Can a robot feel?
Children's beliefs about robots and development of the Uncanny Valley

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1. Introduction

Robots are increasingly a part of children's lives: teaching in classrooms, comforting children in hospitals, etc.

Research on children's interactions with robots is increasing, but little investigates how children's beliefs about robots change across early childhood.

Our goal was to investigate what children think about robots and whether their ideas change with development.

2. The Uncanny Valley

Research with adults shows that some robots can elicit a range of judgments such as nice or "creepy", familiar or strange, etc.

The Uncanny Valley is a phenomenon in which adults report feelings of discomfort when viewing a robot that appears too human-like or that seems to have a mind of its own (Gray & Wegner, 2012).

Do children also experience feelings of discomfort when viewing particular robots?

3. Research Questions

How do children's beliefs about the abilities of robots change over time?

Do children demonstrate the Uncanny Valley similarly to adults?

If not, at what age do children begin to demonstrate the Uncanny Valley?

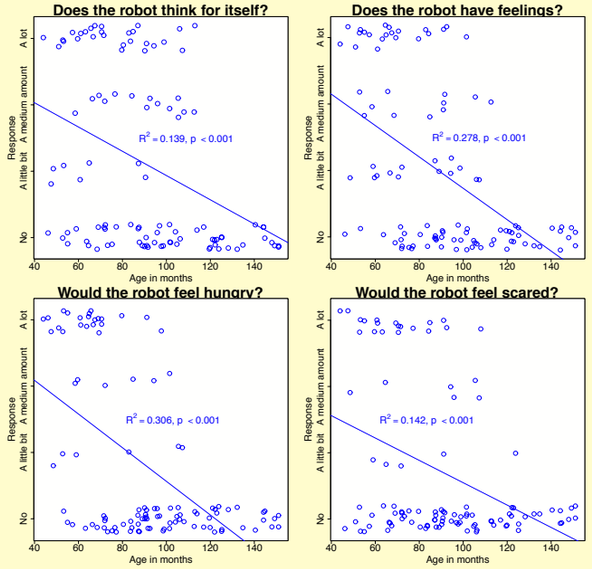
Is the onset of the Uncanny Valley associated with human-likeness or the perception of intentionality in the robot?

4. Methods

Children viewed either a video of a machine-like robot or a human-like robot (identical to those used by Gray & Wegner, 2012), and then answered a series of questions about that robot.

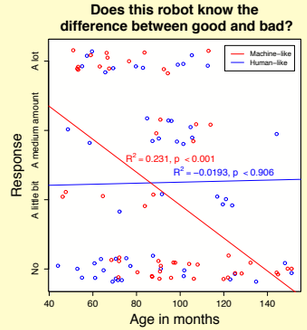
5. Results

Internal Mental States:



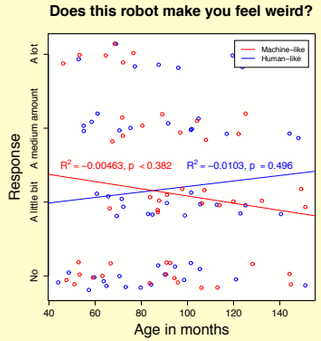
Younger children were more likely to attribute thoughts, $p < .001$; pain, $p < .001$; emotions, $p < .001$; and hunger, $p < .001$; fear, $p < .001$; and decisions, $p < .001$, compared to older children, regardless of the robot's appearance.

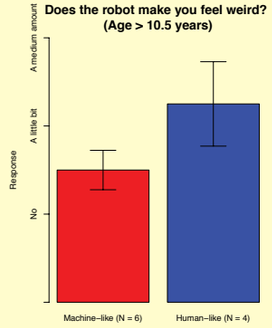
Morality:



For morality, however, older children and younger children equally judged that the human-like robot, but not the machine-like robot, would know the difference between good and bad, $p < .01$. Younger children were more likely to attribute morality to the machine-like robot than older children.

The Uncanny Valley:





Children did not demonstrate the Uncanny Valley similarly to adults. More data from older children will be required to determine when children begin to perceive robots similarly to adults.

6. Discussion

Robots and smart technology are an increasing part of contemporary life. By researching what children of different ages think about robots, and which sorts of robots they consider nice versus "creepy", we not only will better understand their interactions with smart technology but eventually be able to advise on the creation of new devices better suited for children's interactions and learning.