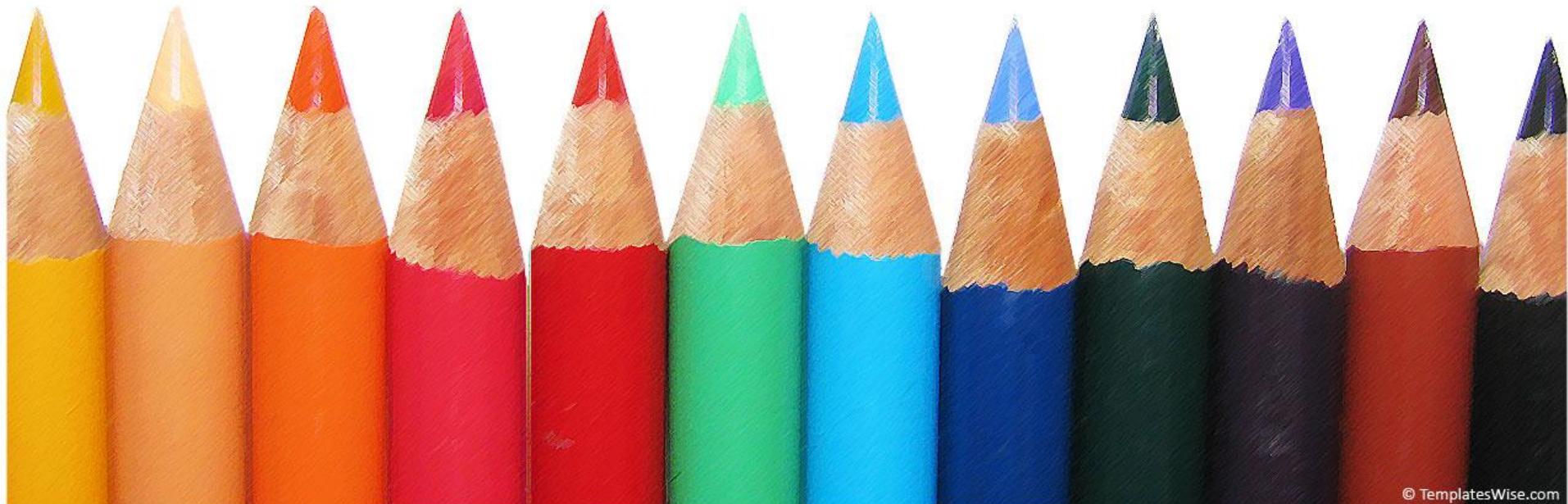


# THEORY OF MIND

Dr Penny Tok





Satellite



Traffic

United States

Mexico

North Pacific Ocean

North Atlantic Ocean

South Pacific Ocean

South Atlantic Ocean

Indian Ocean

Southern Ocean

2000 mi  
2000 km

# More about me

- [www.autismsupportsite.wordpress.com](http://www.autismsupportsite.wordpress.com)
- Facebook:  
<https://www.facebook.com/AutismResearchSingapore>
- Email: [penny.tok@mail.muni.cz](mailto:penny.tok@mail.muni.cz)
- Room: 2.53 but meetings **by appointment only**





# Today

- Course outline
- Assignments and tests
- Theory of Mind (ToM)- what is it
- Why do we need it?
- Theories on ToM

# Course Outline



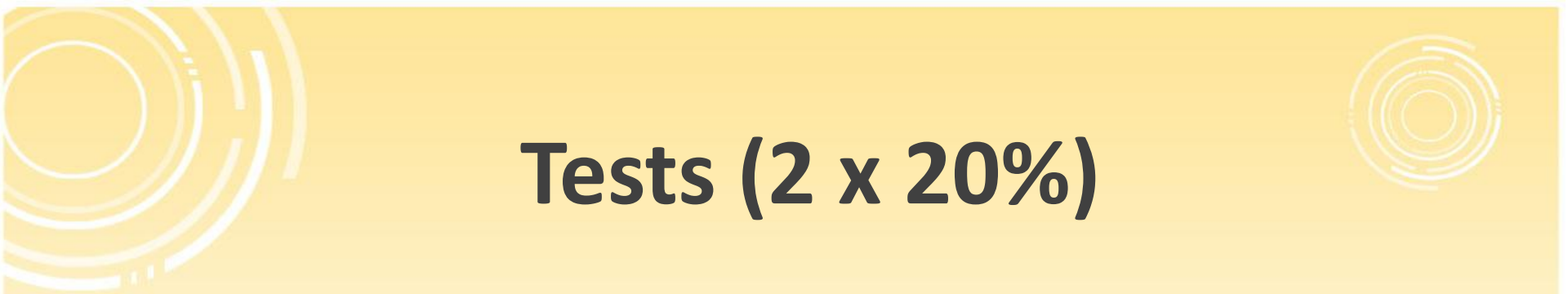
- Lectures followed by seminars 1.5 hours in all
- Wednesdays 12.00 – 1.30pm
- Participation
  
- Dates:
- 20/2, 27/2, 6/3, 13/3, **20/3**,
- 27/3, 3/4, **10/4**, 17/4, **24/4**

# Assignments



Assignment type	Marks	% of total course marks
TWO (2) in-class tests (Short answer questions) <i>DUE: 20/3 &amp; 24/4</i>	20 marks 20 marks	40% (20% each)
ONE (1) 1,000 word essay. <i>DUE: 3/4</i>	20 marks	20%
ONE (1) 20 minute group seminar presentation <i>DUE: 20/3 – 17/4</i>	20 marks	20%
ONE (1) 1,500 word essay based on your presentation topic <i>DUE 24/4</i>	20 marks	20%

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# Tests (2 x 20%)

**Short answer questions such as:**

- Define Theory of Mind and give THREE (3) examples on how it affects our daily lives (8 marks)
- Describe TWO (2) theories of Theory of Mind (6 marks)
- At what age are children considered to have effectively developed a Theory of Mind and why? (6 marks)



# Presentations (20%)

First presentation starts in **week 5**, so you should have formed your group by **Week 3**. Make sure you *tell me your group members* so that we can arrange the presentation dates.

You can:

1. Form your own groups (4 per group) and inform me
2. I will form them for you by drawing lots





# Presentations

- No more than 4 students per group
- Each will have to speak for 5 minutes
- No more than 20 minutes in total
- Bring your own laptop or check that your presentation works on the room computer
- Bring a FILLED IN copy of the presentation score sheet during your presentation

# Essay 1 (20%)

1,000 words

Summarise the differences between implicit and explicit mentalising abilities in humans and discuss the role of meta-cognitive on these two processes.

**Due: Week 7**





# Essay 2 (20%)

- 1, 500 word essay based on your presentation topic

**Due Week 9**

# Important note on essays

1. REFERENCING – APA style (in-text and bibliography)
2. PLAGIARISM <http://plagiarism.org/>
3. LATE SUBMISSION



# What is Theory of Mind?

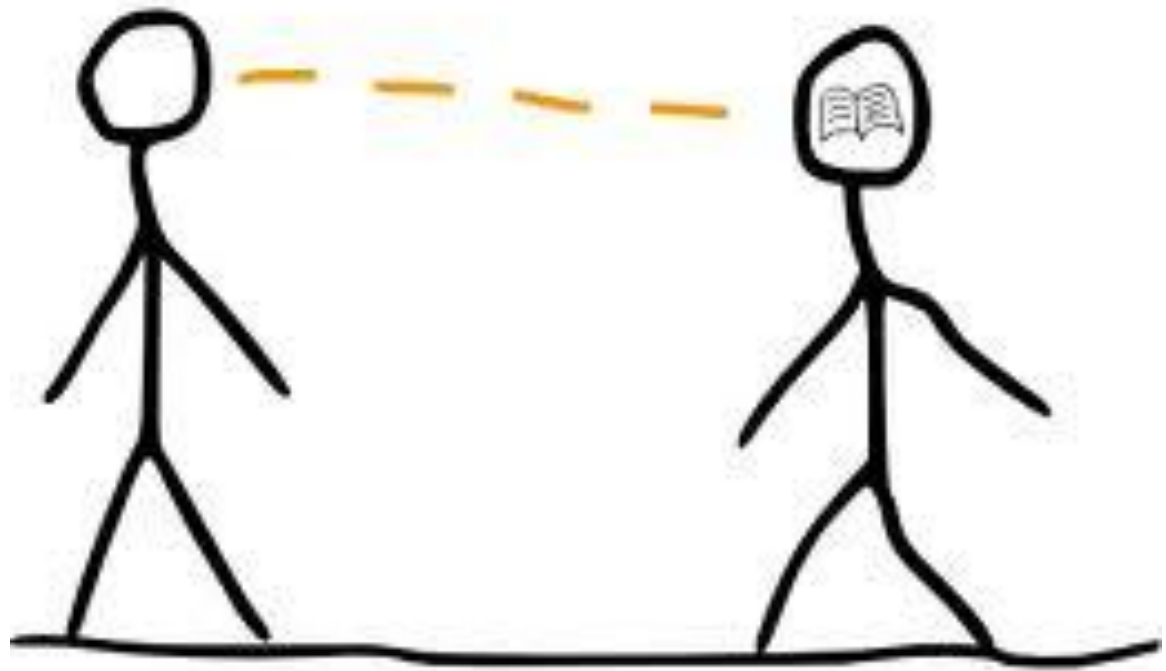
# What is ToM?

- Its an everyday or folk psychology
- Seeing other people and ourselves in terms of mental states
- Understanding that other people have thoughts, emotions, beliefs and preferences that are *separate from our own*.



# Why is ToM important?

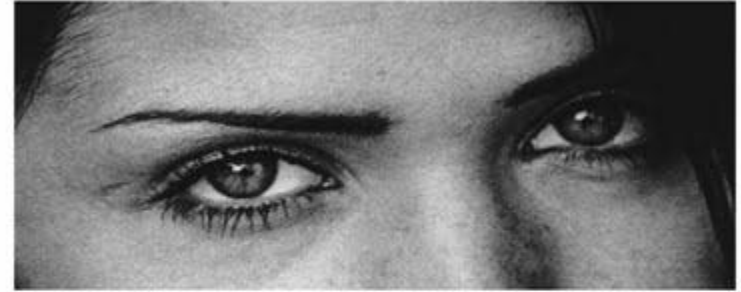
## When do we do it?



<https://www.youtube.com/watch?v=UomW6utuKD0>

<https://www.youtube.com/watch?v=PWMsoKk1nuU>







1) Helps us to comprehend and explain others actions



2) Helps us to predict others behaviour



3) Manipulate others behaviour



SANDY HOOK ELEMENTARY

# WHAT HAPPENED?





1) George likes to go to the gym in the morning, but he forgot it was closed on Mondays, so when he got there he just went straight to work.

2) George usually goes to the gym in the morning but when he got there today it was closed, so he just went straight to work.



*How do we  
do it?*

**Mental state understanding requires realising that such states *may reflect reality and may manifest in overt behaviour* but are nonetheless internal and mental and thus distinct from real-world events, situations or behaviours.**

**Wellman, Cross & Watson, 2001 , p. 655**

# Need to distinguish between:

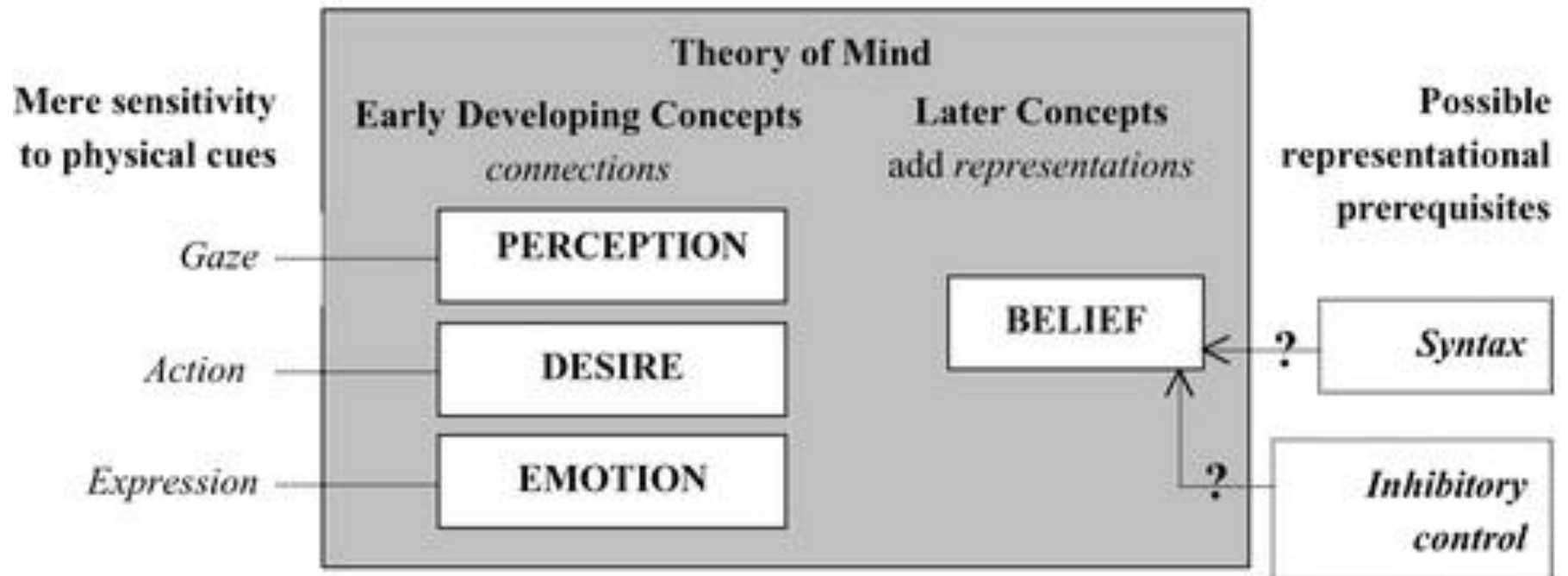
Attribution of  
desires,  
perceptions &  
emotions

Behavioural  
sensitivity to the  
associated  
physical cues



(a)

*Attributing mental states to other minds*



# What affects our development of ToM?

## Genetic influences

- Age
- IQ
- Language abilities



## Environmental

- Past experiences
- Family size (siblings)



# Theories of ToM

a. Conceptual Change account (Gopnik & Wellman, 1994; Wellman, 1990)

b. Theory of Mind Mechanism (Leslie, 1987, 1994)

Modular approach

c. Simulation Theory (Gordon, 1986, Goldman, 1989)

Theory-theory

# Conceptual change account



Emphasises that mental states are *theoretical constructs* that can be used in order to generate *expectations* about how people will *act* in a given situation.

## Assumptions:

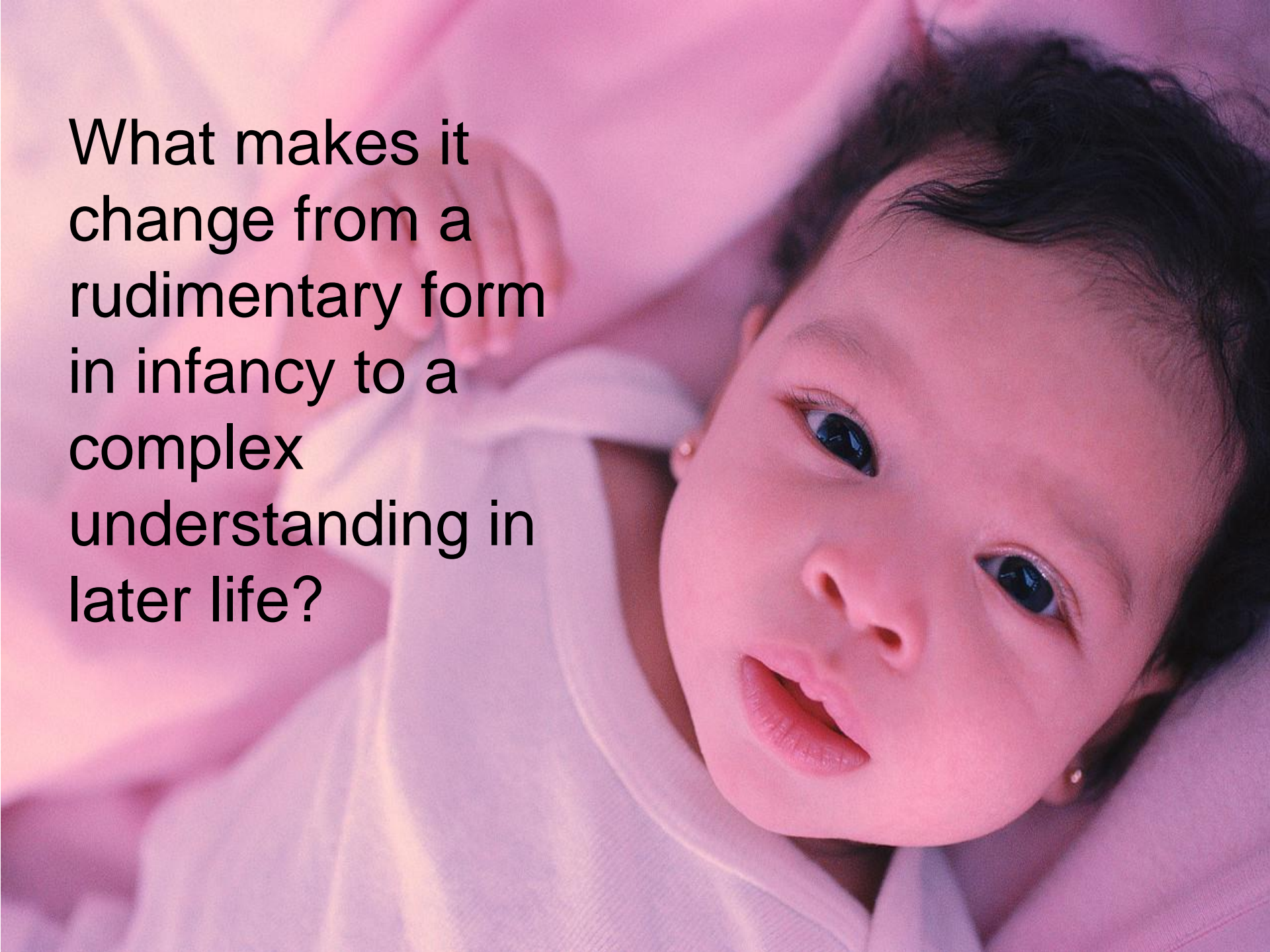
1. Even infants are presumed to have some ***innate understanding*** that behaviours are motivated by internal mental states.
2. Children change through a series of ***qualitatively different*** understandings of how mental states affect behaviour

3. Reaches an ***adult-like state*** of understanding at about ages 3-4

***4. Domain general***



What makes it change from a rudimentary form in infancy to a complex understanding in later life?



Similar to how scientists change their theories based on empirical evidence, children adapt their 'theories' based on their experiences and knowledge. Children as little scientists.

(Gopnik & Meltzoff, 1996)





# Support for conceptual change

Two lines of evidence :

- 1. Difference between 3 year old understanding and a 5 year old.**

Qualitative changes in ToM understanding support the idea of children going through different phases of understanding how mental states relate to the world



AFP/Getty Images

## 2<sup>nd</sup> piece of evidence :

Individual experiential factors seem to affect ToM development- such as 'motherese' (see Taumoepeau and Ruffman, 2008), number of siblings and social-economic factors



The same two points can be used as evidence for alternative theories of ToM development!



# Theory of Mind Mechanism

***Domain specific*** capacity that allows meta-representation of mental subserved by a specific cognitive mechanism: TOMM (Leslie, 1987, 1994)

Part of the core architecture of the human brain *specialised* for learning about mental states


Concepts are introduced into our system by a *mechanism* (like how colour concepts are introduced by mechanisms of colour vision).



Aim of the ToM mechanism is to:

- Permit
- Promote
- Direct attention

To these mental states in order to learn about them.



The outputs of ToMM are descriptions of psychological states in the form of *metarepresentations* or *M-representations*, that is, **agent-centered** descriptions of behaviour.

# Assumptions

1

- Presence of a powerful representational system for representing beliefs and desires.

Made possible by ToMM

2

- Successful reasoning recruits inhibitory selection process (SP)

Between possible others

3

- True belief default



# Supporting evidence

Saxe, et al. (2004): distinct brain regions selectively engaged when people reason about the contents of other's beliefs.



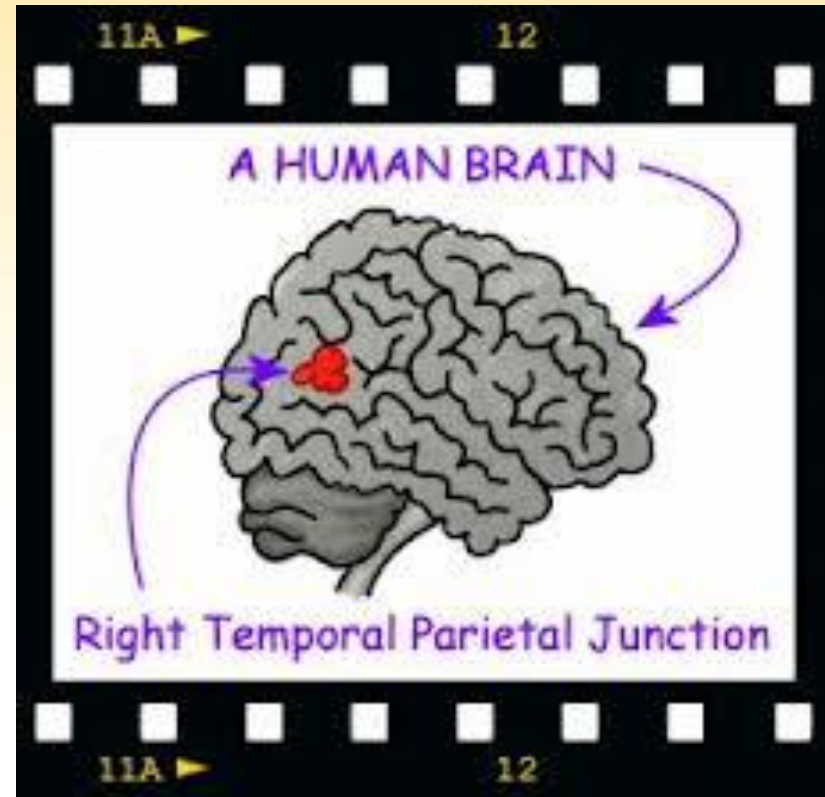


**Social brain**

Rebecca Saxe

<https://www.youtube.com/watch?v=uY6GxjL8RVQ>

- ToM : Domain specific processing machinery
- Two stages of development result from the appearance of two distinct mechanisms rather than from the gradual enrichment of a single mechanism







[https://www.youtube.com/watch?v=MapnGqrY\\_jw](https://www.youtube.com/watch?v=MapnGqrY_jw)



# Simulation Theory

- Denies that we come to understand others through deployment of a theory
- Instead we use our OWN mind to understand others
- Rejects theoretical inference



Basic tenet: put yourself in someone else's shoes and you will be able to simulate them as well as predict and explain their behaviour

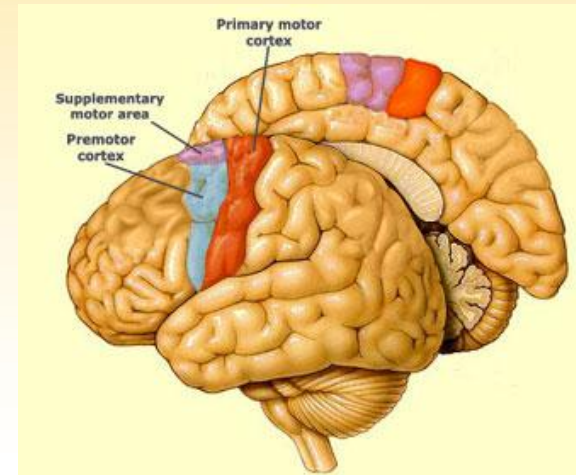
Match or track states by comparison with one's own



# Supporting evidence



- Mirror neurons: initially found in macaque monkeys



- Acts as a simulation of observed behaviour
- Can imitate the task and potentially understand the intent behind the behaviour





# Start thinking about...

- Forming your groups and choosing a topic
- Read through the course outline and take note of the details for the assignments



Read the readings for next week:

- Liu, D., Wellman, H. M., Tardif, T., & Sabbagh, M. A. (2008). Theory of mind development in Chinese children: a meta-analysis of false-belief understanding across cultures and languages. *Developmental psychology, 44*(2), 523-31.
- Onishi, K. H., & Baillargeon, R. (2005). Do 15-month-old infants understand false beliefs? *Science (New York, N.Y.), 308*(5719), 255-8.
- Perner, J., & Ruffman, T. (2005). Infants ' Insight into the Mind : *Science, 308*(5719), 214-216.