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#### Abstract

Relations between interior self-knowledge and (a) imaginary companion (IC) status, and (b) theory of mind abilities were investigated in a sample ( $N=80$ ) of 4- to 7-year-olds. Interior self-knowledge was assessed in terms of the extent to which children acknowledged that they (rather than an adult) were the authority on unobservable aspects of themselves (e.g., dreaming, thinking, hunger). Compared with children without an IC, those who possessed a parentally-corroborated IC ascribed less interior self-knowledge to an adult, with a trend for them to assign more interior self-knowledge to themselves. Children's interior self-knowledge judgments were not associated with their theory of mind performance. IC status was also unrelated to theory of mind performance. We consider how having an IC may provide children with opportunities to distinguish between knowledge that is inaccessible to an external observer and that which an external observer may glean without being told.

## Self-Knowledge in Childhood: Relations with Children's Imaginary Companions and Understanding of Mind

Rosenberg (1979) reported that even 10-year-olds tended to report that adults (rather than themselves) were the best judges of their character. More recent research suggests that children recognize their own authority on certain aspects of self-knowledge much earlier in development. Schoeneman (1981) proposed two types of self-knowledge – interior (knowledge that an external observer is unlikely to ascertain unless they are told), and exterior (knowledge that an external observer may glean without being told). Burton and Mitchell (2003) found that children as young as 5- to 7-years cite self versus other as the authority depending on whether the self-knowledge is interior or exterior.

Despite the growing body of research on children's self-knowledge (e.g., Mitchell & O'Keefe, 2008; Mitchell, Teucher, Kikuno, & Bennett, 2010; Mitchell, Teucher, Bennett, Zeigler, & Wyton, 2009; Raviv, Bar-Tal, Raviv, & Peleg, 1990), no study has yet investigated whether specific child-centered characteristics systematically relate to self-knowledge. The study reported here aimed to address this question, focusing on two factors: children's (a) invention of an imaginary companion (IC), and (b) theory of mind (ToM) abilities.

There are several reasons to expect that IC status will relate to children's self-knowledge. Typical IC creators are aware that others cannot see their IC (Taylor, 1999). Via their language and behavior, the child who creates an IC enables peers and adults to know about the IC. Hence, children with ICs are more likely to be familiar with the knowledge that one's thoughts and feelings are private. In support of this argument, Roby and Kidd (2008) reported that 4- to 6-year-olds who had an IC performed better than their peers without ICs (NIC) on a referential communication task involving describing pictures. IC children were more likely than their NIC counterparts to describe the critical defining features and to ignore redundant features.

Having an IC will help children to recognize that their knowledge is privileged, thus leading to greater insight into the fact that they themselves will be the authority on interior self-knowledge. Children with ICs are also likely to have more opportunities to practise making judgments about knowledge states, and therefore may be better able to discern who knows more about what they are thinking or feeling. This suggestion is supported by the finding that having an IC relates positively to children's ToM performance (Taylor & Carlson, 1997). Given that self-knowledge tasks assess the extent to which children can understand the opacity of internal states and other people's knowledge states, it is surprising that previous research has not investigated the link between self-knowledge and ToM.

In summary, our aim was to investigate how children's self-knowledge related to IC status and ToM performance. We hypothesized that, compared with their NIC peers, children with an IC would be (a) more likely to ascribe more interior self-knowledge to themselves, and (b) less interior self-knowledge to an adult. We also predicted a positive association between ToM performance and self-knowledge. Finally, we expected to replicate previous findings of positive associations between IC status and ToM performance.

## Method

### *Participants*

Participants were 80 children (44 boys) aged 52–94 months ( $M=70$  months), drawn from schools and after-school groups in North-East England. Children originated from a variety of socioeconomic backgrounds. The vast majority of children (96%) were Caucasian and the remaining three children were of Asian or African heritage.

### *Procedure*

Participants were tested individually in a quiet space away from other children. Tasks were administered in the order described below.

### *Self-Knowledge Inventory*

An adaptation of Mitchell et al.'s (2009) procedure was used to assess children's self-knowledge. Children wrote their name, 'mum'/'dad' (children typically chose 'mum'), and their teacher's title and surname initial on cards, with assistance given where necessary. They were then shown three different sized boxes, and told: "The big one means the person knows a lot, the medium one means they know a little, and the small one means they don't know anything. Your job is to decide how much the person knows and to put that person's card in the box that you think matches".

Practice questions were administered to ensure that children understood how to use the cards and boxes to represent knowledge (child knows a lot, mum knows a little, teacher doesn't know anything) and that two people's cards could occupy the same box (mum and child both know a lot). No child failed these controls. The child/parent questions concerned being ill, dreaming, and feeling hungry; the child/teacher questions concerned thinking, having fun, and feeling angry. For each of the six items, after affirming that the child had experienced the state,

the experimenter asked, “When you [are ill], how much does [your mum] know about you being ill?” After the child placed the card in the chosen box, the experimenter continued, “How about you? How much do you know about your [being ill]?” Again, the child placed the card in the chosen box. Presentation of the six items was counterbalanced, and for each item, the adult/child knowledge questions were counterbalanced. Placing a card in the smallest box scored 1 point, in the medium-sized box 2 points, and in the large box 3 points. Higher scores indicate greater interior self-knowledge.

#### *ToM Battery*

Children completed six ToM tasks based on Wellman and Liu (2004). The gender of the story protagonists matched the child’s gender, and the order in which the tasks were presented was randomized. In order to pass the task, the child had to answer both the control and test questions correctly. For each task passed, the child received 1 point, making the range for possible scores 0–6. Internal reliability for the battery was good, Cronbach’s  $\alpha=.69$ .

#### *Imaginary Companion Interview*

Taylor and Carlson’s (1997) interview assessed children’s IC status. The experimenter began, “Now I am going to ask you some questions about friends. Some friends are real, like the kids who live on your street, the ones you play with. And some friends are pretend friends. Pretend friends are ones that are make-believe that you pretend are real. Do you understand?” Children were then asked if they had a pretend friend or remembered ever having one. If children responded positively, they were asked a number of follow-up questions about the IC. Following Taylor (1999), parents completed a questionnaire to corroborate the IC’s existence. Only children whose ICs were corroborated were designated as having an IC.

#### *Receptive Verbal Ability*

Children's receptive verbal ability was assessed using the BPVS (Dunn, Dunn, Whetton, & Burley, 1997) to control for any relations between verbal ability, self-knowledge, and ToM performance.

## Results

### *Descriptive Statistics and Preliminary Analyses*

Ten children reported a parentally-corroborated IC that was entirely invisible and 5 reported an IC that was personified in a toy or object. There was perfect agreement between children's and parents' reports of ICs. The self-knowledge scores of the invisible IC and personified object IC groups did not differ,  $t_s < 1.66$ , n.s. Children were amalgamated into one IC group (8 boys): 18% (2/11) of 4-year-olds, 23% (7/30) of 5-year-olds, 33% (6/18) of 6-year-olds, and no (0/6) 7-year-olds were in the IC group.

There was no association between IC status and gender,  $\chi^2(1) = 0.02$ ,  $w = 0.02$ . Neither was gender related to children's scores on any of the self-knowledge questions,  $t_s < 1.35$ , n.s.,  $d_s < 0.31$ . Gender is thus not analyzed further.

Table 1 shows the mean scores for age, BPVS, and ToM. ToM was positively correlated with age,  $r(78) = .53$ ,  $p < .001$ , and BPVS,  $r(78) = .29$ ,  $p < .01$ . There was no difference between IC and NIC groups with respect to age  $t(78) = 0.29$ ,  $p = .77$ ,  $d = 0.09$ , but children in the IC group obtained marginally higher receptive verbal ability scores than those in the NIC group,  $t(78) = 1.94$ ,  $p = .05$ ,  $d = 0.56$ . The relation between IC status and ToM was investigated using ANCOVA, with age and BPVS score as covariates. IC status was not related to ToM performance,  $F(1, 76) = 0.44$ , n.s.,  $\eta^2 = .004$ . This analysis was rerun for younger (4- and 5-year-olds) and older (6- and 7-year-olds) children with BPVS as the covariate. There was no main effect of IC status for younger,  $F(1, 47) = 1.67$ ,  $\eta^2 = .033$ , or older,  $F(1, 27) = 1.34$ ,  $\eta^2 = .038$ , children.

Paired t tests showed no difference in children's overall assignment of self-knowledge to parent versus teacher,  $t(79)=1.55, p=.22, d=0.18$ . Scores across the six items showed poor internal consistency for both child (Cronbach's  $\alpha=.35, rs -.01-.34$ ) and adult ( $\alpha=.55, rs -.12-.27$ ) questions. Scores for the individual items were thus used in the analyses.

Differences between the self and adult scores for each question were investigated using paired t tests. As shown in Table 2, children attributed more knowledge to self than to adult on five out of six questions.

#### *Relation Between Imaginary Companion Status and Self-Knowledge*

Relations between IC status and self-knowledge ascribed to an adult (see Table 3) were explored using MANCOVA, with chronological age and BPVS scores added as covariates.

There was a main effect of IC status,  $F(6, 71)=2.63, p<.025, \eta^2=.18$ . Post-hoc t tests indicated that, compared to NIC children, those with ICs attributed less knowledge to adults on the 'ill',  $t(76)=11.38, p<.001, d=0.86$ , and 'dream',  $t(76)=5.66, p<.025, d=0.60$ , questions.

For self-knowledge children ascribed to themselves (see Table 3), MANCOVA showed the main effect of IC status approached significance,  $F(6, 71)=2.01, p=.075, \eta^2=.15$ , with children in the IC group ascribing more knowledge to themselves across all questions compared with their NIC group peers. Post-hoc analyses indicated that children with ICs attributed more knowledge to themselves on the 'fun' question,  $t(76)=5.80, p<.025, d=1.14$ . There was also a non-significant trend for IC children to attribute more knowledge to themselves on the 'hungry' question,  $t(76)=3.52, p=.064, d=1.00$ , with a large effect (Cohen, 1988) for this relation. It should be noted that children in the IC group were at ceiling on both of these questions, all attributing a maximum score of 3 to themselves.

#### *Relations Between Theory of Mind and Self-Knowledge*

As shown in Table 4, controlling for age and verbal ability, there were no associations between ascription of self-knowledge and ToM scores.

### Discussion

The aim of this study was to investigate individual differences in children's ascription of interior self-knowledge to an adult versus self, exploring the potential contributions of children's IC status and ToM abilities. As hypothesized, children in the IC group ascribed less interior self-knowledge to an adult than did their NIC counterparts. Conversely, there was a trend for IC children to ascribe more self-knowledge to themselves compared with their NIC peers. For the group as a whole, we replicated Burton and Mitchell's (2003) finding that children of this age ascribe more interior knowledge to themselves than to an adult. Contrary to expectations, self-knowledge was unrelated to children's concurrent ToM performance, and we failed to replicate Taylor and Carlson's (1997) findings of positive associations between having an IC and children's ToM performance. Rather, our results are in line with Fernyhough, Bland, Meins, and Coltheart's (2007) null findings.

Our results support the proposal that having an IC provides children with opportunities for self-examination and self-insight. Interestingly, the specific items on which the IC and NIC groups differed suggest that IC-group children believe themselves to be the authority on aspects of self that are undeniably interior (dreaming), and those which adults may feel they can accurately judge (feeling ill or hungry, having fun). Engaging with a self-created IC thus might facilitate children's understanding that their internal world is private and not always apparent from their language or behavior. The low correlations among individual items also illustrate the heterogeneity in children's interior self-knowledge. Future research should establish whether different aspects of interior self-knowledge develop at different ages and have distinct correlates.

The finding that self-knowledge and ToM are unrelated suggests that accurate ascription of self-knowledge involves more than basic understanding of internal states. In order to pass a ToM task, children merely have to impute mental states accurately to another person. In contrast, accurate reporting of self-knowledge requires a number of steps involving representing and comparing internal states. Thus, basic ToM abilities may be necessary but not sufficient for self-knowledge understanding.

## References

- Burton, S., & Mitchell, P. (2003). Judging who knows best about yourself: Developmental change in citing the self across middle childhood. *Child Development, 74*, 426-443.
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2<sup>nd</sup> ed.). Hillsdale, NJ: Erlbaum.
- Dunn, L. M., Dunn, L. M., Whetton, C., & Burley, L. (1997). *The British Picture Vocabulary Scale* (2<sup>nd</sup> Ed.). Windsor, UK: NFER-Nelson.
- Fernyhough, C., Bland, K. A., Meins, E., & Coltheart, M. (2007). Imaginary companions and young children's responses to ambiguous auditory stimuli: Implications for typical and atypical development. *Journal of Child Psychology and Psychiatry, 48*, 1094-1101.
- Mitchell, P., Bennett, M., & Teucher, U. (2009). Do children start out thinking they don't know their own mind? An odyssey in overthrowing the mother of all knowledge. *European Journal of Developmental Psychology, 7*, 67-84.
- Mitchell, P., & O'Keefe, K. (2008). Brief report: Do individuals with autism spectrum disorder think they know their own minds? *Journal of Autism and Developmental Disorders, 38*, 1591-1597.
- Mitchell, P., Teucher, U., Bennett, M., Zeigler, F., & Wyton, R. (2009). Do children start out thinking they don't know their own minds? *Mind and Language, 24*, 328-346.
- Mitchell, P., Teucher, U., Kikuno, H., & Bennett, M. (2010). Cultural variations of developing a sense of knowing your own mind: A comparison between British and Japanese children. *International Journal of Behavioural Development, 34*, 248-258.
- Raviv, A., Bar-Tal, D., Raviv, A., & Peleg, D. (1990). Perception of epistemic authorities by children and adolescents. *Journal of Youth and Adolescence, 19*, 495-510.

- Roby, A. C., & Kidd, E. (2008). The referential communication skills of children with imaginary companions. *Developmental Science, 11*, 531-540.
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books.
- Schoeneman, T. J. (1981). Reports of the sources of self-knowledge. *Journal of Personality, 49*, 285-293
- Taylor, M. (1999). *Imaginary companions and the children who create them*. Oxford; Oxford University Press.
- Taylor, M., & Carlson, S. (1997). The relation between individual differences in fantasy and theory of mind. *Child Development, 68*, 436-455.
- Wellman, H. M., & Liu, D. (2004). Scaling of Theory-of-Mind tasks. *Child Development, 75*, 523-541.

*Table 1*

Age, Receptive Verbal Ability, and Theory of Mind Performance as a Function of IC Status

	IC status	Mean
Age in Months	NIC	69.51 (9.58)
	IC	70.27 (7.19)
BPVS	NIC	98.68 (9.26)
	IC	103.80 (9.01)
Theory of Mind Score	NIC	4.45 (1.53)
	IC	4.93 (1.03)

Note. Standard deviations are given in parentheses. BPVS = British Picture Vocabulary Scale.

Table 2

## Relation between Ascription of Self-Knowledge to Adult Versus Child

	Self-Knowledge Mean	t
Feeling ill		
Child score	2.25 (0.76)	-1.70
Adult score	2.48 (0.75)	
Having fun		
Child score	2.75 (0.49)	
Adult score	2.23 (0.80)	4.73*
Dreaming		
Child score	2.46 (0.73)	4.84*
Adult score	1.81 (0.86)	
Thinking		
Child score	2.46 (0.69)	2.95*
Adult score	1.81 (0.86)	
Feeling hungry		
Child score	2.81 (0.42)	5.95*
Adult score	2.20 (0.80)	
Feeling angry		
Child score	2.55 (0.75)	5.07*
Adult score	1.89 (0.86)	

\* $p < .01$

Note. Standard deviations are in parentheses. Degrees of freedom = 79. Alpha was adjusted to .008 (.05/6) for multiple comparisons.

Table 3

## Ascription of Self-Knowledge to Adult and Child as a Function of IC Status

		Adult Mean	Child Mean
Feeling ill	NIC	2.60 (.66) <sup>a</sup>	2.20 (.77)
	IC	1.94 (.85)	2.50 (.73)
Having fun	NIC	2.24 (.78)	2.68 (.56) <sup>b</sup>
	IC	2.25 (.86)	3.00 (.00)
Dreaming	NIC	1.92 (.86) <sup>a</sup>	2.54 (.69)
	IC	1.44 (.73)	2.38 (.81)
Thinking	NIC	2.11 (.92)	2.45 (.71)
	IC	2.00 (.89)	2.69 (.48)
Feeling hungry	NIC	2.20 (.80)	2.75 (.50) <sup>b</sup>
	IC	2.25 (.78)	3.00 (.00)
Feeling angry	NIC	1.90 (.88)	2.52 (.77)
	IC	1.94 (.85)	2.56 (.73)

Note. Standard deviations are in parentheses.

<sup>a</sup> post-hoc difference between IC and NIC groups on item for ascribing self-knowledge to adult;

<sup>b</sup> post-hoc difference between IC and NIC groups on item for ascribing self-knowledge to child.

Table 4

Bivariate (Pearson's  $r$ ) and Partial Correlations for Child's Performance on ToM Tasks and Ascription of Self-Knowledge

Self-knowledge Score	Theory of Mind Score
<i>Self-knowledge ascribed to child</i>	
Feeling ill	0.11 (0.14)
Having fun	0.08 (0.10)
Dreaming	-0.03 (0.03)
Thinking	0.13 (0.12)
Feeling hungry	0.23 (0.19)
Feeling angry	0.31* (0.23)
<i>Self-knowledge ascribed to adult</i>	
Feeling ill	0.16 (0.13)
Having fun	-0.08 (-0.08)
Dreaming	-0.24 (-0.22)
Thinking	-0.06 (-0.08)
Feeling hungry	-0.08 (-0.12)
Feeling angry	-0.17 (-0.17)

\*  $p < .01$ .

Note. Partial correlations (controlling for age and verbal ability) are in parentheses. For child and adult self-knowledge analyses, alpha was adjusted to .008 (.05/6) for multiple comparisons.