

Children's reasoning and the mind

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CHAPTER TWELVE

Children's understanding of belief: Why is it important to understand what happened?

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In this chapter we try to show that the mature concept of belief entails more than what usually is examined in developmental "theory of mind" studies. In particular we will argue that the concept of belief entails that the wrong thought which we took to be reality was caused in such a way that left no possibility other than to take it to be reality. In other words, we not only understand what we wrongly believed to be the case, but also that we did so for good reasons. In the case of false beliefs about simply situational facts (like what something is or where it is), these good reasons are important as they save our view of ourselves as healthy persons who are not hallucinating, and they also save our view of an orderly world where objects do not change their identity or their place in unpredictable ways. Understanding the causation of wrong thoughts about what is the case is also responsible for the fact that at times we find false beliefs so funny or tragic.

For the first author the issue of children's understanding of the causation of knowledge and belief has some tradition and what is proposed here is actually a reformulation of the theoretical stance originally formulated more than 10 years ago in Wimmer, Hogrefe, and Sodian (1988). The old formulation was that for mastering the false belief tasks developed in Salzburg (Hogrefe, Wimmer, & Perner, 1986; Wimmer & Perner, 1983), the child has to infer what another person believes from the misleading informational circumstances the other person was exposed to. The main hypothesis was that children below the age of 4 years or so lack the conceptual basis for the inference, namely an understanding of the causal relationship between informational circumstances on the one hand and resulting epistemic states on the other.

This informational causation account was a minority position at the first theory of mind conferences in Toronto and Oxford—only Alan Leslie shared the opposition bench (Leslie, 1988). The majority of researchers viewed young children's false belief problem and similarly their problem with the appearance-reality distinction as due to a more profound conceptual failure, namely as a failure to understand representational relationships in general and in particular the representational nature of mind states (e.g. Flavell, 1988; Perner, 1988; Wellman, 1988). The informational causation position came under empirical attack from various quarters, when it was shown that young children's difficulty with false belief also existed when no inference problem was present. This was the case, for example, for the own-false belief tasks used by Gopnik and Astington (1988), where the child was tricked into a false belief and immediately afterwards was unable to recall it. An attempt to get rid of this piece of counterevidence was unsuccessful and, in fact, strengthened the original finding (Wimmer & Hartl, 1991). This led us to declare defeat and to conclude that the representation deficit position is right and our own causation deficit position wrong. However, there was an additional finding (see later) in the Wimmer and Hartl study that suggested that children's understanding of the causal role of informational causation was involved in their ability to recall a belief. Further studies by Wimmer and Weichbold (1994) and by Wimmer and Mayringer (1998) added to the evidence for an empirical connection between children's ability to attribute a false belief and their understanding of the causal role of the misleading circumstances. The present reformulation of the original Wimmer et al. (1988) position tries to make the theoretical sense of these empirical observations. The theoretical move is actually rather simple. Instead of seeing the false belief problem of young children as an inference problem based on the lack of a conceptual basis of understanding informational causation, we make the stronger claim that there can be no mature concept of belief as long as there is no conceptual understanding of informational causation, because the concept of belief entails such a causal component.

WHAT DOES IT MEAN TO UNDERSTAND "BELIEVE"?

The terms "believe" and "think" are used in everyday parlance with different meanings. The meaning we are concerned with is the one where a person mistakenly takes a situational fact simply as given, as reality so to say, when in fact it is a false thought. This, in a certain sense, is the strongest contrast between reality as it is and reality as it was thought to be. This meaning is also the one which is at stake in the developmental studies concerned with children's understanding of false belief. Two aspects of this meaning are important and get little theoretical and empirical attention. We try to explicate them with the help of an episode experienced by the first author (the "I" in the following section refers to H.W.).

Episode. When recently walking through Budapest, I suddenly discovered my purse no longer being in the trouser pocket. Warned about pickpockets, I expected the worst, but an immediate search discovered the purse in the rucksack. With the relief came the insight: After buying a T-shirt, I mindlessly must have put the purse together with the shirt into the rucksack and what I had felt in my pocket all along was not the purse but the handkerchief.

Thought was reality. The first important aspect highlighted by this episode is that—before discovery—"the purse is in the pocket" was not experienced as a thought at all but was reality. In other words there was no thinking about where the purse is. It was in the pocket in the same way as the rucksack was on my back and the shoes were on my feet. Understanding the experience as a case of false belief and describing the experience as "I thought the purse is in the pocket" captures this aspect of the experience, namely that "the purse is in the pocket" was reality and not a guess or a vague expectation.

Causation by misleading circumstances. In the moment of discovery the given fact "the purse is in the pocket" turned into a false belief and the concept of belief preserves what it was, namely simple reality, but also what had happened, namely that misleading circumstances were at work. In other words, I had good reasons to take "the purse is in the pocket" as reality: The purse was in the pocket before the displacement and feeling the handkerchief in the very pocket where the purse was, supported the thought that the purse is still in the pocket. Furthermore, the additional assumption of inattentiveness, when slipping the purse together with the T-shirt into the rucksack, is quite plausible. These reasons are important for mental hygiene. If I would have been unable to come up with my list of good reasons, hallucination or magical powers would follow. So there are not just epistemic reasons for establishing good reasons for wrong thoughts but also deep emotional ones that go to the heart of the self and the world.

Note that there is an intrinsic connection between "taken a false thought to be reality" and "having good reasons for that". If you cannot come up with reasons that are good in the sense that they fully determined what you were thinking about the critical fact, then you cannot claim to have experienced the thought to be reality. Of course, this analysis applies primarily to simple situational facts like what something is and where something is and not for the belief in the existence of God. However, let us also note that the two features we have highlighted are critical entailments of the everyday concept of belief. This becomes obvious when we ask ourselves what distinguishes a false belief from a false guess. In the latter case there is also a false thought and the thought is referring to a certain situational fact. However, in contrast to a false belief, the thought in the case of a false guess was not taken to be reality when it was conceived. Quite differently, there is typically uncertainty when a guess is formed. And when it turns out to be false then there obviously can be no good reasons for having guessed so.

In essence, our analysis shows that the relation between false belief and false guess is exactly analogous to the one between knowledge and true guess. In this respect, it is interesting to note that the developmental study of children's acquisition of the concept of knowledge had focused on the difference between knowledge and true guess (see Perner, 1991, chapter 7 for review) and so took notice of the importance of having or of not having "good reasons" for taking something to be true. In contrast, to the first author's dismay, the importance of "good reasons" for the concept of false belief has received little attention, neither in the conceptual analysis of the concept (for example, Perner, 1991) nor in the empirical developmental study of it. The field was more or less captured by one critical feature of the concept of belief, namely by the fact that thoughts can be false. As our analysis shows, this is only one aspect and it does not distinguish between false belief and false guess.

Our exemplary false belief episode highlighted "taken to be reality for good reasons" with respect to the self-experience of a false belief. These aspects are also present in understanding false beliefs of other persons. Take our understanding of the fate of Oedipus: When he meets Iocaste there is the attraction of the woman and no chance to know her true identity. Or less tragically: When the Count in "La Nozze di Figaro" is trying to get hold of Susanna in the garden, he is led by the dress of a veiled woman, who turns out to be his wife. We experience these stories as tragic or funny as they are intended to be. We are doing so, because we understand that the other takes as reality something that is not the case and we understand why the other has to do so. For example, the Count is not guessing or mad and hallucinating when he is after Susanna in the garden. This would not be particularly funny. The episode is funny only because we understand that circumstances were at work—actually they were set up by the two cunning women—that left the Count no other chance than to take his wife to be Susanna and make a fool of himself.

DEVELOPMENTAL ISSUES

From the analysis of the belief concept it follows that of particular importance is children's understanding of what had happened, in other words, the question is when and how children begin to understand the causal role of informational conditions in the formation of thoughts. First, we summarise the results of several studies done in our laboratory, which were concerned with children's ability to explain false beliefs or misguided actions. Second, we present the developmental history of one closely watched child (Theo Wimmer) with respect to this causal understanding of knowledge and belief.

Studies on children's belief explanation

A study which is rather close to our exemplary false belief episode was done by Wimmer and Hartl (1991) as a follow-up to a study by Gopnik and Astington (1998). In this study quite similar to our episode, children (3-, 4-, and 5-year-olds)

were tricked into a wrong expectation and then were asked what had happened. In particular, what they had thought and why they had thought so. The specifics were this. Children were shown a well-known container, for example, a Milka box (similar to the English Smarties box but with good chocolate) and were asked what is in it. Because children experienced *only one* such situation we can be pretty sure that children considered as simple fact that chocolate was in the box. Then the experimenter with mock surprise revealed the true content, for example, a pencil. After the box was closed again, children were asked what they initially had thought ("In the beginning, when I took the box out of my bag, what did you think is in here?") followed by the justification question ("Why did you think there is chocolate in here?") Obviously it is the justification question which is of particular interest here. This question was posed to all children. In the case of the many 3-year-olds who responded with the actual content to the belief question obviously a reminder had first to be given: "But in the beginning, you thought there is chocolate in here, didn't you?" Then the justification question followed.

The results were quite clear-cut: Those children who responded correctly to the question what they had thought, were with very few exceptions also able to explain why they had thought so. The most frequent justification was: "Because it is a Milka box". In contrast, those children who had been unable to respond correctly to the belief question, rather infrequently were able to justify their initial response (after being reminded). The other important finding was the developmental progression. Only a minority of the 3-year-olds (about 30%) were able to identify and justify their belief, whereas nearly all the 5-year-olds showed this ability.

Let us assume that our 3-year-olds in fact did not understand the role of the misleading conditions as suggested by their inability to justify their "wrong saying". If this is the case then the last possibility to explain what has happened is lost. This is so because other possible explanations for "wrong saying" are also ruled out. For example, the child is aware that he or she had no intention to say something wrong or to play pretence and, therefore, these causes of "wrong saying" do not apply. So for this child there is no way to assimilate the "wrong saying" into any causal framework. What should follow is that the child quickly suppresses the incomprehensible event. This is exactly what was observed in Wimmer and Hartl's study. About a third of the 3-year-olds (Experiment 1) simply denied in the response to the reminder that they had ever said "chocolate is in here". These denials of having said something wrong were not due to embarrassment, because they also occurred when children observed another person being tricked and expressing a wrong expectation (Wimmer & Hartl, 1991: Experiment 3). The majority of the 3-year-olds in the observer role were unable to recall what the other person had said and in response to the reminder many of them denied that the other person ever had said something wrong. However, we also note that any embarrassment in the case of the self would also indicate a failure to understand the causal role of the misleading conditions. Obviously one

should not be embarrassed when one understands that there was no chance other than to have a wrong expectation.

Our interpretation of children's difficulty with own false beliefs as being due to a lack of causal understanding is not the only one. Alternative interpretations of the "thought amnesia" phenomenon by Freeman and Lacoche (1994) and Mitchell (Chapter 3, this volume) are less radical and assume that the 3-year-old child does not have a conceptual difficulty, but only a memory problem. Freeman and Lacoche suggest that 3-year-olds have a problem with memory search and need helpful retrieval cues to recall their belief. Similarly, Mitchell proposes that "thought recall" is a reconstruction and inference process and that 3-year-olds have a problem with these processes. Both accounts despite their merits strike us as somewhat implausible on simple grounds. If a child has the full concept of belief as these researchers assume, then recognising that what one took to be reality was in fact a wrong belief is an outstanding experience both cognitively and emotionally. Such an experience should not be lost immediately. However, exactly such an immediate loss must be assumed by Freeman and Lacoche (1955) and by Mitchell (Chapter 3, this volume) because in the own false belief studies the time lapse between asking the expectation question ("What's in here?") and asking the belief question ("What did you think is in here?") is rather short, about half a minute or so. We have little doubts that with powerful cues (and luck) one may get 3-year-olds to repeat what they have said. This, however, does not necessarily imply that they understand their "wrong saying" as manifestation of a false belief.

Three other studies from our laboratory examined children's ability to explain the false belief or the misled action of another person (Gschaidler, 1998; Wimmer & Mayringer, 1998; Wimmer & Weichbold, 1994). The overall findings with respect to children's emerging ability to understand the causal role of the misleading informational conditions were similar to the mentioned findings of the Wimmer and Hartl (1991) study. Of particular interest is the recent MA thesis work by Gschaidler (1998). In this study every attempt was made to highlight the importance of the misleading circumstances by contrasting the misled story figure with a non-misled figure (inspired by Robinson & Mitchell's 1995 procedure). For example, in one of the stories the misled Peter was absent when the ice-cream man surprisingly decided to move from the playground to the train station, whereas the non-misled Susi was present during this change. With the intention to meet the ice-cream man Peter was shown on the way to the playground, whereas Susi was shown on the way to the train station. Children then were asked the action explanation questions: "Why does Peter go to the playground to meet the ice-cream man?", followed by the belief explanation question: "Why does Peter think that the ice-cream man is still on the playground?".

The children participating in this study were younger 3-year-olds (3;0-3;6), older 3-year-olds (3;6-3;11), 4-year-olds and 5-year-olds with 16 children in

each age range. Several findings are important. The major developmental progression was observed between the younger and the older 3-year-olds. Of the younger 3-year-olds only three children were able after somewhat extended questioning to come up with a correct action explanation and these explanations always were of the sort "Peter *thinks* the ice-cream man is there" or "Peter *doesn't know* where the ice-cream man is". In no case could they follow up this type of action explanation with a correct belief explanation. We interpret this pattern as a kind of reformulation of the action description into a belief or ignorance statement. In essence, not a single child among the young 3-year-olds was able to link the misled action or the false belief to the misleading conditions. In contrast, about half of the older 3-year-olds could do so, and the 5-year-olds were perfect. In addition, there was the observation that in contrast to the younger children the 5-year-olds in their responses to the action explanation question nearly always used epistemic terms (e.g. "Peter thinks the ice-cream man is still there") and without exception either spontaneously or in response to the following belief explanation question then referred to the misleading conditions (e.g. "Because he had to go home" [before the ice-cream man left the playground]). We interpret this pattern as indication that for the 5-year-olds the role of the misleading conditions was already implied by the use of the mental terms and the role of the misleading conditions was only explicated on further demand. In contrast, the younger children according to this interpretation did not have a concept of "believe" that entails the right sort of causation, therefore, they preferred to immediately explain the wrong action by the misleading conditions.

In summary, this review of findings both from own false belief and other false belief explanation studies suggests a close developmental association between recall of a wrong thought (in case of the self) or attribution of a wrong thought (in case of the other person) and the ability to causally link the wrong thought to the informational conditions which were responsible. Of course, one limitation of this research is that children's understanding of the causal role of informational conditions was always assessed in direct connection with the assessment of thought recall or thought attribution.

A methodological alternative to these cross-sectional group studies is the longitudinal detailed observation of how single children progress to an understanding of false belief. That this alternative may provide interesting developmental data was shown by Shatz's (1994) remarkable observations of how her grandson Ricky in the age from 15 to 36 months acquired mental terms, and by Bartsch and Wellman's (1995) analysis of mental term acquisition based on CHILDES. In the following we add observations from Theo Wimmer, who in the age range from 12 to 48 months was closely watched by his father (the first author) for the occurrence of utterances with epistemic content. These diary data allow us to see in detail a possible developmental pathway with respect to the acquisition of the concept of belief. The "I" in this section refers to the first author.

A longitudinal single case observation

Early epistemic sensitivity. The first use of the term “think”—actually Theo used the German equivalent for “believe” (i.e. “glauben”)—was observed at the age of 2 years and 2 months, when Theo used “think”, apparently when experiencing uncertainty about what is the case. The observation was this. Theo one early morning walked into his parents’ bedroom as he used to do and looked at the bed, where I was visible, whereas his mother was completely covered by the blanket. This led to the comment: “Mommy—I think—there in is”.

Some days before this utterance, Theo began to use “I don’t know” quite frequently. For example, when after recognising an indicative smell, I asked him “Is there something big or little in your napkin?” he appropriately responded with “I don’t know”. Two months later at the age of 2;4 we noted the first affirmative use of “to know”. After visiting the house of his babysitter, he said in the evening: “I now know where Andrea (his babysitter) is living”.

Also around this age, a false utterance with a plausible motive was noted. It occurred when his mother wanted to go with him to the bathroom to brush his teeth. This led him to say: “I already have brushed teeth—with daddy”. Of course, the utterance may have been simply intended to avoid teeth-brushing and less to instil a false belief, but nevertheless.

In summary, we interpret these observations—in particular the use of “think” and “know”—as indications of a sort of epistemic sensitivity: A sense of uncertainty in the case of the “think” utterance, maybe a feeling of having the right answer in the case of the positive “know” utterance and a feeling of having no answer in the case of “I don’t know”. However, the use of “think” was an isolated one and was not observed again for quite some time. Also: Theo at this young age apparently paid no attention to the informational circumstances resulting in uncertainty or leading to knowledge. A relevant observation at the age of 2;5 was this. One evening when we were coming back from a walk, the car of a friend was standing in front of our house and Theo inferred: “Christine is here”. The repeated question “How do you know that?” led to no answer although an answer of the type “her car is here” would not have posed a difficulty. Furthermore, Theo at that age was able to respond appropriately to why-questions as exemplified by the following dialogue:

Theo: “not slippers on”

I: “why not?”

Theo: “go into big bed” (he is not allowed to get into his parents’ bed with slippers on).

Working out the role of informational circumstances for knowledge. The first positive evidence that Theo could link informational circumstances to knowledge was observed at the age of 2;11. We were sitting at the table waiting for lunch. Theo, surprisingly for Andrea, his babysitter, who had prepared lunch,

told me that we would get apple-strudel. Andrea asked him: “How do you know that?” (Actually the direct translation of the German phrase is “Wherefrom do you know that?”) There was a long pause, but then he came up with the answer: “Because I’ve looked in the stove”. This first explanatory use of informational circumstances was preceded by a phase of interest in what somebody is seeing. An episode from the age of 2;9 was that his tiny toy elephant had to see what Theo was eating by being placed onto the edge of the plate.

However, Theo’s first correct answer to a “How do you know that?” question at the age of 2;11 was an isolated occurrence. More frequent occurrences of such answers were noted from the age of 3;6 onwards and at the age of 3;8 Theo’s first spontaneous “How do you know?” question was observed. It occurred when he claimed that his friend Johnny doesn’t have a bathtub and I claimed that Johnny does have one. My claim led him to ask “How do you know that?”. This question was also asked on other occasions. One was that I claimed “Today we will have fine weather” or when I—sitting with him in the bathtub—said: “One gets sick from drinking soapy water”. This latter claim led him to ask: “How do you know, that one gets sick? Have you tried it?”. Another dialogue about reasons for knowing occurred when his mother said “Tomorrow there will be the devils run (Krampuslauf) in the city”. Theo (age 3;9) asked “Wherefrom do you know that?” and Julia responded with “I read it in the newspaper” whereupon Theo commented: “The newspaper is made in the city. They have it in the newspaper what’s going on in the city”.

Quite impressive was an early utterance at the age of 3;0, when Theo formulated a general rule relating information to knowledge. After having asked his mother for the name when finding a piece of glucose, he said: “You know what, when you don’t tell it (the name) to me, then I don’t know it and when you tell me, then I know it”.

In summary, these observations suggest a rather protracted acquisition of understanding the role of informational circumstances. Theo started with an interest in seeing and not seeing towards the end of the third year and ended with spontaneous questions for justifications of a claim one year later. However, it appears that the knowledge concept, at least in his early answers to “how do you know?” questions, is one rather closely tied to being able to respond correctly to a fact or a name question.

Understanding false beliefs. The first case of identifying a false belief was observed at the age of 3;8. When sitting with him in the bathtub, I had asked Theo about the colour of the body-paint in one of the containers and he responded according to the colour of the misplaced lid on the container (sitting in the bathtub I was unable to write down the answer). After opening the container I asked him “But what did you think?” and he correctly repeated his initial answer and with some difficulty he also managed to respond appropriately to “Why did you think there is yellow colour in here?” by pointing to the lid. Two

months before this episode, at the age of 3;6, Theo already had used the term "think" to refer to something I thought was a false belief. Theo's utterance was "Do you know, why I had waked you up? I thought there were ghosts". However, to my question "Were there really ghosts?" he disappointingly answered "yes".

Although the first instance of false belief understanding was observed for the self, nearly at the same age (3;8) Theo also gave evidence for understanding the false belief of other persons. He had watched a TV programme where children in the night took a moving curtain hanging in a tree to be a ghost. After the programme I asked him "What did the children think?" and "What was it really?" and he responded correctly to both questions.

With respect to these first observations it is important to note that Theo did not spontaneously comment on the false beliefs involved. However, at the age of 3;9 Theo also showed a kind of spontaneous belief understanding when he commented on creating a false belief: "I make myself a moustache (using father's razor foam), so that the ladies in the city think I'm a man".

In summary, we would interpret these observations of false belief understanding not as indications of a fully established belief concept, but as first occurrences of conceptually working through belief episodes. The impression particularly in the misleading container situation was that Theo was more or less forced to work through the experience by the questions posed to him. An interesting aspect is that Theo was always able to justify why he had thought something wrong. This is in remarkable agreement with Wimmer and Hartl's (1991) finding mentioned above. In Theo's case (apart from the theory of his father) this co-occurrence of "false thought identification" and "false thought justification" is not so astonishing because 2 months before the belief episodes, he already showed a good understanding of sources of knowledge by answering "how do you know?" questions.

A more general conclusion from the single case observation is the embeddedness of belief understanding into other aspects of the child's emergent thinking about epistemological matters. We were particularly impressed by what we called early epistemic sensitivity, that is, Theo's early use of "think" in a situation where he obviously was uncertain and his use of "know" when he had learned a new fact. This early epistemic sensitivity may have little to do with a clear conceptual distinction between thought and fact, but nevertheless it clearly indicates a kind of self-reflective awareness of differing epistemic states. Furthermore, this sensitivity for "being uncertain" in the case of "think" or for "having the right answer" or for "having no right answer" in the case of "know" and "don't know" may be the building-block for adopting the everyday concept of thought. We note that O'Neill (1996) has also used the term "sensitivity" to characterise her finding that 2-year-olds are responsive in their communicative attempts to the differing knowledge states of their parents.

In correspondence with the present observation about Theo's use of the term "think" is Shatz's (1994) observation that Ricky used "think" quite early to refer

to possibilities and to modulate assertions and that only at the end of the observation period at around 36 months was "think" used to refer to false beliefs. This latter use occurred obviously earlier for Ricky than for Theo. The children studied by Bartsch and Wellman (1995) in their analysis of the CHILDES data exhibited the first advanced belief contrastives between 3;1 (Abe) and 3;9 (Adam) years of age.

The other impressive finding from the single case observation was the gradual understanding of what we call informational causation, which started with an interest into what one sees and what one doesn't see at the end of the third year to spontaneous "how do you know?" questions about one year later. This understanding of circumstances leading to knowledge preceded the first observations of false belief understanding and it is tempting to theoretically assume that first an understanding of informational causation has to be acquired before false belief understanding becomes possible. Of course, a precondition relationship follows from our position that the full everyday concept of false belief entails causation by misleading circumstances. However, some experimental data (Bartsch & Wellman, 1989) suggest that a partial understanding of false belief situations may be possible without an understanding of informational causation, that is, that the child may only register the occurrence of a wrong thought without understanding why.

CONCLUSION

The starting point of our argument was a conceptual analysis suggesting that we as adults experience a false belief as a wrong thought that was taken to be reality because it was caused in such a way that left no possibility other than to take it to be reality. We showed that this causal component of the everyday belief concept distinguishes a false belief from a false guess in the same way as it distinguishes a piece of knowledge from a true guess. We further showed that this causal component of the belief concept is important not only cognitively but also emotionally. In the case of the self it rules out hallucination and in the case of the other it is responsible for the tragic or the funny aspects of false belief episodes. Our complaint was that the study of children's acquisition of belief understanding has largely neglected the causal component of the belief concept and has focused more or less exclusively on children's ability to report (for the self) or attribute (for the other) a false thought.

The review of studies from our laboratory where children were asked to explain a misled action or to justify a given false belief supported our theoretical emphasis on the importance of causal understanding. For example, those children in Wimmer and Hartl's (1991) study who were able to identify what they took to be reality as a false thought most often were also able to identify the "good reasons" for their thought. The important suggestion from Gschaidler's (1998) work on children's explanations of misguided actions was that for 5-year-olds

the use of the term "think" already implied causation by misleading circumstances. However, more direct developmental evidence on the causal entailment of children's belief concept is needed. Such evidence may be provided by examining children's contrastive use of the terms "think" and (wrong) "guess".

The longitudinal single case study provided support for the position that the self-experience of false belief episodes presupposes an understanding of what had happened. In all of the observed instances of false beliefs, Theo was able to point out what had caused the belief. The case study further provided evidence for early epistemic sensitivity as evidenced by the use of "think" in a situation of uncertainty and as evidenced by the early use of "know" and "don't know". An important conclusion was that the understanding of the causal role of informational circumstances for knowledge and ignorance was fully established before the first instances of false belief understanding were observed. This is in agreement with earlier work on the relationship between knowledge/ignorance attribution and false belief attribution (Hogrefe, Wimmer, & Perner, 1986).

The case study suggested that it might be theoretically useful to distinguish two broad phases in children's understanding of belief. In a first one children solve a false belief task by conceptually working through the episode. For example, in a self-experienced false belief episode they may be asked what has happened or they ask themselves such questions. By doing so they may come up with correct answers. The first instances of Theo's false belief understanding may have been of this type. The conceptual prerequisites are that children have the concept of thought (not of belief) and an understanding of the causal role of informational circumstances. These prerequisites allow them to link a false statement to a false thought and a false thought to misleading circumstances. Working through several such episodes in a causal manner may provide the basis for abstracting the common components of such episodes and form the concept of belief as "a false thought taken to be reality because of misleading circumstances". The characteristic of the second phase would be that children in false belief episodes apply the already established concept.

One difference between the two phases has to do with the consequences of being unable to find the misleading informational conditions for a false thought. If this happens in the first phase then children may suppress the thought as incomprehensible as quite a number of children in Wimmer and Hartl's study did. In contrast, a child with an established belief concept may also be unable to find the causal antecedents of a false thought, but given the established belief concept this child will readily identify the false thought as belief and accept the default assumption that causal antecedents were present.

As a final point we would suggest that children's understanding of the causal role of informational conditions may offer a natural solution to one of the conceptual intricacies of the belief concept that led Perner (1991) among others to postulate that children must acquire or already have acquired a general concept of representation when they form the concept of belief. According to Perner's

analysis such a concept of representation requires a distinction between the reference and the meaning of a representation, be this representation a sentence, a picture, or a thought. For example, in the Smarties box episode the child has to understand that the thought "Smarties are in here" refers to the content of the present box in front of him (which contains a pencil), whereas the meaning of the thought refers to, say, a usual Smarties box. The question is whether this theoretical analysis has psychological reality. Our suggestion is that all that is going on is an attempt to causally understand what had happened. If the child is able to understand that this box in front of him caused the thought "Smarties are in here" (because it is a Smarties box and he had no chance to look inside) then the reference-meaning dissociation is solved in a simple way: The wrong meaning of thought is determined by the specific misleading circumstances around this particular Smarties box and the reference of the thought is obvious anyway. So in our analysis there is a causal solution to the reference-meaning dissociation.

In conclusion, if one takes seriously that children's attempt to understand mental phenomena is a theoretical enterprise as suggested by the "theory" approach then it certainly is wise to focus on their causal understanding, because there is little doubt that causal relationships are at the heart of any good theory. One part of the causal understanding of mind phenomena is the understanding of the causal role of informational circumstances in the genesis of thoughts. This understanding is not easy because informational circumstances—such as what one sees and what one does not see—work silently.

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CHAPTER THIRTEEN

False beliefs about false beliefs

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INTRODUCTION

In this chapter we re-examine what 3- to 5-year-olds may or may not understand about the mind. We begin by examining a dilemma that has arisen among studies of 3-year-olds' ability to attribute false belief to others. To anticipate, we conclude that evidence that 3-year-olds are able to pass certain modified tests of false belief can be explained without having to assume that they understand the representational nature of mental states. Instead we argue that it is only necessary to assume that 3-year-olds (1) represent people as thinking about things and as either knowing or not knowing the true state of affairs, and (2) project their own feelings of knowing onto others in reasoning about what others know. We also argue that previous research may have overestimated 4- and 5-year-olds' understanding because traditional tests of false belief allow children to answer correctly by reasoning only about absence or presence of knowledge in themselves and others. Our alternative explanations of 3- to 5-year-olds' understanding of mental states are based on studies suggesting what younger children already know about the mind, and on studies suggesting what older children still have to learn.

THE 3-YEAR-OLD DILEMMA

The dilemma is this: 3-year-olds have performed correctly on tests of false belief under certain conditions (Saltmarsh, Mitchell, & Robinson, 1995; Zaitchik, 1991), but the explanations given of 3-year-olds' performance in these studies do not account for the difficulty they have on a more traditional test of false belief