playing against a cooperative or an unfair counterpart.

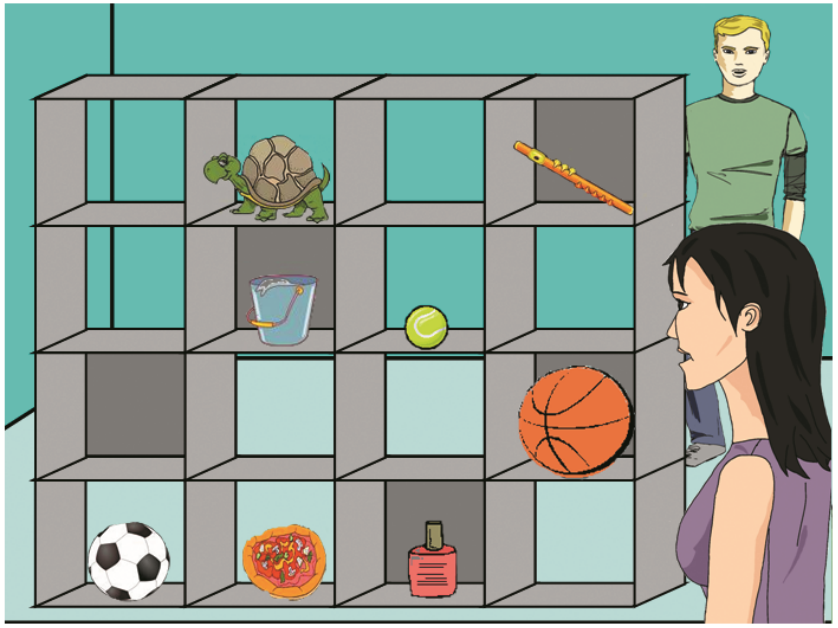
Fett, Shergill, Gromann, Dumontheil, Blakemore, Yakub & Krabbendam *Journal of Adolescence* 2014

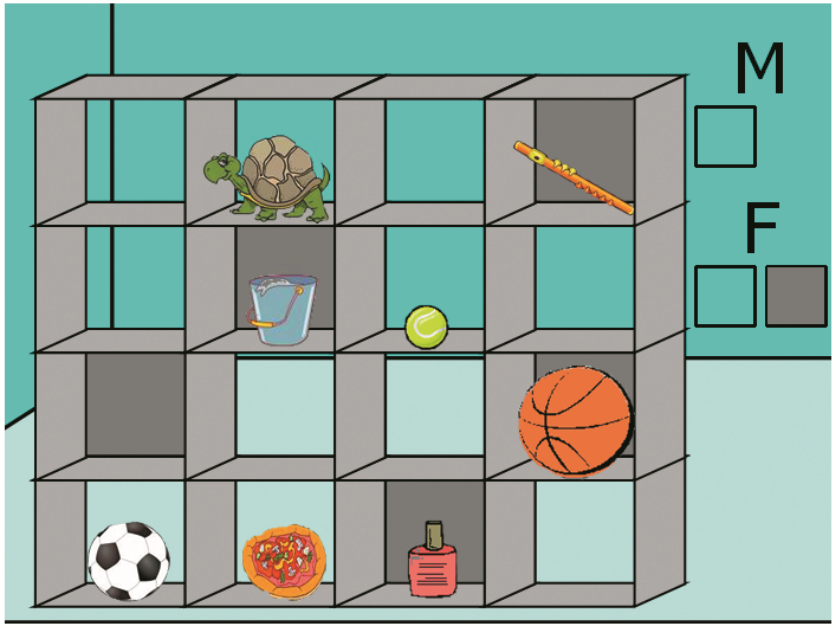
What is behind these developmental differences?

- Developmental differences in inhibitory control
  (Symeonidou, Dumontheil, Chow, Breheny *JECP* 2016)
- Multitasking may be more difficult for adolescents
  (Mills, Dumontheil, Speekenbrink, Blakemore *Royal Society Open Science* 2015)
- Working memory associates with individual – but not necessarily developmental – differences in performance
  (Lin et al. *J of Exp Soc Psychol* 2010; Mills, Dumontheil, Speekenbrink, Blakemore *Royal Society Open Science* 2015)



fMRI study



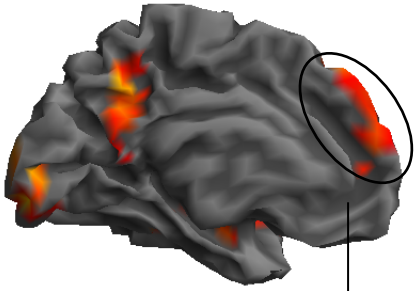


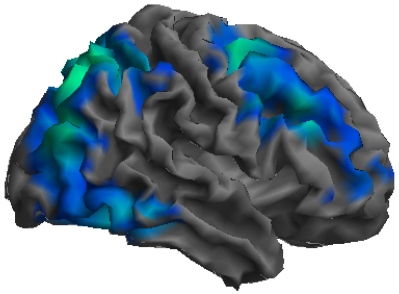
Director factor (Director Present or Absent)
Object factor (1-object or 3-object)

28 female participants, 10-16 and 21-30 years old

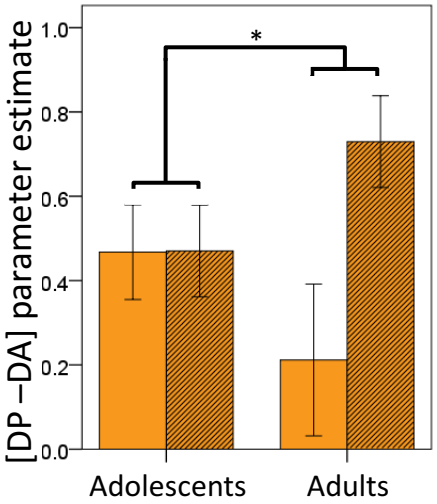
Dumontheil, Kuster, Apperly & Blakemore *NeuroImage* 2010
Dumontheil, Hillebrandt, Apperly & Blakemore *JoCN*, 2012

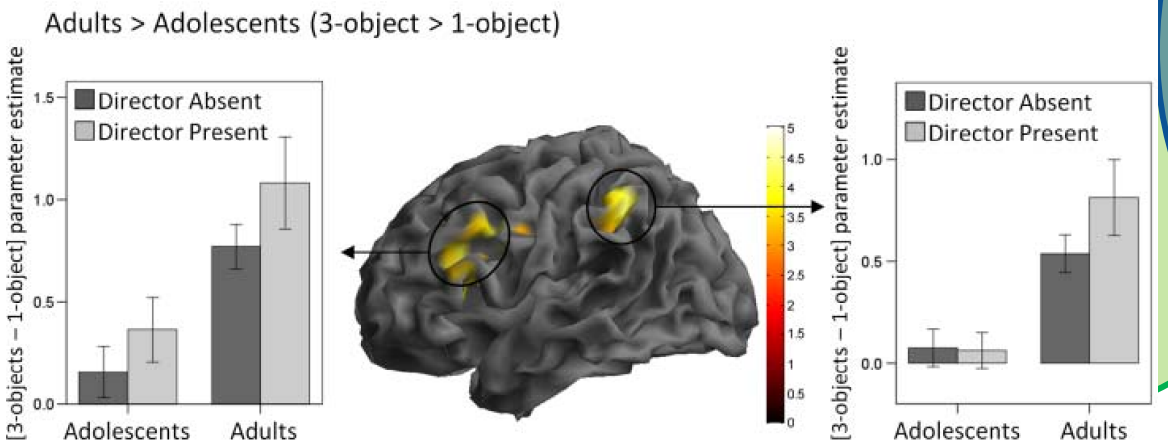
What is behind these developmental differences?





Director x Object*
Director x Object x Age group*

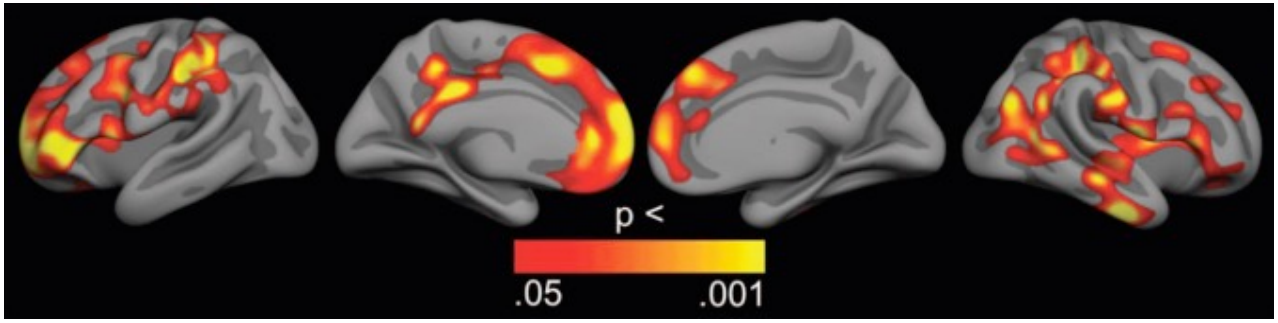




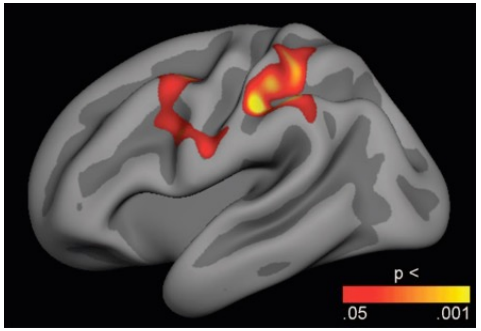
Dumontheil, Kuster, Apperly & Blakemore *NeuroImage* 2010
Dumontheil, Hillebrandt, Apperly & Blakemore *JoCN*, 2012

What is behind these developmental differences?

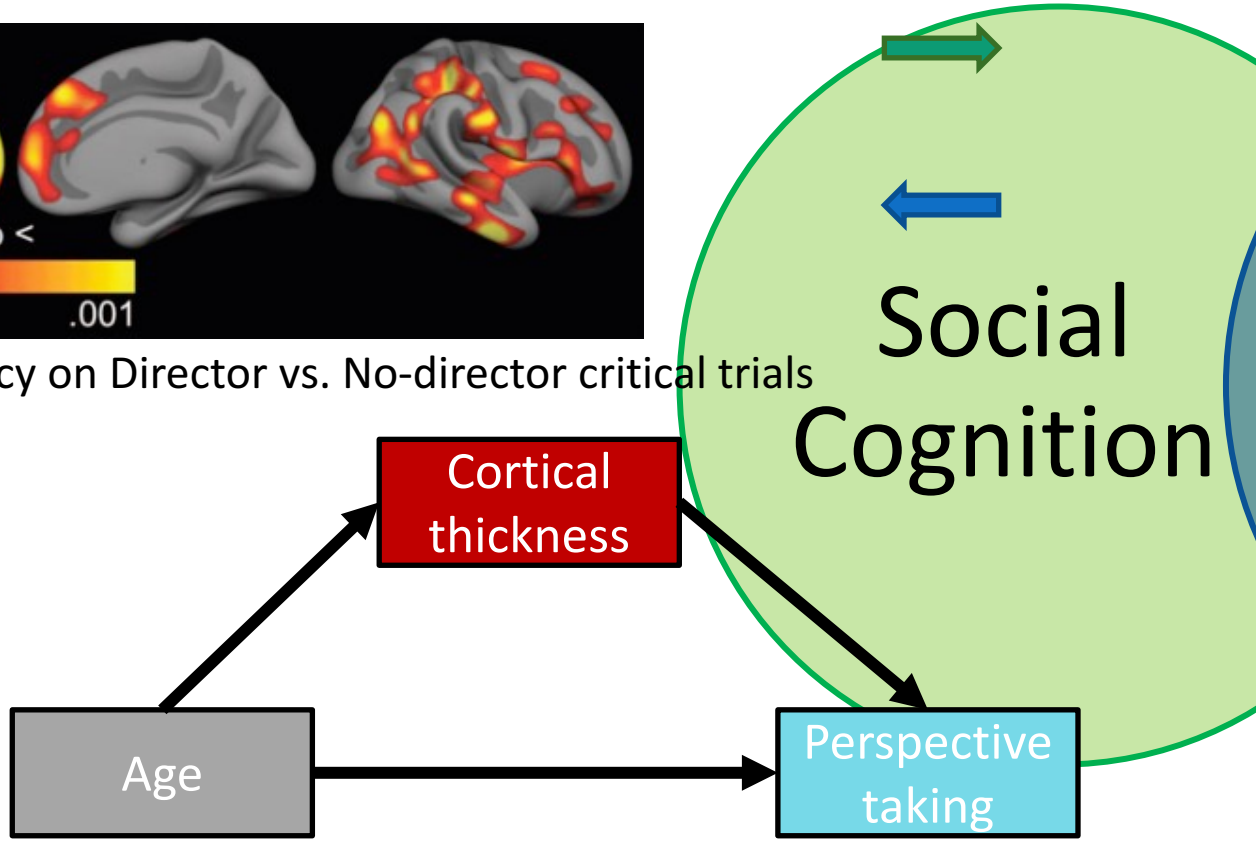
N=226, 8.5–26.7y



Thinner cortex <> better accuracy on Director vs. No-director critical trials



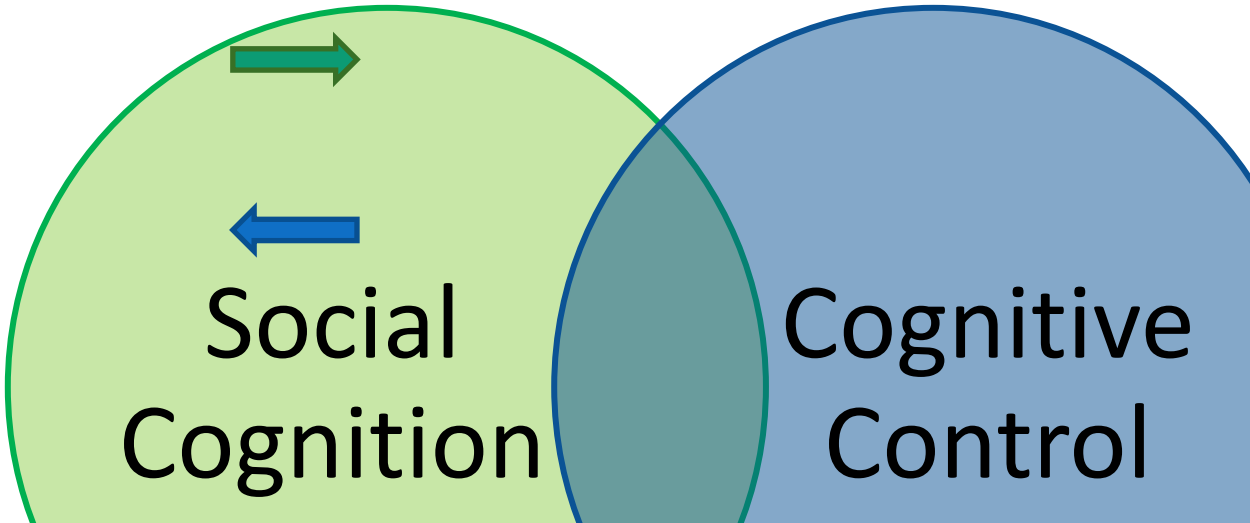
Controlling for age



Tamnes, Overbye, Ferschmann, Fjell, Walhovd, Blakemore & Dumontheil *Dev Psychology* 2018

Conclusions

- Online use of perspective taking increases during adolescence
- Both cognitive control maturation and possibly increased specificity of MPFC activation for the use of ToM may play a role in these developmental changes



… but still, why adolescence?

Who we are

The Centre for Brain and Cognitive Development (CBCD) was founded in 1998 at Birkbeck, University of London and is directed by Professor Denis Mareschal. It has grown steadily and is now internationally recognised as one of the leading centres of its kind in the world.

The work of CBCD members is characterised by its use of converging methods (behavioural testing, eye tracking, ERP, EEG, optical imaging, EMG, computer modelling, functional and structural MRI), and by its theory-driven programmes of empirical research on visual, cognitive, and language development in human infants, children and adults.

The work undertaken at CBCD is only possible through the generous support of our many funders, Birkbeck and the numerous families and children who have volunteered their time.

CBCD biannual report download (PDF)

Thank you!

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