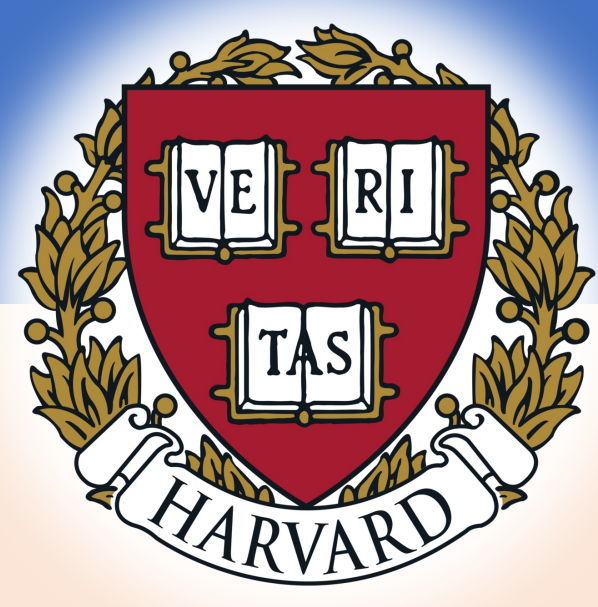




Children ask more questions when they think their teacher is AI



Blerim Jashari¹, Ilona Bass¹, Candice Mills², Tomer Ullman¹, & Elizabeth Bonawitz¹
Harvard University¹, UT Dallas²

Background

- Asking questions is important for children's learning [1-2], but comes with the social cost of signaling that you don't know something
- With age, children become more concerned with appearing competent [3-7] and tend to ask fewer questions [8-9]
- So, children may avoid asking questions when they anticipate judgment
- LLM-based chatbots have become more common in education [10-11]
- If children think AI is incapable of social judgement, or if they don't care about such judgment from AI, they may ask more questions to AI agents

Research Question

Do children ask more questions and learn more when they think they are interacting with an **AI chatbot** vs. a **human teacher**?

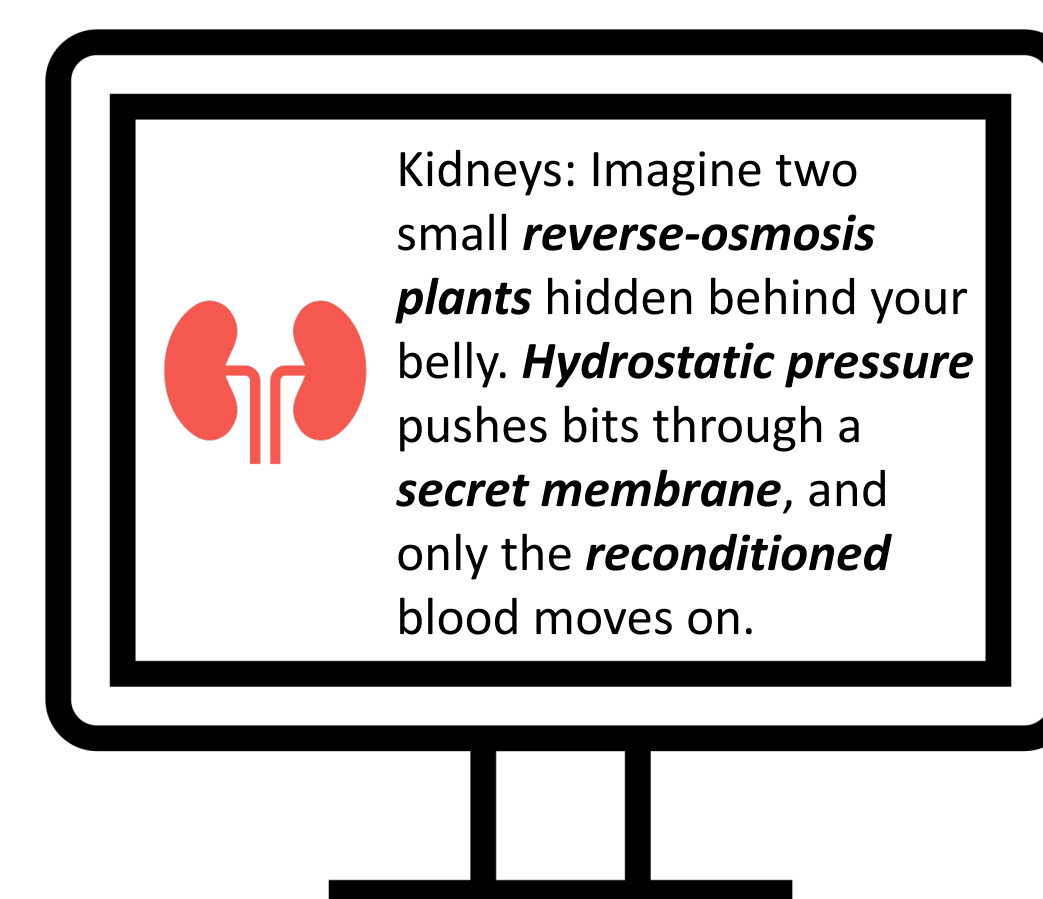
Methods

Participants: Children age 7-12, run over Zoom

1. Learning Phase

Participants heard science stories about four body organs (kidneys, lungs, heart, brain)

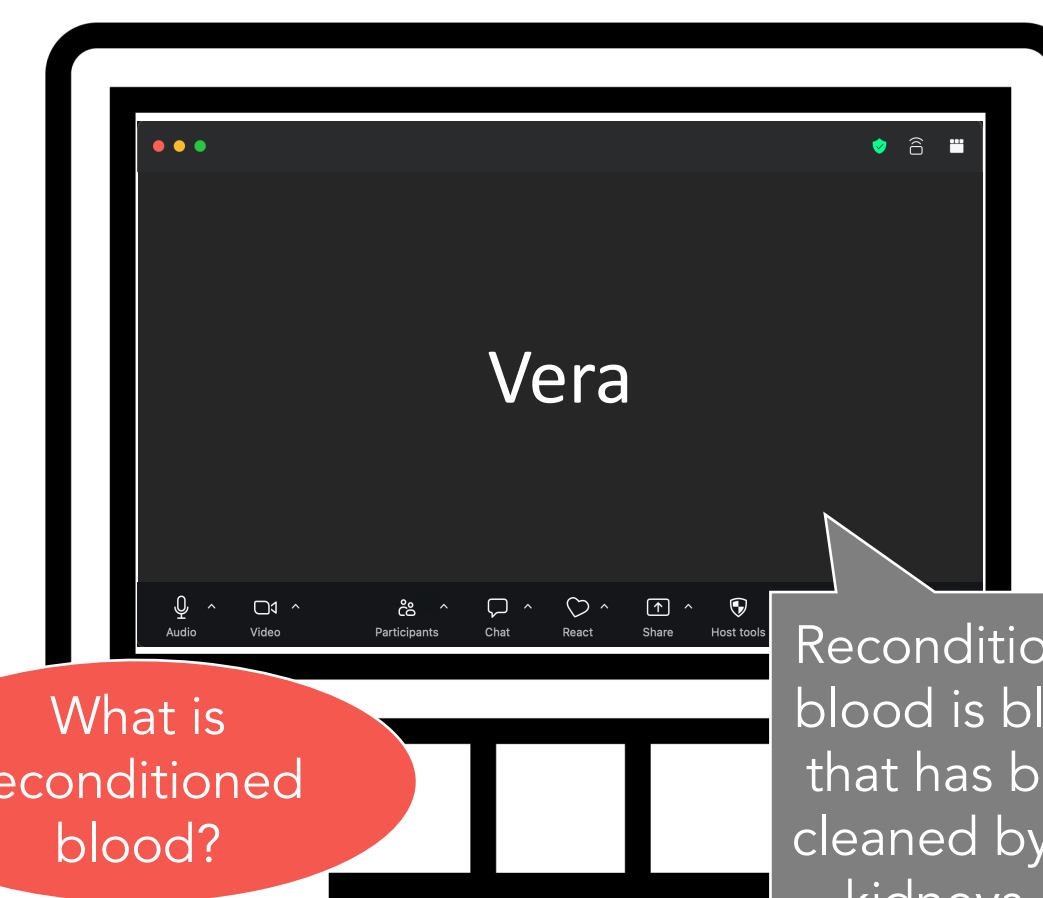
Content was intentionally challenging, including vocabulary and analogies children were unlikely to know



2. Question-Asking Phase

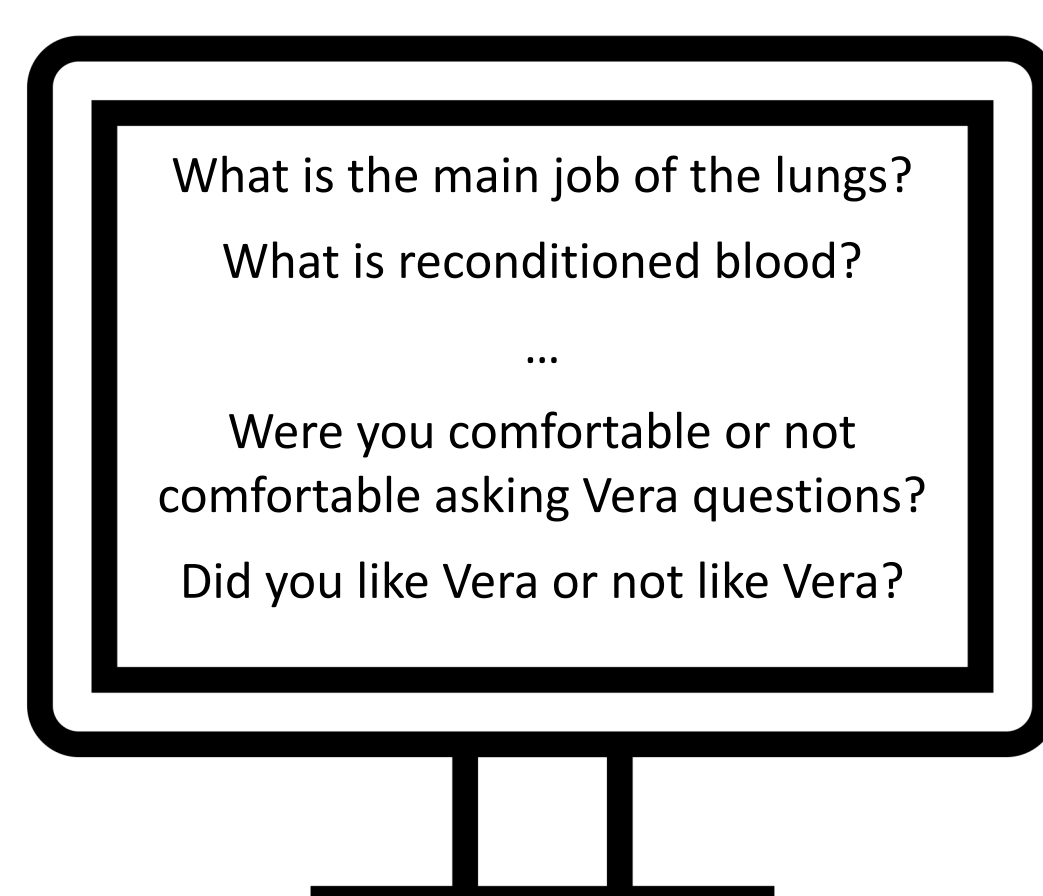
Participants asked questions about the stories to "Vera", who children were told was an **AI chatbot** or a **human teacher** (between-subjects)

Answers from Vera were identical across conditions



3. Assessments

Participants completed learning assessments about the science stories, and answered questions about their experience with Vera (e.g., comfort asking questions, ease of understanding, liking of Vera)

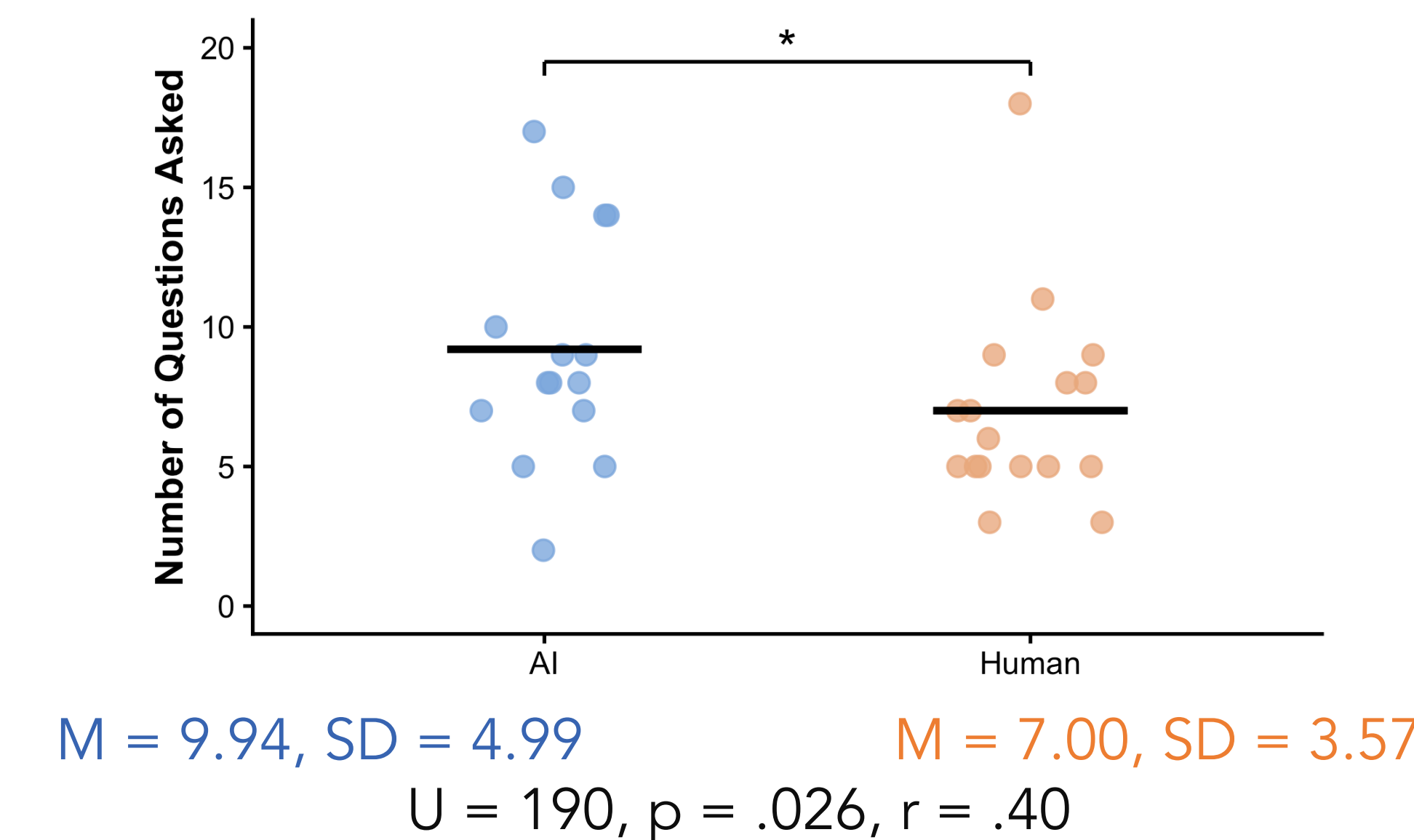


Results

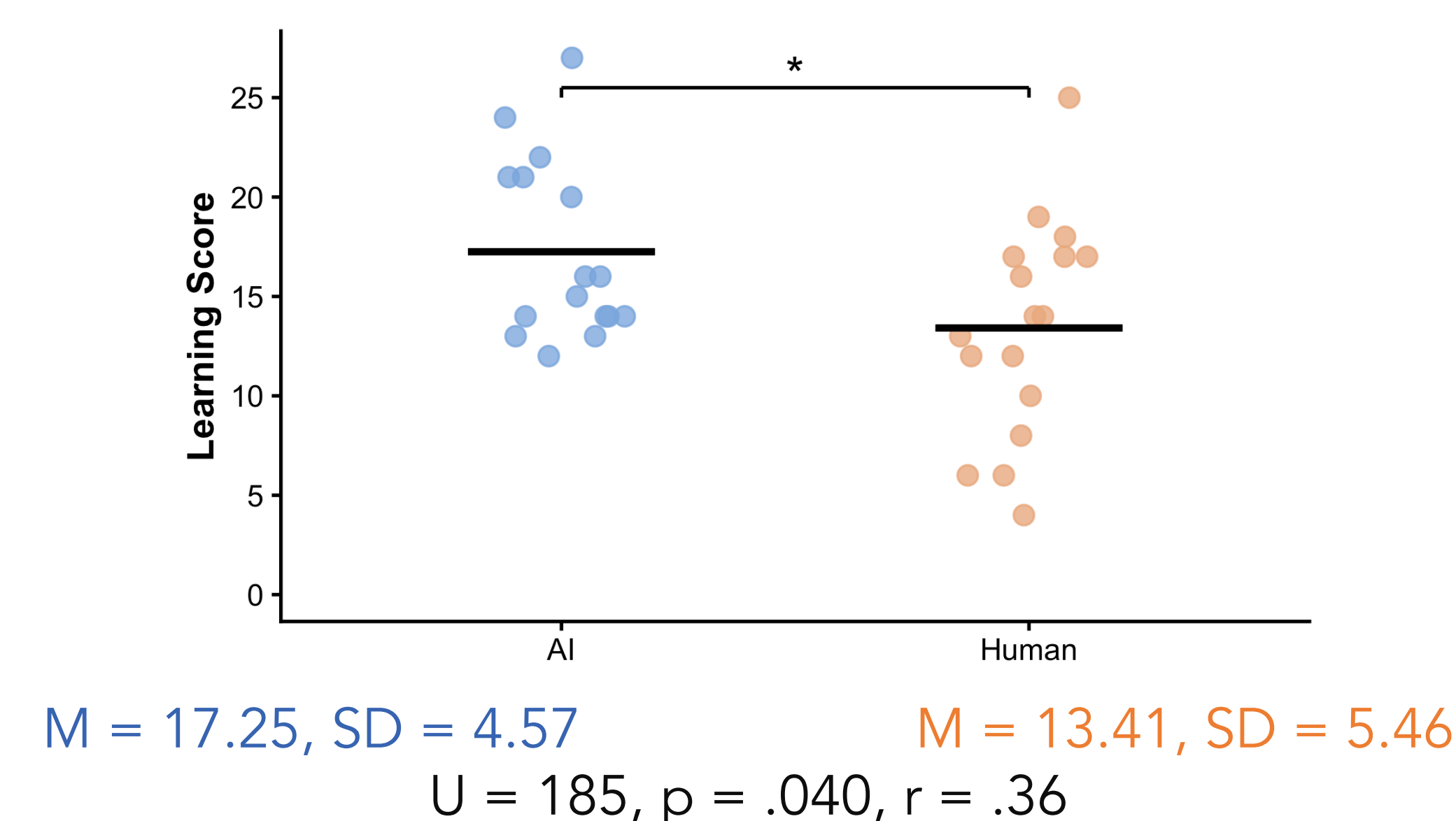
Preliminary data from 33 children out of a target N = 100

AI condition: N = 16; **Human condition:** N = 17

Children in the AI condition asked more questions

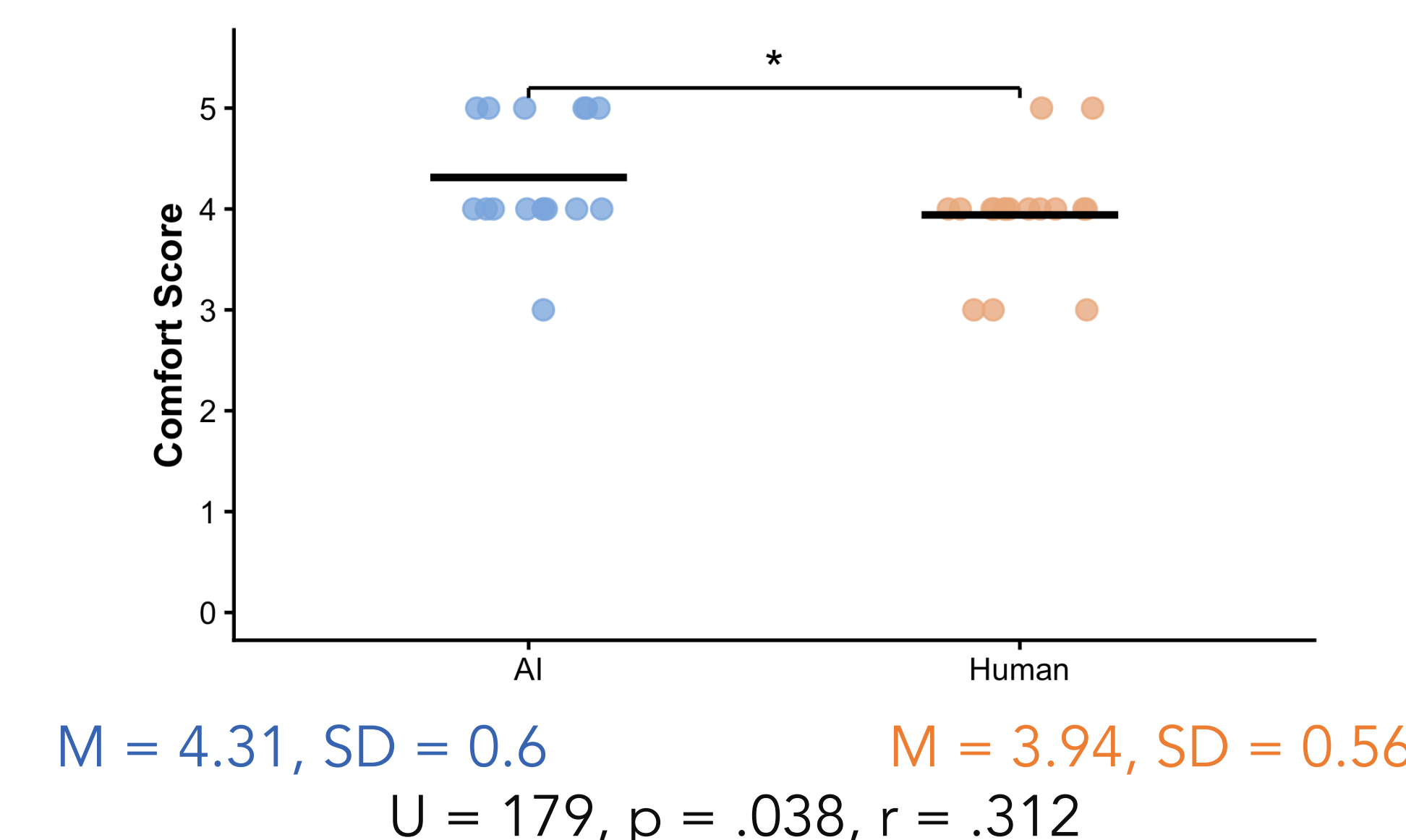


Children in the AI condition learned more*



*Learning scores were not significantly predicted by the number of questions asked

Children in the AI condition were more comfortable asking questions



Discussion

- Children asked more questions, learned more, and felt more comfortable asking questions when they believed they were interacting with an AI rather than a human teacher
- Currently no differences in children's ease of understanding, or liking / trust of the teacher
- Suggests that one way in which AI may support learning is by reducing the social costs of revealing what one doesn't know
- AI agents may thus benefit from being *different* from human agents.
- Learning environments could lower costs associated with asking questions

Ongoing & Future work:

- Complete data collection with full sample
- Code and analyze types of questions children ask (e.g., fact-based questions, explanatory questions, etc.) & explore relationship between behaviors and home/parenting environments.

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