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Judging Who Knows Best about Yourself:
Developmental Change in Citing the Self Across Middle Childhood

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Running header: Locus of self-knowledge

ABSTRACT

Rosenberg (1979) reported that children under the age of 11 do not recognize that they are the authority on their own self-knowledge, placing authority instead with adults. However, results from Studies 1 and 2 suggest that the shift from reliance on adults to self occurs between the ages of 5 and 10 years. The studies also demonstrate parallel development in judging own and other people's self-knowledge. Study 3 shows the beginnings of sophisticated understanding in children aged 5 -- 7 years, who differentiate between information about the self that is best judged by the self, and information that can be judged by others. Suggestions are made as to why this aspect of understanding minds develops later than other aspects of psychological understanding.

Judging Who Knows Best about Yourself: Developmental Change in Citing the Self Across Middle Childhood

Imagine a situation where you are disagreeing with someone about a matter of fact. Presumably, a major consideration will hinge on who can claim to have the most reliable information. A person who had up-to-date and direct access to relevant information is on firmer ground than someone who merely heard a rumor. In that case, if the topic is knowledge about oneself, such as what you are thinking, then surely there can be no disagreement, for people would have to concede that you are uniquely placed to access the relevant information. At least that is what we adults might suppose intuitively, but Rosenberg (1979) made a long-standing claim that an appreciation that you are the authority on your self-knowledge is something that only emerges at the dawning of adolescence. He suggests that prior to that point, children seem to think adults are the definitive authority on their self-knowledge.

Conversation about internal states necessarily has to be based on external behavioral correlates, as if the referent of internal states exist in the public domain (Montgomery, 1997) -- as if your internal states are transparent to other people. Perhaps this experience is an obstacle to children appreciating that they are uniquely placed to access their internal states, which in turn might be an obstacle to acquiring a fully fledged concept of subjectivity. The purpose of this article is to examine Rosenberg's (1979) claim that children think adults are the ultimate authority on self-knowledge. We shall also examine whether children judge differently depending on whether the self-knowledge pertains to themselves or to another child, and whether they make different judgments about different kinds of self-knowledge.

Self-knowledge is the knowledge that you have of yourself which may also incorporate past and future selves (Markus, 1983). Self-knowledge differs from other types of knowledge, as it is formed through both subjective and objective information. Objective knowledge comes from making yourself an object of your own thought, in effect, seeing yourself through someone else's eyes. Subjective information gives rise to privileged knowledge that an individual accesses on how they are feeling, what they are thinking and what their motives really are. An understanding of the difference between your knowledge of yourself, your knowledge of other people, their knowledge of themselves and their knowledge of you, plays an intrinsic role in social interactions, especially the interpretation of actions (Montgomery, 1997). Baldwin (1906), and also Lewis and Brooks-Gunn (1979), theorize that we come to learn about self by learning about others, and vice versa.

Rosenberg (1979), however, likened knowledge about the self to knowledge about anything else, in assuming that there is a definitive truth and that people can differ in the degree to which they are authorities on that truth. This concept forms the basis of his work looking at the locus of self-knowledge: Who knows the truth or is closer to the truth pertaining to self-knowledge? Rosenberg investigated this question not by asking children what they know about themselves but by asking whom they thought knew best about them (the children). As mentioned previously, a very interesting feature of his results was that children seemed to regard adults as a higher authority than themselves on their (the children's) self-knowledge. Perhaps a process of personal discovery or the adoption of culturally held beliefs eventually leads children to regard the individual as the definitive authority on themselves.

It would be surprising, though, if individuals consistently judged themselves or adults to know best for all types of self-knowledge. Rosenberg (1979) suggested that the truth could lie internally or externally to the self and suggested that this may

depend on what characteristics of the self were being judged. Exterior aspects of the self refer to aspects of the self that are public (e.g. characteristics and behavior), whereas interior aspects refer to private knowledge (e.g. thoughts and feelings). With respect to exterior self-components, Rosenberg presented a number of situations in which children were in conflict with someone about a judgement of the self:

‘If I asked you and your mother how good you were, and you said one thing and she said another, who would be right – you or your mother?’

The modal response of participants in middle childhood was to cite their parent (roughly 70% of the time), whereas the modal response of adolescents was to cite themselves (roughly 60% of the time). Even more striking, those in middle childhood were as likely to cite their parent whether the question asked about exterior or interior self-knowledge. Participants were also asked, ‘Who knows best what kind of person you really are – your mother, your father, yourself, or your best friend?’ From those who answered with ‘self’ or ‘parent’, fully 52 percent of children aged 8-11 years answered that a parent knew better than themselves, while among those aged 15 years or over, only 24 percent attributed this knowledge to a parent.

From the findings of his study, Rosenberg (1979) concluded that children are not attuned to the subjectivity of self-knowledge, and have blind faith in adult’s omniscience. He added that adolescents begin to recognize their own uniqueness and come to appreciate that they have privileged access to their own subjective states. Hence, they recognize that they are the ultimate authority on themselves.

Bar-Tal, Raviv, Raviv and Brosch (1991, also, Raviv, Bar-Tal, Raviv & Houminer, 1990; Raviv, Bar-Tal, Raviv & Peleg, 1990) reported evidence that converges with Rosenberg’s (1979). They investigated children’s and adolescents’ ratings of epistemic authority in various knowledge domains, such as pastimes, social relations, science and personal feelings. From their findings, they suggest that the perception of parents as epistemic authorities remains stable during childhood (between the ages of 4 and 9 years). Between the ages of 9 and 18 years, however, the perception of parents as epistemic authorities is gradually replaced by an increasing reliance on friends, siblings and the self.

If Rosenberg (1979) and Bar-Tal et al (1991) are correct to argue that children do not recognize themselves as the authority on their own interior self-knowledge before the age of 10 years, it would imply that this area of folk psychology undergoes much tardier development than other aspects; it would stand in contrast to the early acquisition in understanding about the quality of imagination, desires and thoughts. From about 3 years, children understand that thoughts are substantive and qualitatively different from objects (e.g. Wellman & Estes, 1986). From about 4 years of age children begin to distinguish between their own and others’ beliefs (Gopnik & Astington, 1988; Mitchell & Lacohee, 1991). From about 5 years, they display a sophisticated understanding of who does and does not know about a fact relating to reality (Robinson, Champion & Mitchell, 1999) and can interpret an utterance nonliterally by taking account of the speaker’s false belief (Mitchell, Robinson & Thompson, 1999). By 6 or 7 years, they begin to understand how different minds vary in how they interpret a given piece of information, according to their prior knowledge and experience (Chandler & Boyes, 1982; Taylor, 1988). In short, children’s sophisticated psychological understanding demonstrated in these studies, contrasts with their apparent lack of insight identified in Rosenberg’s (1979) study. Although children understand a great deal about the quality of mental states by 7 years of age, this does not help them to cite themselves as the authority on self-knowledge. Note that children did not deny that they had self-knowledge in

Rosenberg's study, rather they seemed to assume that their parent was a higher authority on their (the children's) self-knowledge.

The questions Rosenberg (1979) asked participants were rather general, for example, 'Who knows best what kind of person you really are...?' and the generality of the question may have led children to cite an adult. Perhaps children below the age of 11 would be more inclined to cite themselves when responding to specific questions. Alternatively, it might be that children cite an adult even when probed with specific questions, in which case they would appear to have a deep seated lack of insight in this arena of psychological knowledge. In turn, this would suggest that acquiring a comprehensive understanding of the mind is surprisingly long and drawn out, much more so than has been recognized hitherto.

The following studies present specific questions about aspects of self-knowledge. These studies also extend previous work by looking at children's understanding of the locus of other people's self-knowledge. In addition to judging that they recognize that they are the authority on themselves, children ought to acknowledge that another person is the authority on their self-knowledge. If the specific questions led children to cite themselves, this would not appear impressive if they also cited themselves when asked who knows best about other people. Hence, our procedure is capable of identifying egocentric responding.

We compared judgements of self-knowledge with children's understanding of the interpretative nature of the mind (Taylor, 1988). In order to pass these tasks, the child must realize that their privileged knowledge is not available to everyone, and that people view the world from different perspectives. Such understanding might be sufficient for a child to appreciate that privileged access to her own subjective states means that she is equipped to give the most reliable interpretation of those states and is thus the authority on her interior self-knowledge.

This study focuses on the period between 5 and 10 years for two reasons: (1) There is clear development in children's understanding of the mind's ability to interpret information during this period (Taylor, 1988); (2) We derive a strong prediction from Rosenberg (1979) that even our oldest group of children would cite an adult as the authority on their (the child's) self-knowledge.

STUDY 1

Method

Participants

Eighty-six children were recruited from two mainstream state-funded schools in Nottinghamshire, UK. The schools that agreed to take part in the study were located in predominantly white, low to middle income communities. Parental permission was then sought to recruit the individual children. Participants were divided into three age groups according to school year: Twenty-four '5-year-olds' aged between 4 years 10 months and 5 years 4 months (mean, 5 years 1 month, 8 girls, 16 boys), 30 '7-year-olds' aged between 6 years 6 months and 7 years 5 months (mean, 6 years 11 months, 18 girls, 12 boys) and 32 '10-year-olds' aged between 9 years 5 months and 10 years 4 months (mean, 9 years 10 months, 16 girls, 16 boys). A further three 5-year-olds (1 girl and 2 boys) were not included in the analysis because they persistently gave content answers, even after prompts. For example, when asked, 'Who knows best what your favorite food is?', they responded, 'Chicken and chips!' One further girl in the youngest age group was excluded for refusing to answer some of the questions.

Materials

A Polaroid camera was used to take a picture of the child at the beginning of testing. Six other photographs completed the array, which included a picture of the child's teacher, a picture of the experimenter, a picture of a boy (Tommy) about the same age as the participant, a picture of a girl (Beth) also about the same age as the participant, a picture of a man (Tommy's teacher) and a picture of a lady (Beth's teacher). Presenting photographs made the task concrete and relieved demands on memory. It was impossible to use photographs of children's parents, so *teacher* served as the adult figure. Young children spend a large proportion of their waking hours at school and in the UK, children of these ages have the same teacher for nearly every lesson. Consequently, they probably feel that their teacher knows a lot about them and what they do.

The main procedure employed 28 questions asking, 'Who know best?'. There were 14 questions, based on Rosenberg (1979) and Damon and Hart (1988), but each was presented twice to every child, once with the self as the subject of the sentence, and once with another child (Beth or Tommy) as the subject (see Appendix 1). Seven of the 'other child' questions had Tommy as the subject and the other seven had Beth and these were the same for every participant regardless of their gender. Each child was assigned to one of four randomly-generated presentation orders of the 28 questions and these were divided into part 1 and part 2 by presenting the first 14 questions as part 1 and the other 14 as part 2. Each part therefore contained a random mix of the questions, some presenting the self as the subject, some Beth and some Tommy.

Twelve of the 14 questions asked about aspects of self-knowledge (e.g., Who knows best what you are thinking?), where it would be appropriate to say that the subject knows best (either self or Beth/Tommy). It would be acceptable to answer the remaining two questions by saying that the teacher knows best (e.g., Who knows best what you will be doing at school tomorrow?). These were included to identify children who were over-inclusive in locating knowledge with the subject.

A version of Taylor's (1988) restricted view task served as a way of assessing understanding of the interpretative quality of the mind. A4 sheets of card, measuring 29.5 by 21 cm, with strategically placed windows allowed four different restricted views of a picture of an elephant and a picture of a giraffe to be presented, and an example appears in Figure 1. The restricted views were always presented in a set order, with the most restricted presented first. The presentation order of the animals alternated between participants.

Design and Procedure

All children were tested individually in a quiet room at their school. A Polaroid photograph was taken of them and they were invited to watch it develop. Once the image appeared, the experimenter showed the pre-existing photographs. The child was then asked to identify the people in the photographs, which ensured that they identified and remembered Beth, Tommy, their respective teachers, and so on. The child was then presented with the tasks in the following order:

1. Locus of self-knowledge Part I (14 questions)
2. Filler Task (False Belief)
3. Locus of self-knowledge Part II (14 questions)
4. Restricted View Task

In response to each locus of self-knowledge question, the child was asked to point to the picture of the person they thought would know best. They were assured

that there were no right or wrong answers and that they should restrict their answers to the people in the photographs. If a child said that they did not know, they were encouraged to take a guess. After the first 14 questions, the child was asked to move the photographs to the side. Two false belief tasks were then administered as filler tasks. As expected, children performed well on these and results will not be discussed in this article. After this, the child spread out the photographs again, the experimenter checked that they remembered the names of the people depicted, and the remaining fourteen ‘Who knows best?’ questions were presented.

Finally, the child was presented with an A4 picture of either an elephant or a giraffe and asked to name the animal. They were then asked to name someone in their class. The original picture was covered with the first restrictive sheet and participants were asked whether the named classmate would know that it is a giraffe/elephant when they see just this picture. This was repeated for all of the restricted views and for both animals.

The card showing none of the animal was included as a control for a ‘yes bias’ following concerns during testing that this may be a problem. Because the control was introduced once testing was underway, only some of the children received it: Twenty of the 10-year-olds, all 30 of the 7-year-olds and 12 of the 5-year-olds. Three of the youngest children included in the final analysis who did not receive the control may have had a ‘yes bias’. To err on the side of caution, these children were marked as failing the task (see below).

Results

The main point of interest is whether children identified the subject (either themselves or Beth/Tommy) as the authority on self-knowledge, whether there was an age-trend relating to these judgements and whether judgements of self-knowledge were predicted by performance on the restricted view task. Before tackling these issues, we shall examine whether children judged differently according to the subject of the question (themselves versus Tommy/Beth) and whether they judged correctly that the teacher knew best when the question was about future activities in school and how good they were at reading. We shall then examine in more detail whether children’s responses were linked with the content of specific questions.

Self and other questions

The 24 questions about self-knowledge were divided into those about the self and those about Beth/Tommy. As can be seen from Table 1, the mean percentage of ‘me’ answers to the 12 questions about another child was zero for the 7- and 10-year-olds, and only five percent for the 5-year-olds. Answering with ‘my teacher’ to a question about Beth/Tommy may also indicate egocentric answering but the number of such answers was also very low (7% for the 5-year-olds, zero for the 7-year-olds and less than 1% for the 10-year-olds). Hence, children seldom answered in an egocentric fashion.

 Insert table 1 here

In response to questions about the self (top of Table 1), children in the two younger groups answered predominantly by pointing to their teacher. Children in the older group gave a much greater number of ‘me’ responses. In answer to questions about other children (bottom of Table 1), participants in all groups tended to choose Tommy/Beth or Tommy/Beth’s teacher. The bottom half of Table 1 also shows that when answering questions about Tommy/Beth, some of the participants picked ‘you’ (the experimenter). This was most common in the 7-year-olds. A clue to the reason

for this pattern was given when a few participants said aloud that they thought the experimenter knew these children quite well.

Effect of content

Around 50 percent of answers from the entire sample were 'subject' to the questions about what you are thinking, what your favorite food is, what you want for your Birthday, how happy you are, how tired you are, how warm you are and how hungry you are. When children were asked who knows best when you are feeling sick, only 33 percent cited the subject. In response to the question about crying, only 39 percent of answers were 'subject'. Twenty-seven percent of answers were the subject in response to the question about how kind you are, and only 20 percent of answers placed the subject as knowing best how friendly they are. These answers will now be compared with the two questions to which we expected answers that the teacher would know best. Table 2 shows the pattern of responses for the four school questions divided as to whether the question was about self or about Tommy/Beth.

 Insert Table 2 here

The mean number of 'me' and 'my teacher' answers to the two questions about another child was again very low with only two percent of the 5-year-olds answering 'me' and nine percent answering 'my teacher'. From Table 2, we see that in response to school activity questions both about self and about other children, all of the age groups tended to choose the subject's teacher as knowing best.

Questions about self and school

Tables 1 and 2 show that the 10-year-olds frequently answered with 'subject' when the question was about self-knowledge (75% self question, 70% Beth/Tommy question). When the question was about school, they usually responded with 'teacher' (95% self questions, 86% Beth/Tommy question). Hence, the older children only judged that they (or Beth/Tommy) knew best when appropriate. In contrast, children in the two younger groups gave a fairly high number of 'teacher' responses to questions about school and self-knowledge.

Main analysis: Developmental change in citing the subject

Figure 2 illustrates the change in type of answer ('subject' in the top half of the figure and 'subject's teacher' in the bottom half) across age in response to questions about self-knowledge. Answering with 'subject' precludes answering with 'teacher', and a negative correlation between the two kinds of answer confirmed a highly significant statistical dependency: $r(84) = -.77, p < 0.001$. Therefore, only analyses based on answers of 'subject' will be reported. A two (gender) x three (age group) x two (self, other) analysis of variance (ANOVA), the third factor being a repeated measure, was performed on the number of times participants cited the subject. A main effect indicated that 'subject' responses were more common when the question was about the participant than about Tommy/Beth: $F(1,80) = 27.44, p < .001$. Another main effect indicated that older participants gave more 'subject' responses than younger participants: $F(2,80) = 25.15, p < .001$. No effects were associated with the gender of the participants. There was a significant interaction between the form of the question (self, other) and age: $F(2,80) = 3.83, p = .03$. Paired *t*-tests within each age group showed that the 5-year-olds [$t(23) = 2.56, p = .02$] and 7-year-olds [$t(29) = 4.20, p < .001$] gave significantly more answers of 'subject' when the question was about self than other. In contrast, 10-year-olds did not respond differently depending on the subject of the question. Perhaps 'subject' responses were less common for questions about Beth/Tommy than self among the 5- and 7-year-olds

because they sometimes responded 'you' (the experimenter) at the expense of responding 'Beth/Tommy'. This would occur if they assumed that the experimenter was acquainted with Beth/Tommy.

Restricted View

The children's answers to the restricted view questions were recorded as Fail, Stage 1 or Stage 2 according to Taylor's (1988) classification. The fail category included children who demonstrated a possible 'yes bias' or 'no bias'. Children were also marked as Fail if they were inconsistent across the two trials. The children were recorded at Stage 1 if they correctly reported that another child would not know what was in the picture when the window was empty, but wrongly reported that another child would know from a nondescript view. The children recorded at Stage 2 judged that another child would know what was in the picture if (and only if) an informative part of the picture was visible through the window (i.e. a uniquely identifiable part of the animal).

To pass the restricted view task, a child needs to acknowledge that they have privileged information about the picture. In other words, they need to acknowledge that another child who has not seen the whole picture, will not recognize the animal *unless the view is informative*. This is similar to the understanding that is needed for answering locus of self-knowledge questions. An individual knows certain information about themselves because they have the privileged access to their internal thoughts and feelings. Whether or not another person can interpret your internal thoughts and feelings depends on the quality of their informational access. If their information is inferior to yours, then it is reasonable to claim that you know best about this aspect of yourself.

Of the 5-year-olds, only 8 percent were recorded at Stage 2, whereas 53 percent of the 7-year-olds and all of the 10-year-olds showed this level of understanding. Because children in the oldest group were at ceiling on the restricted view task, they were not included in the following analysis. Children identified as having reached Stage 2 ($n=18$) were significantly more likely than those not at Stage 2 ($n=36$) to respond with 'subject' in answer to self-knowledge questions: $F(1,53) = 6.06, p=.017$. The mean number of 'subject' answers out of a possible 24, for those not at stage 2 was 4.64 ($S.D. = 6.48$), whereas the mean for those attaining Stage 2 was 9.72 ($S.D. = 8.37$). When chronological age was partialled out in an analysis of covariance, however, the relation between performance on the two tasks was no longer significant: $F(1, 53) = 3.05, n.s.$ In other words, although those who acknowledged the interpretative character of the mind tended to be the same who assigned self-knowledge to the subject, this relation might have been due to more general changes that coincide with age.

Discussion

Children aged about 5 years and to some extent those aged 7 years tended to cite an adult when asked who knows best about self-knowledge. There was little evidence of egocentrism when answering about another child, even among the youngest participants. In contrast, the 10-year-olds typically judged that the subject of the question is the ultimate authority on self-knowledge.

The tendency to cite themselves among the 10-year-olds contrasts sharply with Rosenberg's (1979) finding, but there were some major differences between the two studies. In our tasks the only authority figure available as an option was *teacher*, but in Rosenberg's study the children had the options of parents as well as their teacher. Rosenberg also presented children with the option of choosing a friend as knowing best. The constraint in the current study in the types of other people to whom children

could attribute knowledge may have resulted in the older children artificially citing themselves. For example, it may be that the older children realize that whilst they know better than their teacher how hungry they are, their mother actually knows best of all. This is addressed in Study 2.

STUDY 2

The current study included parents and friends as options in order to be consistent with Rosenberg (1979). From Rosenberg's findings, we would expect all children to cite an adult, most probably a parent, as knowing them best. Two of the questions that Rosenberg asked were also included to allow comparison of the children's answers on the specific questions with more global self-knowledge questions. Even if 10-year-olds cite themselves in response to specific questions, they might cite an adult when the question is worded more generally, as in Rosenberg's study. The restricted view task was used again in this study to further examine the relation between understanding the interpretative character of the mind and locus of self-knowledge.

Because the clearest developmental change identified in Study 1 was between 10-year-olds and younger children, we included just one younger group in the current study. They were aged roughly in between the two younger groups in the previous study, and we designate them as '6-year-olds'.

Method

Participants

Forty-seven children were recruited from a different school in Nottinghamshire according to the same procedure used in Study 1. The school was mainstream state-funded and served a low to middle income predominantly white community. The children were divided into two age groups, consisting of 21 '6-year-olds' aged between 5 years 10 months and 7 years 1 month (mean, 6 years 4 months, 9 boys and 12 girls) and 26 '10-year-olds' aged between 9 years 7 months and 10 years 5 months (mean, 9 years 11 months, 15 boys and 11 girls).

Materials

Cards approximately 10x8cm with stick figure symbols and labels (e.g. Mum) showed the range of people participants could choose as 'knowing best'. Cards were used to represent the child, the experimenter, a boy and girl not known to the participants (Tommy and Beth), Mum, Dad, teacher and friend. The same locus of self-knowledge questions were used as in Study 1 and the restricted view task was also used. Children were asked two additional questions: 'Who do you feel really understands you best?' and 'Who knows best what kind of person you really are?'

Procedure

Each child was tested individually in a quiet room. The child was shown two 'me' cards, one with a stick boy and one with a stick girl, and had to pick one to represent themselves. They were introduced to the 'you' card as showing the experimenter. The Mum and Dad cards were shown to them and it was explained that they didn't just show their own Mum and Dad but anybody's Mum and Dad. The two cards representing Beth and Tommy were introduced and participants were asked to identify which was which. The children were shown three cards with the word 'friend' and two characters. One card showed two boys, one showed two girls and the other showed a boy and a girl. They were free to choose one of these to represent their friends (or Beth or Tommy's friends). Finally, they had to choose a card to represent teacher, where one was a man and one a lady. The child was asked to point out who the different cards represented as a check for understanding: 'When you want to answer with Beth's teacher which card will you point to? When you want to

answer with your Dad which card will you point to?' Any mistakes were corrected and children were pre-tested again until they answered correctly.

The child was then presented with tasks in the following order:

1. Locus of self-knowledge questions Part I (14 questions)
2. Restricted View task
3. Locus of self-knowledge questions Part II (14 questions)
4. Two locus of global self-knowledge questions taken from Rosenberg (1979)

The procedure for the locus of self-knowledge questions and the restricted view tasks were the same as in Study 1. The order of the two locus of global self-knowledge questions was alternated between participants. When the child was asked these questions, the cards showing the range of possible answers remained in front of them given that their options were the same as for the specific locus of self-knowledge questions.

Results

The answers children gave to self-knowledge questions were marked as either 'me', 'Tommy', 'Beth', 'parent', 'teacher' or 'friend' and the restricted view responses were scored as in Study 1. Table 3 shows the pattern of answers for when the questions were about self-knowledge separated by whether the question was about self or about Beth/Tommy. Table 4 shows the pattern when the questions were about school activities, again separated by whether the question was about self or Beth/Tommy.

 Insert Tables 3 and 4 here

Paired *t*-tests showed that there were no significant differences for whether the question was worded about self or about other. We therefore combine the answers of questions about self and other into 'subject', 'parent', 'teacher' and 'friend'. There was only a very small number of answers of 'teacher' to the questions about self-knowledge. For these questions the 6-year-olds gave on average eight percent 'teacher' answers, and the 10-year-olds, one percent. Six-year-olds answered that a friend knows best 13 percent of the time, and the 10-year-olds 11 percent of the time. Only questions about school tended to elicit 'teacher' responses (see below).

Effect of content

As in Study 1, we looked at the number of 'subject' answers to each question individually. Again, roughly 50 percent of answers were of 'subject' to the questions about what you are thinking, what your favorite food is, what you want for your Birthday, how happy you are, how scared, tired, warm and hungry you are. Thirty-eight percent of the children answered that the subject knew best what was wrong when they are crying, whilst 40 percent answered similarly about when they are feeling sick. In response to the questions about how friendly and kind you are, about 30 percent answered that the subject knew best of all.

Generally, the older children answered 'subject' (71%) with only 17 percent answering with 'parent' and one percent answering with 'teacher'. An exception was in response to questions relating to school, when 84 percent judged that an adult knew best (76% 'teacher', 8% 'parent') and only 14 percent answered with 'subject'. In contrast, the younger children generally cited an adult in response to all of the questions. Eighty-seven percent cited an adult in response to school questions (58% 'teacher', 29% 'parent') and 69 percent cited an adult to self-knowledge questions (61% 'parent' and 8% 'teacher').

Main analysis: Developmental change in citing the subject

There were no significant differences between judgements about self and other (Tommy/ Beth questions) in either age group so the two conditions were collapsed and the answers presented as 'subject' and 'adult' in Figure 3. As with Study 1, answering with 'subject' precludes answering with 'adult' (in this case, 'teacher' or 'parent'), and once again there was an unsurprising negative correlation between answering 'subject' and 'teacher' [$r(45) = -.59, p < .001$] and also between answering 'subject' and 'parent' [$r(45) = -.92, p < .001$]. Therefore, only analyses based on answers of 'subject' will be reported. A two (gender) x two (age group) ANOVA was performed on the number of times participants cited the subject. A main effect indicated that older participants gave more 'subject' responses than younger participants: $F(1,43) = 75.47, p < .001$. No effects were associated with the gender of the participants.

Locus of global self-knowledge

Children answered the global questions in a very similar way to that reported in Rosenberg's (1979) study. In response to the question, 'Who do you feel really understands you best?', 11 percent answered with self, 70 percent with a parent, 17 percent 'friend' and two percent said 'teacher'. In Rosenberg's study, this question was not asked about the self because the specific purpose was to see whether children relied more on adults than peers (siblings and friends). This makes a full comparison between studies impossible, although the number of children answering 'friend' in our study is higher than the comparative age group in his study, where only seven percent answered with either friend or sibling.

In response to the question 'Who knows best what kind of person you really are?', 74 percent of the children said either that themselves or an adult knew them best (the rest cited a friend). Of those who answered in this way, 75 percent of the 6-year-olds said that an adult knew them best and 48 percent of the 10-year-olds did likewise. In Rosenberg's (1979) study, of the children aged 8 to 11 years who cited themselves or a parent, 52 percent said that an adult knew them best. Evidently, the pattern of data is similar between studies with respect to answers to a global question.

Restricted view

As in Study 1, 10-year-olds performed at ceiling. In contrast, only five of the 6-year-olds were identified as being at Stage 2. Due to floor effects among the younger children on the restricted view task, it was impossible to execute a meaningful comparison between this and locus of self-knowledge. This issue will be addressed further in Study 3.

Discussion

This study replicated the findings from Study 1 in showing that by the age of around 10, children tended to cite themselves as knowing best about their self-knowledge when the questions are specific, whereas younger children cite adult figures. This corresponds closely with the findings of Study 1 and shows that even when *parents* were available as options, the 10-year-olds were still appropriately citing themselves. However, when asked a global self-knowledge question, 10-year-olds often judged that an adult knows best, which replicates Rosenberg's (1979) finding. Together, the findings warn us against generalizing about 10-year-olds' tendency to cite an adult, merely because they judge in that way in response to a global question.

STUDY 3

The purpose of this study is to focus on younger children (aged 5-7 years) to get a clearer understanding of their tendency to cite adults as knowing best about their

(the children's) self-knowledge. Evidently, children appreciate that adults are not uniformly omniscient, given that they cite relevant adults. For example, they judge that their own teacher knows best what they are thinking, but that Tommy's teacher knows best what he is thinking. Nonetheless, they might still have blind faith in adults' ability to know things, albeit adults who have some connection with the subject of the question. Do children have a general faith in adults' knowledge? In Study 3, we addressed this question by including tests of children's tendency to defer to adults on a matter of factual knowledge (Knowledge test, see below). We also included a test to confirm directly that children would not defer to an unknown adult on a matter of self-knowledge (Stranger test, see below).

We also continued our investigation of the wording of the question. The tendency to cite adults might be peculiar to the exact wording of the 'Who knows best' question. Just as 10-year-olds perform differently whether asked a specific or global self-knowledge question, so younger children might perform differently when presented with a different form of specific self-knowledge question. In Study 3 we asked some children, 'Who knows most of all...?'. If children's tendency to cite an adult was not affected by question wording, then it would offer reassurance that we have identified a robust phenomenon.

We also included a test of language ability to gain greater insight into any relation between answers to self-knowledge questions and performance on the restricted view task. If the two correlate, is this merely because both tasks involve similar linguistic demands? If so, the correlation would vanish when language ability is partialled out.

In this study, we defined different kinds of self-knowledge that we call 'interior' and 'exterior'. Interior self-knowledge is roughly defined as knowledge about yourself that others could only discover when you tell them. For example, others might not know the content of your private thoughts unless you tell them. Exterior self-knowledge is knowledge about yourself that others can gather by observing your behavior. For example, people can discover whether you are honest by comparing what you say with what they know to be true in fact; they can discover whether you have a good sense of humor by noting whether people laugh at your jokes, and whether you appreciate other people's jokes. Perhaps the somewhat coarse method of questioning in Studies 1 and 2 primed children to cite adults. Would children in the current study be more likely to indicate themselves in answer to questions about interior self-knowledge than to questions about exterior self-knowledge?

Method

Participants

The 96 children who took part in this study were divided into three age groups, each of 32 children. The recruitment procedure was as in the other two studies. The children attended a mainstream state-funded school in North Yorkshire, UK, which serves a predominantly white, low to middle income community. The '5-year-olds' were aged between 5 years 0 months and 5 years 11 months (mean, 5 years 4 months, 19 boys and 13 girls), the '6-year-olds' were aged between 6 years 0 months and 6 years 11 months (mean, 6 years 5 months, 16 boys and 16 girls) and the '7-year-olds' were aged between 7 years 0 months and 7 years 11 months (mean, 7 years 4 months, 18 boys and 14 girls).

Materials

All children completed the Test for Reception of Grammar (TROG; Bishop, 1982). The stimuli in the restricted view task were the same as used in the two

previous studies. The Knowledge test involved a large plain paper bag containing six objects which were all roughly the same size: A plastic duck, a rubber football, a small car, a 'Mr. Happy' purse, a toy hedgehog and a large plastic tomato. A smaller red velvet bag decorated with glitter stars was also used, which could easily accommodate any of the objects. In the locus of self-knowledge test, cards were used to represent the child, the experimenter, an unfamiliar man, a boy and girl (Tommy and Beth) not known to the participants, Mum, Dad, teacher and friend, as in Study 2. For the Stranger test, a photograph of a man that the children did not know was also used in order to convey the concept of 'stranger'. The 'me' card was replaced with a blank card that the child had to write their name on. The experimenter's card had 'Sarah' rather than 'you' in case pronoun reversals hindered some of the younger children.

The items for the interior and exterior categories were identified in a preliminary study involving undergraduate students. Thirty-three students were asked to generate questions that could be placed in categories that were developed from a study by Schoeneman (1981). The categories were: a) things about a person that other people could know on the basis of evidence, b) things a person would have to tell about themselves in order for other people to know, c) things about a person that other people could gather from observation and through comparisons with other people, d) things about a person that others may discover through observation but that are based internally. An example was given to aid the explanation of the categories.

From the 375 statements, a list of 39 was compiled after removing duplications and unsuitable suggestions. The list of 39 was given to a further 30 (different) undergraduates who were asked to indicate in which of the 4 categories they would place the statement. Six of the statements were placed in the first category. The consistency of answers varied with the statements from 57 percent to 93 percent (mean = 81%). A further 6 questions were placed in the second category by between 50 percent and 87 percent of the students (mean = 68%). We call these 'exterior' and 'interior' categories, respectively. There seemed to be little consensus over where the remaining questions should be placed, and six questions were selected at random from these as filler items, giving a total of 18 questions.

Design and procedure

In the locus of self-knowledge test, participants answered 18 questions, half with themselves as subject, and the other half with either Tommy or Beth as subject. Half of the children were asked all of the questions in the style of 'Who knows best....' and the other half were asked 'Which person knows most of all...'. Two different random presentation orders were created for the questions. The questions covered 3 categories: Interior self-knowledge, exterior self-knowledge and fillers (see Appendix 2). The subject of each question varied between participants, such that question content was not confounded by whether the subject was self or other.

Children were tested individually in a quiet room at their school. Each child participated in two sessions, with about a week between. All children completed the TROG in the first session using the standard procedure outlined in the manual.

In the second session, children were presented with the tasks in the following order:

- 1) Knowledge test
- 2) Stranger test
- 3) Locus of self-knowledge Part I (9 questions)
- 4) Restricted view task (or filler task)
- 5) Locus of self-knowledge Part II (remaining 9 questions)
- 6) Filler Task (or restricted view task)

The Knowledge test and Stranger test examined whether children judged that an ill-informed adult knows better than they even on matters of fact. In the Knowledge test, children were told to look inside the paper bag and choose one object to hide in the star bag, whilst the experimenter was not looking. The child was then asked either ‘Who knows best which toy is in the star bag now, you or me?’ or ‘Which person knows most of all which toy is in the star bag now, you or me?’ (Whether ‘you’ was said first or second alternated between participants.) Then the experimenter tried to guess what was in the bag. The hidden toy was returned to the paper bag and the child was asked to turn away while the experimenter hid a toy. The same question was asked, and then the child guessed which toy had been hidden. For half of the children, the experimenter hid the toy first and for the other half, they hid it first.

In the Stranger task, the experimenter showed a photograph of a man, explained that he lives in a different town, and asked whether they had met him. All children correctly answered negatively. They were then shown a stick man with the label ‘man’ written on it and were told that when they wanted to answer that the man in the photograph knew something most of all/best they should point to this ‘man’ card. They were then shown the three ‘friend cards’ used in Study 2. The child was asked to pick one of these cards, for when they want to answer with ‘friend’. They were asked to name their favorite animal and then choose from the man, their friend or themselves, who knows best that an X is their favorite animal.

In the locus of self-knowledge task, the man card was put away, and the child was introduced to the rest of the cards, along with the introductory preamble, as in Study 2. Then the first nine locus of self-knowledge questions were presented. The child was subsequently presented either with the restricted view task or the filler task which involved perspective taking. Children performed well on the perspective taking task and results will not be discussed in this article. For the restricted view task, the procedure was as described in Studies 1 and 2. The remaining nine locus of self-knowledge questions were asked, followed either by the restricted view or the perspective taking task, as appropriate.

Results

Knowledge test

To score as correct, children had to answer appropriately to both questions: That they knew best when they hid the object, and that the experimenter knew best when she hid the object. Twenty-three children (four 7-, six 6- and thirteen 5-year olds) made one or more errors but 15 of these (four 7-, five 6- and six 5-year olds) could be considered egocentric answers: Children said that *they* knew best both when they had hidden the object and when the experimenter had hidden it. This accounts for all but one of the errors made by 6- and 7-year-olds.

Stranger test

Each child was asked to indicate whom they thought would know their favorite animal, given the option of themselves, their friend or an adult stranger. Only 3 children (one from each age group) answered ‘stranger’, again suggesting no general tendency for children to say that an adult knows best. Overall, 25 children said that their friend would know best, comprising 18 aged 5 years, 5 aged 6 years and two aged 7 years.

Locus of self-knowledge

Answers to the 18 locus questions were analyzed using a paired *t*-test, to see if there was a difference in the type and frequency of answers (e.g. Mum, friend) depending on the wording of the question: ‘Who knows best...’ or ‘Which person

knows most of all...' No comparisons approached significance, and we combined data from the two wordings in the analyses reported below.

The following analyses are based on the results from the 12 questions pertaining to interior and exterior self-knowledge. Table 5 shows the pattern of answers given in response to the interior self-knowledge questions about self and about Beth/Tommy. Table 6 shows the pattern for the exterior self-knowledge questions about self and about Beth/Tommy.

 Insert Tables 5 and 6 here

Preliminary analyses established that children's responses were not affected by the subject of the question. For example, they were just as likely to answer 'subject', whether that happened to be themselves or Beth/Tommy. The responses were therefore combined in the ensuing analyses, whether the questions were about self or about other.

Content of questions

In the interior category, 40 percent of answers (range 31% for 'Who knows best what is wrong when you cry?' to 45% for 'Who knows best what secrets you know?') cited the subject of the question, six percent cited 'teacher' (range 1% for 'Who knows best what your favorite food is?' to 10% for 'Who knows best what you want to be when you grow up?') and 41 percent cited a parent (range 28% for 'Who knows best what games you like to play?' to 50% for 'Who knows best what your favorite food is?'). For the exterior category, 28 percent of answers cited the subject (range 23% for 'Who knows best how helpful you are?' to 41% for 'Who knows best how fast you can run?'), 33 percent cited 'teacher' (range 5% for 'Who knows best how good you are at tidying your room?' to 59% for 'Who knows best how hard you work?') and 28 percent cited a parent (range 9% for 'Who knows best how good you are at sums?' to 63% for 'Who knows best how good you are at tidying your room?'). Most of the remaining answers cited 'friend'. These accounted for 11 percent of answers in the interior category, and eight percent in the exterior category. The questions about secrets, what games you like, how fast you can run and how helpful you are, all elicited answers of 'friend' about 20 percent of the time.

Main analysis: Comparison between interior and exterior self-knowledge questions

For the interior questions, children seem to cite either the subject or a parent, whereas for the exterior questions, teachers are judged also to be in a position to know best about certain information. Interior questions elicited citations of 'subject' 40 percent of the time (47% cited an adult), while exterior questions elicited citations of 'subject' 28 percent of the time (61% cited an adult).

As in the previous two studies, answering with 'subject' precludes answering with 'adult' ('teacher' or 'parent'). There was a negative correlation between answering 'subject' and 'teacher' [$r(94) = -.60, p < .001$] and also between answering 'subject' and 'parent' [$r(94) = -.79, p < .001$]. Therefore, children received a score between 0 and 6 according to how many times they cited the subject for interior and exterior questions. We computed a two (gender) x three (age) x two (interior, exterior) ANOVA, the last factor being a repeated measure. A main effect showed a tendency to cite the self more often in response to interior than exterior questions: $F(1,90) = 21.85, p < .001$. There was no main effect of gender, nor any significant interactions. The main effect of age approached significance: $F(2,90) = 2.93, p = .059$.

The sensitivity of the test for age trends is not optimal with ANOVA for two reasons. First, we might expect an increasing preference with age to cite the subject

especially in response to questions inquiring about interior self-knowledge. A main effect of age that combined interior and exterior self-knowledge questions would therefore reduce the prospect of identifying a significant trend. Second, age is a continuous variable, and to treat it as categorical inevitably results in a loss of statistical sensitivity. Therefore, we conducted a post hoc correlation between age (in months) and the number of times participants cited the subject in response to interior self-knowledge questions. A significant association reflected the trend for older children to cite the subject more frequently than the younger children: $r(94) = .32$, $p = .02$. The correlation between age and answers to exterior questions was nonsignificant: $r(94) = .17$, n.s.

Restricted view task

The results from this task were similar to those in Studies 1 and 2 and similar to Taylor's (1988) findings. Of the 5-year-olds, only six were scored at Stage 2, whereas 15 of the 6-year-olds and 22 of the 7-year-olds were at Stage 2: $\chi^2(2, n=96) = 16.26$, $p < .001$. Fewer 5-year-olds attained Stage 2 than 6-year-olds [$\chi^2(1, n=64, \text{corrected}) = 4.52$, $p < .05$] and 7-year-olds [$\chi^2(1, n=64, \text{corrected}) = 14.29$, $p < .001$], but there was no difference between 6- and 7-year-olds.

Children who attained Stage 2 ($n = 43$) in the restricted view task were more likely to locate self-knowledge with the subject in the 6 questions in the interior category (mean, 3.09, S.D. = 2.21), than children who did not attain Stage 2 ($n = 53$; mean, 1.87, S.D. = 2.17): $t(94) = 2.7$, $p < .008$. However, when we controlled for verbal ability in an analysis of covariance, the effect associated with attaining Stage 2 disappeared: $F(2,95) = 2.4$, n.s.

Discussion

Using the Knowledge and Stranger test, we confirmed that most children were not generally inclined to over-attribute knowledge to adults, and our findings accord with previous research in this respect (e.g. Robinson et al., 1999). We replicated the age trend for older children to be more inclined to cite the subject of the question than younger children, in this case with questions that concerned interior self-knowledge, and showed that the trend is robust with respect to wording of the question. We extend the previous findings by demonstrating that the age-trend is apparent even in the 5 to 7 year age-range.

The children exhibited the beginnings of a sophisticated level of self-understanding, in that they were more likely to cite the subject as knowing best in relation to interior than exterior self-knowledge. Apparently, they are sensitive to the distinction between information about yourself which other people are unlikely to know unless you tell them, and information which other people can know about you purely from observation.

Understanding that minds interpret information (the restricted view task) seemed to improve notably between 5 and 6 years of age, which is consistent with previous research (Taylor, 1988). Children who understood the interpretative quality of the mind also tended to cite the subject as knowing best about interior self-knowledge, but the relation appeared to be coincidental to proficiency in language. Hence, we have no grounds for positing a direct link between understanding the interpretative quality of the mind and citing the subject as knowing best about interior self-knowledge.

GENERAL DISCUSSION

Even though 5- and 6-year-olds cited adults in preference to themselves as the authority on their (the children's) self-knowledge, this was not a product of 'blind faith' in adult omniscience. Children deny that both unfamiliar and ill informed

adults possess knowledge. Moreover, they judged that while their own mother or teacher knows most about them, Beth's mother or teacher knows most about her. Hence, they do not think that adults *ipso facto* have superior knowledge, rather they realize that some adults may know more than others. No evidence of egocentric answering was found; indeed, understanding about the locus of own and other people's self-knowledge appears to develop in parallel. Perhaps most impressive of all, children discriminated between interior (e.g. 'Who knows best what your secrets are?') and exterior (e.g. 'Who knows best how hard you work?') self-knowledge even before the age of 7 years. Discrimination between the two kinds of question seems to reflect sensitivity to the distinction between those aspects of self that can be detected from external clues and those that cannot. Hence, from about the age of 6 years, children begin to understand what kind of things other people can and cannot apprehend from you.

Were Rosenberg's (1979) findings incorrect to indicate that 10-year-olds cite adults as the authority on self-knowledge? No – we replicated his finding in Study 2, showing that when the question was worded generally (e.g. 'Who knows best what kind of person you really are?'), children aged about 10 years tended to cite an adult. However, it would be a mistake to generalize by supposing that children aged 10 years characteristically cite an adult for all kinds of questions about self-knowledge. When the questions asked about specific issues (e.g. 'Who knows best when you are happy?'), then those in middle childhood typically cited themselves. In summary, sometimes children do cite themselves as an authority on their self-knowledge, and therefore we need to be careful not to generalize too widely from Rosenberg's finding.

It is possible that even younger children would have demonstrated insight into the locus of self-knowledge had we used different kinds of wording or included different question content, and therefore we cannot conclude that younger children are categorically different from older children. For example, if a child and her mother contradicted each other on a specific item of the child's self-knowledge, observing participants as young as 5 years or even younger might side with the child as the source of correct information (c.f. Robinson et al, 1999). Moreover, the shift from citing an adult to citing oneself as the authority on self-knowledge might actually be a shift in emphasis, with children younger than 7 relying more on adults than the self, and children older than this relying more on the self than adults. In other words, even very young children may be aware that they have knowledge about themselves but feel that an adult's knowledge is more reliable or better.

The finding that children's judgements of self-knowledge develop in a similar way whether questioned about themselves or about another person could inform the theory versus simulation debate on children's understanding of the mind. Gopnik (1993) argues that if understanding of other people's mental states follows a similar developmental path to understanding one's own mental states, then this would lend support to theory theory. This is because you would not be able to use your own mind for simulating another person's if your own mind were not transparent to itself. However, some theorists argue that a process of simulation is also involved in making judgements about your own mental states (e.g. Gordon, 1996).

While the beginnings of sophisticated understanding of self-knowledge are apparent at about 6 years of age, we saw evidence of substantial developmental progression by 10 years. By this time, children had shifted considerably in tending to cite themselves as the authority on self-knowledge. While Rosenberg (1979) reported a shift from exterior to interior locus of self-knowledge between middle childhood

and adolescence, we find that the shift starts to occur between early and middle childhood -- though it may continue to develop into early adolescence, as Bar-Tal et al (1991) found.

The form of internal and external self-knowledge is different, which has interesting implications for the way we construe development. Internal self-knowledge tends to be qualitative, such as whether you know a fact, whether you are hungry, whether you are tired. In contrast, external self-knowledge tends to be comparative, such as how fast you can run. A child who claimed to be a fast runner presumably means that he is fast relative to other children his age. Children's growing awareness that they are the authority on internal self-knowledge might coincidentally reflect their ability to distinguish between self-knowledge that has a qualitative form and self-knowledge that has a comparative form.

In principle, it seems reasonable to suppose that children would be aware that they have knowledge about themselves, given that they appreciate the substantive quality of their own thought from about 3 years of age (e.g. Wellman & Estes, 1986; Wellman & Woolley, 1990; Wellman, Hollander & Schult, 1996), which in itself could be a sign of incipient self-knowledge. However, Taylor (1988) identified a kind of understanding that develops later, at about 6 or 7 years, when children begin to understand that a sample of information can be interpreted differently by different minds, according to prior knowledge. For example, they appreciate that while they can interpret a nondescript portion of a picture as part of a giraffe, another person, who had no previous access to the complete picture, would not know that it was a giraffe. Similarly, we raised the possibility in the Introduction that by about 6 or 7 years, children begin to grasp that their privileged access to internal states might allow them to interpret things about themselves differently (and more accurately) than other people (including adults).

This possibility gains some support from the finding that by about 6 years children begin to discriminate between internal and external aspects of self-knowledge. That is, they grasp that some kinds of information about the self is amenable to accurate interpretation by other people, while some kinds of information about self is less easy for others to interpret or access. However, the relation between performance on the measure of understanding the interpretative mind (Taylor's task) and citing themselves as the authority on interior self-knowledge was unimpressive. Indeed, the relation might arise purely from the verbal demands that are common to both tasks, given that it diminished to a nonsignificant level when verbal ability was covaried.

Why did we fail to find a strong relation? The relations we report were based on children's tendency to cite themselves as an authority on their self-knowledge. Judging self-knowledge in that way cannot strictly be construed as a test of understanding the interpretative mind, given that the test did not require children to judge that a single piece of information would be interpreted in different ways by different minds.

Still, we might suppose that if children did not understand that different minds interpret differently, then they would assign self-knowledge to an adult by default. Similarly, incompetent children would not judge at random in Taylor's task, but judge by default that another person knows the sample is a picture of a giraffe. However, there might be different bases to the two kinds of default. In Taylor's task, the default would be to credit anyone who has access to the sample of information with knowledge of the full picture. In answer to questions about self-knowledge, in contrast, children do not credit anyone with knowledge about themselves, but only a

relevant adult. In consequence, it seems that young children might have a positive basis for attributing self-knowledge to a relevant adult, and if so, this would be a factor that is absent from variance in the measure derived from Taylor's task. Presumably, this additional factor in answers to the self-knowledge questions prevents a strong relation emerging with Taylor's measure.

Why should children who can demonstrate sophisticated understanding of many aspects of the mind, still defer to relevant adults about interior aspects of themselves? The way in which a child learns about itself, other people, the environment and interactions between them is guided by input from other people. If we think of a child acquiring knowledge of any kind, much of the information comes from adults, so it is not surprising that children regard adults as knowledgeable figures, indeed, more knowledgeable than themselves.

Rosenberg (1979) suggested adults convey to children that they are attuned to their internal states. For example, adults tell their children to eat something or they'll be hungry, that they (the children) are tired or that they have thought hard about something. In the case of young children, it might actually be accurate for adults to convey that they are an authority on the child's internal states. Seemingly, younger children do not always know when they are tired or that they have thought hard about something. Accordingly, it might be appropriate for younger children to judge that an adult knows best about their self-knowledge in some cases. Indeed, perhaps adults would judge that they know better than their young child about the child's internal states. Eventually, as children come to interpret internal cues more reliably they would begin to appreciate that although adults confidently speak as if they can access the child's internal states, in fact they cannot.

Interpreting internal cues about one's own psychological states is not necessarily straightforward. Montgomery (1997) uses Wittgenstein's Private Language Argument to suggest that a child learns about mental states and their labels from external signs. He points out that because internal states, such as thoughts, cannot be apprehended directly, talk about mental states would have to be based on their behavioral correlates. In consequence, children's earliest use of mentalistic terms tends to be based on observable behavior. For example, children aged about 3 years tend to say that a person *remembered* the location of his chocolate even if he actually had no relevant information and merely stumbled on the chocolate purely by chance (e.g. Johnson & Wellman, 1980). An implication is that children might start out supposing that states which are actually internal can somehow be accessed publicly, and that adults would therefore be informed about these, just as they seem to be informed about most things in the public domain. Presumably, when children note discrepancies between their own interpretation of their internal cues and adults' assertions, they might begin to consider that adults actually know less than they profess to know. Alternatively, children might simply adopt a culturally held belief that internal states are best known by the self, along with a host of other cultural norms acquired during childhood.

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Appendix 1

Questions used in Studies 1 and 2.

Self questions

Who knows best what you are thinking?

Who knows best what Beth's favorite food is?

Who knows best what you want for your Birthday?

Who knows best when Tommy is happy?

When you cry who knows best what is wrong?

Who knows best when Beth is feeling scared?

Who knows best if you are a friendly person?

Who knows best if Beth is a kind person?

Who knows best how tired you are?

Who knows best when Beth is feeling sick?

Who knows best if you are warm enough?

Who knows best when Beth is feeling hungry?

School questions

Who knows best what you will be doing at school tomorrow?

Who knows best how good Beth is at reading?

Rosenberg's questions (Study 2 only)

Who do you feel really understands you best?

Who knows best what kind of person you really are?

Appendix 2

Questions used in Study 3.

Interior category

- Who knows best what your secrets are?
- Who knows best what games Tommy likes?
- Who knows best what you want to be when you grow up?
- When Beth cries, who knows best what is wrong?
- Who knows best what your favorite food is?
- Who knows best when Tommy is feeling hungry?

Exterior category

- Who knows best how good you are at sums?
- Who knows best how well Beth can sit still?
- Who knows best how fast you can run?
- Who knows best how hard Tommy works?
- Who knows best how good you are at tidying your room?
- Who knows best how helpful Beth is?

Filler questions

- Who knows best when you are angry?
- Who knows best when Tommy is feeling poorly?
- Who knows best when you are excited?
- Who knows best how good Beth is at telling jokes?
- Who knows best how friendly you are?
- Who knows best how kind Tommy is?

Author notes

This research formed the heart of a PhD by the first author at the University of Nottingham. Please address correspondence to Peter Mitchell, School of Psychology, University of Nottingham, University Park, Nottingham NG7 2RD, UK. Thanks go to the staff and children at New Park Primary School, Albany Infant School, Cloudside Junior School, and Sunnyside Primary School who kindly took part in these studies.

Table 1. Pattern of answers in Study 1 given in response to the 24 questions about self-knowledge .

Subject is self	5-year-olds	7-year-olds
Subject	20%	44%
Teacher	46%	53%
You (experimenter)	13%	<1%
Wrong child	9%	<1%
Wrong teacher	10%	2%
Subject is B/T	5-year-olds	7-year-olds
Subject	10%	24%
Teacher	39%	44%
You (experimenter)	21%	25%
Wrong child (egocentric answers)	13(5)%*	5(0)%*
Wrong teacher (egocentric answers)	15(7)%*	1(0)%*

*The numbers in parenthesis indicate what percentage of the ‘wrong child’ answers were made up of egocentric ‘me’ or ‘my teacher’ answers to questions about Tommy and Beth.

Note: The table is divided by whether the subject was self (top half of table) or Beth and Tommy (lower half of table), shown as percentages and divided by age group.

Rounding of figures resulted in some cells not adding up to 100 percent.

Table 2. Pattern of answers in Study 1 given in response to the 4 questions about school activities.

Subject is self	5-year-olds	7-year-olds
Subject	4%	12%
Teacher	77%	88%
You (experimenter)	4%	0%
Wrong child	9%	0%
Wrong teacher	7%	0%
Subject is B/T	5-year-olds	7-year-olds
Subject	4%	8%
Teacher	50%	75%
You (experimenter)	9%	14%
Wrong child (egocentric answers)	13(2)%*	3(0)%*
Wrong teacher (egocentric answers)	24(9)%*	0%

*The numbers in parenthesis indicate what percentage of the ‘wrong child’ answers were made up of egocentric ‘me’ or ‘my teacher’ answers to questions about Tommy and Beth.

Note: The table is divided by whether the subject was self (top half of table) or Beth and Tommy (lower half of table), shown as percentages and divided by age group.

Rounding of figures resulted in some cells not adding up to 100 percent.

Table 3. Pattern of answers in Study 2 given in response to the 24 questions about self-knowledge.

Subject is self	6-year-olds	10-year-olds
Subject	13%	73%
Parent	61%	15%
Teacher	9%	2%
Friend	16%	10%
You (experimenter)	0%	0%
Wrong child	1%	0%
Subject is B/T	6-year-olds	10-year-olds
Subject	13%	69%
Parent	60%	19%
Teacher	6%	1%
Friend	12%	10%
You (experimenter)	0%	0%
Wrong child (egocentric answers)	10(5)%*	0%

*The number in parenthesis indicate what percentage of the wrong child answers

were made up of egocentric 'me' answers to questions about Tommy and Beth.

Note: The table is divided by whether the subject was self (top half of table) or Beth and Tommy (lower half of table), shown as percentages and divided by age group.

Rounding of figures resulted in some cells not adding up to 100 percent.

Table 4. Pattern of answers in Study 2 given in response to the 4 questions about school activities.

Subject is self	6-year-olds	10-year-olds
Subject	5%	12%
Parent	34%	10%
Teacher	60%	77%
Friend	0%	2%
You (experimenter)	0%	0%
Wrong child	2%	0%
Subject is B/T	6-year-olds	10-year-olds
Subject	5%	16%
Parent	24%	6%
Teacher	57%	75%
Friend	10%	4%
You (experimenter)	0%	0%
Wrong child (egocentric answers)	0%	0%

*The numbers in parenthesis indicate what percentage of the wrong child answers

were made up of egocentric 'me' answers to questions about Tommy and Beth.

Note: The table is divided by whether the subject was self (top half of table) or Beth and Tommy (lower half of table), shown as percentages and divided by age group.

Rounding of figures resulted in some cells not adding up to 100 percent.

Table 5. Pattern of answers in Study 3 given in response to the 12 questions about interior self-knowledge

Subject is self	5-year-olds	6-year-olds
Subject	25%	46%
Parent	59%	39%
Teacher	6%	2%
Friend	7%	13%
You (experimenter)	0%	1%
Wrong child	2%	0%
Subject is B/T	5-year-olds	6-year-olds
Subject	24%	41%
Parent	44%	38%
Teacher	11%	7%
Friend	17%	9%
You (experimenter)	1%	0%
Wrong child (egocentric answers)	1(0)%*	5(1)%*

*the numbers in parenthesis indicate what percentage of the wrong child answers

were made up of egocentric 'me' answers to questions about Tommy and Beth.

Note: The table is divided by whether the subject was self (top half of table) or Beth and Tommy (lower half of table), shown as percentages and divided by age group.

Rounding of figures resulted in some cells not adding up to 100 percent.

Table 6. Pattern of answers in Study 3 given in response to the 12 questions about exterior self-knowledge

Subject is self	5-year-olds	6-year-olds
Subject	25%	25%
Parent	27%	19%
Teacher	32%	44%
Friend	14%	10%
You (experimenter)	2%	2%
Wrong child	0%	0%
Subject is B/T	5-year-olds	6-year-olds
Subject	17%	31%
Parent	43%	21%
Teacher	29%	37%
Friend	8%	6%
You (experimenter)	1%	1%
Wrong child (egocentric answers)	1(0)%*	4(3)%*

*The numbers in parenthesis indicate what percentage of the wrong child answers

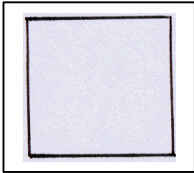
were made up of egocentric 'me' answers to questions about Tommy and Beth.

Note: The table is divided by whether the subject was self (top half of table) or Beth and Tommy (lower half of table), shown as percentages and divided by age group.

Rounding of figures resulted in some cells not adding up to 100 percent.

- Figure 1. Restricted view stimuli.
- Figure 2. Percentage of answers of 'subject' and 'teacher' to questions about self and other children in Study 1. Note that responses other than these are not represented on the graph.
- Figure 3. Percentage of answers that were 'subject' and 'adult' in Study 2. Note that responses of 'friend' are not represented on the graph.
- Figure 4. Percentage of answers that were 'subject' and 'adult' divided by age group and category for Study 3. Note that responses of 'friend' are not represented on the graph.

Figure 1



Blank view
- Control for 'yes' bias



Non-descript view



Possibly identifiable view

Figure 2:

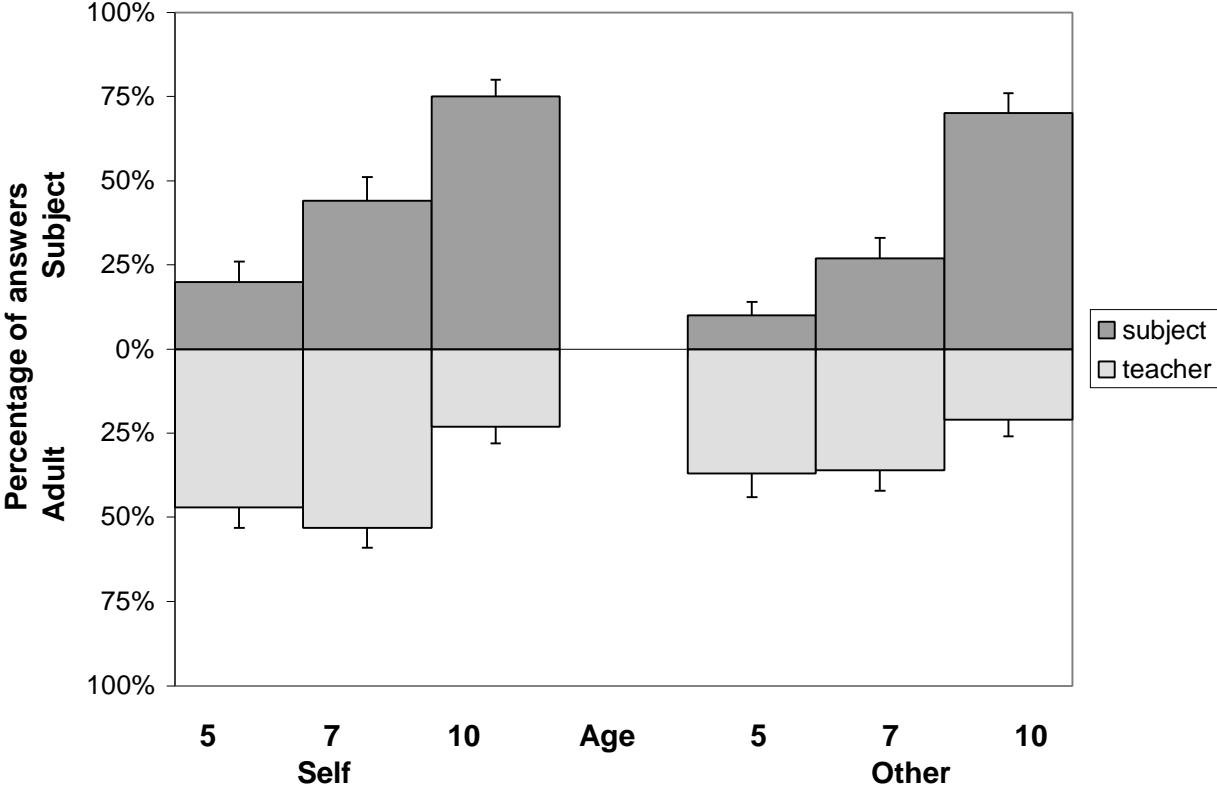


Figure 3:

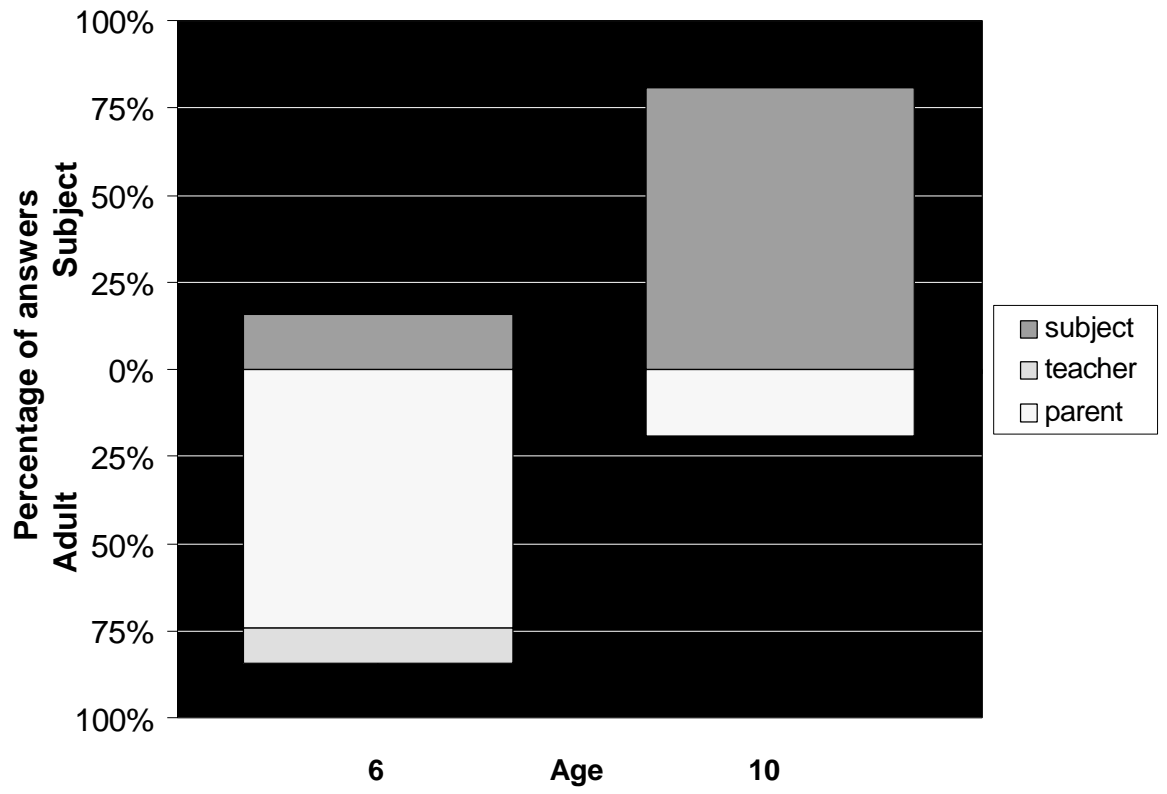


Figure 4:

