RUNNING HEAD: UNDERSTANDING THE KNOWLEDGE GAINED FROM SEEING AND FEELING

Children's Working Understanding of the Knowledge Gained from Seeing and Feeling

E.J. Robinson,

Warwick University, U.K.

S.N. Haigh,

Keele University, U.K.

J.E.C. Pendle,

Warwick University, U.K.

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Correspondence concerning this article should be addressed to E.J. Robinson,

Department of Psychology, Warwick University, Coventry CV4 7AL, U.K.

Abstract

In three Experiments, (N = 48 3- to 4-year olds; 100 3- to 5-year olds; 54 4-year-olds), children who could see or feel a target toy, recognized when they had sufficient information to answer "Which one is it?" and when they needed additional access. They were weaker at taking the informative modality of access when the choice was between seeing more of a partially visible toy and feeling it; at doing so when the target was completely hidden; and at reporting seeing or feeling as their source of knowledge of the target's identity having experienced both. Working understanding of the knowledge gained from seeing and feeling (identifying the target efficiently) was not necessarily in advance of explicit understanding (reporting the informative source).

Children's Working Understanding of the Knowledge Gained from Seeing and Feeling

How efficiently and effectively do young children find out about objects' properties? Do they, for example, spontaneously feel an object to find out whether it is hard or soft? The published literature does not tell us. Although it is well documented that young children suffer from limited reflective understanding of the connection between information access and consequent knowledge state, we do not know how far such limitations are reflected in their knowledge-seeking behavior. The research reported here was designed to find out.

Children's tendency to over-estimate their knowledge and underestimate the uncertainty arising from limited information, is reported in two distinct literatures. First, research on children's understanding of ambiguity and undecidability shows that children younger than 7 or 8 years tend to: Make a single interpretation of information that affords more than one interpretation; judge that they know the true interpretation when a judgement of "don't know" would be appropriate; and judge that limited input tells or shows them or another person enough to identify the target. By around 7 to 8 years, in contrast, many children demonstrate in various ways and across a range of tasks, that they are aware that input can be ambiguous, that a perceiver could make the wrong interpretation or would not know the correct interpretation, and that two perceivers might legitimately make different interpretations (e.g. Braine & Rumaine, 1983; Carpendale & Chandler, 1996; Chandler & Helm, 1984; Klahr & Chen, 2003; Pieraut-le-Bonniec, 1980; Robinson & Robinson, 1982; Robinson, Thomas, Parton & Nye, 1997; Taylor, 1988).

In the tasks cited in the preceding paragraph, children gained incomplete knowledge about a target object via a single modality, such as seeing a partially obscured

object, when they needed to see more of it to be sure of identifying it accurately. A second relevant body of literature examines children's understanding about knowledge gained from different modalities such as seeing or feeling. Although 3-year-olds differentiate epistemic from non-epistemic access (Pillow, 1993), 4- and 5-year-olds still have incomplete understanding of the specific knowledge to be gained from a particular modality of input such as seeing or feeling (O'Neill, Astington & Flavell, 1992; O'Neill & Chong, 2001; Pillow, 1993). Children are also poor at reporting the source of knowledge just gained, for example by seeing or feeling (Gopnik & Graf, 1988; Wimmer, Hogrefe & Perner, 1988). O'Neill and Chong (2001) give a memorable account of errors made: "To watch a child sniffing a swimming pool and tell you that is how they found out it contained cold water is quite striking!" (pp812-813).

Presumably the research summarized above is of interest at least in part because it is assumed to have implications for children's everyday life. The findings raise the possibility that children aged 3- to 5- years are inefficient, ineffective and inaccurate at finding out about the physical world. It seems plausible that many young children assume they know whether a particular food tastes nice or nasty just by looking at it, but then so might many adults. Perhaps less plausible is that on opening the fridge and glimpsing a small part of an opaque milk carton, young children act as if they know whether it is full or empty, for example by announcing "We need more milk!" If such behaviour is not in evidence, why are children's responses inappropriate in the experiments cited above?

One obvious explanation is that in the tasks cited, children were required to reflect and comment on the knowing process rather than merely gain knowledge: For example they were expected to report the source of knowledge just gained, or to judge what they or another protagonist knew. We have little evidence about the working understanding

children reveal when they simply find out about objects in the physical world rather than reflect on how to find out or what they know from particular access.

It is important to gather such evidence not just because of its potential relevance to our understanding of children's everyday learning about the world, but also because it is potentially relevant to a developmental account of the more reflective understanding heavily studied so far. One possibility is that researchers can infer understanding about the process of gaining knowledge in the pattern of children's behavior, well before their verbally explicit comments on the knowing process reveal that same understanding. In other domains of knowledge this can be the case. For example, children's direction of gaze or their impulsive grasping imply understanding of a protagonist's false belief at a much younger age than their more reflective pointing or their verbal response (Clements & Perner, 1994; Garnham & Perner, 2001). Similarly, children's spontaneous gestures when solving an arithmetic problem can reveal more advanced understanding than their verbally explicit comments about how to solve it (Goldin-Meadow, 2006).

Theoretical accounts of cognitive development such as those by Karmiloff-Smith (1992) and Dienes and Perner (1999) propose that development within any domain of understanding can proceed from an implicit, procedural level through increasingly explicit, reflective and declarative levels. A different but related distinction, between cognitive and metacognitive understanding in any domain (e.g. Flavell & Wellman, 1977; Schneider & Sodian, 1988) is also useful for capturing the essential difference between finding out about the world and knowing how to find out.

Within both these theoretical approaches (implicit *vs* explicit understanding; cognition *vs* metacognition), a question of interest is how effectively children can behave with or without the benefit of reflective understanding. For example, when inferring a protagonist's belief, Dienes and Perner (1999) argue that implicit understanding relies on

abstraction of behavioral regularities. Until children achieve "genuine causal understanding of the underlying processes," evidenced by explicit understanding (p749), these authors argue, they are severely limited in their ability to track mental states. Similarly, within the domain of oral communication skills, although young children manage reasonably well as listeners and speakers without explicit understanding about the causes of communicative success and failure, once such understanding is achieved, their behavior as speakers and listeners shows greater appropriate flexibility (Robinson & Robinson, 1983). One implication is that even if children's finding out behavior is in advance of their ability to comment on the knowing process, we might find serious limitations in the former until the latter is in evidence.

We posed two broad research questions: First, how efficiently do young children use seeing and feeling to identify target objects? We examined this by providing children initially with either informative, uninformative, or no access to a target toy. For example, they could see a toy that was identified by color, or they could feel it, or it was completely hidden. We observed whether they spontaneously sought further information only when it was necessary, and whether they then took the informative modality of access if there was a choice.

Second, how does children's knowledge-seeking behavior relate to their ability to report on how they found out? One possibility is children's spontaneous behavior when identifying a target object reveals full command of the knowledge to be gained from seeing and feeling before they can comment reflectively on the knowing process. An alternative possibility is that children's knowledge-seeking behavior is limited until they achieve reflective understanding of the knowing process.

Experiment 1

We compared children's responses in two tasks. In one, the *partial access identity* task, they saw one of a pair of toys and were asked which one it was. On some trials the toys were identified by color, so children could answer correctly without gaining further information. On other trials the toys were identified by feel, so children had to touch the toy in order to be sure of answering correctly. We were interested in whether or not children answered the question on the basis of necessary and sufficient information access, or whether they answered on the basis of insufficient or unnecessary information, for example without feeling a hard or soft toy, or only after feeling a toy identified by color. In the second task, the *source reporting* task, children both saw and felt a toy and were asked how they knew which one it was. Can children who efficiently identify the target toy, also report the informative source?

Method

Participants. The sample comprised 48 children (18 boys and 30 girls; age range, 3;5 to 4;4 mean = 3;11), who attended nursery classes in a mixed working-class / middle-class area of U.K.

Materials. We used 5 pairs of toys that either felt the same but differed in color, for example red and blue stylised cats, and 5 pairs that looked the same but one was hard and the other soft, for example yellow bears. A plain box was used for the warm-up trials for the partial access identity task.

Design. Children were allocated alternately to the partial access identity task and the source reporting task. Each task was preceded by 2 warm-up trials. The partial access identity task included 8 experimental trials, and the source reporting task included 6. In each task, on half the experimental trials feeling was informative and on half seeing was informative. Eight different orders of these two trial types were cycled between children.

Procedure. Children allocated to the *partial access identity task* began with two warm-up trials designed to discourage children from guessing a toy's identity. On each warm-up trial, a pair of toys was introduced and children agreed on their properties. The Experimenter (S. Haigh) hid one of the toys in the plain box, and asked the child "Which one is inside?" Children who guessed without opening the box were told "Don't guess, you can find out which one it is", followed by prompts if necessary.

Eight experimental trials followed. Each began with children agreeing that the toys in a pair looked (or felt) the same but felt (or looked) different. The Experimenter mixed up the toys behind his back, and then placed one on the table just out of the child's reach. The child was asked "Which one is it?" We noted whether children named the toy only after leaning over to touch it, or named it before or without touching it.

Children allocated to the *source reporting* task received 2 warm-up trials designed to familiarize them with the source question for seeing and feeling. The Experimenter mixed up the toys behind his back then handed one to the child. The child was asked which one it was, and while still holding the toy, was asked the source question, for example, "How did you know it was the hard one?" adding prompts if necessary. Children who answered wrongly or who failed to answer were told the correct answer. Those who answered correctly were told, for example, "That's right, you knew it was the hard one because you felt it." Six experimental trials then followed with the same format but without feedback after the source question.

Results and Discussion

Performance in the partial access identity task. Children gained a score of 1 when they felt the toy before identifying it. The mean score out of 4 (sd) on the feeling informative trials was 3.29 (1.37); on the seeing informative trials it was 1.17 (1.43): *t*

(23) = 5.49, $p < .001$. Children more frequently felt the toys when it was necessary to do so, and more frequently identified it without feeling when seeing was sufficient.

From the above analysis, we cannot tell whether children showed any overall tendency to touch the toy unnecessarily, or a tendency not to touch it when it was necessary to do so. Further analysis showed neither was the case. The same data were scored differently when seeing was informative: Children scored 1 when they identified the toy before or without feeling it. Hence correct behavior scored 1 in both tasks. The mean score out of 4 (sd) was 2.83 (1.43), not significantly different from the score when feeling was informative, 3.29 (1.37). Children were no more or less likely to do nothing when seeing was sufficient, than they were to feel when that was necessary.

Performance on source reporting task. Children gained a score of 1 when they correctly reported the informative source. There was no difference in correct source reports whether seeing or feeling was informative: Mean source scores out of 3 (sd) on the see and feel trials were 1.08 (1.25) and 1.17 (1.13) respectively.

Comparison between tasks. We eliminated final seeing and feeling trials in the partial access identity task, so that both tasks contained 3 trials when seeing was informative and 3 when feeling was informative. Children were given a combined score out of 6 for each task. Mean scores out of 6 (sd) for partial access identity and source reporting tasks were 4.67 (1.37) and 2.21 (1.82) respectively: t (46) = 5.29, $p < .001$. Children were better at identifying the toys on the basis of necessary and sufficient information than they were at reporting the informative source.

To conclude, the results so far are consistent with the suggestion that children's working understanding of the connection between information access and knowledge state, revealed in the pattern of their behavior, is in advance of the reflective understanding revealed in their explicit source judgements.

Experiment 2

The results so far relate only to *recognition* of informative and uninformative access: In the identity task children had only to recognize whether or not they had sufficient information to identify the target, and in the source reporting task they had only to recognize whether seeing or feeling had led to their knowledge of the target's identity. In Experiment 2 we included a *no access identity task*, that demanded prediction of the knowledge to be gained from seeing or feeling. We also included a different *partial access identity task,* filling in a condition missing in Experiment 1 by adding trials on which children were initially given uninformative or informative access by feeling. Finally, we included an older age group.

Method

Participants. We tested 50 nursery children (age range = 3,1 to 4,5; mean age = 3,11), and 50 children in their first year of formal schooling (U.K. reception class). The age range was 4,6 to 5,6; mean age = 5;0. The children came from mixed middle to working class backgrounds.

Design. Each child had two warm-up trials and four experimental trials, two of these in the *partial access identity* task and two in the *no access identity* task (which also included the *source reporting* question). On one trial in each task seeing was informative and on the other, feeling was informative. The following variables were counterbalanced between children: Order of the partial access and no access identity tasks; order of seeing informative and the feeling informative trials; order of presentation of forced-choice alternatives in the identity question and the source question; in the partial access task, whether children were given initial access by seeing or feeling.

Materials. We used a tunnel with a window cut into one side, into which one of a pair of toys could be placed. The window had a curtain that could be lifted to see what

was inside. The open ends of the tunnel allowed children to feel what was inside. Each trial used a different pair of toys that either looked the same but felt different, or a pair that felt the same but differed in color. A bag was used to hide the toys in while they were placed inside the tunnel.

Procedure. The Experimenter was J.E.C. Pendle. Two *Warm-up trials* gave children practice at feeling and seeing toys inside the tunnel, and with the source question. In the *partial access identity* task, children were given one mode of access to the hidden toy, either seeing, or feeling. For children given seeing access, the curtain on the tunnel was raised before the toy was slipped inside, allowing the toy to be identified if color, but not if hardness, was the defining attribute. The curtain remained raised throughout the trial. Children given feeling access were asked to place their hand inside the tunnel, and could therefore feel the toy when it was placed inside, allowing it to be identified if hardness, but not if color, was the defining attribute. Their arm remained in the tunnel while the test question was asked. Children were then asked, "Now I want you to find out whether it is the (soft dog or the hard dog) inside the tunnel." When informative access was given at the outset, children could answer correctly without taking further action. When the toy was identified by hardness, children given seeing access had to put their hand inside the tunnel. When the toy was identified by color, children given feeling access had to raise the curtain. We were interested in whether children identified the toy on the basis of necessary and sufficient access.

The *no access* task was the same for all children. They were asked which toy was in the tunnel not having been given any initial access: At the start of each trial the curtain was down and their hand was outside the tunnel. We were interested in whether their initial response was to take informative access. After children had identified the toy, the

Experimenter invited them to take the other mode of access and once they had both seen and felt the hidden toy, the *source question* was asked as in Experiment 1.

Results and Discussion

Children were scored as correct in answer to the *partial access identity* question if their final answer came after they had received or taken informative access. Children were scored as correct in answer to the *no access identity* question if they spontaneously took informative access, and only took the uninformative access when subsequently invited to by the Experimenter. Children's answers to the *source* question were scored as correct if they reported the informative source.

Answers in the partial access identity task. Twenty-three out of 50 younger children, and 38 out of 50 older children, responded correctly on both their trials, and the remainder were correct on one of their two trials. There was no difference in children's scores in the partial access identity task according to whether they were initially given informative or uninformative access, both when the access they were given was seeing (when the curtain was raised at the start of the trial: 37 and 39 correct responses out of 50 respectively), and when access given was feeling (when their hand was in the tunnel at the start of the trial: 38 and 47 correct responses out of 50). That is, they were no more or less likely to seek additional information when that was necessary (for example, to feel a hard or soft toy when the curtain was raised at the start of the trial) than to answer on the basis of the access given when that was sufficient (for example, *not* to feel a blue or red worm when the curtain was raised at the start of the trial).

Answers in the no access identity task. Five of the 50 younger and 18 of the 50 older children responded correctly on both trials. Ten younger and 3 older children failed both their trials. The younger children performed no differently whether seeing or feeling was informative. The older children showed a preference for feeling the hidden target

toy: Twenty-two were correct only when feeling was informative, compared with 8 who answered correctly only when seeing was informative (binomial test, $p = .016$). We offer no explanation for this. Previous findings on such preferences have been inconsistent (O'Neill et al., 1992; O'Neill & Chong, 2001), and no such effect was found in Experiment 3 using exactly the same task with a slightly younger age group.

Comparison between tasks. Children gained a score out of 2 for their answers to each of the partial access identity, no access identity, and source questions. The mean scores appear in Table 1. A 3 x 2 x 2 ANOVA was conducted with question type (partial access identity *vs.* no access identity *vs.* source) as a within-child variable, and age (3- to 4- years *vs*. 4- to 5- years) and trial order (partial access before or after no access tasks) as between-child variables. Significant main effects were found for question type, $F(1.87, 179.1) = 31.41$, $p < .001$, partial $\eta^2 = .246$ (Greenhouse-Geisser correction was used because the homogeneity of variance assumption was violated), and for age $F(1, 96) = 25.80$, $p < .001$, partial $\eta^2 = .212$. There were no other significant effects. For the main effect of age, reception children performed significantly better on all trials than nursery children. For the main effect of question type, additional multiple comparisons analysis indicated children performed significantly better on partial access identity compared to no access identity, and on partial access identity trials compared to source (both $p < .001$).

There was no difference between performance on the no access identity and the source questions: Children were no worse at reporting explicitly the source of their knowledge than they were at identifying the toy in the no access task. The implication is that children do not necessarily reveal more advanced understanding about the

knowledge gained from seeing and feeling when they simply identify the target toy, than when they reflect on the knowing process (source reporting).

Children found it easier to identify the target toy efficiently in the partial access identity task than in the no access identity task. Although the older children performed better than the younger ones in the partial access task, even the 3- to 4-year olds did well as a group. Importantly, as in Experiment 1, in the partial access identity task children performed just as well whether they were given informative or uninformative access: They recognized both when they knew the toy's identity on the basis of the information provided, and when they did not know. We cannot yet conclude, however, that children positively selected the informative mode of access. Perhaps, having recognized that they had insufficient information, children simply took the only other available response option, without necessarily understanding that this would be informative. The superior performance on the partial access identity task over the no access identity task may be because only in the latter did children have to imagine in advance which mode of access would provide sufficient information to identify the toy.

Experiment 3

In Experiment 3 we found out whether children given uninformative visual access, knew whether seeing more or feeling was necessary to identify the target toy. We compared children's performance on a modified version of the partial access task used in Experiment 2, with their performance on the no access task used in Experiment 2. In the modified partial access task, children who realised that partial visual access to the target was uninformative had an alternative to feeling the toy: They could raise a second curtain to see more of it, and this provided identifying information on half the experimental trials. If this modified partial access task was easier than the no access task, we would be able to conclude that children not only recognized when they had insufficient information

to identify the target, but also knew what modality of access would provide the necessary additional information. On the other hand, should we find no difference in performance on the partial access and no access tasks in Experiment 3, we would have no grounds for arguing that children predict the informative modality, rather than just recognize uninformative access, in the partial access tasks in Experiments 1, 2 and 3.

Method

Participants. 54 children were tested (age range = 4,1 to 5,2; mean age 4,8). They attended U.K. primary schools serving a mixed working class and middle class area.

Materials. For the no access identity task, materials were as in Experiment 2. For the modified 3-option partial access identity task we used a second tunnel on which the curtain was split vertically down the middle, giving two smaller curtains that could be lifted, each to reveal half of the target toy. Pairs of toy dogs were used. Dogs in one pair differed only in the color of their collar. Dogs in the other pair differed only in that one felt hard and the other soft. When children looked behind one of the curtains they could see only the toy's body, and when they looked behind the other curtain they could see only the toy's head and collar.

Design. Each child had two warm-up and four experimental trials. Two experimental trials used the *no access identity task* as in Experiment 2. The other two experimental trials involved the new 3-*option partial access identity task*. In this latter task children were given initial partial visual access that was always insufficient to identify the target, because the dog's collar was not visible, or because the dog was identified by feel. The following variables were counterbalanced between children: Order of no access and partial access tasks, order of seeing informative and feeling informative trials, and order of presentation of the forced-choice alternatives (e.g. hard or soft toy) in the identity question.

Procedure. The Experimenter was J.E.C. Pendle. The warm-up and procedure for the no access task were as in Experiment 2, but with no source question. Immediately before their two experimental trials in the 3-option partial access task, children had a demonstration of the new tunnel.

Results and Discussion

Criteria for correct scores were as in Experiment 2. Nearly all the 32 errors on the 3-option partial access identity task consisted of choosing the wrong modality of additional access. Children who answered correctly on only one out of their two trials in a task were no more likely to answer correctly when seeing was informative or when feeling was informative, so we combined scores out of two to compare tasks. The mean scores (sd) were 1.26 (.62) in the no access task, and 1.41 (.53) in the partial access task. These scores were above chance: no access task, $\chi^2(2, N = 54) = 7.93$, $p < .05$; partial access task, $\chi^2(2, N = 54) = 18.60$, $p < .001$ (comparing the observed frequencies of scores 0, 1, and 2 with the distribution expected by chance). Performance on the no access and partial access tasks was compared in a 2 x 2 ANOVA with task (no *vs* partial access) as a within-child variable, and trial order (no access before *vs* after partial access task) as a between-child variable. No significant effects were found either for the main effect of task, $F(1, 52) = 3.00$, $p = .089$, partial $\eta^2 = .055$, or the interaction of trial order $F(1, 52) = 0.31$, $p = .580$, partial $\eta^2 = .006$.

Hence children were no better at predicting whether they needed to see or feel a hidden toy when they had uninformative access to it in the 3-option task, than when they had no access. The implication is that when children had uninformative access to the toy in Experiments 1 and 2, some children sought appropriate additional information merely because that was the only alternative available. For example, in Experiments 1 and 2,

some children probably felt a toy to see if it was hard or soft, having recognized that what they saw was insufficient but without predicting that *feeling* was necessary.

A further interesting finding was the lack of difference in difficulty between trials on which children needed to see more of the target they had partially seen (within modality ambiguity), and trials on which they needed to feel the target they had partially seen (between modality ambiguity). The developmental relationship between children's handling of these two types of ambiguous input could be examined further. As mentioned in the introduction, judgments under these two conditions have typically been examined in distinct literatures, and understanding about aspectuality has not been treated as part of a wider problem understanding when they have sufficient or insufficient information to make a confident interpretation (but see Robinson, Thomas, Parton & Nye, 1997).

General Discussion and Conclusions

We can now answer the questions posed in the introduction. First, we were interested in how efficiently young children use seeing and feeling to identify objects' properties. Children performed relatively well in the partial access identity tasks in Experiments 1 and 2: They generally recognized when they had been given informative access, and when they had not, they generally took the only other available mode of access. In contrast, performance was much poorer in the no access tasks in Experiments 2 and 3, and in the 3-option partial access task in Experiment 3, when children had to predict whether seeing or feeling would allow them to identify the target. Children who recognized that they needed more information did not necessarily know what information they needed.

Second, we were interested in how children's knowledge-seeking behavior related to their ability to report on how they found out. One possibility was children's behavior when identifying a target object would reveal full command of the knowledge to be

gained from seeing and feeling before they could comment on the knowing process. This was not the case. Our results suggest that initially, working understanding about sources of knowledge is limited to recognition of sufficient and insufficient access. Children's working understanding extends to being able to predict the knowledge to be gained from particular modes of access only when, and possibly because, explicit understanding is achieved.

Within a framework of cognition *vs* metacognition, the ability to reflect on the knowing process might be expected to bring advantages in terms of more efficient or effective knowledge-gaining behaviour. As yet we have no evidence of direction of causality or even of causal connection, but this framework may prove more useful for future work than one of levels of implicit or explicit understanding, since placing our tasks on a dimension of implicit *vs* explicit understanding is not straightforward. The source question "How do you know" is uncontroversially a test of verbally explicit, reflective understanding. Similarly, children's immediate responses to "Which one is it?" in the partial access identity task of Experiment 1, seem uncontroversially to assess implicit understanding. The difficulty arises with the other tests of working understanding. The no access prediction task (and by inference Experiment 3's partial access task) was no easier than the explicit source question. We might conclude, therefore, that they demand similar levels of reflective understanding about the knowing process. If so we would need to differentiate the partial access task in Experiment 1 from at least some of the other finding out tasks, in terms of the level of understanding required. Yet it seems difficult to draw a line conceptually between reaching to touch a visible toy on the table (Experiment 1), inserting a hand inside the tunnel to touch a visible or partially visible toy (Experiments 2 and 3), and inserting a hand inside the tunnel to touch an invisible toy (Experiments 2 and 3). All these tasks seem to be in clear

contrast to the source reporting task, and to O'Neill et al's (1992) task in which children announced how they would find out which toy was in the tunnel. That is, with the hindsight of our results, the *a priori* classification of tasks as tests of working *vs* reflective understanding seems to map more easily onto a cognitive *vs* metacognitive framework than onto one of levels of implicit *vs* explicit understanding.

What do our results tell us about how effectively children learn about objects in their everyday lives? It might have been that 3- to 4-year-olds require correction from others, and that when operating autonomously they over-estimate the knowledge they can gain from ambiguous input. Our results suggest that correction from others may not be necessary. Even if children initially take uninformative access, for example by looking at an opaque milk carton to find out how full it is, the results of the partial access identity tasks suggest they are likely to self-correct: As soon as they see the carton they will realize that more information is needed. Initially they may be unable to predict precisely what mode of access is necessary, but will continue to explore until they recognize that they have sufficient information. Our results suggest that 3- to 4-year-old children's working understanding of the connection between information access and knowledge state, even if limited, allows them to find out accurately about objects' properties despite their well documented limitations in more reflective understanding.

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Table 1

Mean Scores (s.d.) Gained in Response to Identity and Source Questions in Experiment 2

Age	Partial access identity	No access identity	Source report
3- to 4 – years	1.46	.88	.92
N = 50	(.50)	(.56)	(.72)
4- to 5-years	1.76	1.32	1.42
N = 50	(.43)	(.55)	(.61)

Note. Maximum score = 2.