Mobile Robotic Telepresence: A New Social Hierarchy?

CHENG LIN, Jimin Rhim, AJung Moon

RAISE @ McGill

BACKGROUND:

Mobile Robotic Telepresence robots (“Skype on wheels”) have been adopted and studied in a large number of settings (e.g., offices, education, elderly care, conferences). Lee and Takayama’s study on MRPs in offices suggests that MRPs alter social norms [1]. However, it is still unclear whether remote MRP pilots and local users agree on what the new norms should be.

RESEARCH QUESTION:

Is there a difference in the social hierarchy expected by MRP pilots and local users? If so, what factors impact the social hierarchy?

HYPOTHESES:

We propose to explore the relationship between expected social hierarchy of MRPs across: different settings (***Context***), different perceptions of robot autonomy (***Perceived Autonomy***), and pilots vs. local users (***User Type***). We hypothesize the following:

H1. MRPs that embody their remote pilots more are ranked higher on the social hierarchy.

H2. Remote pilots rank MRPs higher on the social hierarchy than local users do.

H3. The expected social hierarchy that governs MRP use varies across different settings.

PROPOSED STUDY:

- Online, simulation-based survey; participants assigned to either be *MRP pilots* or *local users*.
- Participants watch simulated human-MRP interactions from a first-person perspective. In these simulations, the MRP and local user compete for space (e.g., both try to line up in the same line).
- Use validated scales to measure (i) the acceptability of interactions and (ii) the local human’s perceived autonomy of MRP.

We propose a study that characterizes the **social norms** governing **Telepresence Robots**.

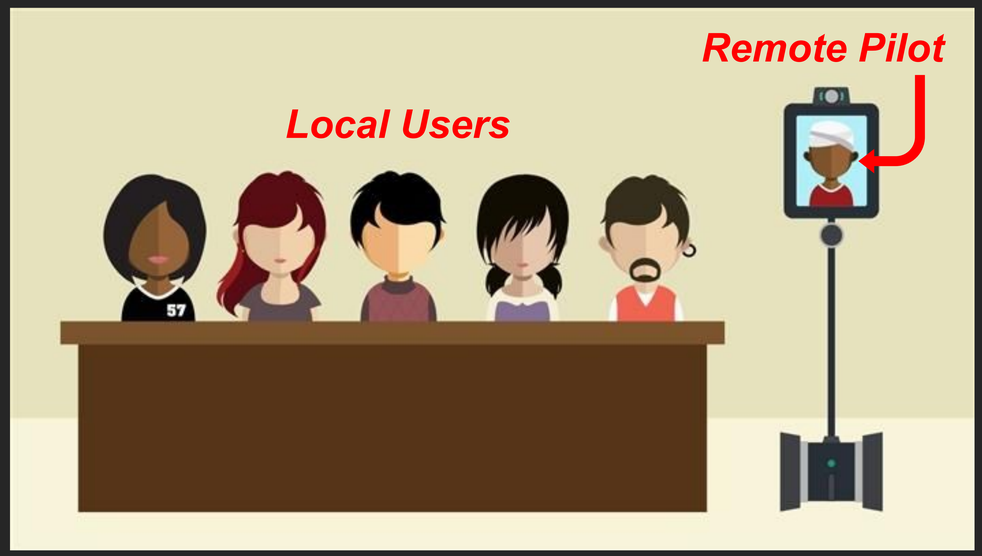

Figure 1. Drawing of an *MRP pilot* and *local users* (Source: S. Ladzinski, *Educause Review, 2018*).

To access the poster and presentation, take a picture or visit https://tinyurl.com/mrp-norms

MRP social norms and different settings (*Context*)

- Lee and Takayama find no consistent pattern in social norms across different settings [1].
- Local users do not always treat MRPs like they treat another human (e.g., local users felt obliged to help MRP move around).
- Local users do not always treat the systems like any other communication device (e.g., local users felt it was rude to shut off MRP without asking pilot first).

MRP social norms and *Perceived Autonomy*

- Lee and Takayama find that how participants referred to the MRP (as a “robot” vs. “person”) influenced the norms participants expected [1].
- Booth et al. report that a user’s perception of a robot’s (Turtlebot’s) autonomy influenced whether participants communicated with robot [2].

MRP social norms and POV (*User Type*)

- Lee and Takayama find that whether participant was a remote pilot or local user affected what the participant considered rude or polite [1].
- Takayama and Go find that remote pilots and co-located humans sometimes employ different metaphors to describe the same MRP, resulting in harmful interpersonal interactions [3].
- Yang et al. find in a study on the use of MRPs during shopping that remote pilots attribute higher levels of agency to MRPs than co-located humans; this influenced how parties interacted socially [4].

References

[1] M. K. Lee and L. Takayama, “”Now, i have a body”: uses and social norms for mobile remote presence in the workplace,” in Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, CHI ’11, (New York, NY, USA), pp. 33–42, Association for Computing Machinery, May 2011.

[2] S. Booth, J. Tompkin, H. Pfister, J. Waldo, K. Gajos, and R. Nagpal, “Piggybacking Robots: Human-Robot Overtrust in University Dormitory Security,” in Proceedings of the 2017 ACM/IEEE International Conference on Human-Robot Interaction, HRI ’17, (New York, NY,USA), pp. 426–434, Association for Computing Machinery, Mar. 2017.

[3] L. Takayama and J. Go, “Mixing metaphors in mobile remote presence,” in Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work, CSCW ’12, (New York, NY, USA), pp. 495–504, Association for Computing Machinery, Feb. 2012.

[4] L. Yang, B. Jones, C. Neustaedter, and S. Singhal, “Shopping Over Distance through a Telepresence Robot,” Proceedings of the ACM on Human-Computer Interaction, vol. 2, pp. 191:1–191:18, Nov. 2018.