

Addressing Asymmetrical MRP Interactions for Inclusive Social Norms in Hybrid Classrooms

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In this position paper, I use the example of assistance recruitment interactions between remote and local users of Mobile Robotic Telepresence (MRP), to highlight the issues of communicative asymmetries and “othering”. Giving users the tools to better understand each other’s perspective and needs could enable them to communicate and collaborate more effectively.

CCS Concepts: • **Human-centered computing** → **Human computer interaction (HCI)**; **Collaborative and social computing devices**.

Additional Key Words and Phrases: computer-mediated communication, human-robot interaction

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1 INTRODUCTION

While Mobile Robotic Telepresence (MRP) is overall positively received in the domain of education [9, 18, 24], studies also report socially awkward interactions and instances of exclusion [3, 19, 25, 27]. And while MRP is marketed as a substitute for in-person contact, the capabilities and limitations of a remote user are very distinct from those of local attendees¹; driving an MRP is slow and challenging in narrow environments, visual and auditory acuity is also limited and remote users don’t have an awareness of their own volume and imposition in the local’s environment [4, 19, 22]. As such there are different needs (e.g. assistance) and possibilities of communicative actions - which, however, users may not be consciously aware of or able to explain. It is therefore worth examining those in detail for a better understanding of MRP. Assistance refers to any actions aimed towards the resolution of trouble that another person is facing [17]. Literature in education has observed assistance interactions among peers, and between students and teachers [2, 11, 14, 21], and studies of MRP in schools have also identified the need for helping telepresent students, for example by manually picking up and transporting the MRP to another location [1, 23]. I present assistance recruitment here, as it is important in itself but also as an example on which to unpack the issues of fractured ecology and “othering” - phenomena which will apply to communication in general.

2 ASSISTING IN MRP

Pairs of remote and local adult users performed a collaborative, timed searching task, as part of a qualitative study of assistance recruitment via MRP [5]. A remote user sees his target object (a pink paper) and drives straight towards it. The local user utters “On the left hand side there’s a pink piece of paper, I don’t know if you can see it”. The remote

¹In line with existing literature, I use the term *remote user* for the person piloting the robot, *local users* for the people in the physical location of the robot

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user responds, “Is it the one I am looking at right now?”. The local user turns to look, “Yeah it is”. In another pair, a remote user notices the target object in the distance, but her path to it is blocked by furniture. “Oh what’s that?”, she exclaims, possibly hoping that her partner will help her figure out how to get closer. After waiting for a while, she gives up and goes to search elsewhere.

2.1 Assistance and inclusion

Assistance recruitment describes interactions in the here-and-now that solicit actions from others so as to resolve trouble [17]. Such actions can range from explicit (a clear request), to somewhat implicit (stating a problem or suggesting it though verbal and embodied displays) to most implicit (letting the other infer the need from circumstances) [17]. Literature suggests that people would choose more implicit methods to avoid appearing imposing and depending on how entitled they feel to the help [6, 8, 13]. In the first example from above, the local user inferred a need from the circumstances and offered to help by pointing out the location of the object, albeit wrongly as the remote user had already seen the paper. In the second example, the remote user opted for an implicit method (expressing trouble) and when it didn’t work, she moved on rather than impose further. Resolving trouble may be a normal part of everyday life [10], but being repeatedly in a position of relying on help and recruiting it, may have an accumulative effect on MRP remote users sense of belonging among their local classmates or colleagues[7]

2.2 Fractured ecology and being “Other”

The examples also demonstrate how the fractured ecology of the users prevents them from communicating effectively. The ecology of the task is “fractured” because the task participants have different access to it [20]. They also have asymmetrical access to relevant communicative information the other may provide [12]. In first example, the local user does not know what the remote user can see or how well. The participants adjust their behavior to compensate for this [15] (the remote user explicitly says “is it the one I am looking at right now”, then the local user turns to see the direction of his partner’s gaze) so as to make their perspective more clear to the other. In the second case, the remote user was not able to monitor the local user so as to have feedback on whether she was heard and how to adjust her assistance recruitment strategy. The local user at the same time was -perhaps- not as attending to the remote user’s limitations, assuming she was able to get on with the task. The difference in perspectives, and inability to assume that perspective, may lead to local users “othering” the remote - treating them differently. We’ve seen instances of remote users treated badly, as well as studies showing exclusion and in-group/out-group dynamics in group tasks [3, 25, 26]. Such behavior would be problematic for remote students experience of belonging in a hybrid classroom.

3 FUTURE WORK

For MRP to be embraced, there need to be social norms in place that work for both local and remote parties, so that classroom interactions can happen smoothly (e.g., remote users getting the help they need without being in a position of always having to impose on others). Closer examination of MRP interactions (such as through ethnomethodological studies) could further shed light on what hinders effective use [16]. In addition, future work should address users asymmetrical understanding on the medium and how it can be remedied (for e.g., through training).

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