Can Robots Manifest Personality?: An Empirical Test of Personality Recognition, Social Responses, and Social Presence in Human-Robot Interaction

By Kwan Min Lee, Wei Peng, Seung-A Jin and Chang Yan. (2006)

Presented By Adam and Karine.

Background.

- Robots are integrated into daily life.

-pets.

-nurses.

-emotional companions.

- Many more.

Big Five Factors. John And Srivastava (1999)

- Extroversion
- Agreeableness
- Conscientiousness
- Neuroticism
- Intellect

Extroversion

- Along with agreeableness is important factor with interpersonal interaction.
- Research suggests extroversion is most observable out of the other factors.
- Extroversion has been seen to be important in human to computer interactions.

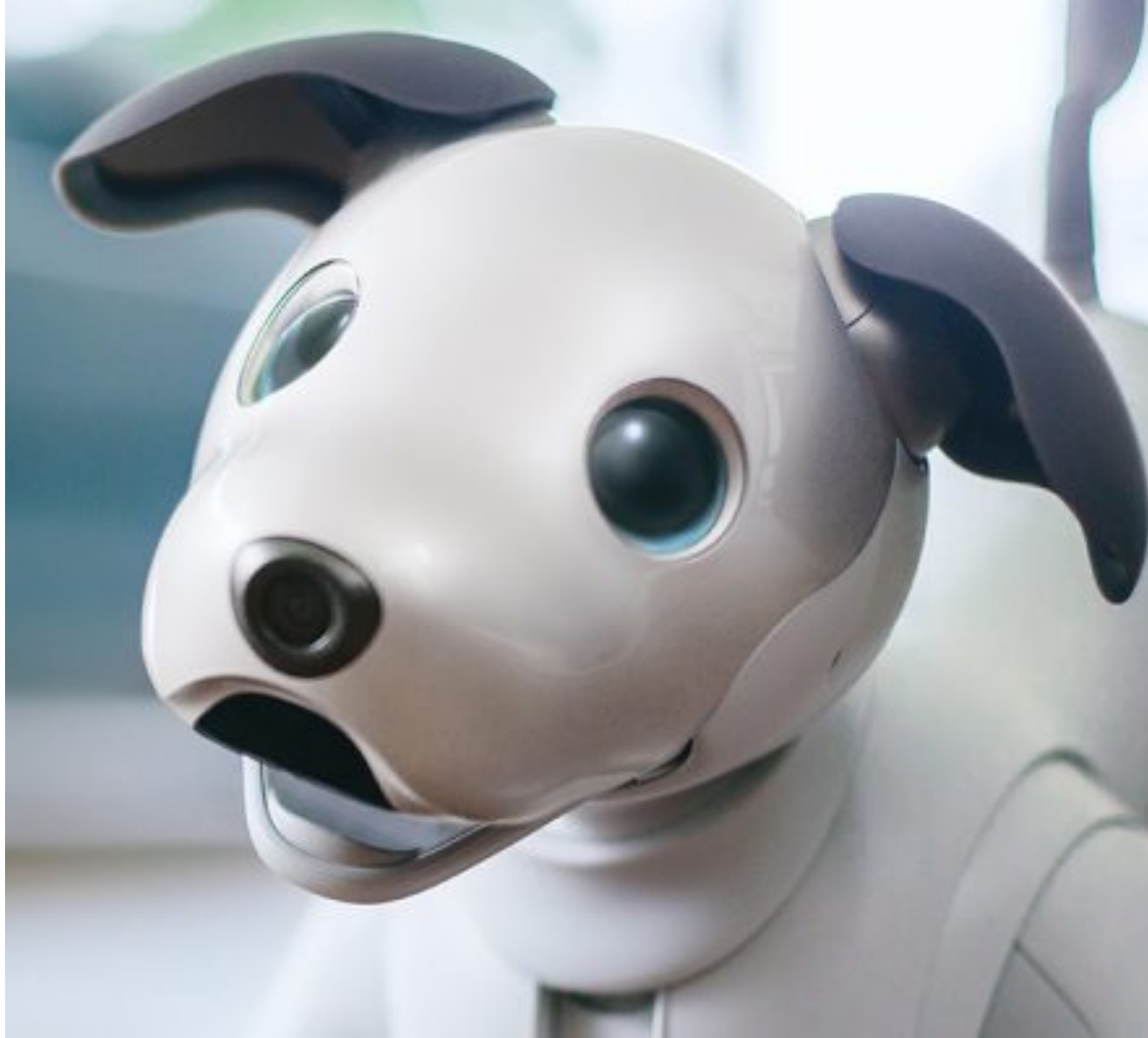
Hypotheses

RQ – If people apply personality base social rule to a robot manifesting a personality, will they use the similarity attraction rule or the complementarity attraction rule.

1. People with recognise personality with robot when it manifest personality through verbal and non-verbal cues
2. People will apply personality based social rule to robot when the robot manifest personality through verbal and non-verbal cues
3. Feeling of social present will mediate robot user's social responses to a robot
4. The tendency to form parasocial relationships will be a significant covariate for robot user's feeling of social presence and there response to the robot.

AIBO (2006)
(sony)

- Eyes, Tales, Ear and lights to express emotions
- Speech recognition and touchable sensors
- 53 Simple phases
- Memory and learning ability.



Participants

- 200 in total
- Only 48 used – most consistent on personality test
- Ages between 19-34
- 24 introvert & extrovert.
- Students involved in communication course.
- Extra credit as compensation
- Randomly assigned to personality type

Manipulation

- **Pilot test**

- 10 graduate students
- Confirmed personality manipulation worked
- After observing the verbal and non-verbal cues of either AIBO
- All considered there AIBO to have the personality of which it was programmed

	Extrovert AIBO	Introvert AIBO
Verbal cues		
Voice	140 Hz fundamental frequency	84 Hz fundamental frequency
	40 Hz frequency range	16 Hz frequency range
	216 words per minute speech rate	184 words per minute speech rate
	Volume level set at 3	Volume level set at 1
Melody	High volume	Low volume
	Volume level set at 3	Volume level set at 1
	Fast rhythm	Slow rhythm
	Wide range of musical scale	Narrow range of musical scale
	Exciting mood	Quiet mood
Nonverbal cues		
LED lights	Colorful	Plain
	Frequent flashing	Occasional flashing
Moving angle	Two to three times wider than the introvert AIBO for the same act	30–50 percept of the angles compared to the extrovert AIBO for the same act
Moving speed	50–75% of the interpolation between motions compared to the introvert AIBO	Interpolation between motions 1.3 to 2 times longer than the extrovert AIBO
Autonomous movements	More frequent random walking and tail wagging when no command is given	Less frequent random walking and tail wagging when no command is given
	Motions in walking and tail wagging are faster, with wider angles	Motions in walking and tail wagging are slower, with narrower angles
	LED is colorful with more flashing in random walking and tail wagging	LED is plain with less flashing in random walking and tail wagging

Procedure

- Between subject design
- 2 by 2 subject design

- Participants did a pre-experiment questionnaire, focusing on their ability to form parasocial relationships.

- Watch tutorial on how to interact on AIBO.
- Randomly assigned to interact for 25 mins
- Given a list of 17 commands on how to interact with AIBO.

Post-experiments

- Asked to fill in questionnaire.

- personality

- Intelligence

- Attractiveness

Results

Dependent variables	*M* (*SD*)				*F* values and effect sizes		
	Introvert subject		Extrovert subject		Main effects		Interaction
	Introvert AIBO	Extrovert AIBO	Introvert AIBO	Extrovert AIBO	Participant personality (P)	AIBO personality (A)	P × A
Intelligence	3.85 (2.30)	5.67 (2.10)	5.35 (1.68)	4.20 (1.89)	.28, η^2= .01	.15, η^2= .00	7.06 *, η^2= .14
Social attraction	2.89 (1.97)	3.69 (2.36)	3.03 (2.19)	1.52 (.69)	1.26, η^2= .03	.98, η^2= .02	5.11 *, η^2= .11
Enjoyment of interaction	6.10 (1.40)	7.10 (1.24)	6.41 (2.38)	5.22 (2.35)	1.11, η^2= .03	.09, η^2= .00	3.97 †, η^2= .09
Social presence	4.88 (1.25)	5.61 (2.05)	6.16 (1.84)	4.69 (1.78)	.85, η^2= .02	.98, η^2= .02	5.17 *, η^2= .11

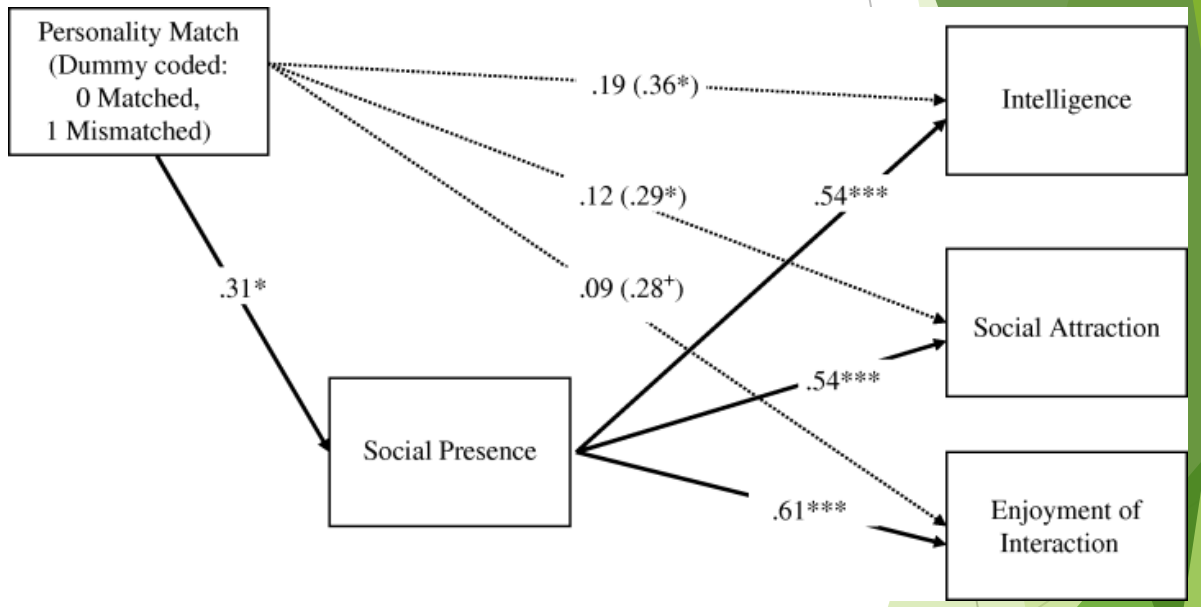
† $p < .10$.

* $p < .05$.

** $p < .01$.

Results (Con'd)

- Hypotheses where all supported by research finding
- RQ evidence shows complementarity attraction affect. In all dependnt variables.



Discussion

- Robot was responded to as if it had a personality.
- Interaction and Parasocial relationships was helped by the ability to talk and touch the robot.

Discussion