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# Are robots morally culpable? The role of intentionality and anthropomorphism

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## INTRODUCTION

This study examined children's judgments of intentionality and culpability of human and robot agents, in addition to the tendency to anthropomorphize.

- Perceiving intentionality for another's actions can influence moral judgment [1].
- Previous work has demonstrated infants' ability to differentiate that humans have intentions and mechanical devices do not [2].
- However, perceiving personified technology (such as robots) as social beings has been evidenced when the robot is behaving in a socially contingent manner [3].

## METHOD + RESULTS

### Participants

N=63 (46% female)

- 3-year-olds ( $n=32$ ,  $M=3.60$  years,  $SD=.58$ )
- 5-year-olds ( $n=31$ ,  $M=5.55$  years,  $SD=.33$ )

### Conditions

- Robot(socially contingent)
- Robot (non-contingent)
- Human
- Control

### Measures

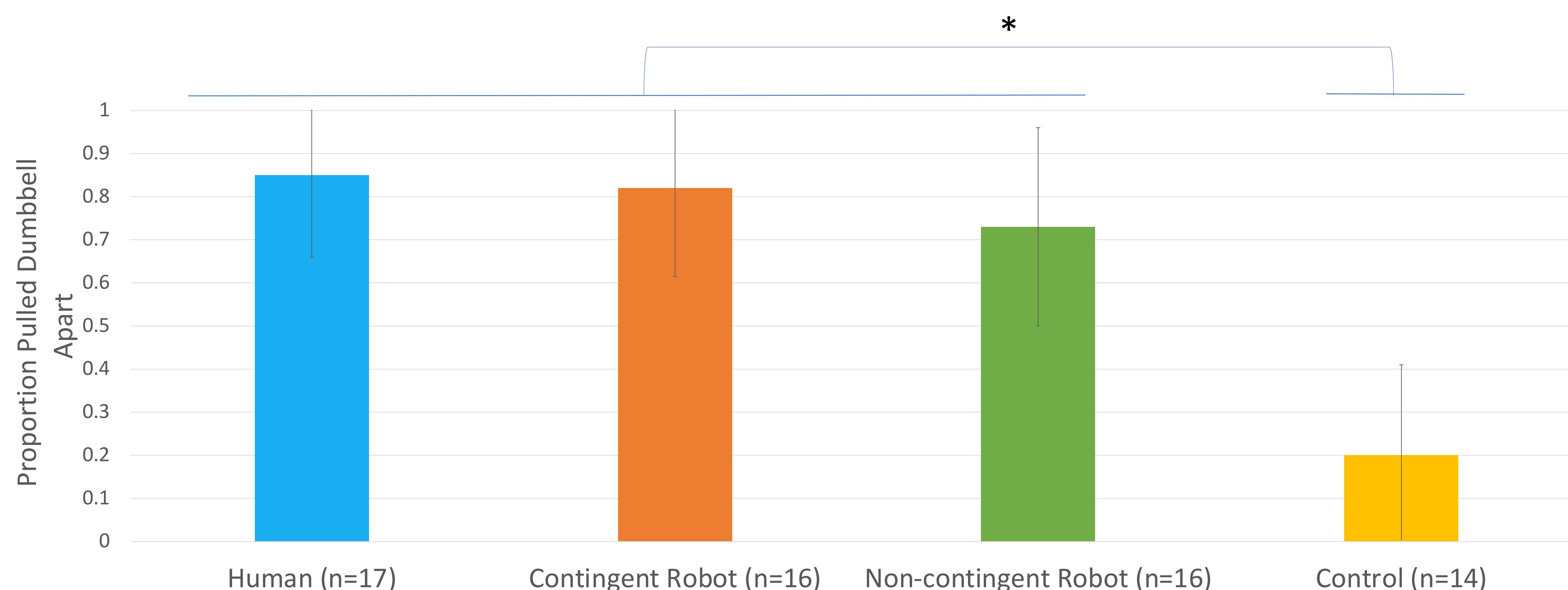
- Dumbbell Task
- Tower Task
- Anthropomorphism

### DUMBBELL TASK

- Participants viewed video of either a human or a robot (socially contingent or non-contingent) attempting to pull a wooden dumbbell apart, but failing to do so.
- Dumbbell was placed in front of the participant to see if they would imitate the intended-but-failed action.
- If children understood the agent (human or robot) as intentional, they should complete the intended-but-failed action.



Figure 1. Proportion of participants who pulled dumbbell apart (excluding those who did not touch the dumbbell).



\*  $F(3, 45)=5.56$ ,  $p=.002$ ,  $\eta_p^2=.27$ ; Error bars = SD

## METHOD + RESULTS

### TOWER TASK

- Participants viewed video of a person building a block tower, after which the agent (human, robot) knocked the tower over.
- Participants rated acceptability, deservingness of punishment, and act intentionality ('on purpose' or 'on accident').
- 'Culpability scores' were computed as the difference between acceptability and punishment.

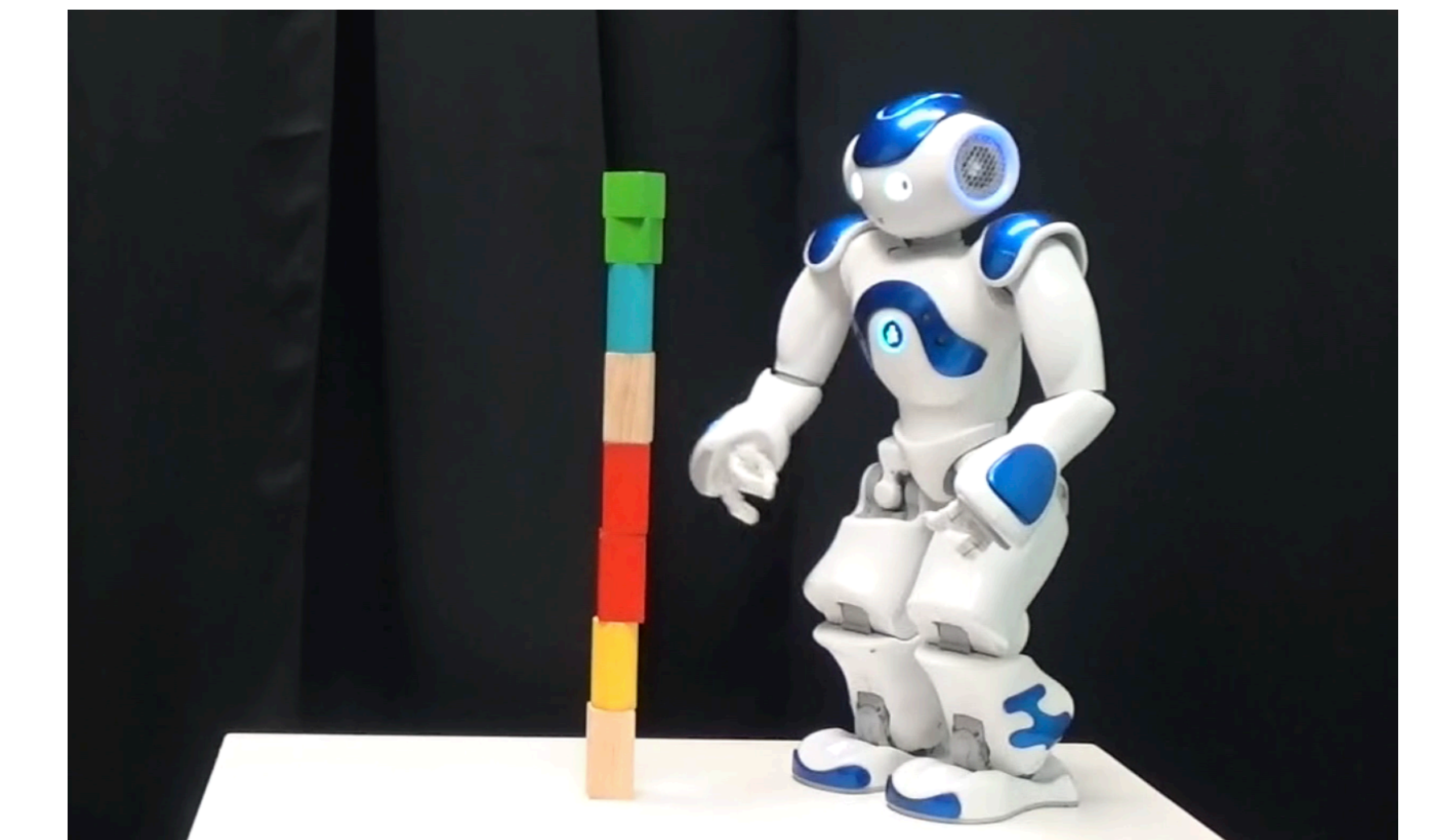
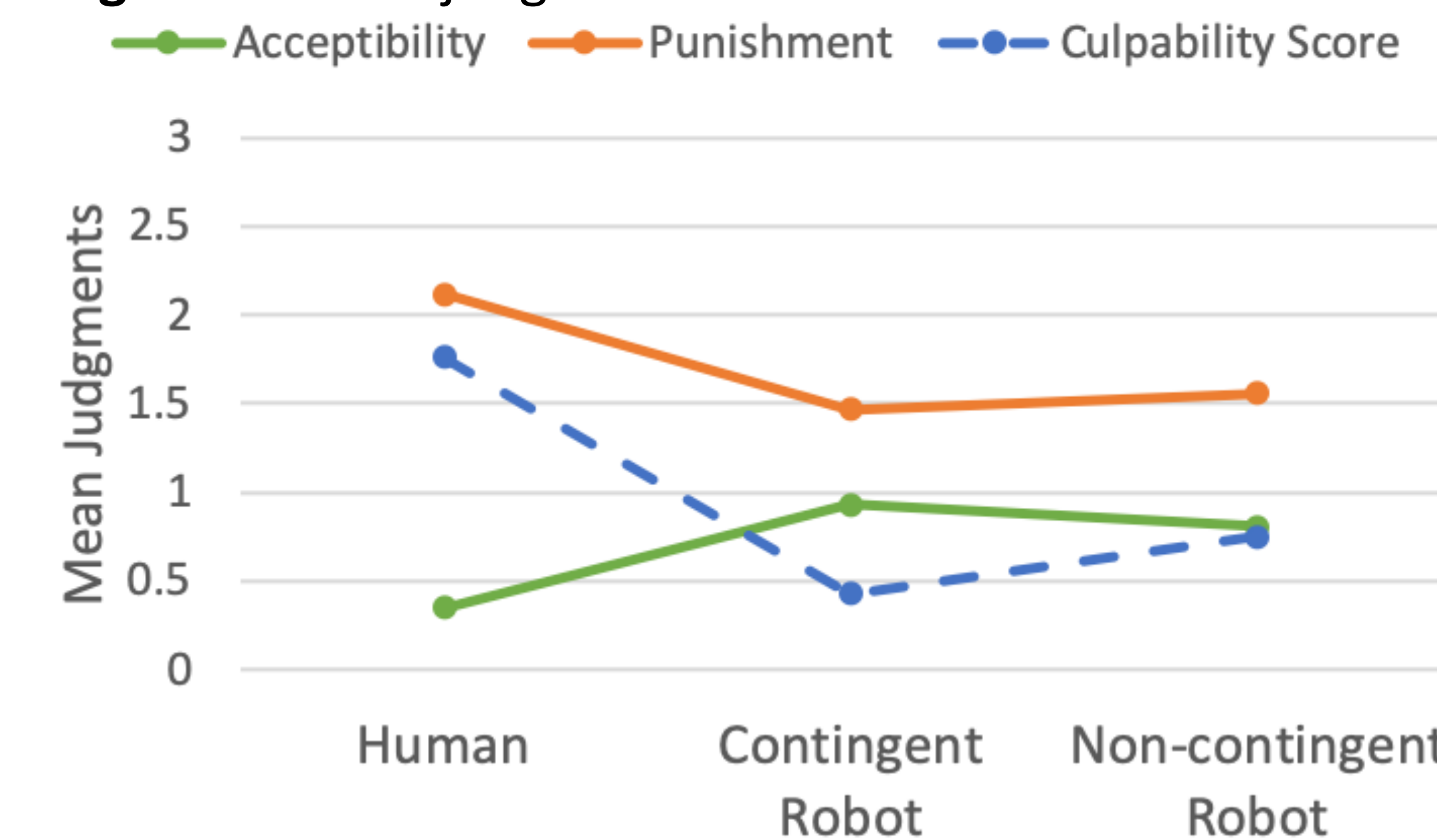


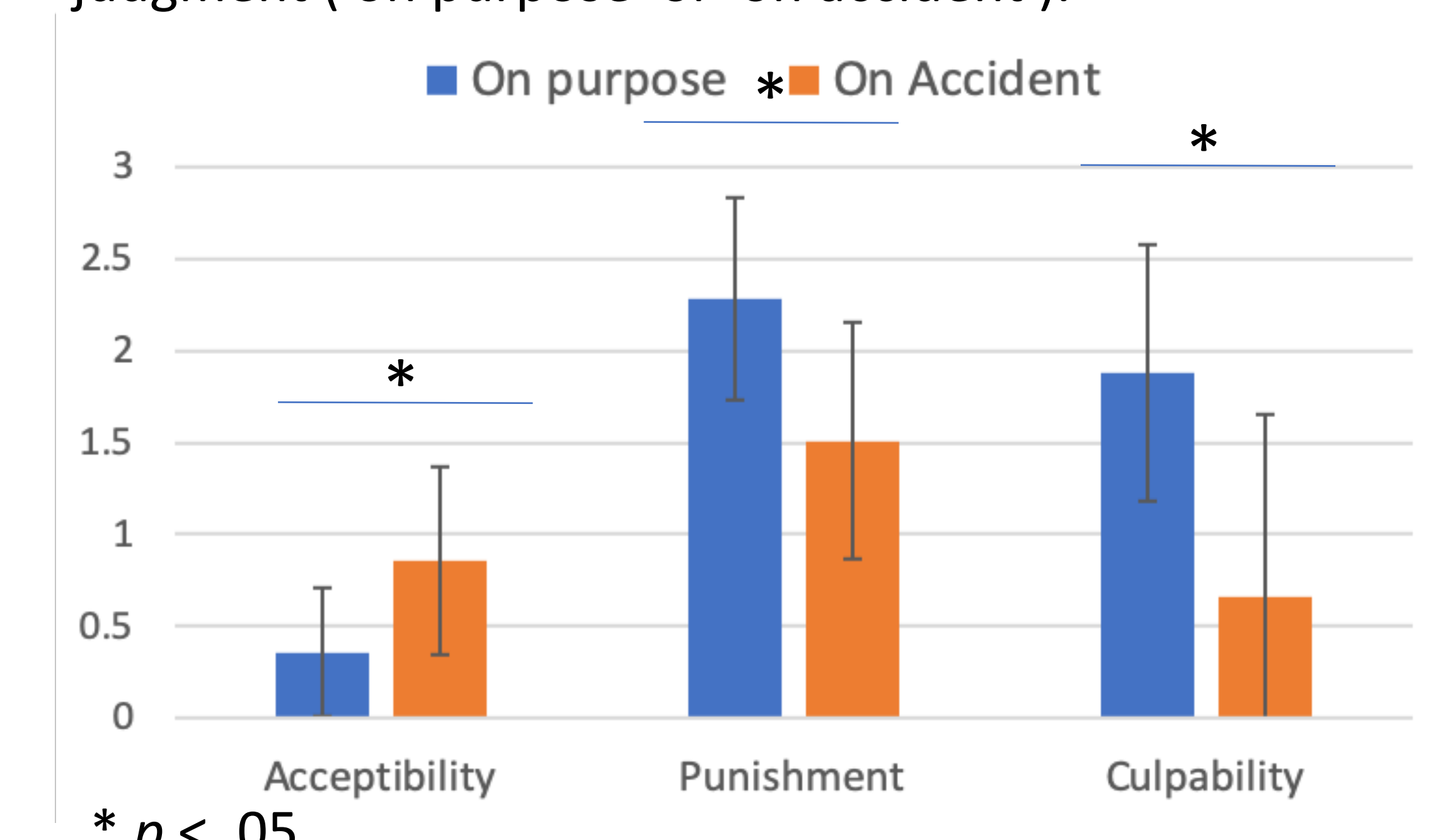
Figure 2. Mean judgments on Tower Task.



### ANTHROPOMORPHISM

- Participants were given the Individual Differences in Anthropomorphism Questionnaire - Child Form (IDAQ-CF) [4].
- IDAQ-CF assessed attribution of internal states (e.g., intentions, thought, and emotions) to non-human animals, nature, and technology.

Figure 3. Mean scores on Tower Task by intention judgment ('on purpose' or 'on accident').



\*  $p < .05$

	Punishment	Culpability
IDAQ-CF	.51**	.39**

Figure 4. Correlations between anthropomorphism and judgments of punishment and culpability for the robot.

\*\*  $p = .01$

## CONCLUSIONS

Three- and five-year-olds viewed a robot as intentional and morally culpable for its actions, and these attributions were tied to their tendency to anthropomorphize.

- Children inferred the robot had intentions to the same degree as humans.
- Although culpability for the agent's actions was tied to intentionality (i.e., acting on purpose), children viewed the robot as less culpable than the human.
- Children with greater tendency to anthropomorphize were more likely to judge the robot, but not the human, as morally culpable.

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