Are three year olds really insensitive to factivity?
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How early do children understand presupposition? Are preschoolers able to make inferences based on the presence of a presupposition trigger? In this study, we address such questions by investigating three year olds understanding of the verbs think and know. We ask in particular whether they are able to recognize the factivity of know and the non-factivity of think.

Previous studies show that children have difficulty with think until at least age four, and tend to respond based on the truth of the complement clause, rather than the truth of the whole sentence. They would thus reject a sentence like John thinks that Mary is home in contexts in which Mary is not home, even if John thinks that she is [1-5]. If children always assume that think sentences report true beliefs, their responses to affirmative think and know sentences should be similar and be based on the truth of the complement in the actual world. To see whether children are able to distinguish think and know, we need to look at their understanding in negative contexts. Given three year olds’ tendency to assume that think only reports true beliefs, our paper addresses two questions: (a) have some children lexicalized think as know? and (b) what semantic representations do children have for know? More specifically we asked whether children are able to recognize the factivity of know and the non-factivity of think in negative contexts. In a context where the truth of the complement clause is unknown, are they able to use the factivity of know to infer the truth of the complement clause?

Previous research suggests that children do not differentiate know and think until at least age four [6-8] and some even argue that children might not have a fully adult-like understanding of know until much later [9-14]. However, this failure could be due to the metalinguistic nature of many of the tasks. We thus designed a task that allows children to demonstrate their understanding without having to explicitly compare sentences. We asked children to find a toy hidden in one of two boxes using clues in the form of attitude reports, using a 2x3 within subjects design with verb (think and know) and negation (none, embedded, matrix) as factors:

   A) No negation: Lambchop knows/thinks that it’s in the blue/red box
   B) Embedded negation: Lambchop knows/thinks that it’s not in the blue/red box
   C) Matrix negation: Lambchop doesn’t know/think that it’s in the blue/red box
   D) Control: It’s not in the blue/red box.

Our results suggest that three year olds do distinguish think and know. We see that children are sensitive to the difference between verbs, the location of negation and the interaction of these factors. Children treated ¬think p differently from ¬know p; and they treated ¬know p differently from know ¬p. However, children’s performance on ¬know p was distributed bimodally, with 16 children getting 0 or only 1 trial correct and 6 children getting 2 or all 3 correct. Performance was distributed normally around the mean in all other conditions. Sixteen of the participants reliably choose the opposite of the box that was mentioned, consistent with a non-factive representation for know. The remaining 6 participants reliably choose the box that was mentioned in their clue, consistent with a factive representation for know.

Our data suggests that some preschoolers might begin to understand know at an earlier age than earlier literature indicates. The behavior of roughly one third of our subjects is consistent with an adult-like understanding of know. The others, however, do not distinguish think and know even under negation, effectively treating neither one as factive. Thus some children distinguish think and know before age 4, even when they still assume by default that think sentences only report true beliefs. Moreover, we find no evidence that children build a factive representation for think. Still, our results suggest that children’s early representations of know may be non-factive and raise the question of how children come to recognize that know is factive and think is not.
Selected References: