A Nonverbal False Belief Task:
The Performance of Children and Great Apes
Josep Call and Michael Tomasello, 1999

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Review of Traditional Theory of Mind Tasks
- Test knowledge of understanding of false belief in others
- Sally/Anne hiding finding game – Sally and Anne are in a room together. Sally hides an object and leaves the room. Anne moves it to another location. Sally returns. Experimenters ask the audience where Sally will look for her object.
- 3-4 year olds generally fail, 4-5 year olds succeed

Shortcomings of Traditional False Belief Tasks
- Require advanced linguistic structures (sentential complements)
- Require child to inhibit knowledge of reality
- Cannot be used with nonverbal organisms

Participants

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>Reward</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-5 yr olds</td>
<td>14</td>
<td>sticker</td>
</tr>
<tr>
<td>Chimps and Orangutans</td>
<td>9</td>
<td>grapes and oranges</td>
</tr>
</tbody>
</table>
Experimental Design

- Variation of a traditional hiding/finding game

Main Test: Communicator watches the Hider hide a reward in one of two containers and then leaves the room. The Hider switches the containers. The communicator returns and indicates which container has the reward. Participants are asked to locate the reward.

Steps of Reasoning

1) Communicator indicates that the reward is in the container where she saw it hidden
2) The containers were switched
3) The reward is in the other location

Differences in Ape Experiment

- Many more trials performed
- Communicator never leaves the room but instead turns away from the setup
- Controls performed again after false belief task
- In the modified version, the marker was left on the bucket while the apes selected the bucket containing the reward

Control Tests

Check competency in skills needed to successfully perform the task other than understanding of false belief

- Understanding of Indication Method - Behind barrier, Communicator watches Hider place reward in bucket. Communicator indicates bucket to participants.
- Visible Displacement - Communicator indicates reward’s location. Hider opens the container and moves the reward.
- Invisible Displacement - Same as visible but containers are switched and participants do not see the object.
- Ignoring Communicator - Hider hides reward. Communicator leaves. Hider switches buckets. Communicator returns and indicates bucket with reward (the wrong container)

At the end of each test, participants are asked to choose the bucket containing the reward.
Results with Humans

- Percentage of correct trials comparable between nonverbal and verbal tasks
- Individually, children who scored well in one scored well in the other
- Consistent with past results that performance increases with age

Consequences validates nonverbal task as indicator of understanding of false belief

Whorfian Consequences?

Apes’ failure in the false belief task is consistent with Whorfian claims that language is needed for understanding concepts.

Results with Chimps

Chimps notably perform BELOW chance

Possible reasons for failure:
- Still too cognitively demanding
- Communicator staying in room
- Apes don’t have theory of mind
- Leaving marker on may have confused chimps

Figure 6: Mean (SD) percentage of correct trials in the three modified control tests and the false belief test during the follow-up phase. *p < .05.