IMPROVING THE ACCEPTABILITY OF SOCIAL ROBOTS: MAKE THEM DIFFERENT FROM HUMANS

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Observation

The social robot market is growing rapidly. However, what the arrival of these **new kind of social agents** means for society is largely unknown.

Previous studies highlighted **abuse** of social robots, with many of these robots having **human like features (resemblance)**.

Hypotheses and Predictions

- During social interactions humans create **dominance hierarchies**.
- The establishment of these hierarchies is governed by specific **behavioral/morphological cues** and occurs preferentially when there is a basis for skill comparison **(e.g. possibility for simulatability of functions with the human body)**.
- Dominance accompanying behavior occurs when humans consider that **they can do better than the robot**.
- If the robot's **skill is not in the human repertoire**, such comparison is precluded and dominance accompanying behavior **reduced**.
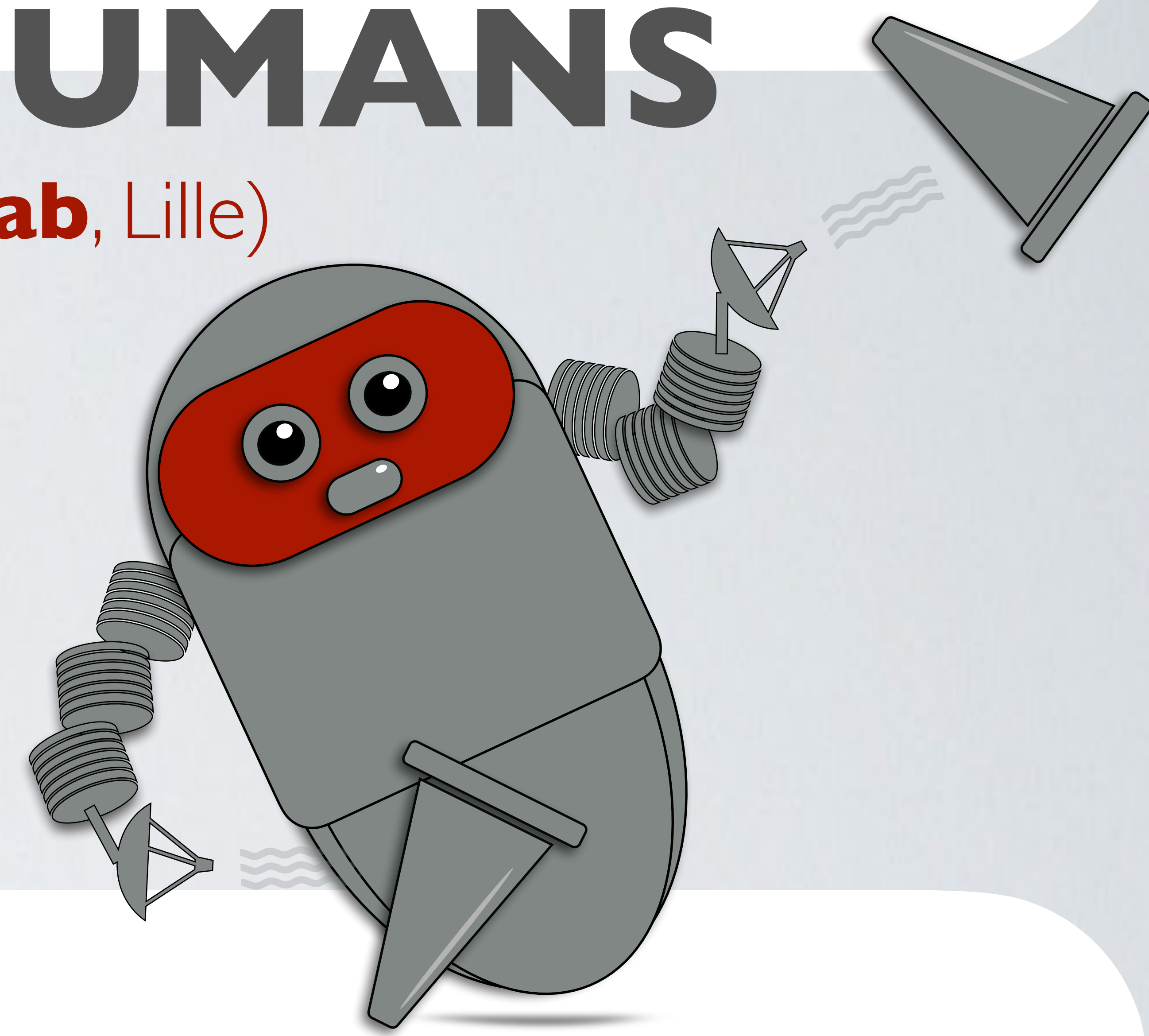
Test

16 robots presented two-by-two (120 different pairs; functions shown via **video clips**).

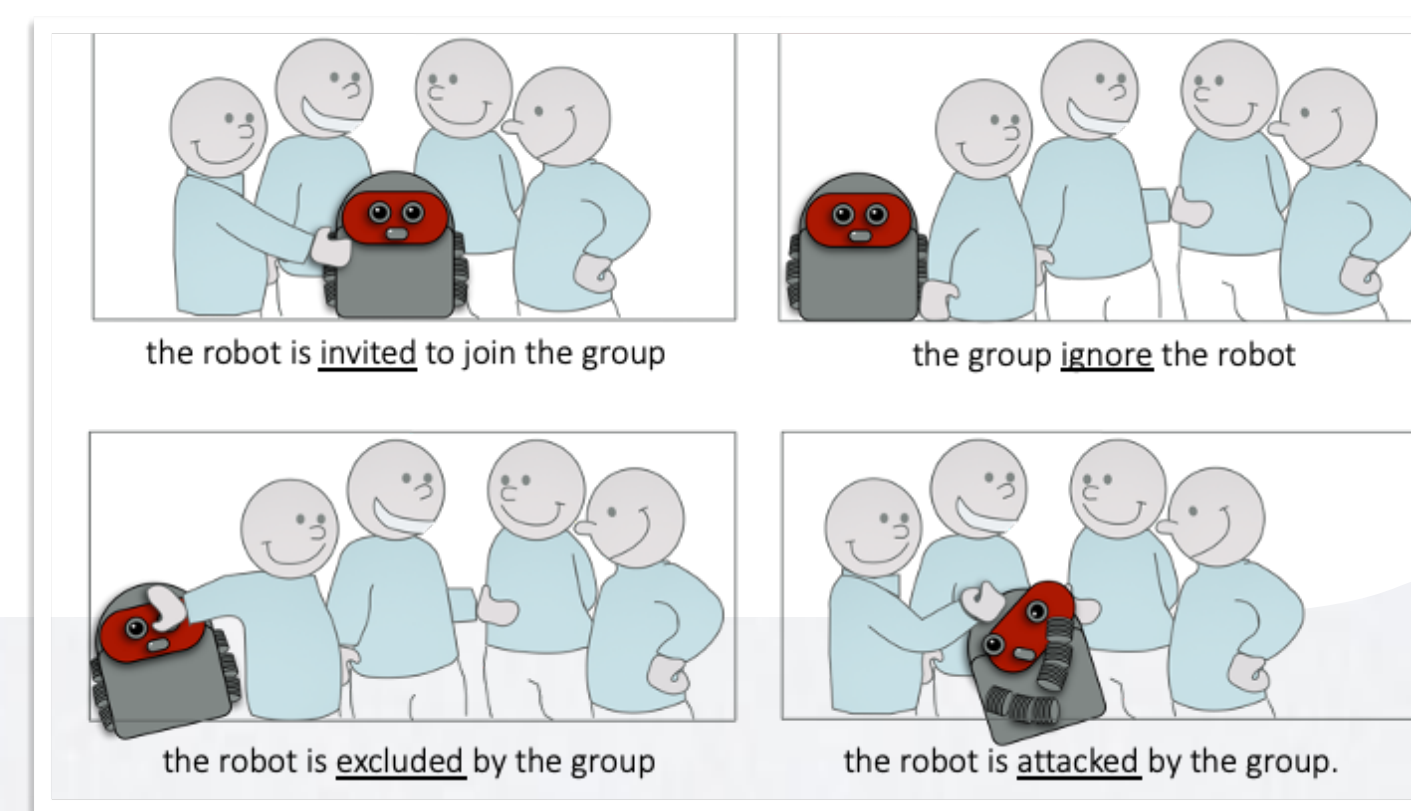* Rating of robot's **resemblance** to humans (n=25).

* Rating how well the robots possessed five essentialized human qualities (Haslam et al., 2004): **independent**, **intelligent**, **imaginative**, **creative**, and **talkative** (n=25 per quality).

* Rating the degree of **simulatability** of each function with the human body (1-7 Likert scale).

* Estimate the outcome of a situation in which a <u>robot is approaching a group of humans</u>: the robot is either **invited**, **ignored**, **excluded**, **attacked** (n=31).
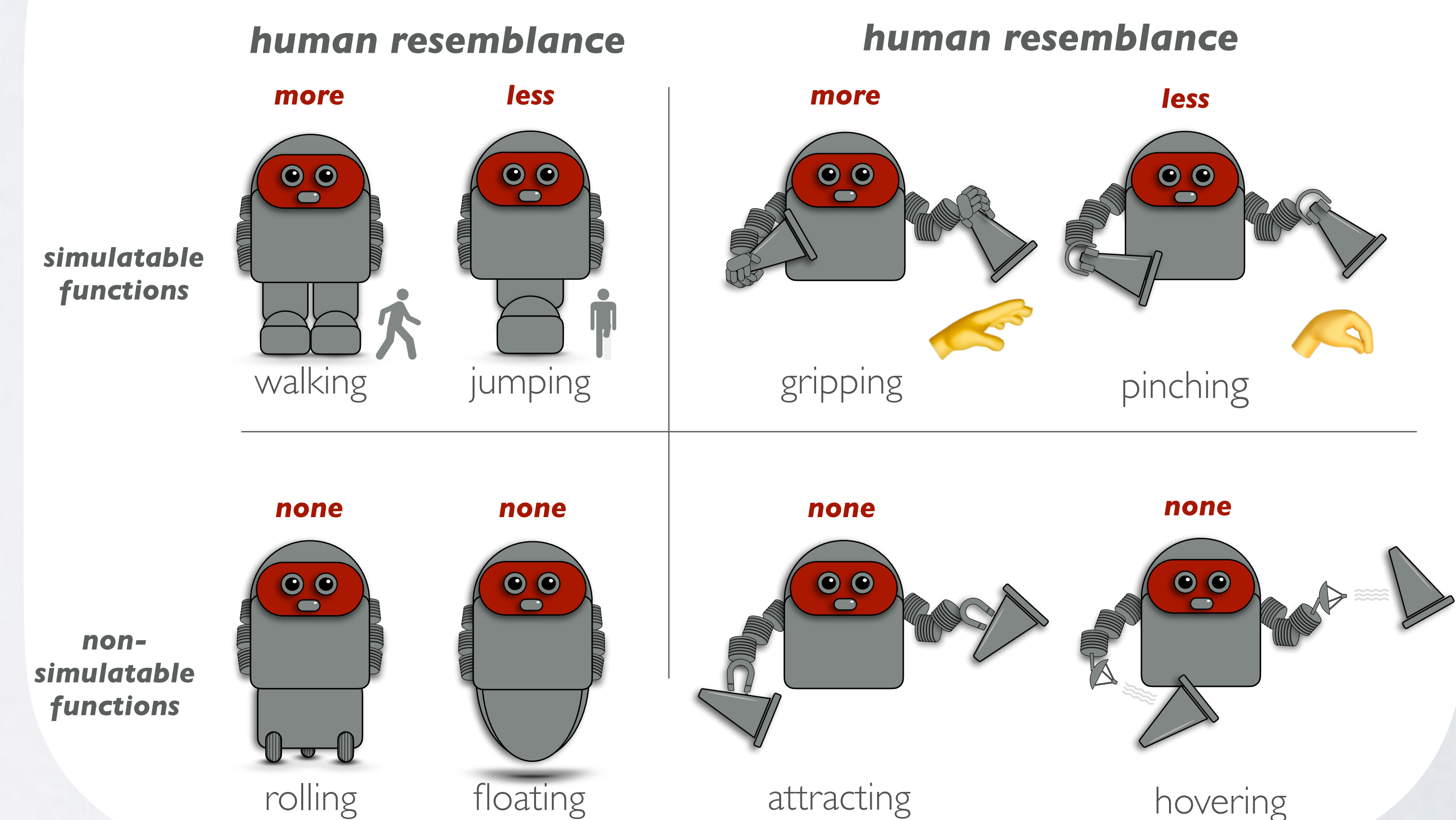
Analysis: t-test; ANOVA or Friedman's test

Haslam, N., et al. (2004). Essentialist Beliefs about Personality and Their Implications. *Personality and Social Psychology Bulletin, 30*(12), 1661-1673.
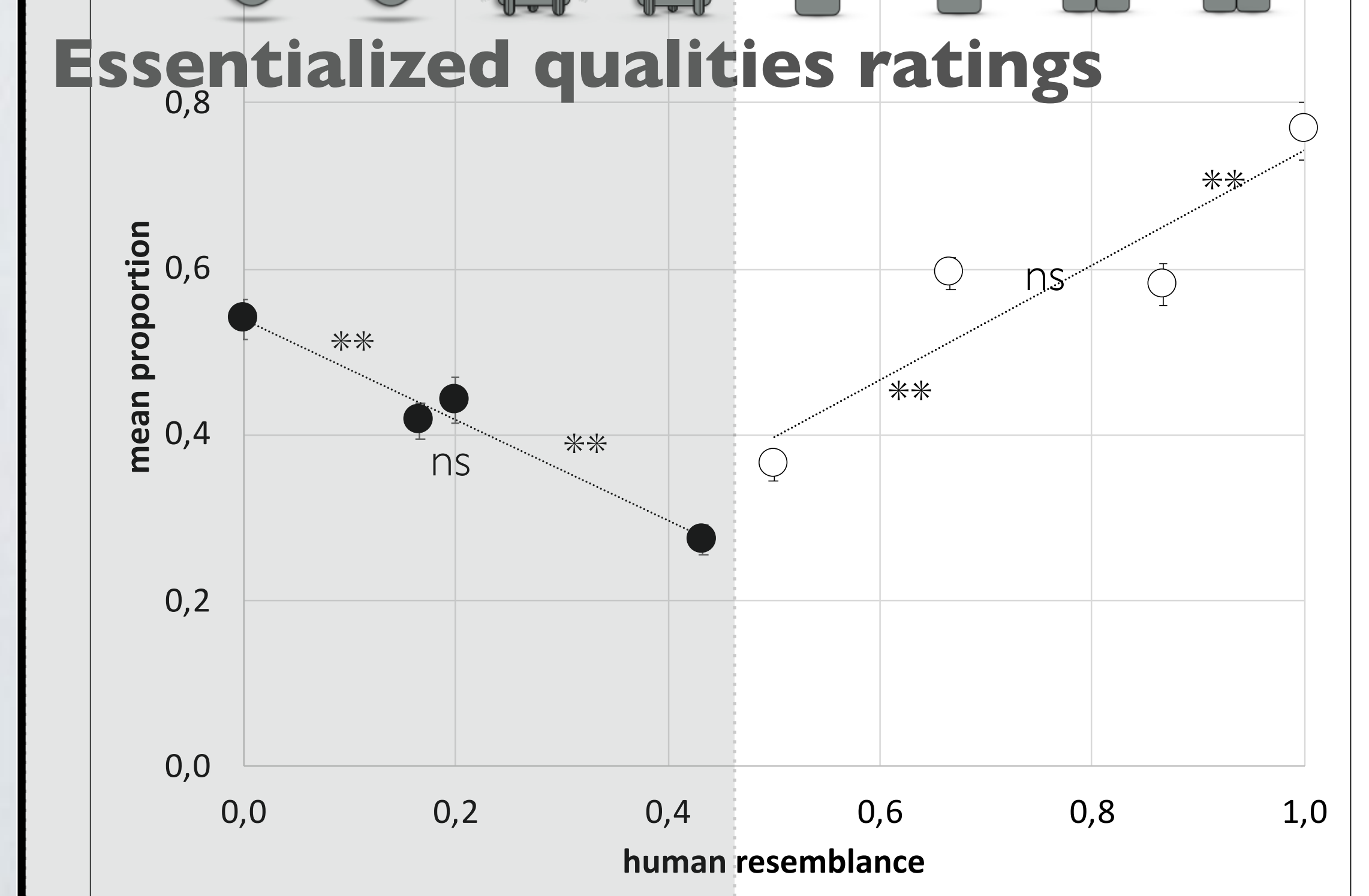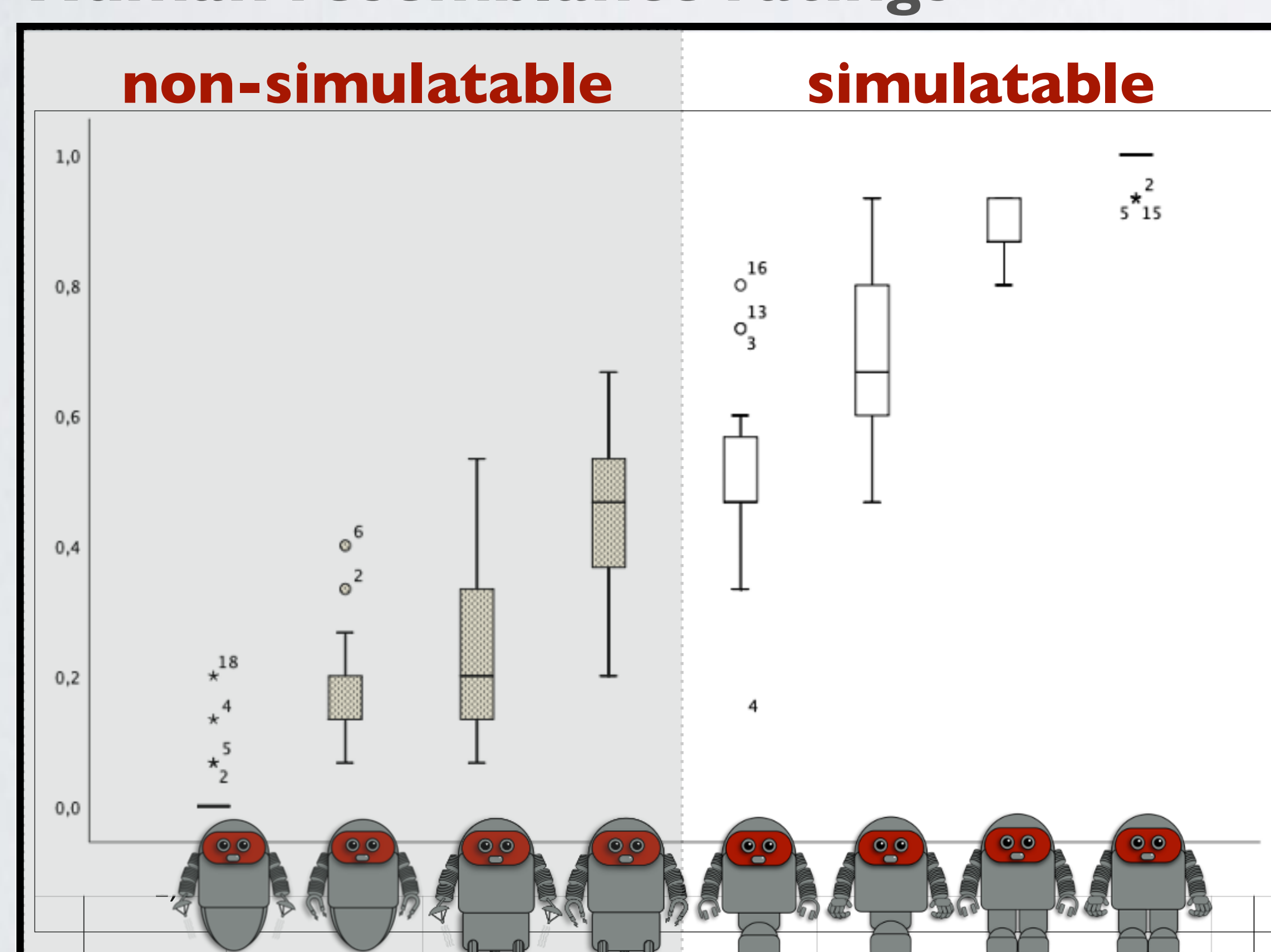
the robot is <u>invited</u> to join the group
the group <u>ignore</u> the robot
the robot is <u>excluded</u> by the group
the robot is <u>attacked</u> by the group.

Robot stimuli

16 Robots (4 upper x 4 lower extremities. Functions simulatable/ non simulatable)

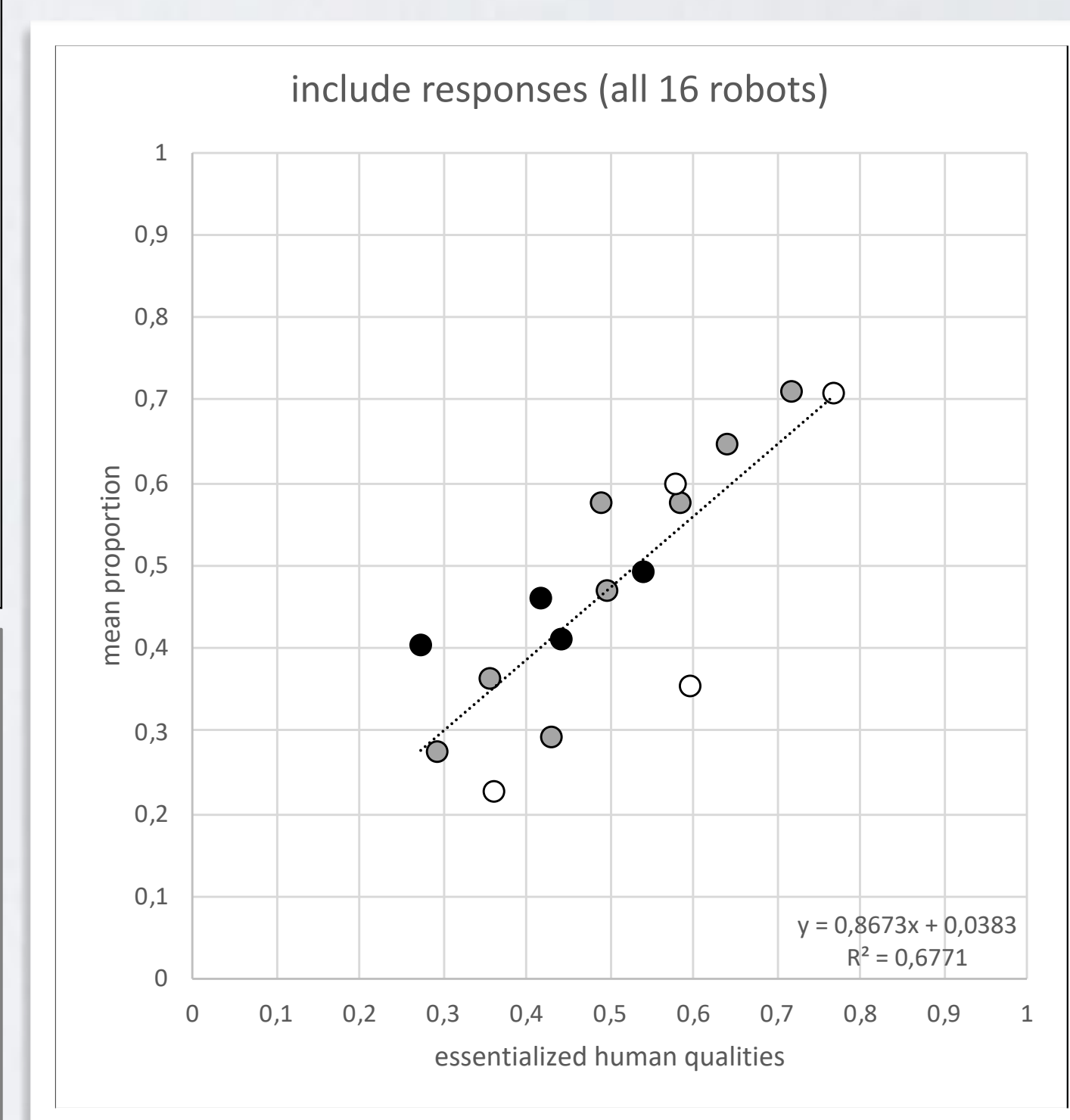|	*human resemblance*		*human resemblance*	
	more	*less*	*more*	*less*
simulatable functions	walking	jumping	gripping	pinching
non-simulatable functions	*none* rolling	*none* floating	*none* attracting	*none* hovering

Results

Human resemblance ratings

non-simulatable **simulatable**

Essentialized qualities ratings

mean proportion

human resemblance

Social reactions to the Robots

include

exclude/attack

ignore

mean proportion — human resemblance

include — ns — non-SIM / SIM

exclude/attack — * — non-SIM / SIM

ignore — * — non-SIM / SIM
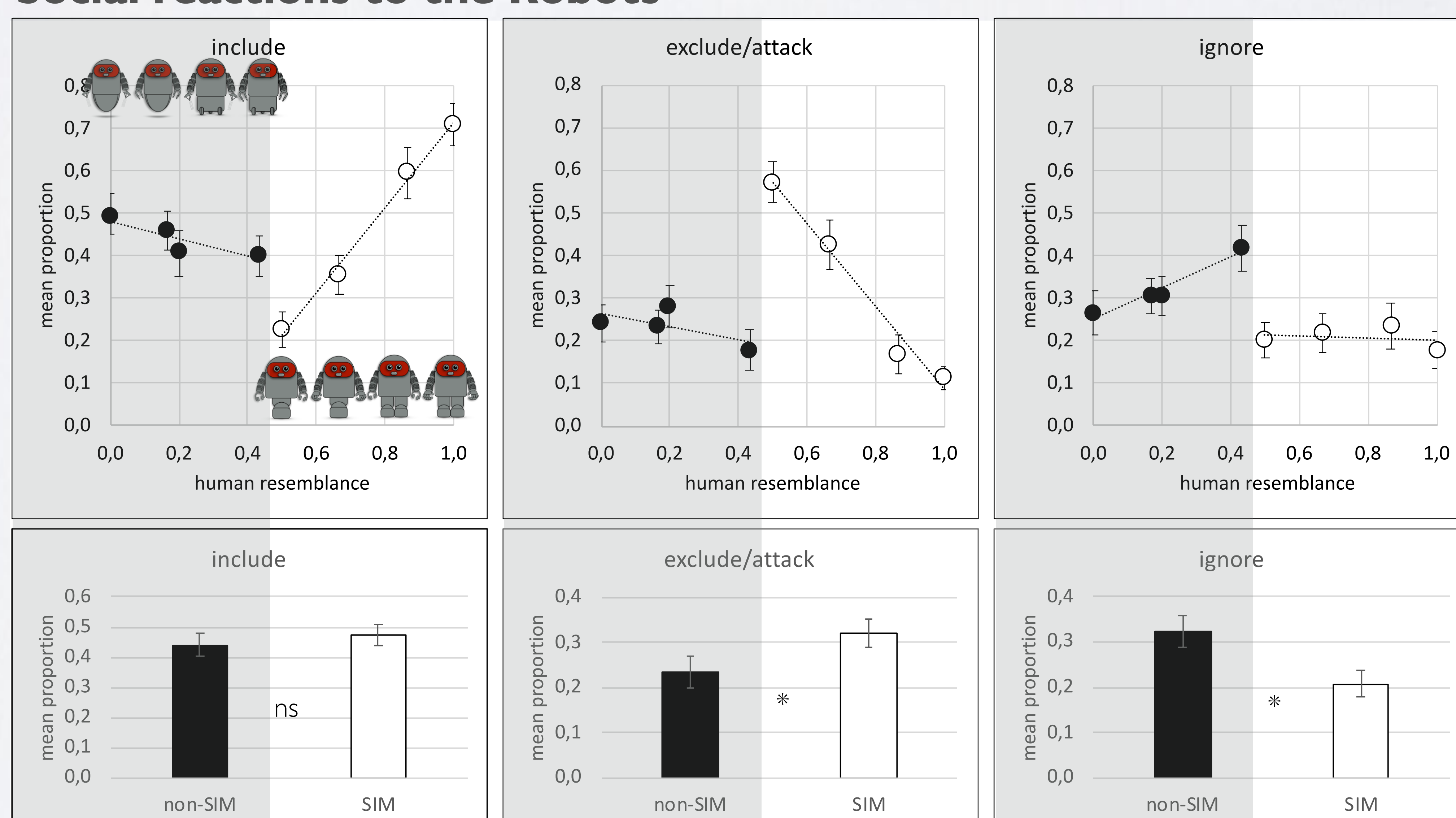
Perceived essentialized human qualities predict acceptability

include responses (all 16 robots)

y = 0,8673x + 0,0383
R² = 0,6771

essentialized human qualities

Conclusion

- **Non-simulatable** functions are reacted to differently than **stimulatable** functions.
- **Abusive** behaviors is seen for robots with **simulatable** functions of **lesser human resemblance**.
- Robots with **non-simulable** functions are **ignored rather than abused**.
- **Essentialized qualities** (not human resemblance) predict robot's **acceptability**.

Unless social robots perfectly mimic humans, it is safer to provide them with functions that are not in the human repertoire.

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