FAST-TRACK REPORT

Young children have difficulty ascribing true beliefs

Kevin J. Riggs and Andrew Simpson

Department of Psychology, London Metropolitan University, UK

Abstract

Using the format of a false belief task (Wimmer & Perner, 1983), we investigated the ability of 88 3- and 4-year-olds to ascribe a previously held true belief to a story protagonist. In an unexpected transfer task, children found true belief ascription as difficult as false belief ascription even though they could answer memory questions about story details. Results are discussed in relation to theoretical accounts of theory of mind development that stress the importance of understanding the falsity of belief, and those accounts that stress the importance of information or executive processes.

Introduction

Children develop an understanding of many of the mental states that constitute a theory of mind over the first four years of life. For example, Wellman and Bartsch (1988) showed that 2-year-olds understand the relation between desire and behaviour, and 3-year-olds the relation between true belief and behaviour. In their true belief task children were told a story in which two objects were placed in two locations with the protagonist seeing (and therefore forming a belief about) one of the objects in one location. Three-year-olds were asked to predict where the protagonist would look for the object. Around two-thirds of children answered correctly and the authors concluded that 3-year-old children understand about true beliefs.

An important landmark in the acquisition of a theory of mind is reached when children understand the relation between false belief and behaviour around 4 years of age. In a typical unexpected-transfer false belief task, children watch as a story protagonist places an item in location A then leaves. In his or her absence, the item is transferred to location B and children are asked where the protagonist thinks the item is, or where the protagonist will go to get the item. Passing the false belief task is seen as an important landmark because it meets an important requirement for crediting the child with understanding mental states in others. This requirement is that we are certain the child’s response is based on the protagonist’s belief and not based on the child’s own knowledge of current reality. False belief tasks meet this requirement because the child’s own belief (their knowledge of current reality) and the protagonist’s false belief differ.

A number of recent studies have looked at children’s understanding of both true and false beliefs (e.g. Garnham, & Ruffman, 2001; Ruffman, Garnham, Import & Connolly, 2001) and these authors have concluded that children come to understand about true beliefs earlier than they understand about false beliefs.

In this paper we question whether children understand about true beliefs earlier than they understand about false beliefs. We question it because no true belief study to date has applied the above requirement to tasks assessing children’s understanding of true belief: children could have answered correctly by reporting what they knew to be currently true. Therefore, to assess true belief understanding, we need a true belief task that – like the false belief task – allows us to differentiate belief-based responses from responses that are based on the child’s own knowledge of current reality. Such a task is possible if we ask children to ascribe a past true belief to a story protagonist. When we ascribe past true beliefs to another person, the content of that belief can differ from what we (ourselves) know to be currently true. For example, I know that earlier today Chris believed (truthfully) that he was in his kitchen – I also know that he is currently in his office.

Wimmer and Hartl (1991) and Saltmarsh, Mitchell and Robinson (1995) report true belief studies that seem to meet the requirement outlined above. In a deceptive box task children were shown either a matchbox or a chocolate box and asked what they thought was in the
box. After the (unexpected) content was revealed children were asked the following false belief question: ‘When I took the box out of my bag, what did you think was in here?’ In a different part of the experiment children were introduced to a true belief-state change problem. In this task the box contained the expected content, but the content was then changed for something atypical while the child was watching. Children were much better at recalling their own initial true belief in the true belief state-change condition than their previously held false belief in the standard deceptive box task. However, Wimmer and Hartl’s own interpretation of these findings is that children glossed the belief question as a question about the box’s contents. Others (e.g. Perner, 1991) have raised a general concern about the validity of using deceptive box tasks to assess belief understanding at all (though see Saltmarsh et al., 1995).

Despite a number of studies reporting early true belief understanding, a few studies have reported children’s comparable performance on true and false belief tasks (Roth & Leslie, 1998; Surian & Leslie, 1999). For example, Roth and Leslie (1998) compared children’s performance on a standard false belief task to performance on a partial true belief task. In the partial true belief task the child and an actor saw the experimenter hide a coin under one of three paper hats. The actor left the room and the child was then asked where the actor would look for the coin upon his return. Children were no better at predicting behaviour in the partial true belief task compared to a standard false belief task. On the basis of these findings one might want to suggest that young children find true belief ascription as difficult as false belief ascription. However, we ought to be cautious about drawing this conclusion. Although Roth and Leslie (1998) constructed their partial true belief task to be similar to a false belief task, the task structure is very different from the standard unexpected transfer false belief task commonly reported in the literature. Perhaps children found the partial true belief task difficult because with three locations and two objects it was more taxing of working memory than the standard task with two locations and one object (although some early false belief tasks used three locations and one object (see Astington, Harris & Olson, 1988).

In summary, given the contradictory findings reported above, and concerns about the tasks used to assess true belief understanding, the aim of the present study was straightforward. Using an unexpected transfer task we sought to investigate whether children find it easier to answer questions about a protagonist’s past true belief compared to questions about a protagonist’s current false belief. We were also interested in children’s ability to recall past facts from the story and whether performance here differed from performance on either of the two belief questions. We also devised two versions of the true belief and memory questions to see if precise or imprecise time referencing in these questions (they both ask about an earlier time in the narrative) had an impact on children’s performance.

Method

Participants

Eighty-eight children (37 boys / 51 girls) aged between 36 and 48 months participated in the experiment (mean age 43 months). The children were from three different nurseries in a middle-class suburb of north London. Six children were excluded from the final analysis because they gave non-sensible responses or no response at all.

Design

Each child was given two stories and asked one question at the end of each story. All children had a false belief question at the end of one story. For the other story, half the children had a true belief question and half the children had a memory question. Half the children in the true belief-question group had this question in an imprecise form and half the children had it in a precise form. This also applied to children in the memory-question group. This design was chosen to minimize carry over or order effects due to repeat questioning. Both stories were based on a standard unexpected transfer false belief task. So for example in one story, Linda was sitting in her living room reading her book. Being thirsty she left her book on the floor and went to the kitchen to get a glass of milk. Linda’s sister then walked into the room and took the book upstairs to read.

Concerning this particular story there were five questions that could have been asked. A false belief question, two true belief questions (precise and imprecise) and two memory questions (precise and imprecise). The five questions were:

False belief question: Where does Linda think her book is?
True belief precise question: When Linda left the living room, where did she think her book was?
True belief imprecise question: In the beginning of the story, where did Linda think her book was?
Memory precise question: When Linda left the living room, where was the book?
Memory imprecise question: In the beginning of the story where was the book?
All question types and stories were counterbalanced across participants.

**Apparatus/materials**

Both stories were acted out using Play people (8 cm high), with models and props to the same scale.

**Procedure**

Each child was tested alone in a small room. After the child had been tested on the first story there was a 5-minute gap in which the child engaged in a filler task (playing football with the dolls) before being tested on the second story.

**Results**

Six of the 88 children were excluded from the final analysis because they failed to give appropriate answers. Of the remaining 82 children there were 42 children in the memory-question group and 40 children in the true belief group.

There was no significant difference in the number of correct responses to the imprecise and precise forms of the true belief questions (5/20 imprecise, 10/20 precise, $\chi^2 = 2.67, p = .10$) or the memory questions (17/21 imprecise, 19/21 precise, $\chi^2 = .78, p = .38$). In subsequent analyses the data across this variable were combined and are presented in Table 1.

We compared performance in the true belief question to performance in the false belief question. Ten children answered both questions correctly, and 22 children answered both incorrectly. Five children passed the true belief task but failed the false belief task. Three children responded the opposite way. There was no significant difference in the number of correct responses across the two questions (Binomial test (8,3) $p > .05$).

Memory question performance was very good with only 6 out of 42 children answering incorrectly. We compared performance in the memory questions to performance in both the false and true belief questions. There were significantly more correct responses to the memory questions than the false belief questions. Twenty-three children passed the memory questions but failed the false belief questions. Two children responded the opposite way (Binomial test (25,2) $p < .05$). There were more correct answers to the memory questions (36/42) than the true belief questions (15/40). This difference was significant ($\chi^2 = 5.8, p = .02$).

**Discussion**

Using an unexpected transfer task we found no difference in children's ability to ascribe true and false beliefs to a story protagonist. Moreover, performance in the memory questions was near ceiling, making it unlikely that problems with true belief ascription were due to problems remembering the whereabouts of story items at key times. Why children found the memory questions easier than past true belief questions – despite their apparent similarity – is unclear. One possibility is that answers to memory questions are recalled from memory, but answers to belief questions (true and false) are constructed or inferred (Peterson & Riggs, 1999). Another possibility is that children have a bias to respond on the basis of their own currently held true belief when asked about a protagonist's beliefs (true or false) but no bias when asked memory questions about reality (see Leslie, German & Polizzi, 2005, and Simpson & Riggs, in press, for more discussion on this point).

Our findings are consistent with those reported by Roth and Leslie (1998). Children's difficulty with true belief ascription extends beyond ascribing partial true beliefs to cases involving past true beliefs. Our findings also suggest that when children have to inhibit their own knowledge of current reality they have as much difficulty ascribing true beliefs as they do false beliefs. This in turn raises the possibility that good true belief performance reported in other studies (Wellman & Bartsch, 1988; Garnham & Ruffman, 2001; Ruffman et al., 2001) reflects the fact that children did not have to inhibit their own current knowledge of reality when answering the true belief question.

The findings reported here pose a problem for those theoretical accounts that stress the importance of false belief ascription in the development of a theory of mind (e.g. Perner, 1991; Mitchell, 1996). Rather, these findings suggest that children's difficulty with false belief ascription is symptomatic of a more general difficulty with the information processing or executive demands that both true and false belief tasks pose. Whether these demands are inhibitory in nature (e.g. Roth & Leslie, 1998; Russell, 1996) or reflect a difficulty with keeping information in

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Children’s responses to the belief and memory questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>True belief-question group</td>
<td>Memory-question group</td>
</tr>
<tr>
<td>False belief</td>
<td>True belief</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
working memory (e.g. Gordon & Olson, 1998) is currently being debated and is a topic for future research.

References


Received: 2 December 2004
Accepted: 13 January 2005