

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



علوم شناختی

جلسه ۲۴ (ب)

فراپازنمایی، اوتیسم و نظریه‌ی ذهن

Metarepresentation, Autism, and Theory of Mind

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PART 3: APPLICATIONS



Chapter 13: Exploring Mindreading



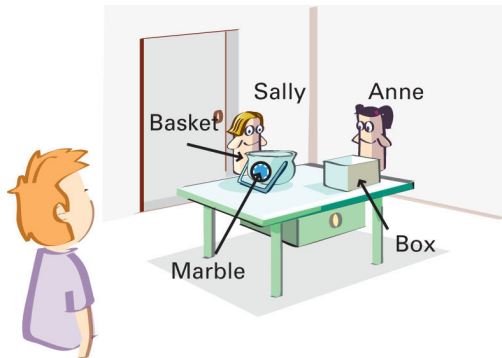
Chapter 13.2: Metarepresentation, autism, and theory of mind



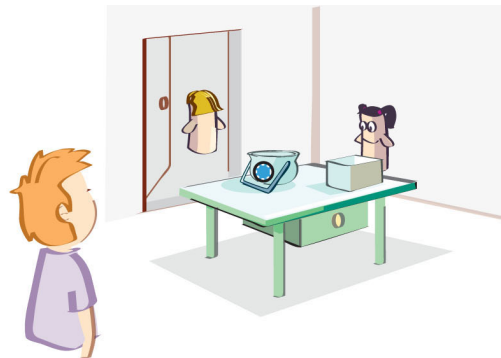
False belief task

- Autistic children have problems with pretend play.
- Three groups:
 - autistic children
 - children with Down syndrome
 - children with no cognitive or social disorder

False belief task



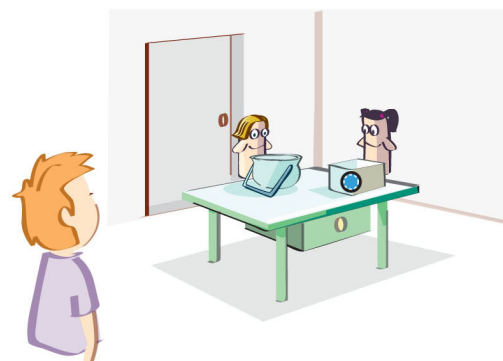
(a) Sally places her marble in basket.



(b) Exit Sally.



(c) Anne transfers Sally's marble to box.



(d) Re-enter Sally. The experimenter asks:
Where will Sally look for the marble?

Young children typically
pass at 4 years

Pretend play and success on the false belief task

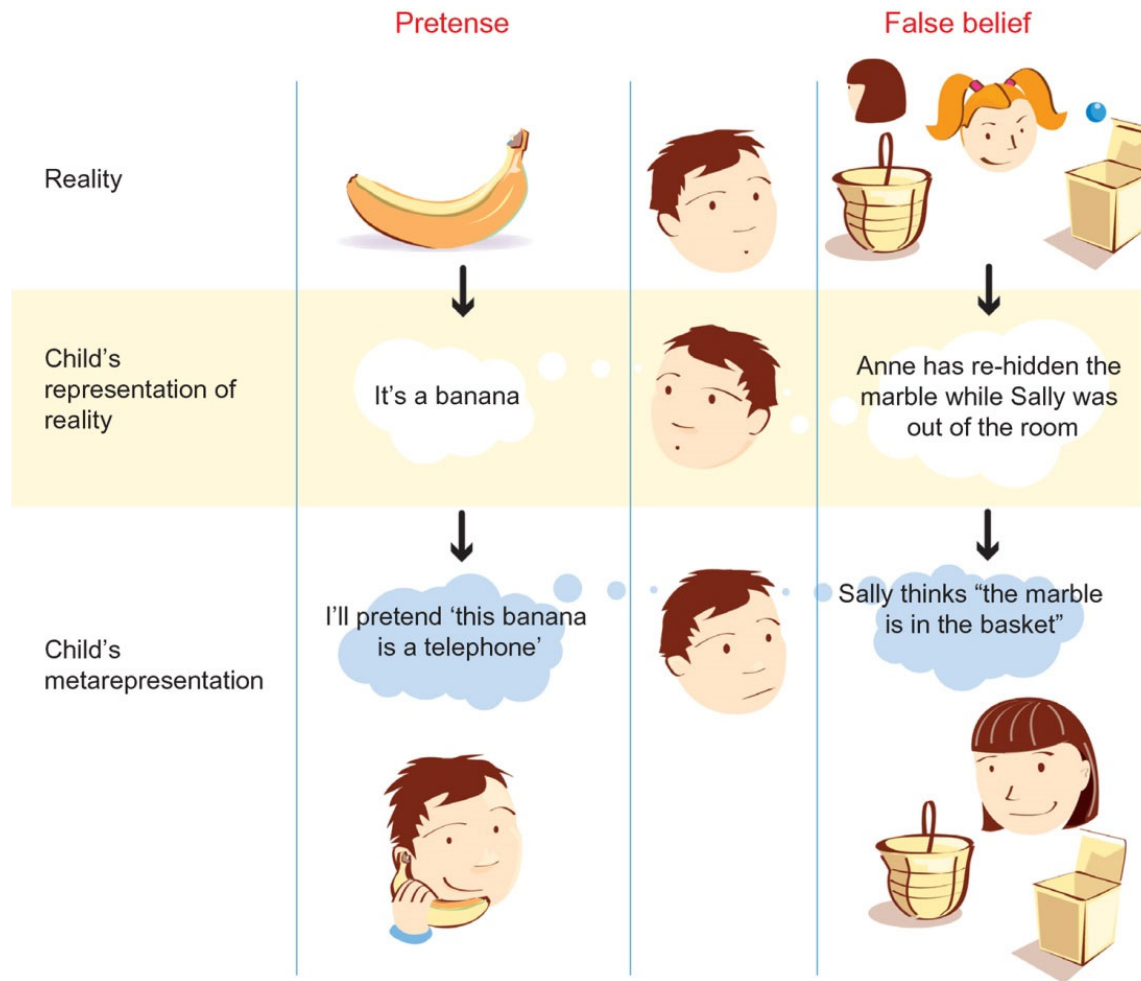
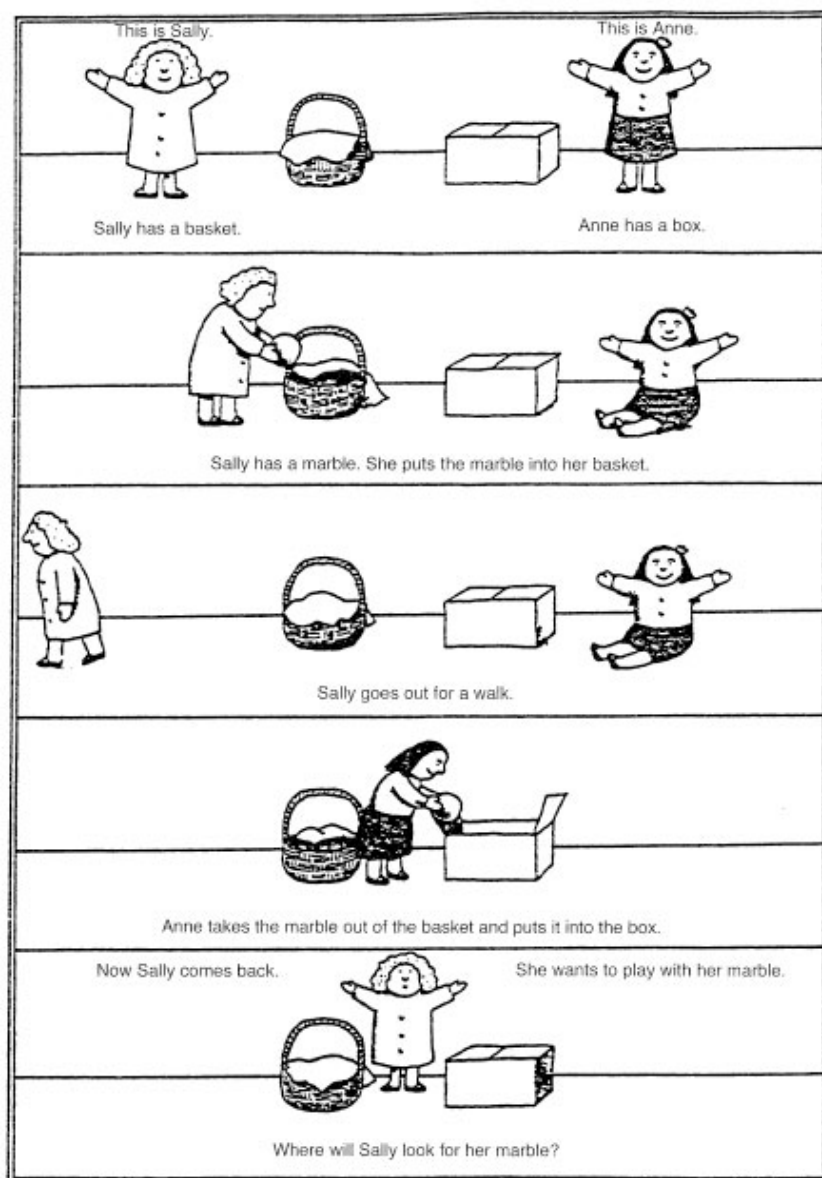


Illustration of the connection between pretend play and success on the false belief task.



Sally-Anne task

POPULATION	MEAN VERBAL MENTAL AGE	MEAN NONVERBAL MENTAL AGE
Normal group	4;5	4;5
Down syndrome group	2;11	5;1
Autistic group	5;5	9;3

Three questions

- (1) Where was the marble in the beginning? **[Memory]**
- (2) Where is the marble really **[Reality]**
- (3) Where will Sally look for the marble? **[Belief]**

Results

- All children from 3 groups answered Memory and Reality questions successfully
 - 85% of Down syndrome and normal children passed Belief question
 - 80% of autistic children failed Belief questions
- Leslie, Frith, and Baron-Cohen concluded that both pretend play and mindreading depend upon a single mechanism for metarepresentation

Questions

- 1) How should we think about the time-lag between pretend play and passing false belief task?
 - Leslie: ToMM is in place at 2, but cannot attribute false beliefs until nearly 4.
 - Perner: pretend play does not involve metarepresentation

- 2) Must we think about mind-reading as a theoretical achievement?

Onishi & Baillargeon (2005)

- The false belief task by Baron-Cohen, Leslie, and Frith is a verbal test.
- Verbal tests make additional computational demands.
- It is possible that young children fail the task because of these additional computational demands.

A less demanding false belief test

- Used a violation of expectations paradigm
- 15-month-old infants were familiarized to an actor searching for a toy in one of two boxes (yellow and green, respectively).
- They were then presented with different conditions.
 - In one condition the toy was moved from one box to the other with the actor clearly watching.
 - In a second condition the toy was moved in the absence of the actor.
- After the toy was moved the actor then looked for the toy in one of the two baskets.

Result

- **Hypothesis:** the length of time that the infants looked at each of the scenarios would be a guide to their implicit understanding of false belief.
- **Result:** Infants looked significantly longer when the actor searched in the yellow box than when the actor searched in the green box, even though the toy was really in the green box.
- **Conclusion:** Infants have an understanding of false belief much earlier than suggested by the traditional false belief task.

Interpretation

- The original, verbal false belief experiments test for a cognitive ability considerably more sophisticated: they are directly targeting explicit conceptual abilities manifested in verbal responses and explicit reflection.
 - **Explicit understanding** of the false belief
- The Onishi and Baillargeon experiments test the nonverbal expectations that young children have about behavior and how behavior is affected by what an agent has and has not observed.
 - **Implicit understanding** of the false belief



CHAPTER THIRTEEN

Exploring Mindreading

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Overview

This chapter introduces what is often called *mindreading*. This is a very general label for the skills and abilities that allow us to make sense of other people and to coordinate our behavior with theirs. Our mindreading skills are fundamental to social understanding and social coordination.

The dominant model of mindreading in cognitive science emerged from studies of pretending in young children. Section 13.1 presents the information-processing model of pretending proposed by the developmental psychologist Alan Leslie. In Section 13.2 we build up from pretending to mindread, looking in particular at the *false belief task*, which tests young children's understanding that other people can have mistaken beliefs about the world.

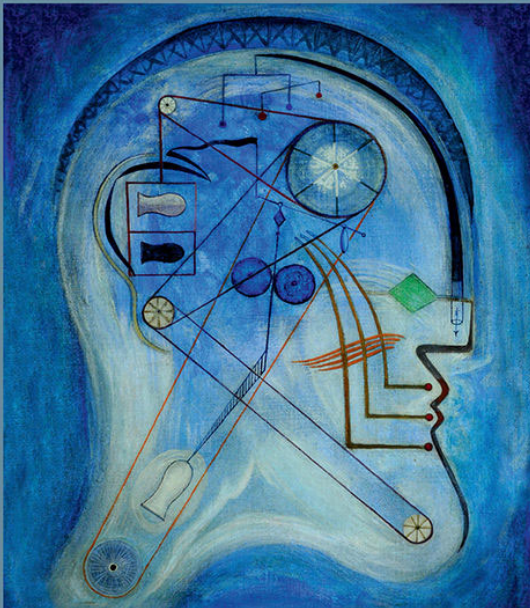
The central feature of Leslie's model is what he calls the *theory of mind mechanism* (TOMM). The TOMM's job is to identify and reason about other people's *propositional attitudes* (complex mental states, such as beliefs, desires, hopes, and fears). Section 13.3 introduces a model of the entire mindreading system developed by the developmental psychologist and autism specialist Simon Baron-Cohen in response to a wide range of experimental data both from normal development and from autism and other pathologies.

José Luis Bermúdez

Cognitive Science

An Introduction to the Science of the Mind

Third Edition



José Luis Bermúdez,
Cognitive Science:
An Introduction to the Science of the Mind,
3rd ed., Cambridge University Press, 2020.
Chapter 13 (Section 13.2)