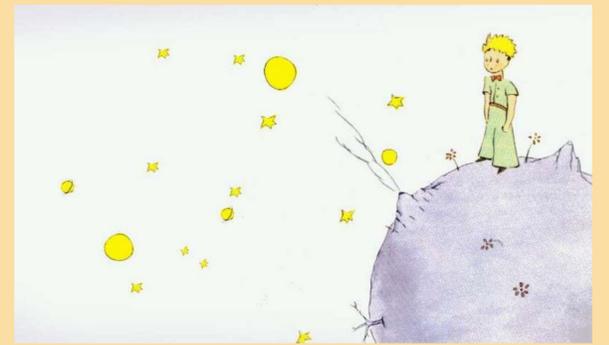




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AIM

- to show that children master the meaning of modal adverbs as early as 5 years old, but not scalar implicatures at this stage based on two experimental studies on the acquisition of epistemic modality conducted on 2 groups of 25, respectively, 20 Romanian monolingual 5-year-old children (and 2 groups of 20 adults controls),

- a colouring task and
- a TVJT on the modal adverbs *sigur* 'certainly' and *poate* 'maybe/ possibly'

Why epistemic adverbs rather than modals?

Because epistemic adverbs are understudied in acquisition studies and also more frequent in Romanian.

PREVIOUS FINDINGS

Previous experimental work on epistemic modals

- Hirst & Weil 1982, Noveck, Ho & Sera 1996, Noveck 2001, Ozturk & Papafragou 2014 a.o. have shown that children are sensitive to the relative strength of modals from very early on, being aware of the existence of a modal scale
- 5-year-olds still have problems with understanding logical modals.
- A full grasp of epistemic modality seems to be in place only at 7 years old.

Previous experimental work on epistemic lexical items

- Similar results have been obtained experimentally for epistemic lexical items such as (*un*)*sure*: 4 to 6-year-old French children attribute certainty more easily than 8-year-olds (Bassano a.o. 1992, Bassano 1996).
- From a production perspective, corpus data show a difference between epistemic adverbs and epistemic modals (possibly explained in terms of sentential embedding in English): children use epistemic adverbs (but not modals) before 3;00 (Cournane 2015).

EXPERIMENT 1 (COLOURING EXPERIMENT)

Hypothesis

- Children master the meaning of the epistemic modal adverbs *sigur* 'certainly' and *poate* 'maybe/ possibly'.

Participants

- 25 Romanian monolingual 5 year olds & 20 adults (control group)

Procedure

- a colouring task: children are asked to colour certain drawn objects/ animals based on sentences with modal adverbs:

- Sigur că pisica este portocalie.*
'Certainly the cat is orange.'
 - Poate că pantalonii sunt roșii.*
'Maybe the trousers are red.'

Test sentences		Control sentences	
Sentences with <i>sigur</i> 'certainly': <i>Sigur că mărul este roșu.</i> 'Certainly the apple is red'. <i>Sigur că funda este roz.</i> 'Certainly the ribbon is pink'. <i>Sigur că pisica este portocalie.</i> 'Certainly the cat is orange.' <i>Sigur că floarea este albastră.</i> 'Certainly the flower is blue.'	Sentences with <i>poate</i> 'maybe': <i>Poate că triunghiul este galben.</i> 'Maybe the triangle is yellow'. <i>Poate că vaza este verde.</i> 'Maybe the vase is green'. <i>Poate ca pantalonii sunt roșii.</i> 'Maybe the trousers are red'. <i>Poate ca cercul este albastru.</i> 'Maybe the circle is blue'	Affirmative sentences: <i>Rombul este portocaliu.</i> 'The rhombus is orange.' <i>Mașina este roșie.</i> 'The car is red.' <i>Pasărea este neagră.</i> 'The bird is black.' <i>Pălăria este verde.</i> 'The hat is green.'	Negative sentences: <i>Tricoul nu este albastru.</i> 'The T-shirt is not blue'. <i>Ursul nu este roșu.</i> 'The bear is not red'. <i>Casa nu este galbena.</i> 'The house is not yellow'. <i>Pantofii nu sunt negri.</i> 'The shoes are not black'.



Figure 1: Examples of answers for sentences a) and b)

EXPERIMENT 2 (TVJT)

Hypothesis

- Children do not derive scalar implicatures with epistemic adverbs as much as adults.

Participants

- 20 Romanian monolingual 5-year-olds & 20 adults (control group)

Procedure

- The method is a colour adaptation of an experiment on modals and scalarity Noveck (2001) previously conducted on 8-10 -year- olds.
- It is based on a scenario where children are told that the Little Prince has magically made certain objects seem colourless but the objects actually have colour, the children are given hints and they are supposed to say whether they agree or not with the sentences describing the colour of the objects.
- For example, children are shown a drawing with stars, as in **Figure 2**, and they are told that the third colourless star actually has colour, and it is the same colour as the first star.



Figure 2: Drawings used in Experiment 2

- They are asked to give truth value judgments for 6 different sentences presented in a randomized order, consisting of: 1 test item (the underinformative sentence *Poate că steaua e galbenă* 'Maybe the star is yellow'), 3 control items (*Poate că steaua e albastră.* 'Maybe the star is blue', *Sigur că steaua e galbenă/ albastră* 'Certainly the star is yellow/ blue'), 2 fillers (which are false) (see **Table 2 & 3**).
- This procedure is repeated 4 times, for each of the 4 drawings involving stars, flowers, ribbons, circles.

Table 2: Sample sentences for a drawing Table 3: Test sentences (controls and fillers aside)

The third star is the same colour as the yellow star.	a) <i>Poate că steaua e galbenă.</i> 'Maybe the star is yellow'. b) <i>Poate că floarea e roșie.</i> 'Maybe the flower is red'. c) <i>Poate că funda e roz.</i> 'Maybe the ribbon is pink'. d) <i>Poate că cercul e maro.</i> 'Maybe the circle is brown'. a) <i>Sigur că steaua e galbenă.</i> 'Certainly the star is yellow'. b) <i>Sigur că floarea e roșie.</i> 'Certainly the flower is red'. c) <i>Sigur că funda e roz.</i> 'Certainly the ribbon is pink'. d) <i>Sigur că cercul e maro.</i> 'Certainly the circle is brown'.
a) <i>Poate că steaua e galbenă.</i> 'Maybe the star is yellow'. b) <i>Poate că steaua e albastră.</i> 'Maybe the star is blue'. c) <i>Sigur că steaua e galbenă.</i> 'Certainly the star is yellow'. d) <i>Sigur că steaua e albastră.</i> 'Certainly the star is blue'. e) <i>Poate că steaua e portocalie.</i> 'Maybe the star is orange'. f) <i>Sigur că steaua e roșie.</i> 'Certainly the star is red'. (a)- test item (underinformative). (b), (c), (d)- controls, (e) and (f)-fillers + randomization	

Results

- The task reveals that children consider contextually underinformative sentences true (98.75%), unlike adults, who consider them false more ($p < 0.001$).

- This suggests that children do not yet produce scalar implicatures with *poate* 'maybe/ possibly' and are significantly more logical than adults.

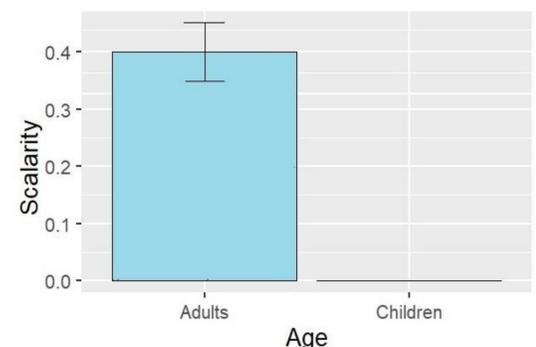


Figure 3: The proportion of scalar implicatures with epistemic adverbs (with standard error) per age in Experiment 2

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- Cournane, Ailis. 2015. Revisiting the Epistemic Gap: Evidence for a Grammatical Source. *BUCLD 39 Proceedings*. Somerville, MA: Cascadilla Press. • Hirst, W., & Weil, J. 1982. Acquisition of the epistemic and deontic meaning of modals. *Journal of Child Language*, 9: 659-666. • Noveck, I. A., Ho, S. & Sera, M. 1996. Children's understanding of epistemic modals. *Journal of Child Language*, 23, 3: 621-643 • Noveck, I. 2001. When children are more logical than adults, *Cognition* 78: 165-188 • Ozturk, O., & Papafragou, A. (2014). The acquisition of epistemic modality: From semantic meaning to pragmatic interpretation. *Language Learning and Development* online: 1-24.