

A welcomed social presence: Attentive and responsive robots make good reading buddies



Ryssa Moffat¹, Nathan Caruana¹, Aitor Miguel Blanco¹, Emily Cross^{1,2,3,4}

¹School of Psychological Sciences, Macquarie University, Australia

²Centre for Elite Performance, Expertise and Training, Macquarie University, Australia

³Institute of Neuroscience and Psychology, University of Glasgow, United Kingdom

⁴MARCS Institute for Brain, Behaviour and Development, Western Sydney University, Australia

WESTERN SYDNEY
UNIVERSITY



The MARCS Institute for Brain,
Behaviour and Development

BACKGROUND

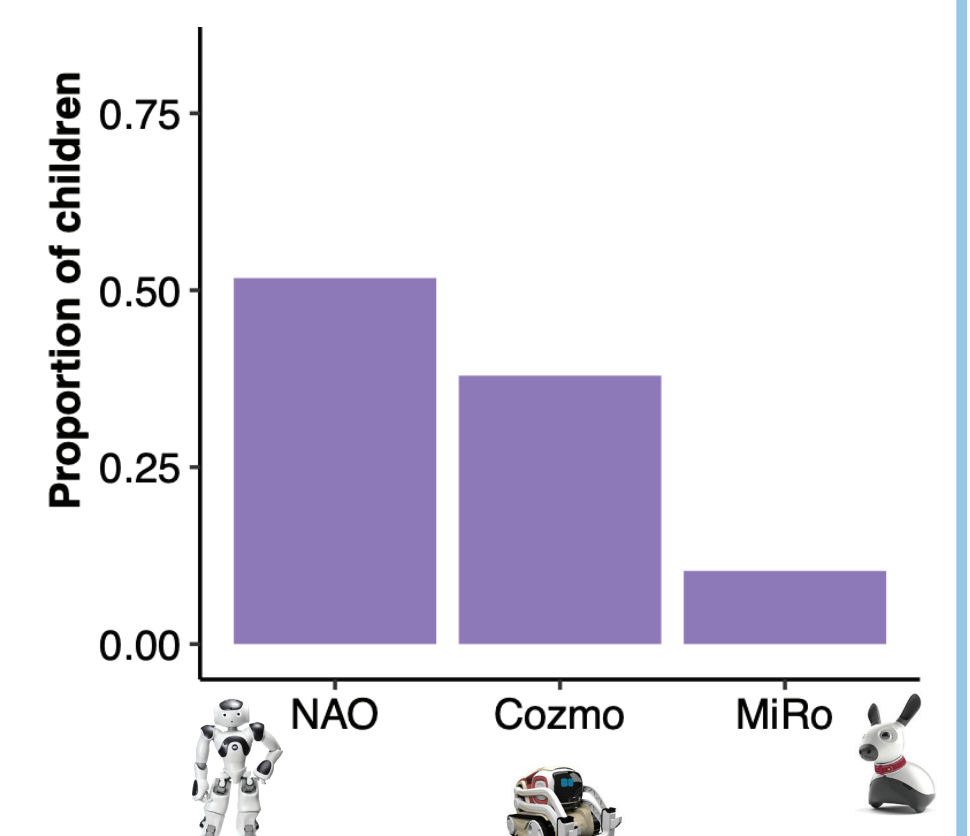
Robot assisted education is gaining traction in classrooms. Education robots can serve many roles (tutor, peer, novice) to directly support learning but can also indirectly support learning by providing socioemotional support. Yet we do not know **how a robot's appearance and function shapes children's perceptions of robot as social agents**.

METHOD & RESULTS

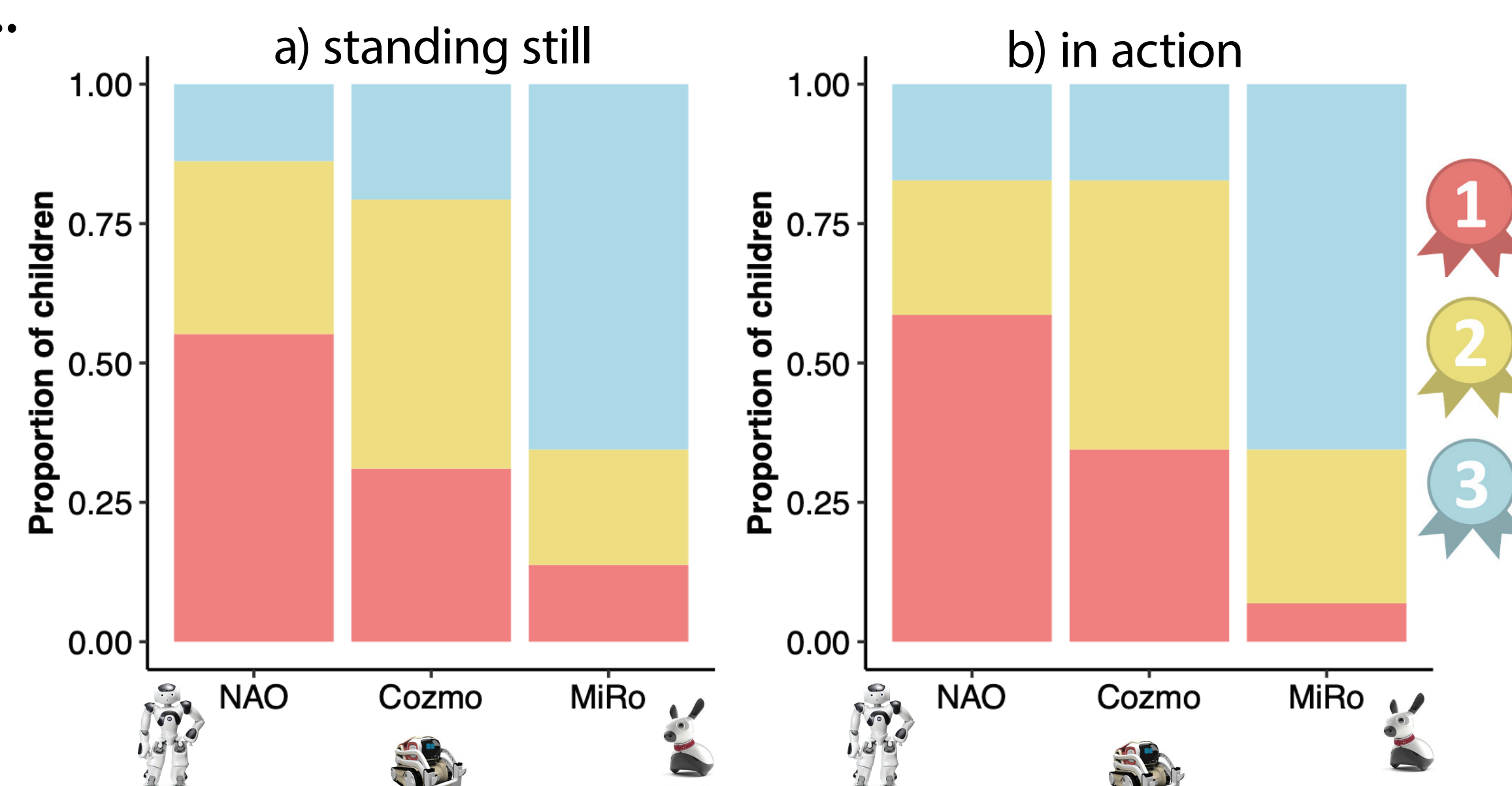
1 We showed 30 children (aged 5-12) three robots in the context of semi-structured interview with a reading activity.



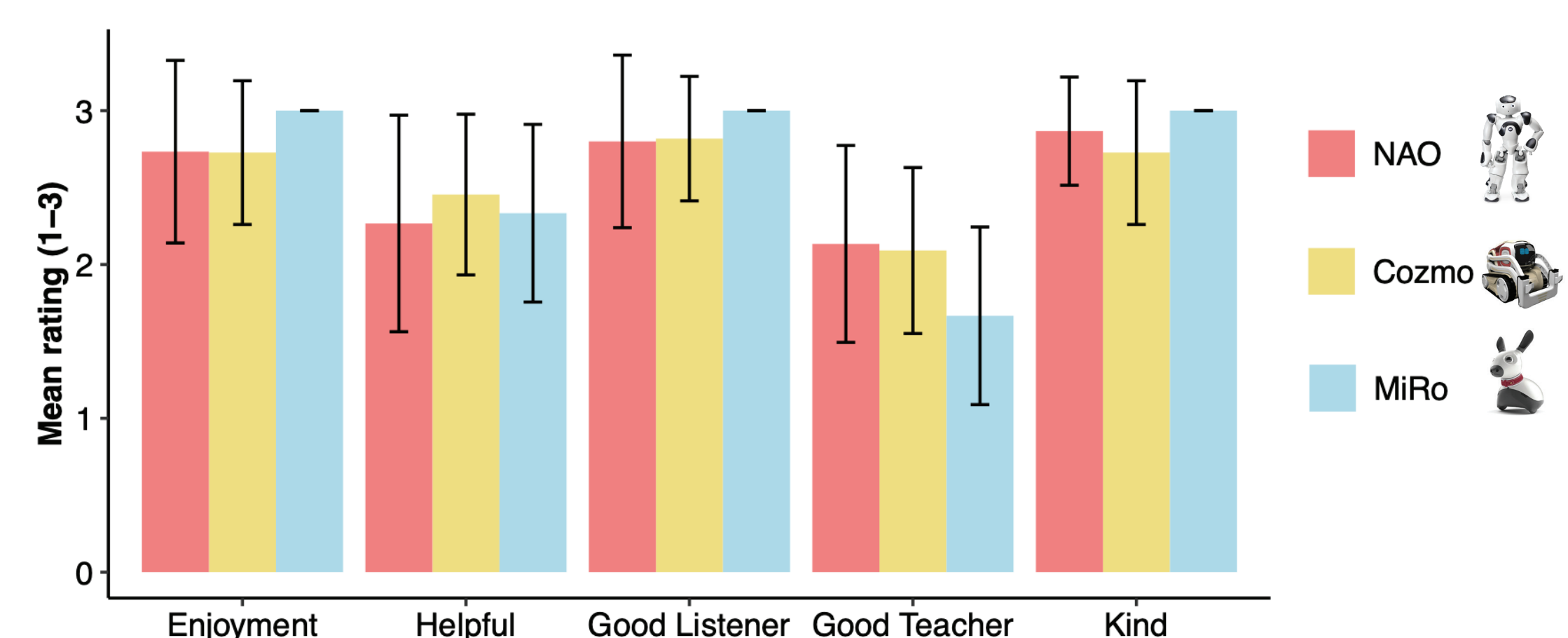
4 Next, children read a book to the robot of their choice, which responded to key plot-points with emotive animations (using Wizard-of-Oz technique).



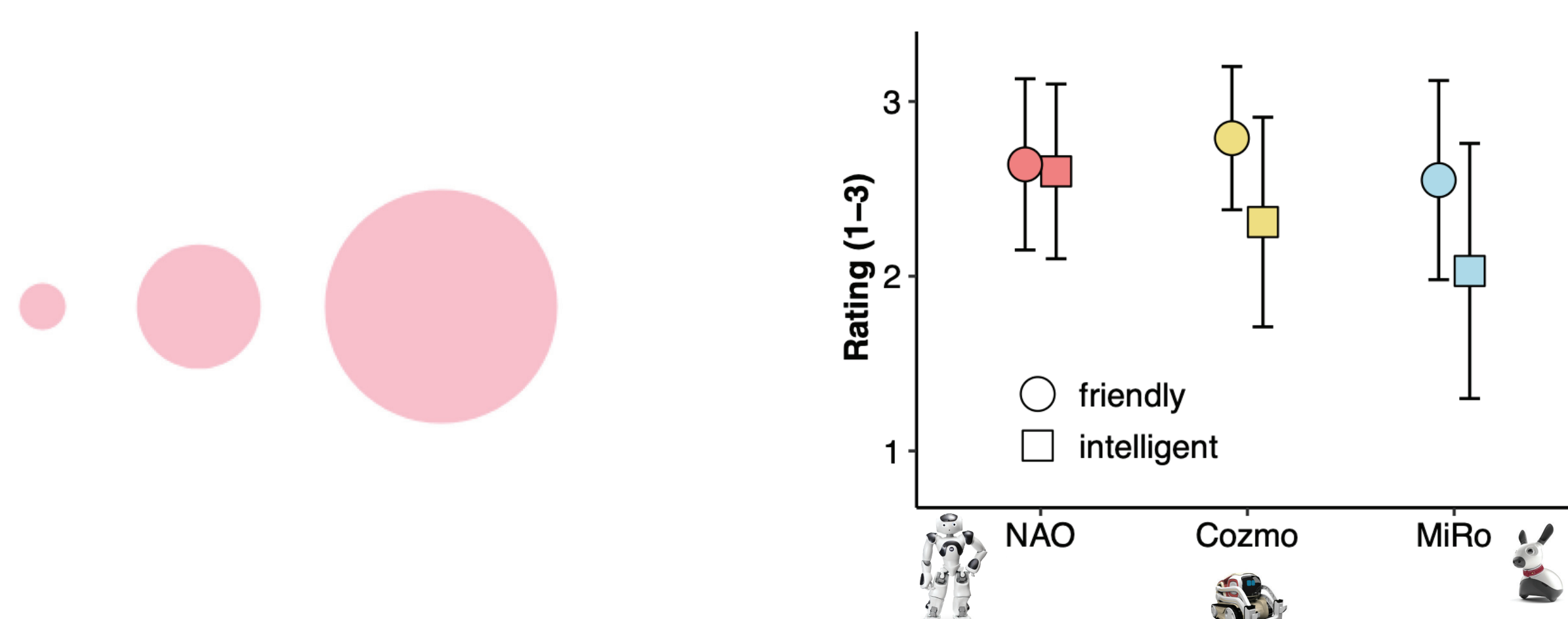
2 Using a custom-made application, children ranked the robots from most to least favourite using ribbons, after seeing the robots...



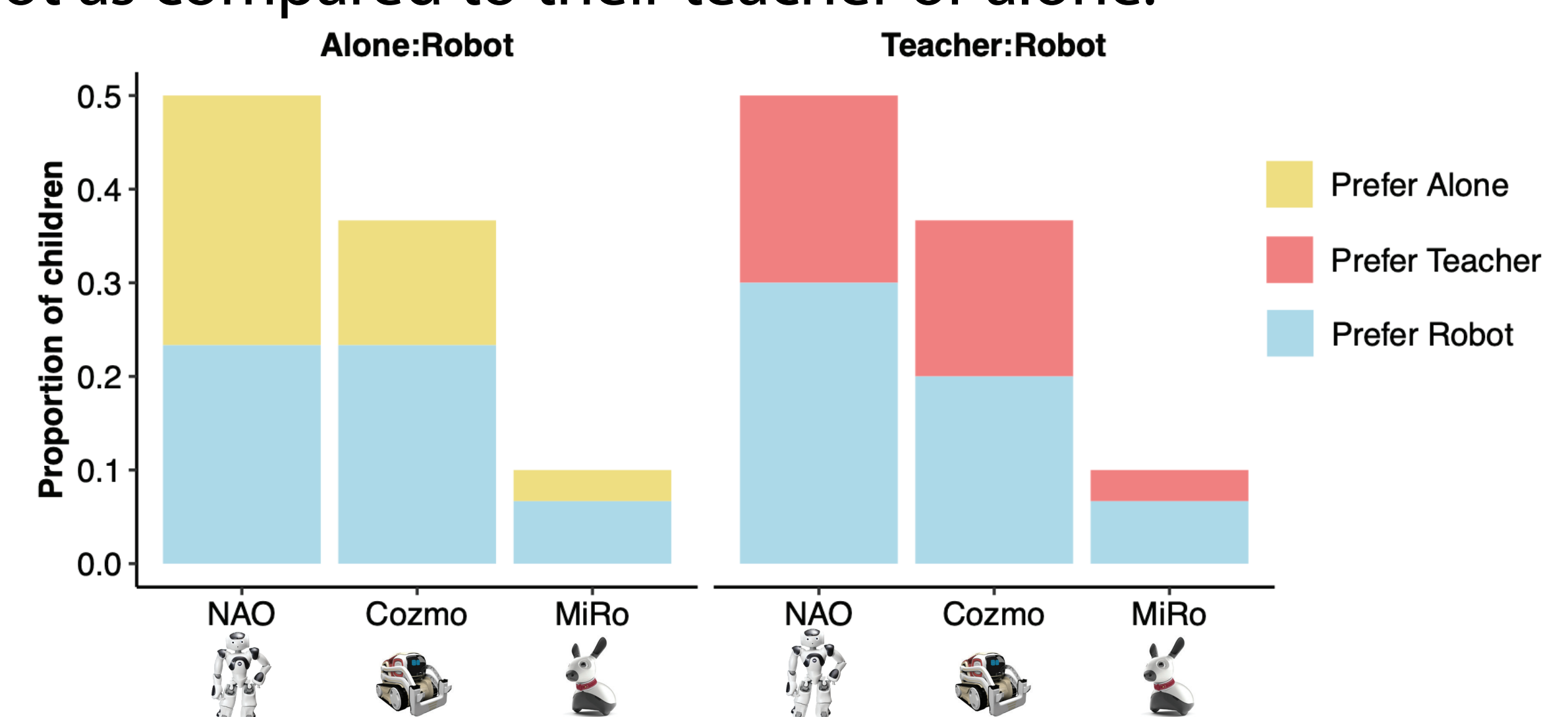
5 After reading to their chosen robot, children used the 3-point visual scale to rate the robot on...



3 After seeing each robot in action, the children rated the robot's intelligence and friendliness using a 3-point visual scale.



6 And indicated whether they would prefer to read with that robot as compared to their teacher or alone.



QUALITATIVE ANALYSIS

7 We also analysed the interview responses using reflexive thematic analysis:

THEME 1

Robots offer a welcomed social presence

- 1.1 Robots comfort, calm, support and encourage
- 1.2 Robots are cool and fun



- 'I really like sitting next to a robot when I read' [P124, age 6]
- 'It sounds like he's encouraging you when he's making the noise' [P126, age 8]

THEME 2

Robot animations can engage and distract

- 2.1 Robots can engage by reacting
- 2.3 Robots can engage by being attentive
- 2.2 Robots can distract by reacting
- 2.4 Robots can promote comprehension through emotive expressions



- 'He's just there listening and out of nowhere he just makes it ... distracts you' [P108, age 12]
- 'He was a very, very good listener, except when he makes noise ... it makes me muddle my words' [P103, age 8].

THEME 3

Helpful reading robots can talk

- 3.1 Verbal robots appear intelligent and literate
- 3.2 Corrective verbal feedback from robots would be welcomed



- 'Maybe if she could talk, she could read the book' [P122, age 6]
- 'Explain what the words mean if I don't know ... what they mean' [P126, age 8]

DISCUSSION

- Children appreciate robots presence while reading, but are quick to mention the possibility of distraction.
- NAO was the most popular reading buddy.
- Children associated the ability to speak with increased intelligence and literacy.
- Wizard-of-Oz procedure for animating robot emotions has limitations (e.g., autonomy and timing).

CONTACT INFO

Nathan Caruana @NateCaruana
nathan.caruana@mq.edu.au

Ryssa Moffat
ryssa.moffat@mq.edu.au

