
The Use of Awareness Displays for Role Clarity in Distributed Workgroups

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Abstract

During group work, sometimes members' roles are unclear, which leads to confusion about which activities one should do. This may be especially true in distributed groups, where it is harder to see what others are doing, and when roles are not assigned to members. Awareness displays can provide information to group members to help them determine their roles. I will explore this using collaborative groups in multi-player online games. This study will first observe groups to identify factors associated with role ambiguity, develop an awareness display which provides role-related information, and lastly, test the display in an experimental setting.

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Role clarity, awareness, collaboration

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H.5.3. Synchronous Interaction

Research Overview*Motivation*

In workgroups with multiple people, it is sometimes hard to determine which group members are responsible for performing which components of a task, which can cause confusion or uncertainty about what one should be doing. It may be especially hard to determine this when group members are geographically dispersed and are unable to observe activities of other group members, or when roles are emergent (versus being assigned by a leader.) As role clarity is an important component of successful and enjoyable group work [6], it is important to better understand how to promote role clarity in ambiguous distributed collaborations. One way to approach this problem is to explore how visual awareness displays, particularly ones which selectively present information to group members, may provide clues to group members about which activities they should be performing.

Related Work

Role Clarity

In many group work situations, there is a division of labor for tasks, which leads to differentiated roles. Members of a group hold *role expectations*, which are understandings of their roles as well as the roles held by others in the group [6]. Sometimes roles are assigned to group members by a leader [6] and are fairly clear. In other instances, these role expectations are not clear among members of a group and people are often confused about what they should be doing, which leads to a reduction in *role clarity*. Role clarity has been argued to lead to not only more enjoyable, but also more effective group work [6].

Research which has explored role clarity in collocated groups has identified many ways in which group members establish role clarity, but often these strategies require group members to be collocated (e.g., observation of others' activities in the environment) [1,6]. Since group members in geographically distributed settings are unable to engage in these strategies, they must rely on technological systems to provide this information.

Awareness Displays

Visual awareness displays are one feature that technological systems can employ to help promote role clarity in distributed workgroups. These awareness displays can help to provide some workspace awareness [3], and some of the contextual information about group members that is available in the environment in collocated settings. Maintaining awareness of the activities of others has been shown to be extremely important during group coordination [4].

Sometimes it is more useful for all members of group to have the same information made available to them, and other times it is more useful for different group members to have different types of information. Dourish and Bellotti describe this in explaining two models for the transmission of awareness information: the informational model and the role-restrictive model [2]. In this description, informational models allow for tools and activities to be clearly divided among roles (e.g., an editor and an author on a paper would be provided with different options during a collaborative writing task). However, role-restrictive awareness displays can instead filter information about the activities of others according to role (e.g., an editor may only need to see that a paper is not yet complete, whereas a writer may need to see than an editor is editing a paper, as well as the changes which have been made to the document since he or she began editing). In situations where the distinctions between roles is more ambiguous, these types of awareness displays may be helpful in indicating to group members which roles they should fill.

Collaboration in Online Games

I am interested in exploring the use of visual awareness displays to promote role clarity by examining groups of players participating in collaborative tasks in Multi-player Online Games. In these games, players from around the globe connect to a virtual, persistent world via the internet and collaborate with others to accomplish a variety of tasks.

Multi-player Online Games are an interesting environment in which to study collaboration because they provide an opportunity to observe groups performing a variety of dynamic and interdependent

collaborative tasks. Furthermore, these games have applications to other activities, as they have been identified as spaces that are suitable for conducting teamwork training for real-life scenarios (e.g., [5]).

In these games, players have visual awareness displays which provide information about the status and activities of their group members. However, all group members receive the same information, regardless of their role in the group. While some role distinction is determined by the type of character a person plays (which they select when they begin the game), there are opportunities for role overlap and ambiguity among many of the characters. Tailoring awareness displays by character may help alleviate some of this ambiguity.

Research Question

The primary question motivating my research is: What is the role of visual awareness displays in promoting role clarity in distributed workgroups? This general question leads to two additional sub-questions:

1. Do general awareness displays and role-tailored awareness displays produce different effects on role clarity?
2. Does the presence of an awareness display affect how group members discuss their and others' roles?

Research Goals and Methods

To examine the questions above, I intend to conduct a combined observational and experimental study. In the first phase of this study, I will observe groups of players collaborating in a natural setting to observe situations and factors in which role ambiguity occurred, whether (and when applicable, how) group members

discussed their roles, and any consequences of the role ambiguity. Observation under these circumstances may be tricky, as groups participating in certain collaborative tasks are unable to be observed by people outside the group, and participating in the collaborations may affect the groups' behaviors. Therefore, I am exploring options such as collaborating with computer scientists to develop an add-on that would collect players' performance data as well as logs of their text chat in order to be able to unobtrusively examine this behavior.

In the second phase of this study, I will then collaborate with computer scientists to develop a role-based awareness display drawing on the factors identified in the exploratory phase described above, and compare the role-based display with a traditional awareness display in a controlled, experimental game setting. This would allow me to more carefully isolate and control for individual factors and aspects of role clarity and the awareness displays.

Work in Progress

I have read and worked on studies about distributed collaboration over the past three years which has aided me in forming clear ideas about my dissertation topic, and I am currently in the process of planning the study described above. To date, I have selected a topic and have begun working on a literature review, but I have not yet started the data collection process for this project.

Therefore, my future plans for my dissertation include undertaking the studies above, and then I will complete the writing of my dissertation document.

Expected Contributions

I anticipate that my research will find that role-tailored awareness displays promote role clarity in distributed workgroups, which should affect the ways in which group members discuss their roles within the group and result in more effective and enjoyable collaborations. This work has two key anticipated contributions. First, by isolating factors which are associated with role clarity in distributed workgroup situations, this study can help improve our overall understanding of how role clarity is established in distributed environments. Second, as role clarity has been shown to improve performance in workgroups, making progress in the promotion of role clarity in distributed workgroups may help improve performance on these tasks, which has practical benefits.

Benefits of Attending the Doctoral Colloquium

Presently, I have defined my dissertation topic and I am preparing to begin these studies. As such, I have clear ideas about the aims of my research, but am still able to make changes to the goals and design of my study, if needed. By participating in the doctoral colloquium, I hope to gain ideas and insights about my work through discussion with other attendees. As I have a social science background, I would also benefit greatly from sharing my plans to build a data collection tool with other attendees with technical backgrounds to learn from their experience with system design. I would also benefit from discussing my plans for an awareness display with those who have experience with building these displays or observing their use in groups.

Additionally, I am interested in learning about and providing feedback for other participants' work, as well as continuing to build connections with other members of the CSCW community.

References

1. Bechky, B. A. Gaffers, Gofers, and Grips: Role-Based Coordination in Temporary Organizations. *Organization Science* 17, 1 (2006), 3-21.
2. Dourish, P. and Bellotti, V. Awareness and coordination in shared workspaces. *Proceedings of the 1992 ACM conference on Computer-supported cooperative work - CSCW '92*, November (1992), 107-114.
3. Gutwin, C. and Greenberg, S. A Descriptive Framework of Workspace Awareness for Real-Time Groupware. *Computer*, (2002), 411-446.
4. Heath, C. and Luff, P. Collaboration and control: Crisis management and multimedia technology in London Underground Line Control Rooms. *Computer Supported Cooperative Work* 1, 1-2 (1992), 69-94.
5. Hussain, T.S. and Ferguson, W. Efficient development of large-scale military training environments using a multi-player game. *2005 Fall Simulation Interoperability Workshop*, (2005), 421-431.
6. Kahn, R., Wolfe, D., Quinn, R., and Snoek, D. Organizational stress: Studies in Role Conflict and Ambiguity. *International Journal of Stress Management* 1, 1964. <http://www.springerlink.com/index/10.1007/BF01857999>.