

**(18) Communication in Virtual Environments:****Establishing Common Ground for a Collaborative Spatial Task**

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**Abstract**

The aim of this study was to find out how the communication process in a shared virtual environment (SVE) varies depending on which type of technical system is used. Of specific interest in the study was how common ground, a fundamental part of the communication act, is established in various computer-mediated collaborative situations.

Participants in this study carried out a collaborative task solving a Rubiks-cube type puzzle in three different conditions: (1) in a SVE where one person used an immersive projection technology (IPT) system and the other person used an ordinary desktop system, (2) in a SVE where both persons used the same type of IPT system (though they were in different countries), and (3) in a SVE where both persons used ordinary desktop systems.

By varying the technologies in the SVE conditions we wanted to investigate how the grounding process is affected by the different technologies used as well as by the combination of same and different VR systems.

By analyzing audio recordings of the communication between the partners in the three conditions we found that the grounding techniques vary between the different conditions due to the characteristics of the technologies used. Most important to the grounding process we found were the technical possibilities of: (1) hearing the partner, (2) seeing the partner and partner's objects, (3) sharing the view of the environment with the partner, and (4) understanding how (with what devices) the partner interacts with the SVE.

In this paper we discuss how different VR technologies affect the grounding process. We also make suggestions of how to facilitate networked collaboration in the future.