

## Introduction

Adults understand that others have hopes, desires, beliefs and intentions => mental states. These inform how an individual acts. Our appreciation that other people are similar in this way is 'theory of mind'. Believed to develop in first 4 years of life.

There are parallels between ToM and **Piaget's** concept of egocentrism. Up to 6-7 y.o. **Piaget** argues children cannot detach themselves from their own perspective of the world - makes them unable to understand that others have different perspectives - e.g. three mountains task. Only once they have their own ToM can they appreciate the perspective of others.

**Donaldson's** subsequent research shows children not as egocentric as **Piaget** believed - establishing a ToM occurs earlier in development.

**Premack and Woodruff** definition of ToM: An individual has ToM if they impute mental states to themselves and others. ToM is a theory, as the states are not directly observable and can be used to make predictions about others.

**Premack and Woodruff** used an experiment on a chimp, Sarah, to demonstrate ToM. Of 24 pairs of photographs shown, 21/24 that solved a problem for someone else (e.g. a key for getting out of a cage) were selected. They concluded it showed she could understand another's intentions. **Dennett** criticises - arguing Sarah could have passed the task without reflecting on other's states but by simply applying her own knowledge - the *external contingencies* of objects - e.g. cage and key go together.

He argues that the way to understand if ToM is present is by reference to situations where someone's knowledge of the world is different to the real state. This can be achieved by using a situation known as an unexpected transfer task.

## Book 3 Chapter 6 - Understanding Minds

### **Unexpected Transfer Task**

**Wimmer and Perner** - Maxi task. Chocolate in blue cupboard; mother moves it to green cupboard; when Maxi returns, where will he look for it?

3 y.o. - 0% correct  
4-5 y.o. - 57% correct  
6-9 y.o. - 92% correct

Later refinements (e.g. Sally/Anne) minimise further skills required such as language, but still show ToM develops around 4 y.o.

Cross-cultural research - e.g. **Avis and Harris** in Cameroon, show similar findings in non-Western cultures.

Young children are therefore realists - they believe people behave how the world is. At 4y.o., they start to metarepresent - the ability to hold more than one representation at once, e.g. in the UTT.

False beliefs are a common feature of life. Deceptive box (smarties) test - **Gopnik and Astington** shows when children start to understand their own false beliefs.

Smarties tube, sealed, shown to child who is asked to say what's inside - opened to reveal pencils. Sealed again. Child asked to say what they believed it contained before it was opened. Younger children will say 'pencils'. Puppet introduced - will he believe it contains smarties or pencils? - Again, younger children say 'pencils'. It's not embarrassment at giving the wrong answer - **Wimmer and Hartl** introduced a 'silly puppet' who always got things wrong with no significant difference in the results.

## **Jokes, irony, sarcasm - second order ToM**

Development of ToM leads to other skills - e.g. the ability to spot explicit and implicit meanings in jokes such as 'Where are the Andes?' Sarcasm and irony show similar pattern of development - e.g. 'You've done a really good job of tidying your room' - when it isn't.

This requires second-order ToM - the ability to attribute beliefs about beliefs or intentions. Develops around 6-8y.o.

**Sullivan et al** studied 48 children using stories to determine their second-order ignorance (does John know that Mary knows x) and second-order belief understanding (what does John think that Mary thinks). Assessed ability to distinguish lies from jokes.

Results show children only distinguish lies from jokes after they can attribute second-order ignorance, but before they could attribute second-order false belief.

The skill required to tell a joke from a lie is therefore the ability to appreciate what different people do/do not know, not the skill to reflect on the knowledge people have about others' minds.

### **Improved social interactions**

**Ashington and Jenkins** - assessed ToM skills of 30 children, 3-5 y.o. 10 minute sessions of pretend play observed. Measured 'joint proposals' - good ToM skills => more joint proposals. Concluded there was an association between ToM skill, ability to reflect on own desires and incorporate their partner's desires during play but did not establish a causal relationship.

A subsequent study used a longitudinal design to establish a causal relationship; 20 children aged 3 and 4 on 3 occasions over 7 months. On each occasion they were given a series of false belief tasks and video-recorded in pretend play with a friend.

Measured amount of pretend play, joint proposals and explicit role assignment ('let's be x now').

No evidence found that social behaviour predicts ToM - but performance on ToM understanding predicted number of joint proposals / role assignments.

### **Bullying**

Development of ToM brings an improved capacity to bully and lie as more sophisticated strategies become available for use. This contrasts with the image of the 'oafish' bully.

Studies show 'ringleader' bullies score higher on understanding emotional/cognitive content of other people's minds c.f. 'follower' bullies, victims or defenders of victims. (Sutton et al).

### **Developing a ToM**

(a) Everyday life - using mental state terms

**Wellman and Bartsch** - 10 children, aged 2-5. 200,000 utterances examined for desire-based terms and belief based terms. 12,000 identified - 6% of total.

Age based trend from desire -> own desires and others' desires. Children pass tests for an understanding of desires before false belief understanding.

**Repacholi and Gopnik** - Broccoli. 14m.o. respond egocentrically - always offering their preference (biscuit) to the researcher despite their stated preference for broccoli. 18m.o. inferred broccoli was wanted - even if it conflicted with own preference.

A critical shift occurs at around 18m.o. when children appreciate others may have different desires.

(b) Associated cognitive skills

Learning about people is inborn or develops very rapidly after birth. E.g. ability to discriminate between faces, voices, movement; need to interact;

Turn taking. This forms the executive function. Two important skills are joint attention and understanding intentions.

Joint attention - **Charman et al.** 13 tested at 1;8 and again at 3;8 (Longitudinal study).

1<sup>st</sup> occasion - # times gaze switched between a noisy toy and adult/experimenter recorded. # times child looked at adult when toy removed or hands held so they could not reach it. Observed the extent the child engaged in pretend play. A final measure was of imitation.

2<sup>nd</sup> occasion - ToM tests administered. Only joint attention @ 1;8 associated with 3;8 ToM ability - as joint attention has a directly social goal.

(c) Understanding intentions - Meltzoff

40 children, 18m.o.. watch an adult try to pull apart a toy and fail. Control group saw this happen successfully.

All children given the toy. Children who saw the failed attempt more likely to pull it apart than those who had not seen any demonstration.

Same experiment repeated but with mechanical hands. Human demonstration 6x more likely to have been 'understood'.

Results imply 18m.o. can understand and appreciate intentions.

### **Social Factors and ToM**

**Vygotsky** - perspective is that development of ToM occurs as it is a fundamentally social skill.

Social interactions

(a) Interaction with siblings: **Jenkins and Ashington** found false belief scores increase with the # siblings and compensates for lower language ability.

**Ruffman et al:** 444 English and Japanese children 3;1 to 6;11. Number of ToM tests passed increases with # older siblings a child has - possibly due to more opportunities for pretend play, teasing, talk about feelings.

(b) Interaction with adults: **Lewis et al;** 82 Greek pre-school children and 75 from Cyprus studied. Contact patterns with adults established and ToM tests conducted. Results similar to **Ruffman et al** - performance on tests improves with # adult kin or # adults in contact with the child.

### **Communication**

(a) Language use in family - 3 factors found to relate to children's belief understanding (**Ruffman et al**).

- i) Age of child
- ii) # older siblings
- iii) # times child was disciplined by asking how they thought the other person would feel.

Implication is that asking children to reflect on mental states facilitates ToM development.

(b) Other forms of communication - e.g. deaf children

**Woolfe et al** - late signers show less well developed ToM than native signers of 4y.o. hearing children.

Implication is that access to conversation, regardless of medium, is important in developing ToM skills.

### **Gender**

**Charman et al** - study of 1,500 children 2;4 to 6;3 shows slight advantage to girls when younger than 4;8 on false belief tasks. Older than this, the difference is not present.

### **Conclusion**

Balance of research shows a strong relationship between social environment and cognitive development - supporting **Vygotsky**.

**Piaget**'s views are not ruled out, as factors in creating a ToM interact, so the idea children theorise themselves has not been shown to be incorrect.

There is a complex transactional relationship present between social environment and cognitive development which can be seen clearly when considering ToM development.