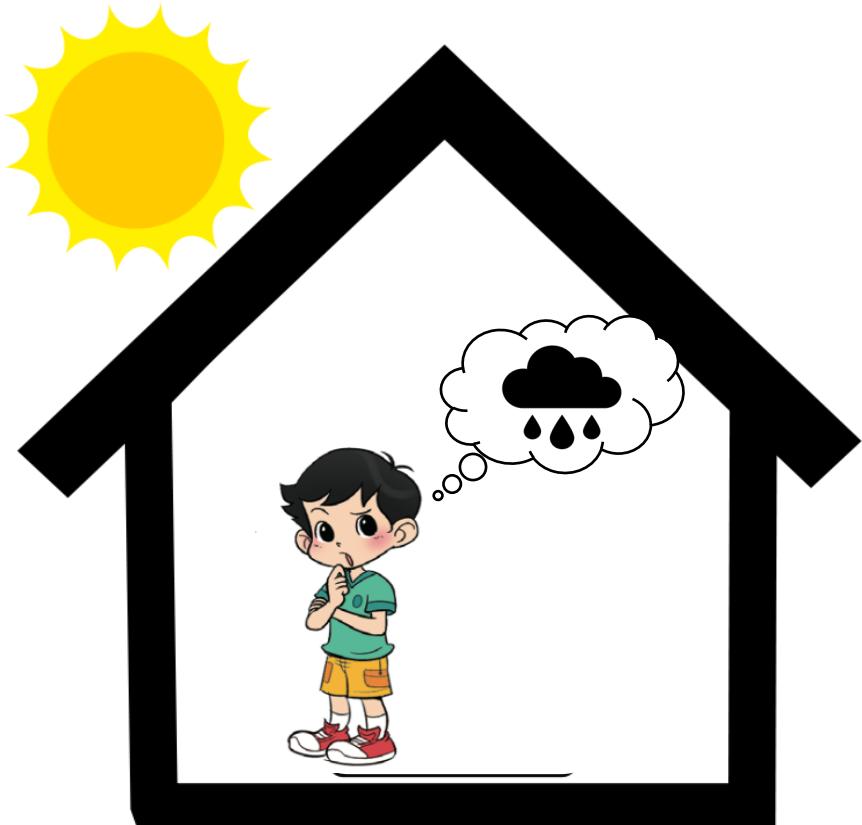


Acquisition of belief reports by Mandarin-speaking children

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3-year-olds make false belief errors



- (1) Taoqi thinks it's raining.
 - 3-year-olds: "No! It's sunny outside."

Conceptual hypothesis: they can't attribute false beliefs to others

e.g. Wimmer & Perner 1983; Baron-Cohen, Leslie, & Frith 1985

Pragmatic hypothesis: they *can* attribute false beliefs, but they have problem understanding why people talk about beliefs

Lewis et al. (2017)

Speakers use belief reports to:

- Discuss someone's beliefs:
(2) A: Why is Taoqi carrying an umbrella?
B: He **thinks** it's raining.

 - Add the **content** of someone's belief to the conversation
(3) A: What's the weather like?
B: I **think** it's raining.
 - Speak about the main point: it's raining.
- Lewis et al. (2017): Children makes false belief “errors”, because they over-assume the parenthetical uses.
 - Evidence: English-speaking 3-year-olds do respond to literal use of *think* when the context discourages parenthetical uses.
 - Today: Can the same contextual manipulations help **Mandarin-speaking** children?

Mandarin belief reports

- Mandarin speakers use *juede* “think” similarly:

Mandarin-speaking 3-year-olds have similar problems with *think-like verbs* like their English-speaking peers

- Mandarin twist: a verb dedicated to expressing false belief, *yiwei*

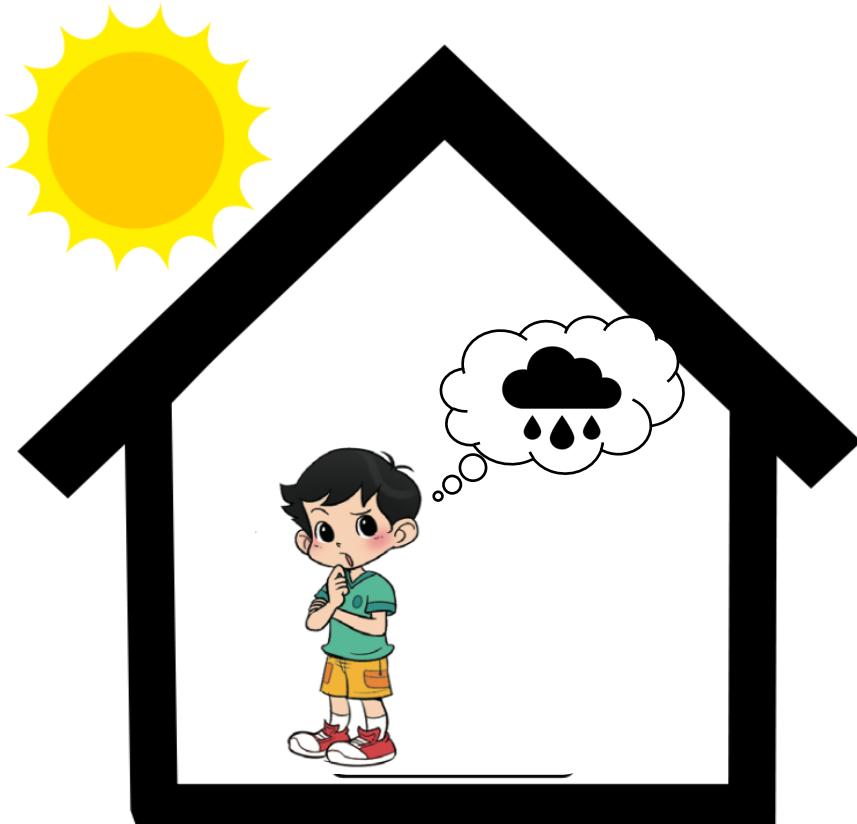
Mandarin-speaking 3-year-olds do not have problems with *false-belief verbs*

Today:

- Can Lewis's contextual manipulation help Mandarin-speaking 3-year-olds respond to the literal use of *juede* "think"?
- We will test 2 manipulations from Lewis et al (2017):
 - Sentence truth manipulation: can children reject a false *think* sentence based on a false literal meaning? (Experiment 1)
 - Belief salience manipulation: can children accept a (true) *think* sentence reporting a false belief in conflicting beliefs scenarios? (Experiment 2)
- Main findings:
 - The contextual manipulation helps, but the effect is muted.
 - Mandarin-speaking *adults* make similar false belief "errors" as English-speaking children without the contextual manipulation

Experiment 1: Sentence Truth

Can children reject a false *think* sentence based on a false literal meaning?



(7) Taoqi thinks it's raining outside.

True statement, false complement

- 3yo: “No!” (False belief error)
- Pragmatic hypothesis: because speaker meaning (parenthetical use) is false.

(8) Taoqi thinks it's sunny outside.

False statement, true complement

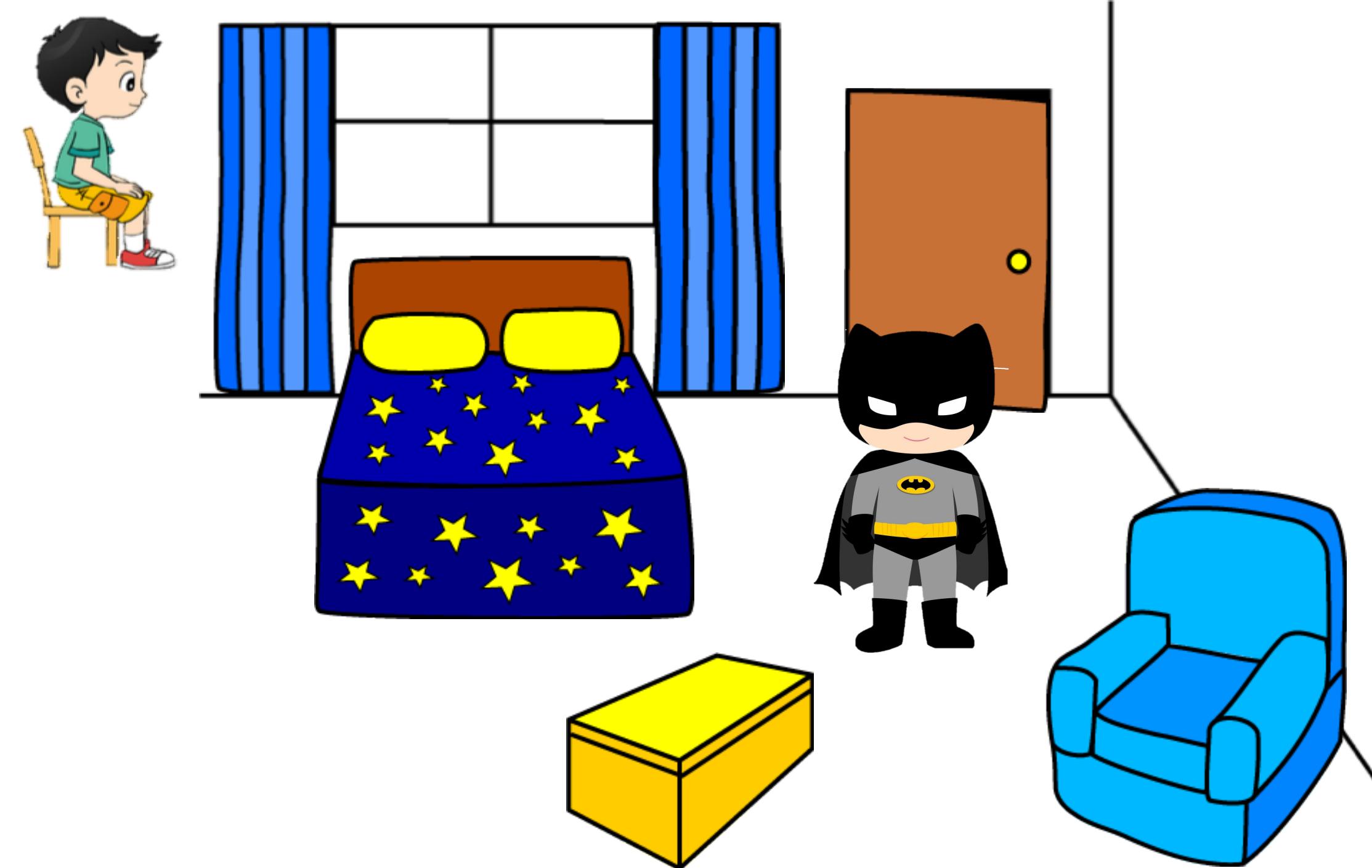
- Pragmatic hypothesis: 3yo “No!” because the literal meaning is false
- Conceptual hypothesis: 3yo “Yes!” because the content of the reported belief is true.

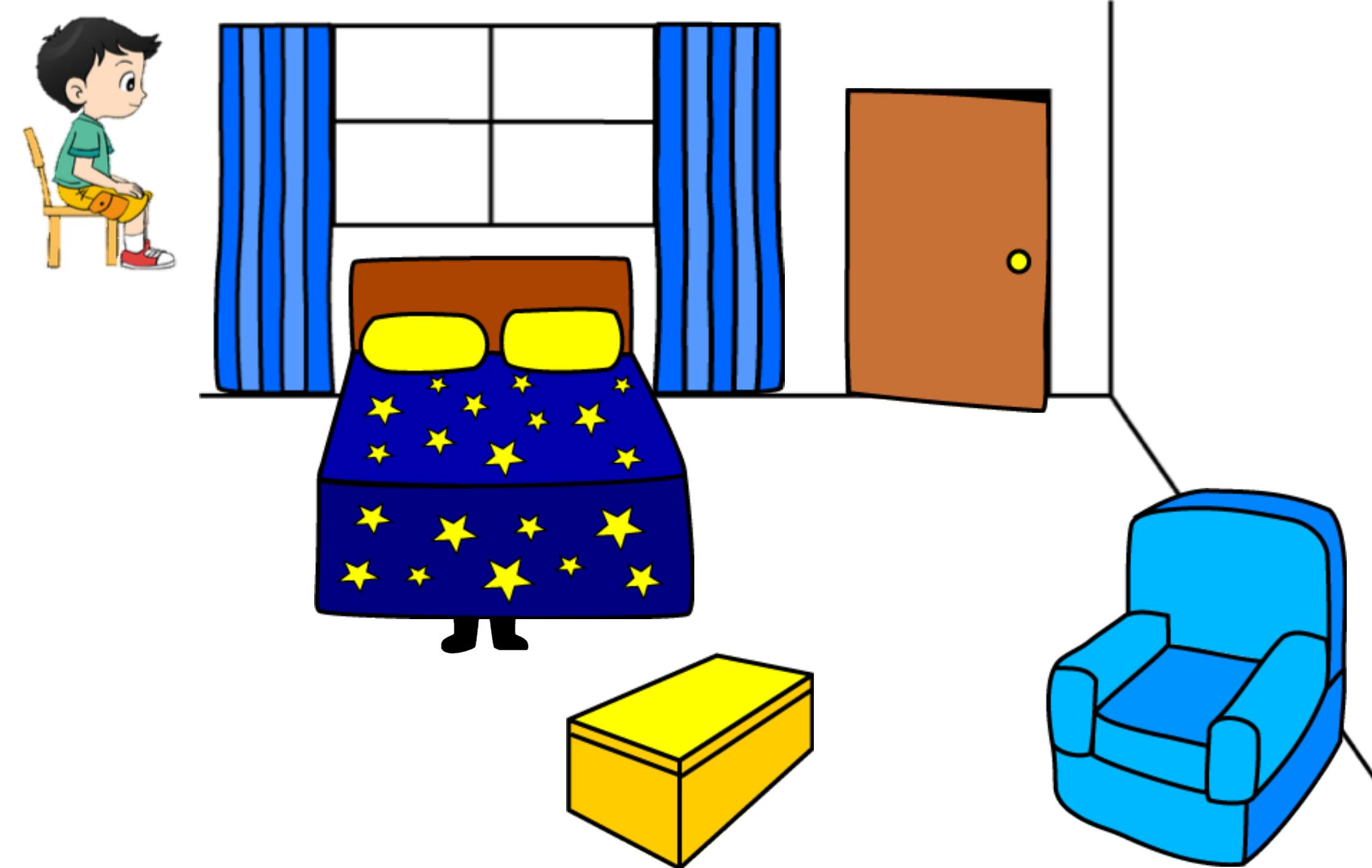
Experiment 1: Sentence Truth

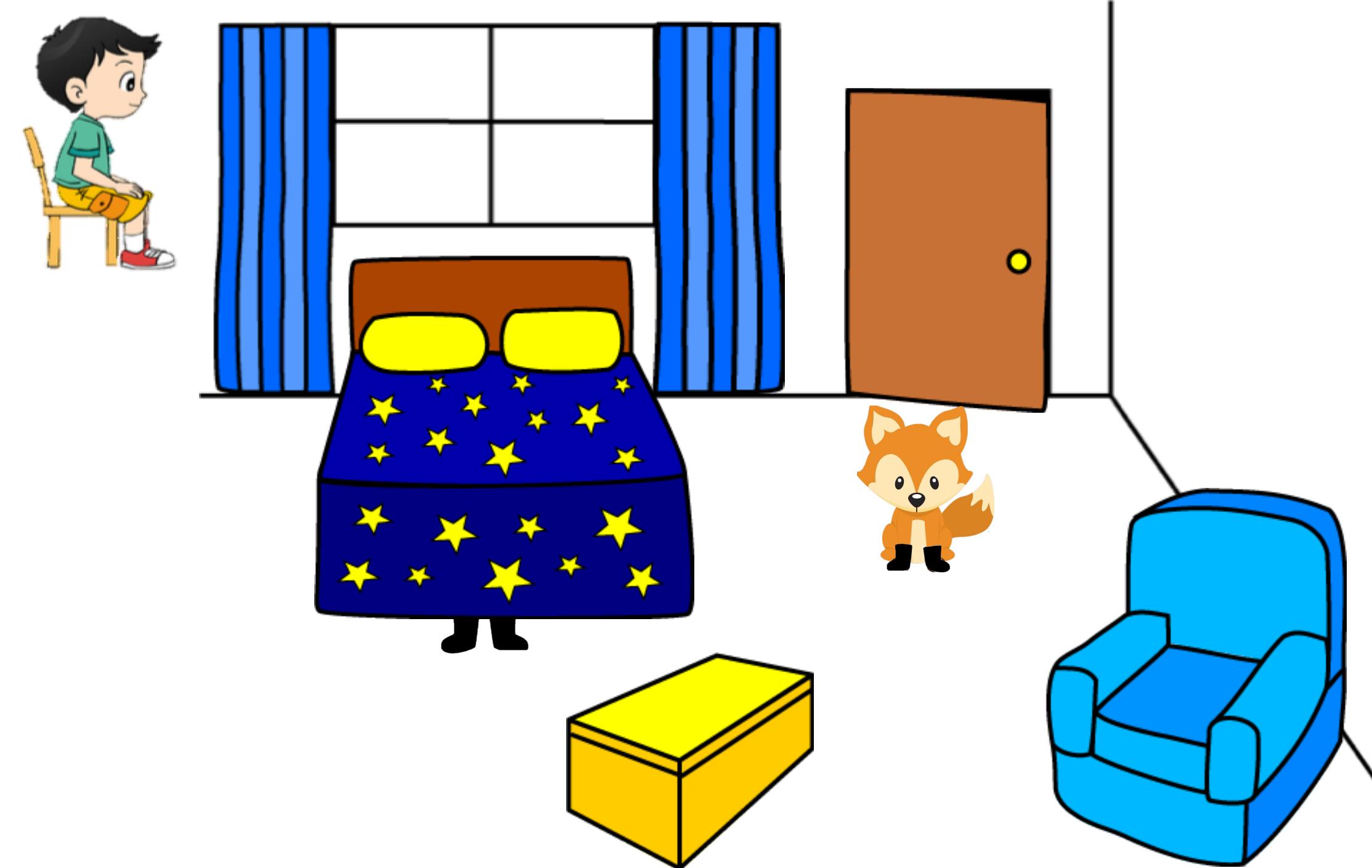
- Inspired by Lewis et al. (2017)
- 35 children (3;2-4;2, mean 3;8) and 35 adults
- Truth-value judgment task
- With an onscreen character Taoqi, children listened to stories like the following:

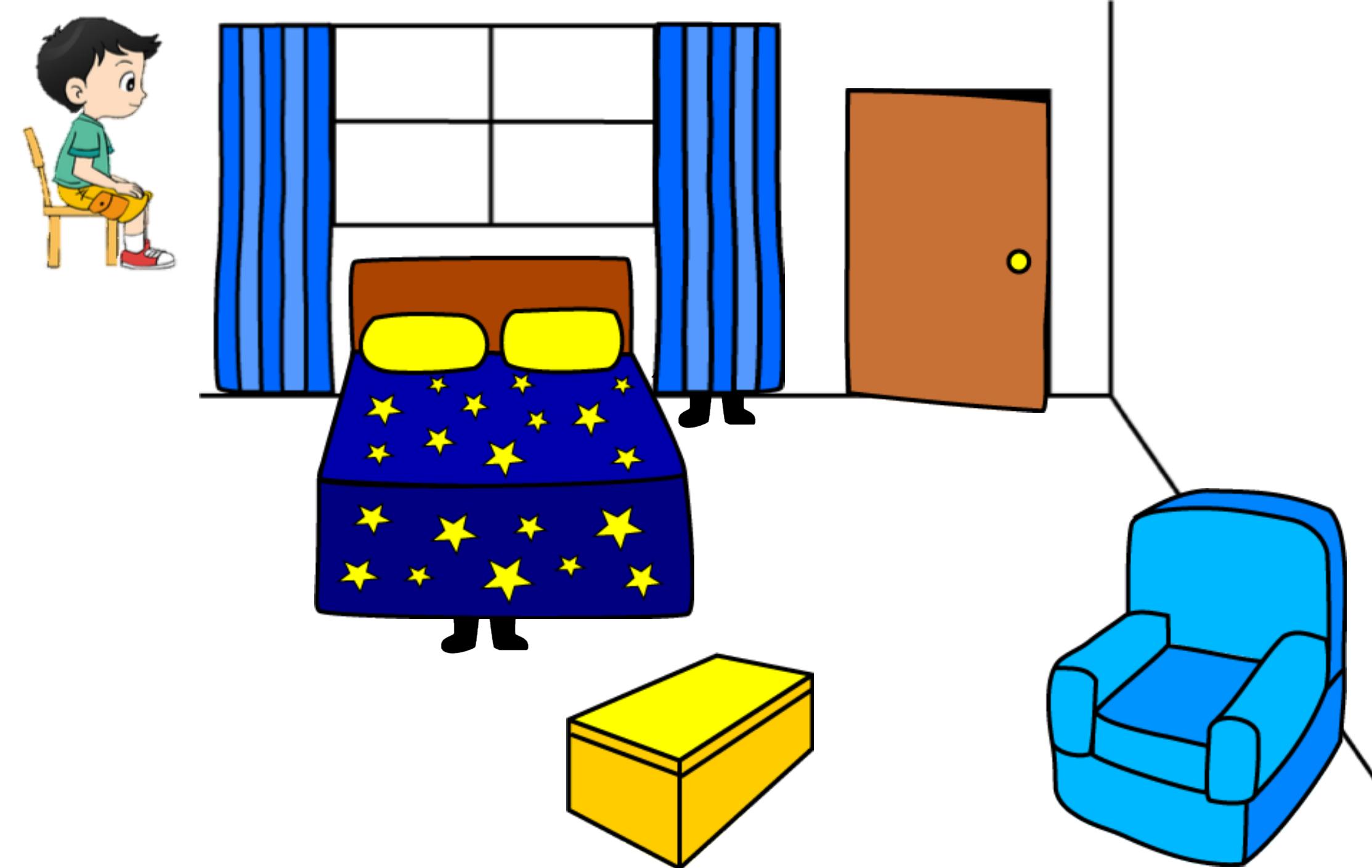


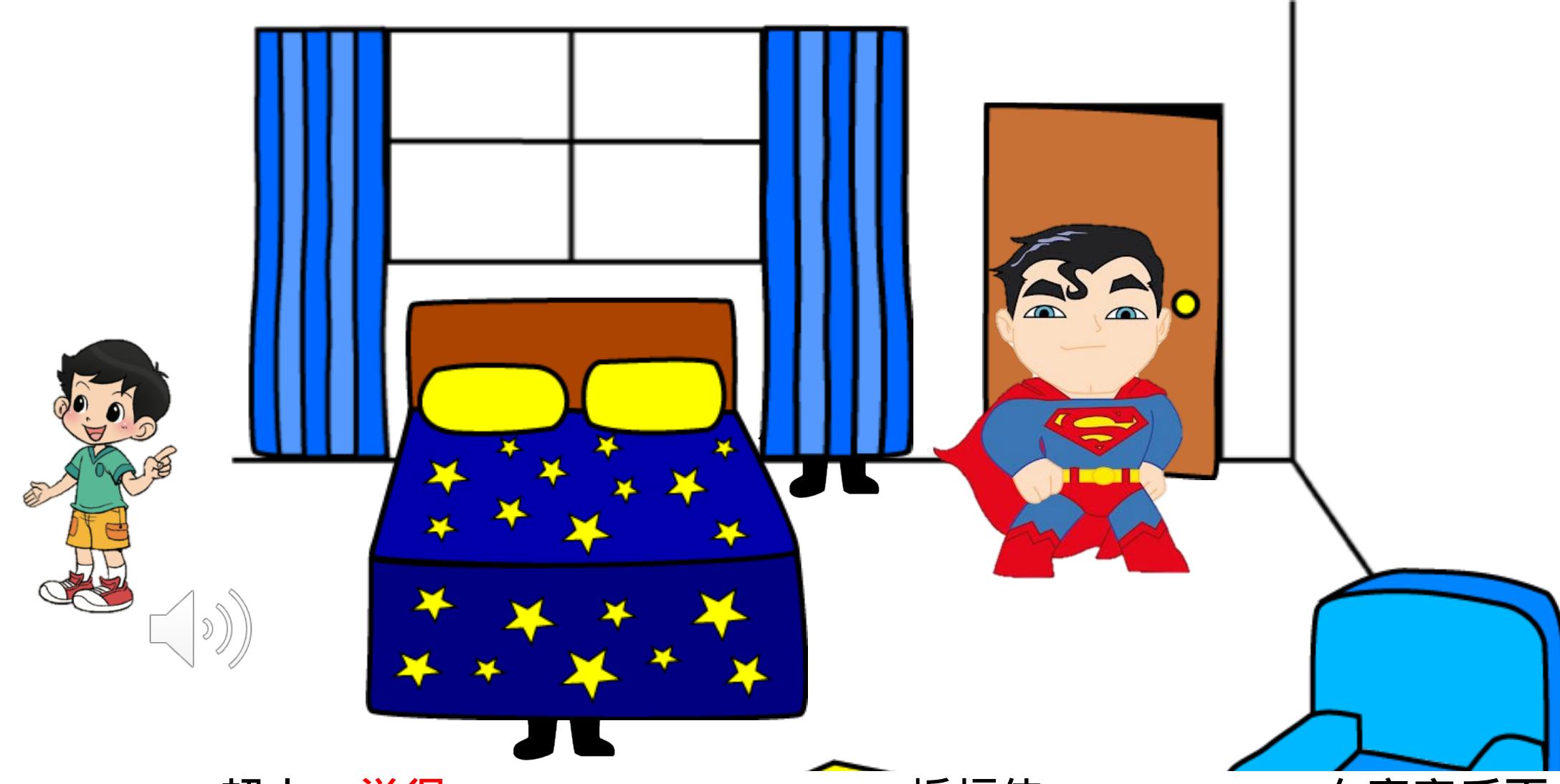












超人 觉得

[Matrix Superman thinks

[Complement

蝙蝠侠

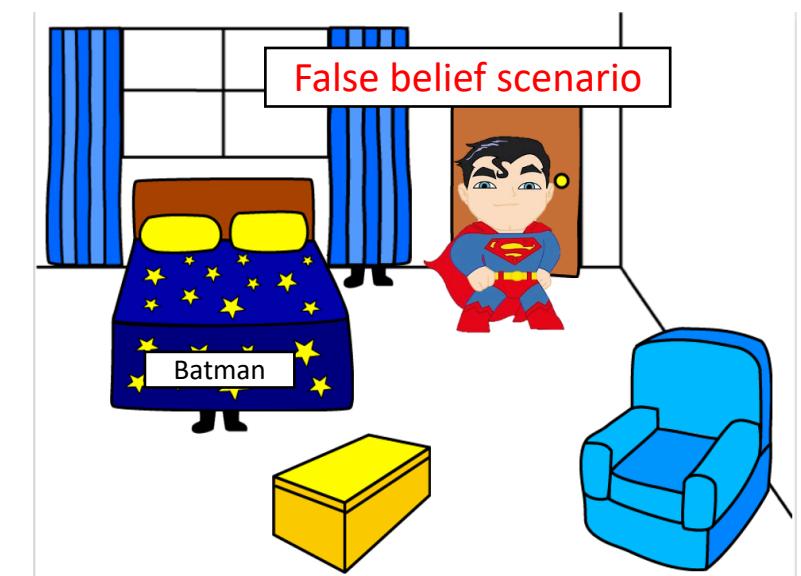
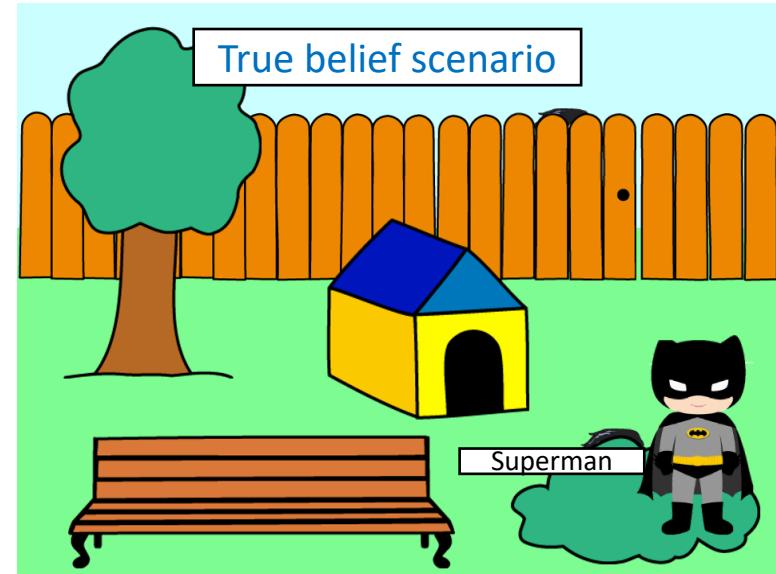
Batman

在窗帘后面

is behind the curtain]]

Exp 1 Design: 2x2 within-subject

		True	Complement
		False	Complement
False-belief condition			
Sentence	True		
	False		



Exp 1 Material

- Each condition: 4 test sentences
- 16 stories; each paired with one test sentence and one filler sentence
- 4 practice stories

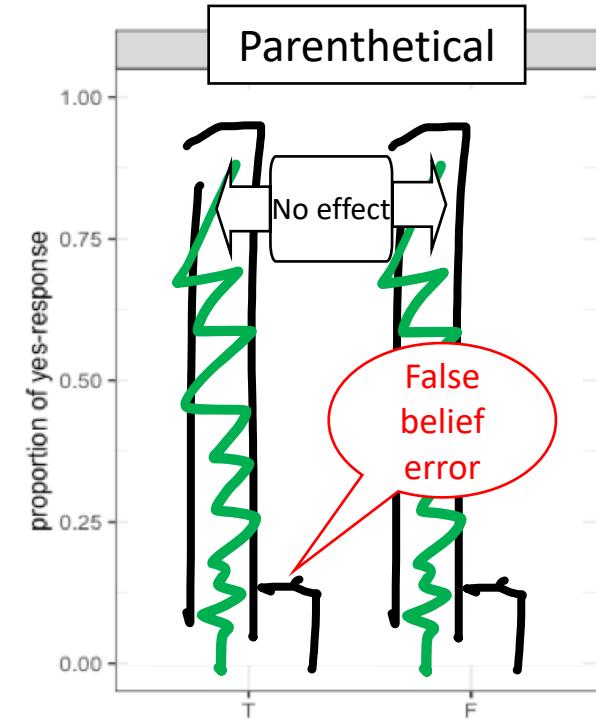
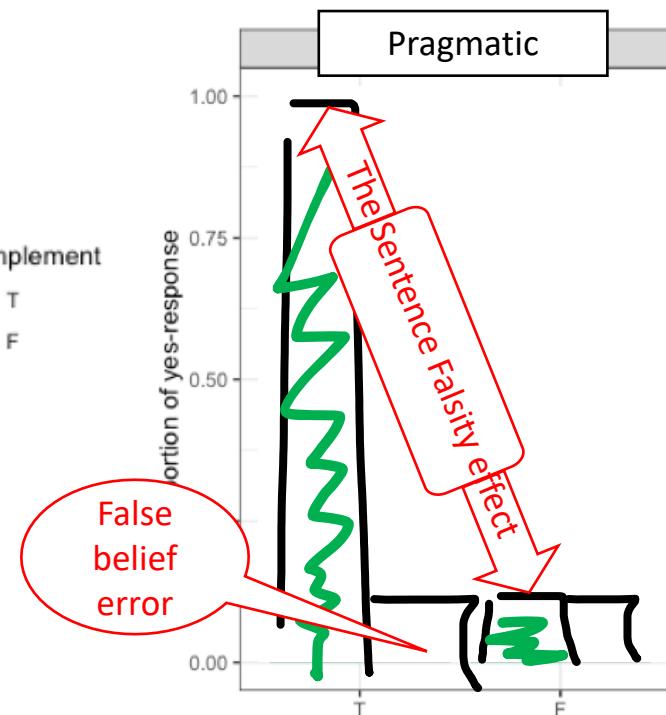
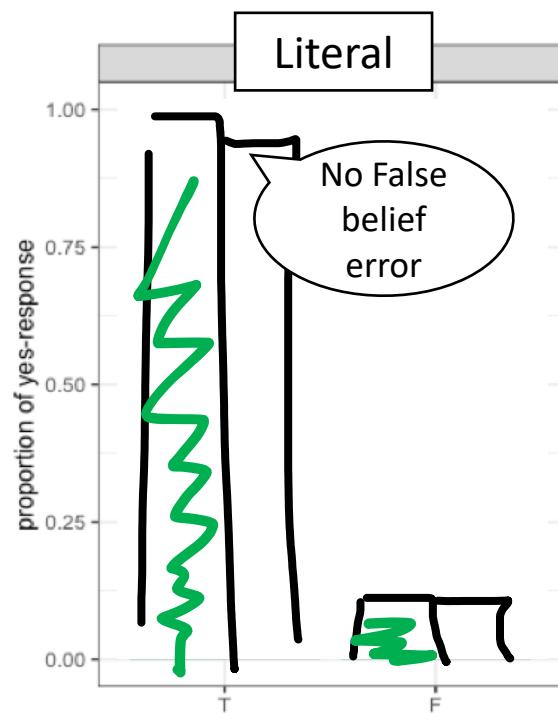
Exp 1 predictions

Do 3-year-olds have access to the literal use of *juede*?

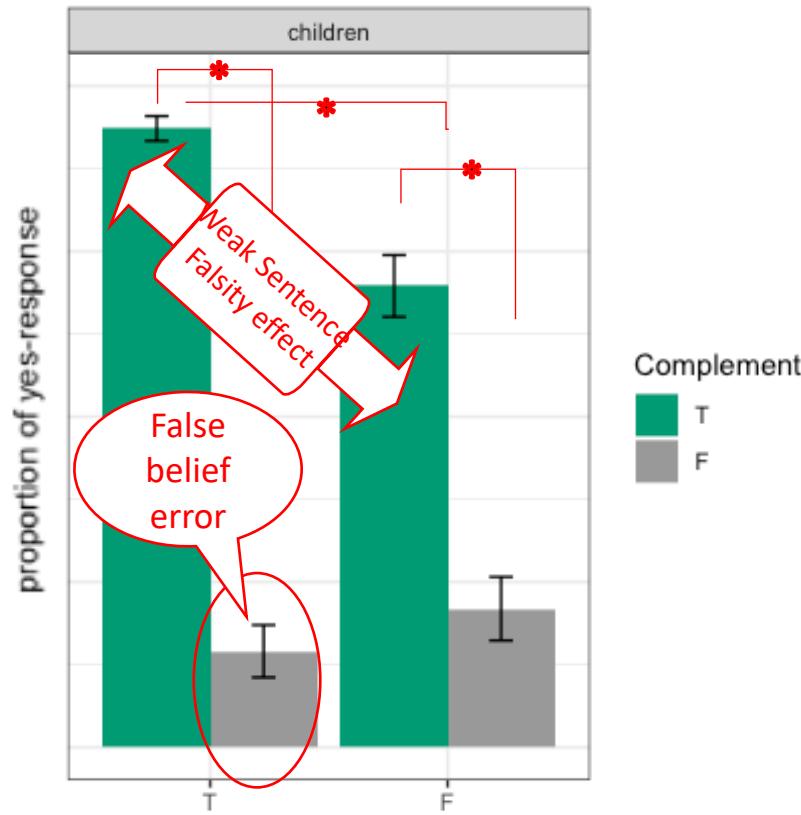
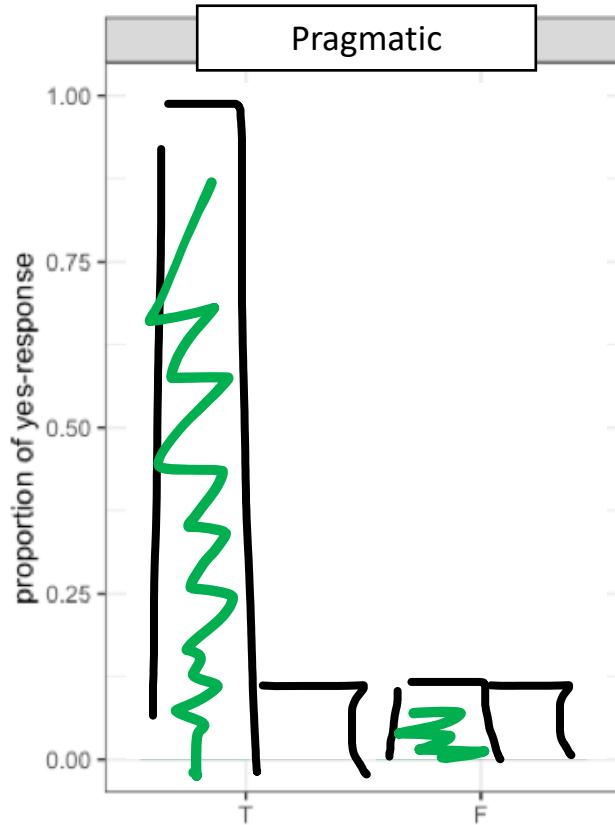
Yes:

Yes, but only when the sentence is false (the pragmatic hypothesis, Lewis et al. 2017):

No:



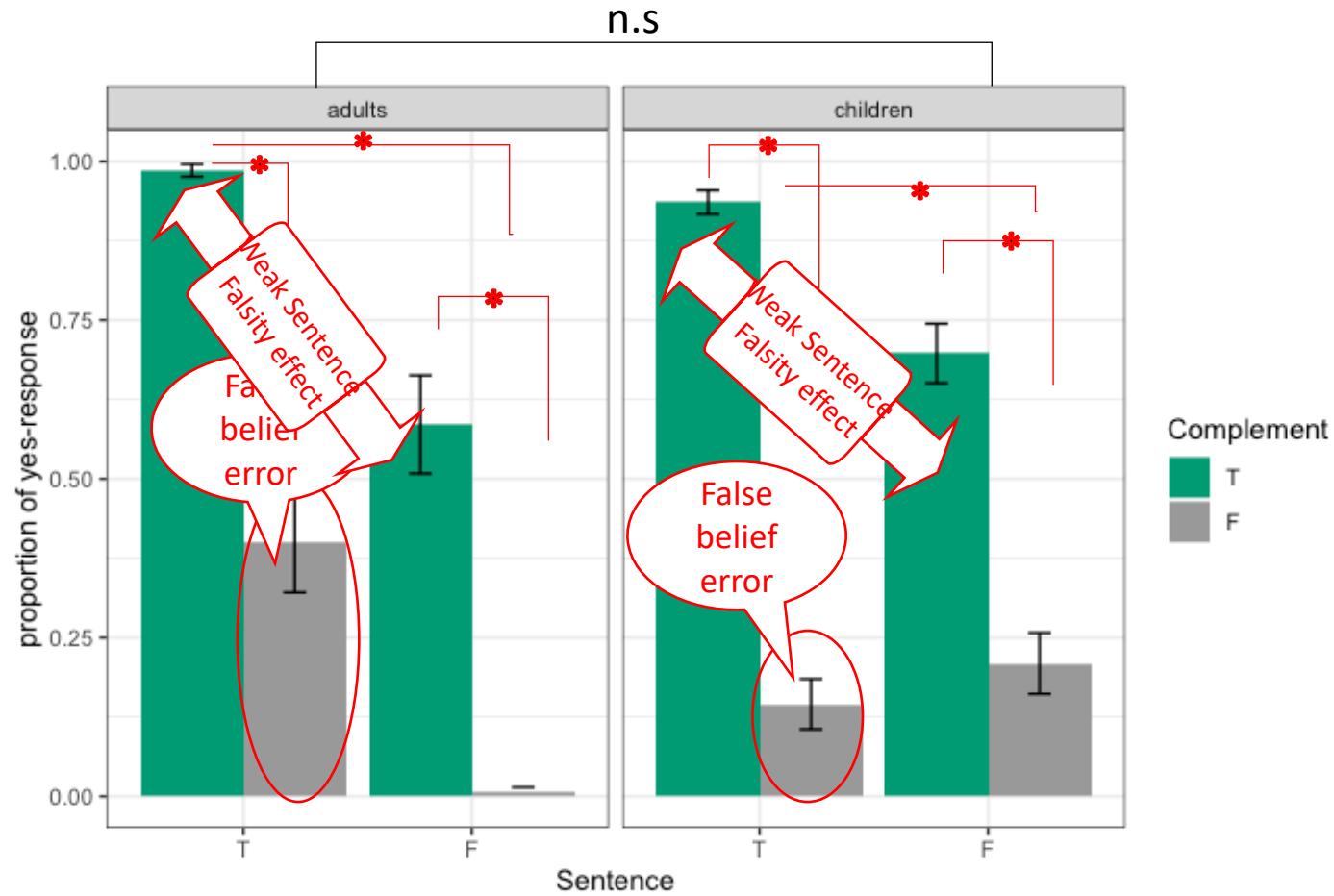
Exp 1: Results



3yos make false belief errors: say “no” when the sentence is true and the complement is false

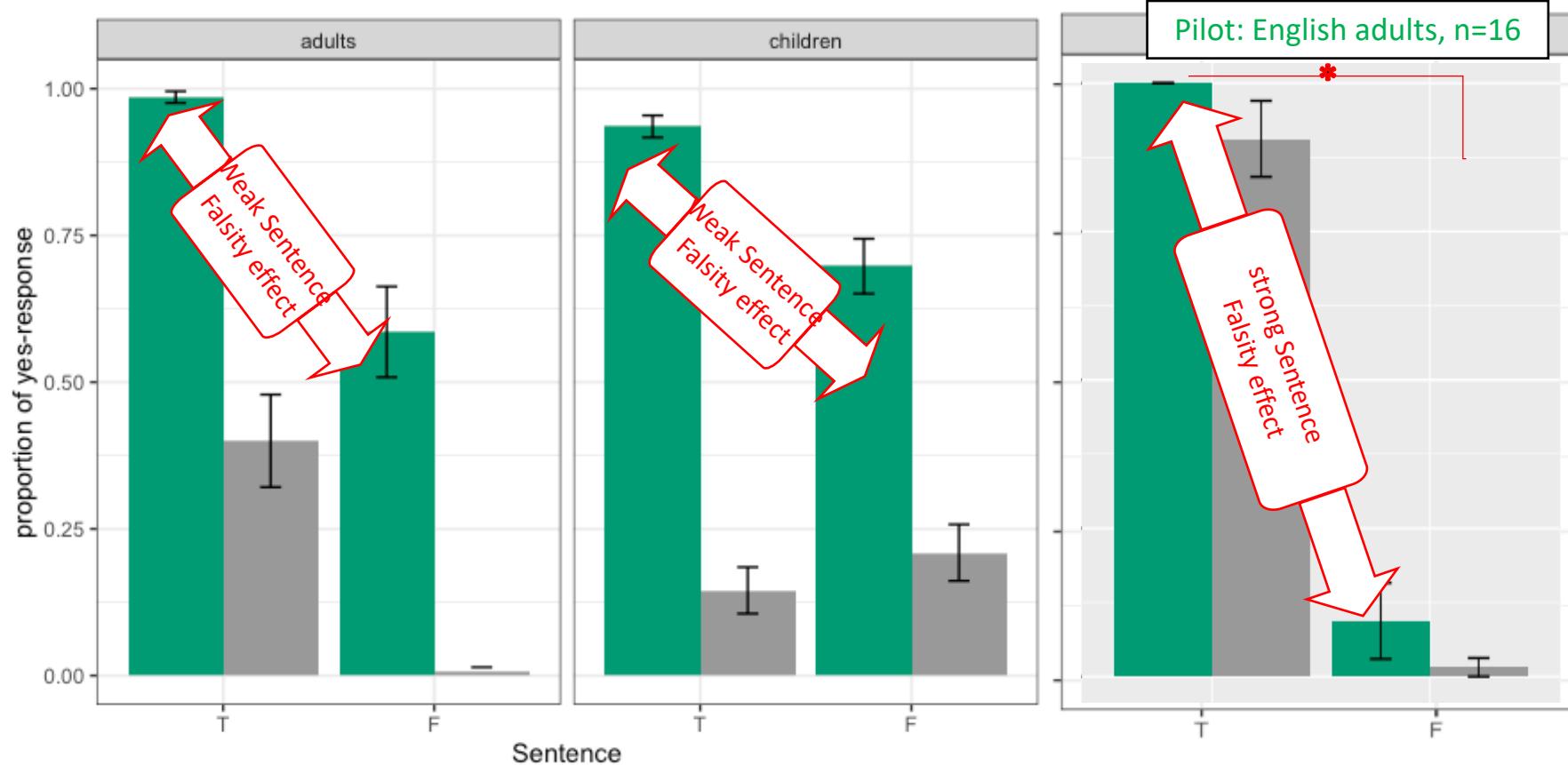
The pragmatic manipulation worked:

Exp 1: Results



- No difference between adults and children
- Adults also make false-belief errors
- The pragmatic manipulation worked: we see a main effect of sentence truth

Exp 1: Results

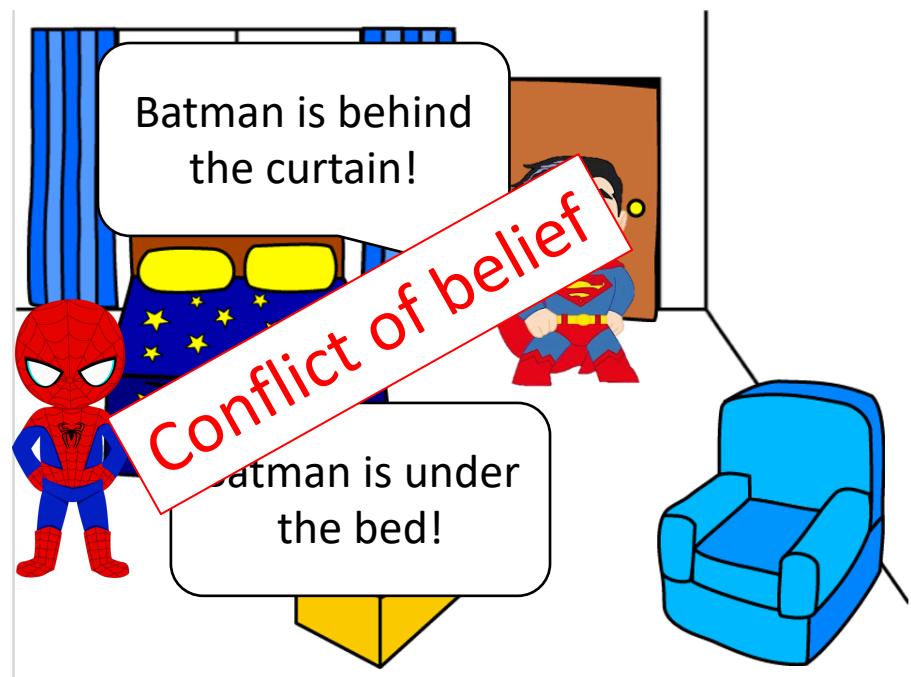


But the effect of sentence truth is muted: the effect in Mandarin is smaller than in English

Interim discussion

- Both adults and 3-year-olds make false-belief errors
 - Given that adults have a mature conceptual system, these results lend further support to the pragmatic over the conceptual hypothesis.
- The pragmatic manipulation worked: Sentence Falsity Effect
 - 3-year-olds have access to the literal use of *juede*
- But the Sentence Falsity Effect in Mandarin is much smaller than in English

Experiment 2: Relevance of belief



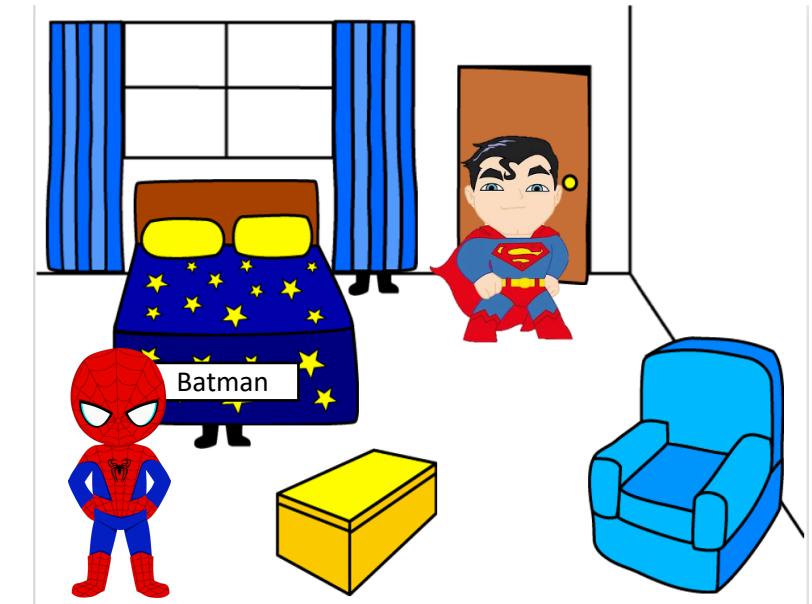
- Can children accept a (true) *think* sentence reporting a false belief in conflicting beliefs scenarios?
- If children have access to the literal use of *juedet*, they should make fewer false belief errors when there are two seekers
- Similar design as Exp 1 otherwise
- 32 children (3;2-4;2, mean 3;8) and 32 adults

Exp 2 Design: 2x2 within-subject

		True
		False
False-belief condition		
Complement	T	
	F	
True		False

Sentence

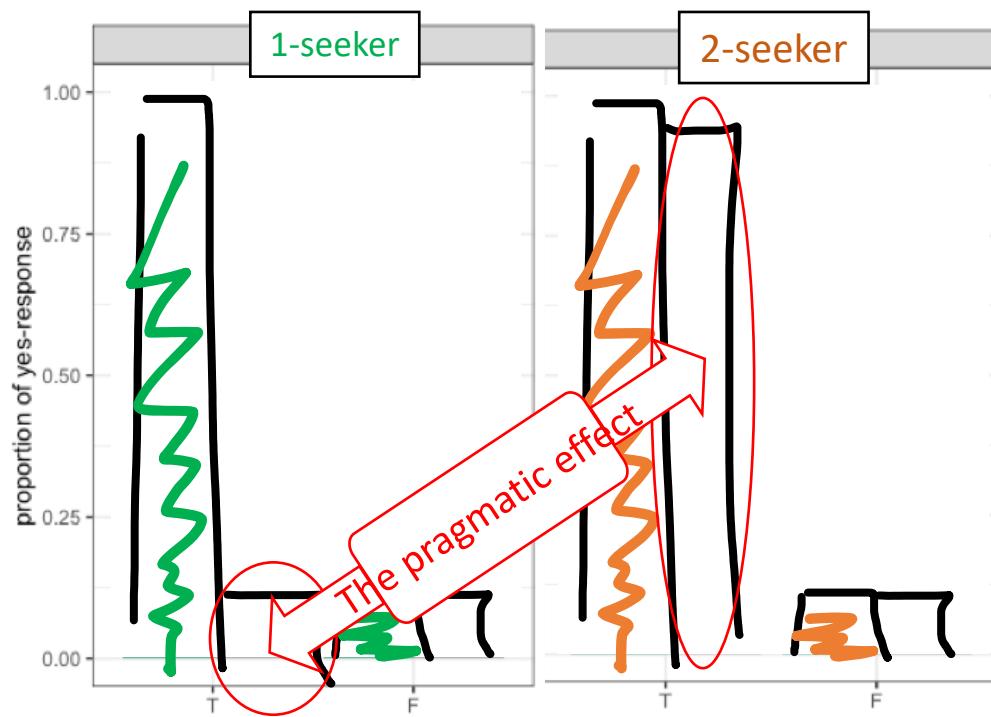
Complement



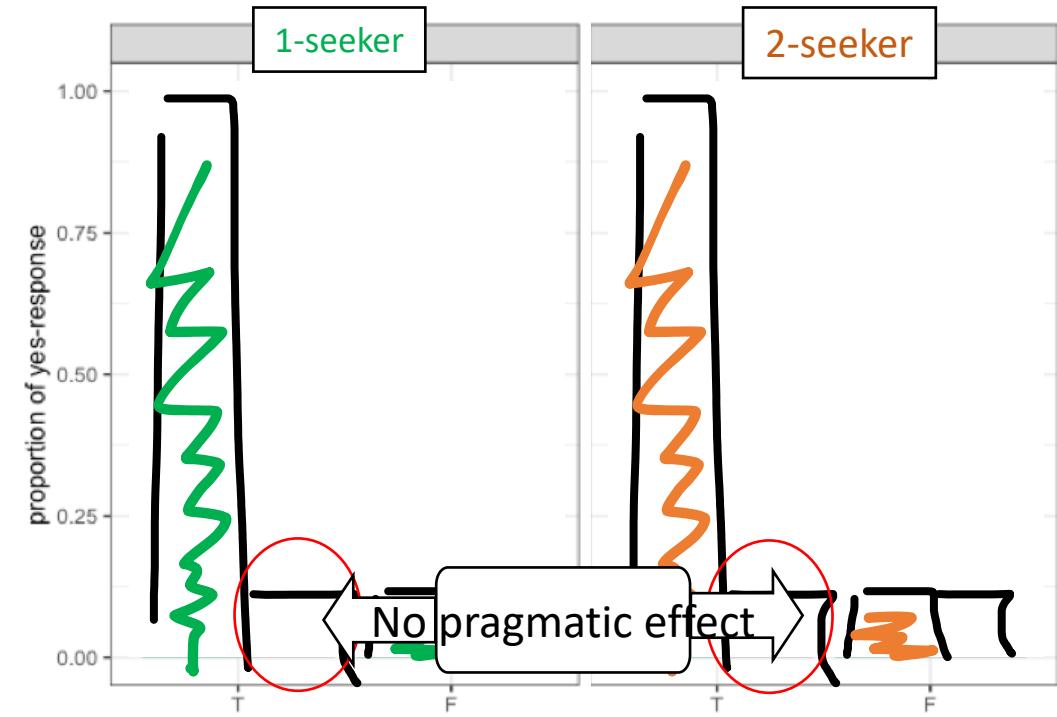
Exp 2 predictions

Would highlighting the relevance of belief help children access the literal use of *jude*?

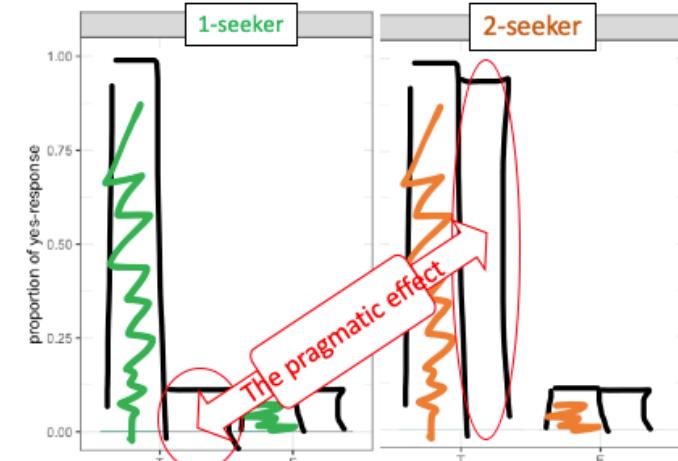
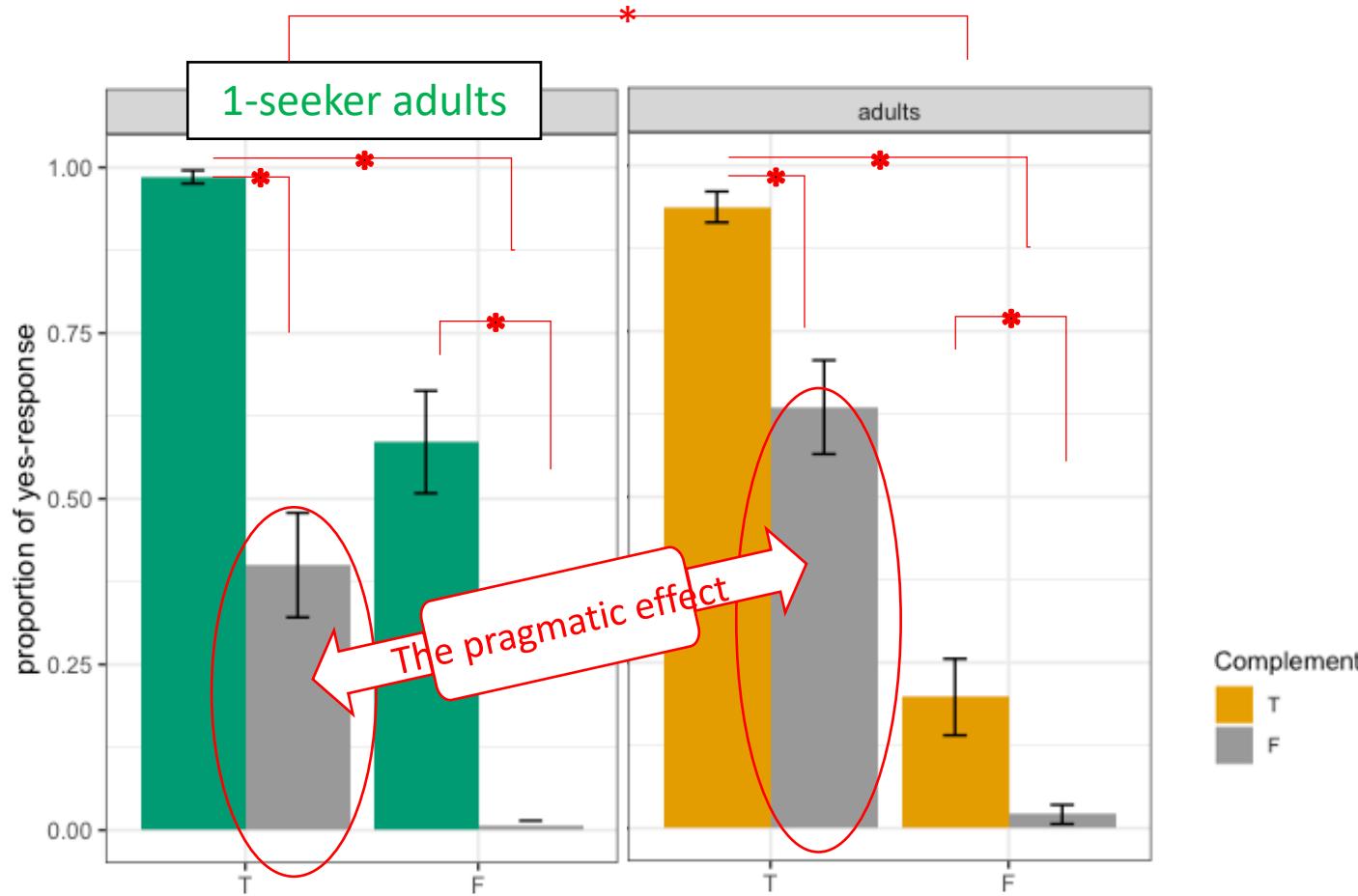
Yes:



No:

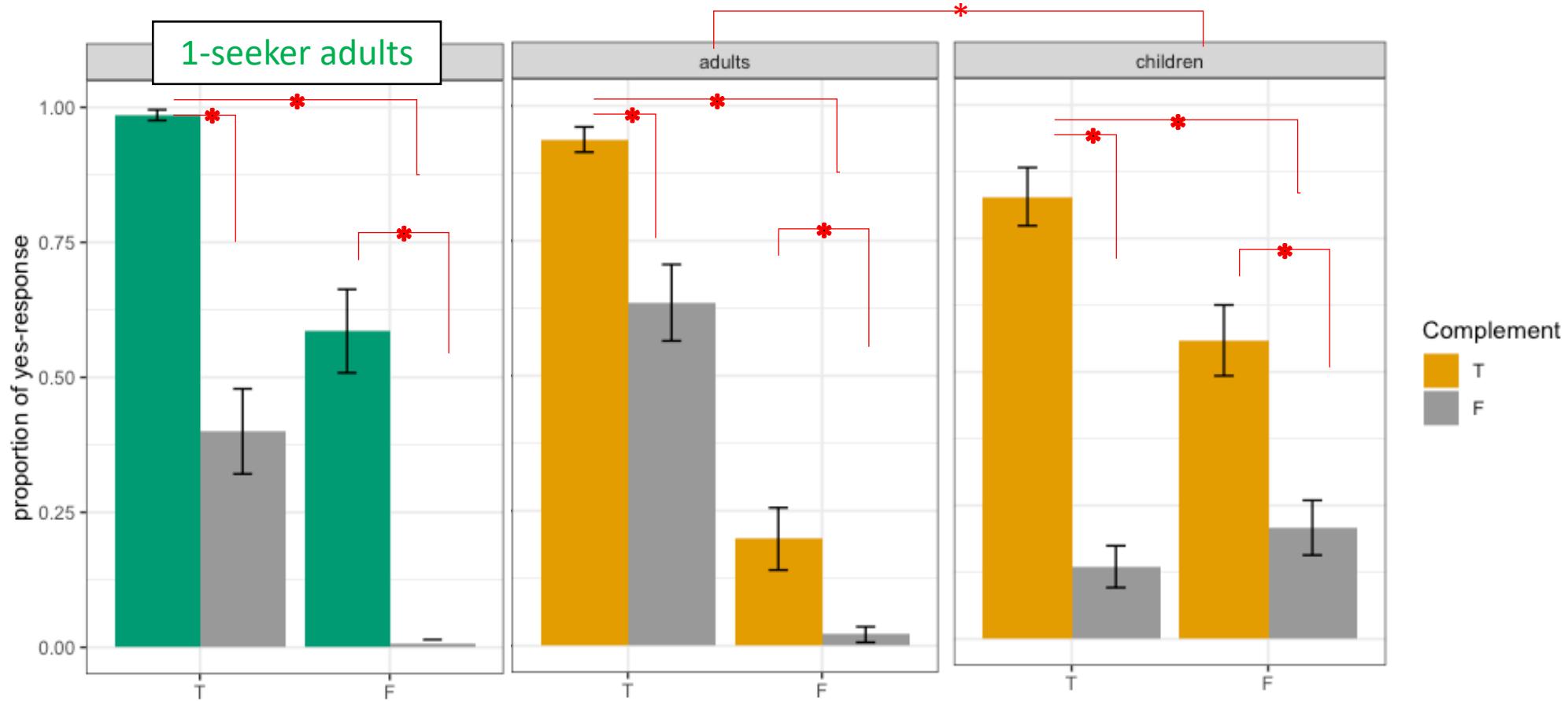


Exp 2 Results: adults

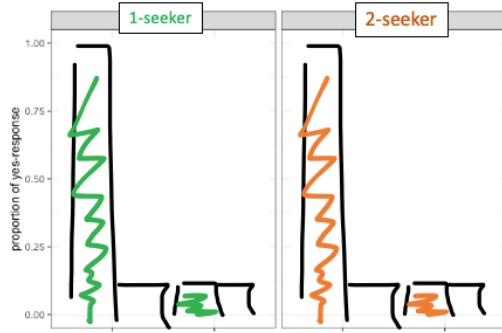


the 2-seeker manipulation highlights the relevance of belief, making adults recognize this as a literal use (i.e., no false belief “errors”)

Exp 2 Results: children

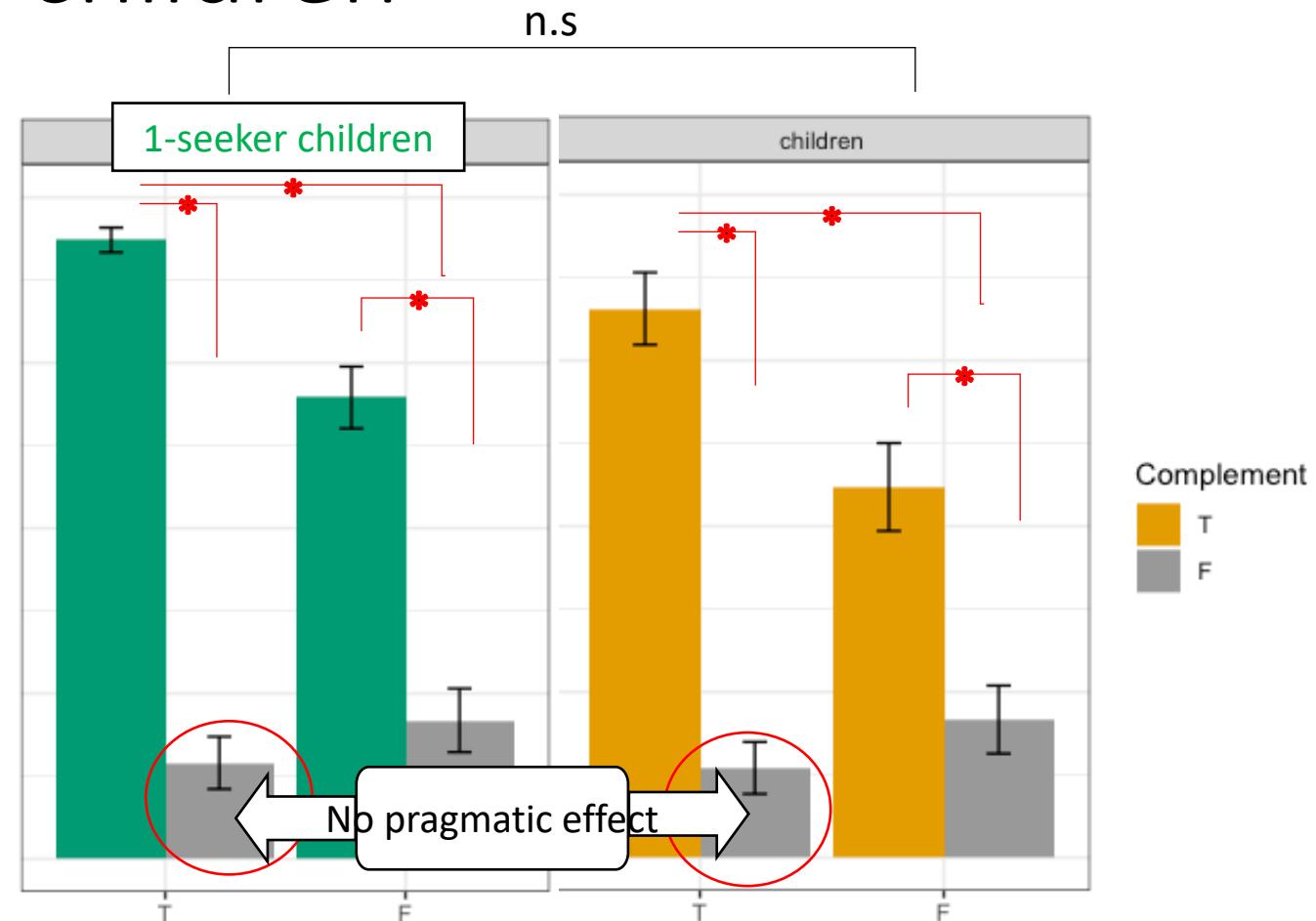


Exp 2 Results: children



No difference between children's behavior between 1-seeker and 2-seeker conditions

Adding another seeker does not help children overcome false belief errors
→ possibly because of *yiwei*



Conclusions

- 3-year-olds make false belief errors, but so do adults
 - Not a conceptual problem
- 3-year-olds are sensitive to the sentence truth manipulation
 - They have access to the literal use of *jude*
- The effect of sentence truth is muted for both adults and children: compare to English-speaking adults, the effect is smaller
 - There might be other factors influencing Mandarin speakers' interpretation of *jude*
- Relevance of belief manipulation helps adults access the literal use but fail to help 3-year-olds

Discussion

- Why are the pragmatic manipulations not as effective in Mandarin?
 - Our hypothesis is that the existence of *yiwei* might be influencing Mandarin speakers' interpretation of *think*-like verbs
 - Since *yiwei* is more appropriate in the false belief condition, children might be compelled to use *yiwei* instead of *juede*
- Next step: testing this effect of *yiwei*

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Q&A