

Blind Trust: how making a device humanoid reduces the impact of functional errors on trust

Christopher Vattheuer, Annalena Nora Baecker, Denise Y. Geiskkovitch, Stela Hanbyeol Seo, Daniel J. Rea, James E. Young



University
of Manitoba



LinkedIn @ Christopher Vattheuer
vattheuc@myumanitoba.ca
<http://hci.cs.umanitoba.ca/people/bio/christopher-vattheuer>

Humanoid Kiosks



Pepper at an Apple Store!

Photo Courtesy of Pikrepo



Pepper Working at an Airport Restaurant!

Photo Courtesy of HMSHost



Pepper Working at a Retail Store!

Photo Courtesy of SoftBank Robotics America

Manipulative?

Lots of Money Involved!

Manipulative?

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We only see their interface!

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Lots of Money Involved!

We only see their interface!

Who is paying for it? Why?

Manipulative?



Sanoubari, E. et al.: (alt.HRI). (2019).

What are the Differences?



Photo Courtesy of HMSHost



Photo courtesy of Tmyl, Wikimedia

In What Ways do People Trust Humanoid Kiosks
Differently than Tablet Kiosks?

Between Participants Experiment

39 Participants

Between Participants Experiment



Interaction

Question 1: How should 5 people split a \$125 bill?

“Okay Pepper, How should 5 people split a \$125 bill?”

Question 1: How should 5 people split a \$125 bill? _____

Question 2: How much is a 13% tip on a \$31.00 meal? _____

Question 3: What is 15 times 6? _____

Question 4: How should two people split a \$43.20 meal? _____

Question 5: What would a 20% tip on a \$28.00 meal be? _____

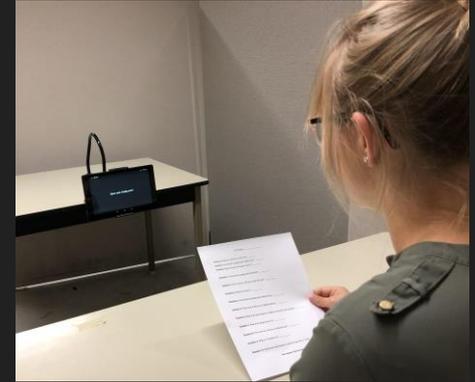
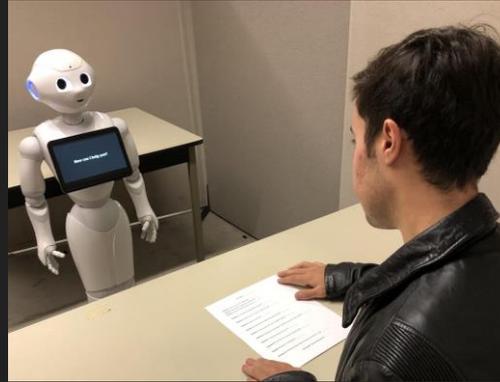
Question 6: What is the total charge for a \$350.00 meal with a 25% gratuity? _____

Question 7: What is the square root of 15? _____

Question 8: How much is a 10% tip on a \$20.00 meal? _____

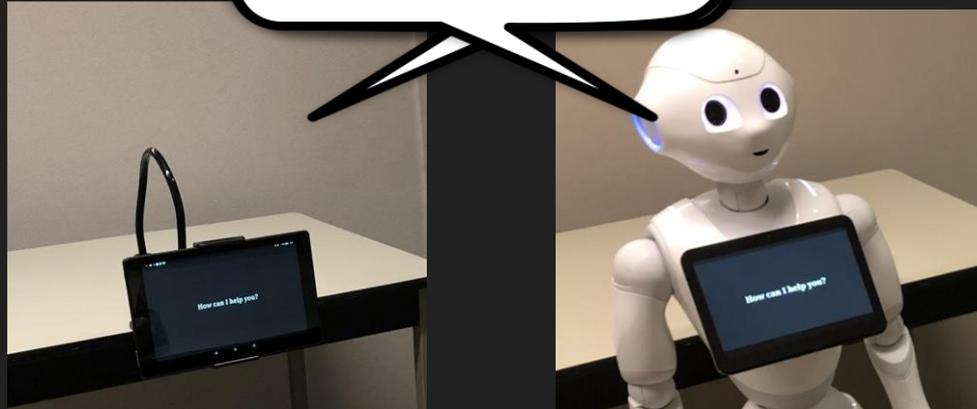
Question 9: What is 17 divided by 3? _____

Question 10: What is the total charge for a \$40.52 meal with a 1% tip? _____



Interaction

“Among **5** people, a
\$125.00 meal costs
\$25.00 a person.”



Trust Survey

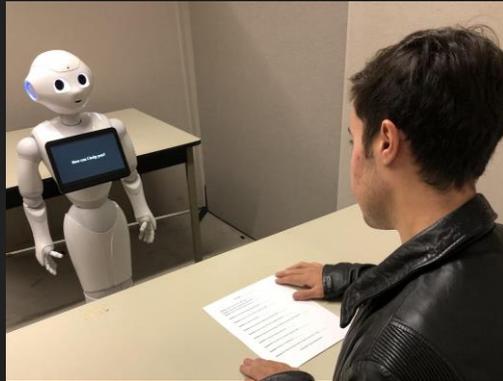
Please rate the agent using the scale from 0 (Not at all) to 7 (Very). If a particular item does not seem to fit the robot in the situation, please select the option that says, "Does Not Fit."

Reliable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Sincere	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Capable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Ethical	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Predictable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Genuine	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Skilled	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Respectable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Someone you can count on	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Candid	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Competent	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Principled	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7

Reliable Does Not Fit Not at all 0 1 2 3 4 5 6 Very 7

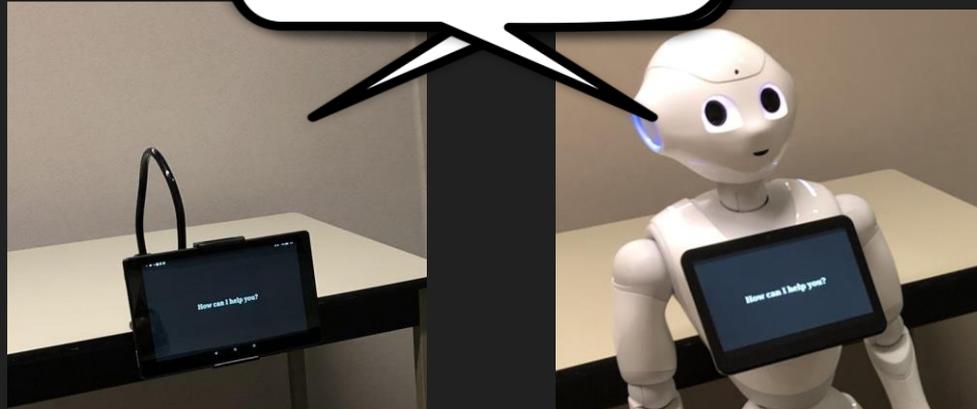
Interaction

“Okay Pepper, how should two people split a \$35.26 bill?”



Wrong Answers

“Among 2 people, a
\$35.26 meal costs **\$43.00**
a person.”



Trust Survey Two

Pre-Mistakes

Please rate the agent using the scale from 0 (Not at all) to 7 (Very). If a particular item does not seem to fit the robot in the situation, please select the option that says, "Does Not Fit."

Reliable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Sincere	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Capable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Ethical	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Predictable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Genuine	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
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Respectable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
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Candid	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Competent	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Principled	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7

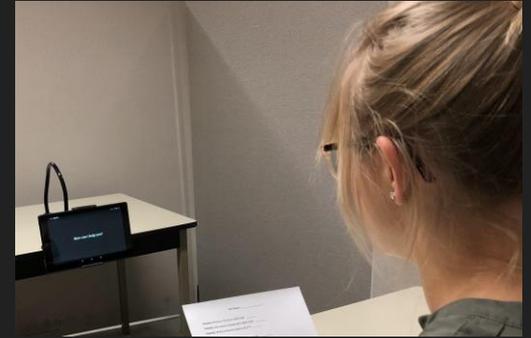
Post-Mistakes

Please rate the agent using the scale from 0 (Not at all) to 7 (Very). If a particular item does not seem to fit the robot in the situation, please select the option that says, "Does Not Fit."

Reliable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Sincere	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Capable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Ethical	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Predictable	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Genuine	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Skilled	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
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Someone you can count on	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
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Competent	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7
Principled	Does Not Fit	Not at all 0	1	2	3	4	5	6	Very 7

Capacity Trust

Reliable - trust in the agent's consistency
Capable - trust in the agent's skill



Capacity Trust

Reliable - trust in the agent's consistency
Capable - trust in the agent's skill



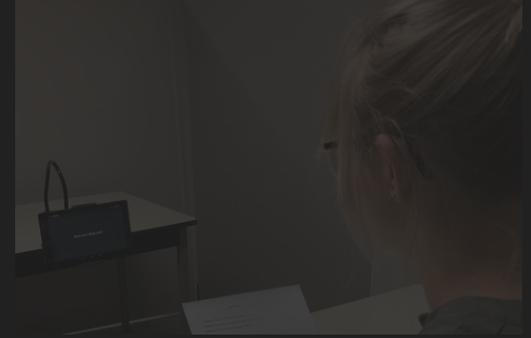
Moral Trust

Ethical – agent is principled
Sincere – agent is authentic



Moral Trust

Ethical – agent is principled
Sincere – agent is authentic



Significance of the Finding

No observed impact on Moral Trust.

Healthy skepticism about implementation.

Serious implications - banks, hospitals, schools.

Thank you!

Questions?

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Statistics

2x2 Mixed Model ANOVAs, (between: tablet, humanoid; within: baseline, errors)

Main Effect of Agent Embodiment on trust in all trust subscales.

Tablet Mean Trust Rating < Humanoid Mean Trust Rating.

Interaction between Agent Error and Form on Moral Trust scales.

Post hoc t-tests(Bonferroni correction) used to investigate the interaction:

No difference in baseline Moral Trust - humanoid and tablet.

Statistically significant difference in post error trust Moral Trust - humanoid and tablet.

No effect of Agent Error on moral trust for humanoid.

Statistically Significant effect of agent error on moral trust for Tablet.

Demographics

39 participants.

13 Failed Manipulation check.

24 Participants aged: 18-37, Average Age 24.1

9 female – 15 male.

11 Humanoid Condition, 13 Tablet Condition.