

# Sex Differences in the Perceived Social Intelligence of Robots

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### Introduction

- People are utilizing robots in many areas, including home activity, healthcare, building, and other assistive tasks (Broadbent, Stafford, & Macdonald, 2009).
- Social intelligence is the ability to recognize relevant social behaviors and utilize them appropriately in social circumstances (Ford & Tisak, 1983).
- When robots are perceived as more socially intelligent, this facilitates smoother HRIs and successful integration into society (Dautenhahn, 2007).
- Social intelligence can be measured using the Perceived Social Intelligence (PSI) Scales.
- Examining if the sexes vary in how they perceive the social intelligence of robots may assist with the creation of better robots that are suited to individuals' needs. The current study contributes to this growing area of research by examining possible sex differences in the perceived social intelligence of robots.

### Method

- 295 participants (150 M, 145 F) between the ages of 19 and 72 ( $M = 37$ ,  $SD = 11.5$ ) viewed five videos showing robots interacting with humans.
- Participants rated each robot on 80 items using the 20 PSI scales. The PSI scales (Barchard et al., 2018) were designed to measure four aspects of social intelligence: (a) overall social competence, (b) the ability to identify humans, individuals, and groups, (c) the ability to recognize, adapt to, and predict human behaviors, cognitions, and emotions, and (d) the ability to present oneself as a desirable social partner (someone who is friendly, helpful, caring, and trustworthy, and not rude, conceited, or hostile).
- Participants responded to the PSI items using a 5-point scale, with responses 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly Agree*.
- We ran a between-within analysis of variance (ANOVA) to determine if there were significant differences in how males and females rated the robots. Mauchly's test indicated the assumption of sphericity was violated  $\chi^2(189) = 17848.74$ ,  $p < .001$ . Degrees of freedom were corrected using the Greenhouse-Geisser estimate ( $\epsilon = .22$ ).
- Upon finding a significant interaction, we ran one-way ANOVAs on each of the 20 PSI scales to determine specific differences between the sexes.

### Results

- The differences between men and women varied across the PSI scales ( $F(4.26, 4933.96) = 4.81$ ,  $p = .001$ ).
- 20 one-way ANOVAs revealed significant differences on four of the PSI Scales: Hostile ( $F(1, 1407) = 8.65$ ,  $p = .003$ ), Identifies Humans ( $F(1, 1414) = 22.04$ ,  $p < .001$ ), Conceited ( $F(1, 1444) = 5.82$ ,  $p = .016$ ), and Rude ( $F(1, 1395) = 3.05$ ,  $p = .033$ ). These differences were all small. See Figure 1.

### Discussion

- The purpose of this study was to determine if there are differences in how males and females perceive the social intelligence of robots.
- Males rated the robots as slightly more hostile, conceited, and rude compared to females, while females saw the robots as slightly better able to identify human beings. The remaining 16 PSI scales had no significant differences. We conclude that males and females perceive the social intelligence of robots similarly. However, there were wide differences in individuals' perceptions.
- Creating robots that display social behaviors will make interactions between humans and robots easier (Anzalone, et al. 2015) and may ease the integration of robots into society. Future research could examine which robot social behaviors have the greatest impact on the perceived social intelligence of robots.

Males and females perceive robots as having similar levels of social intelligence.



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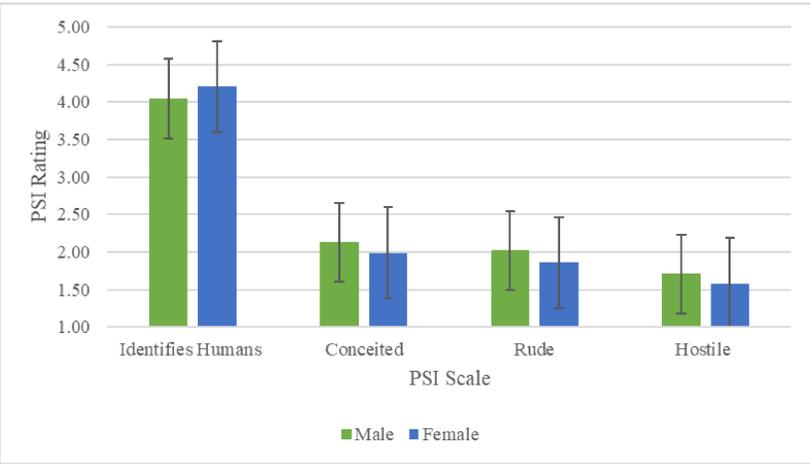
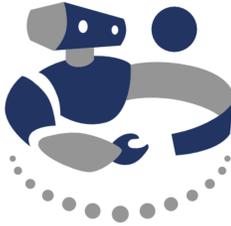


Figure 1. Means of the four PSI scales with significant differences between males and females. Error bars represent standard error of mean scores.

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