

Social Media and Trust Building in Virtual Teams: The Design of a Replicated Experiment

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ABSTRACT

In this paper, we present the proposal for a partial replication of a controlled experiment to further assess how knowing personal and expertise information about other team members may enhance initial trust building. Other than increasing confidence into the findings of the original study, we also aim at evaluating whether the provision of personal social media information, can lead to even higher level of trust in virtual teams.

Author Keywords

Trust building; Affective trust; Social awareness; Social media; Virtual teams.

INTRODUCTION

Trust is the key factor for the success of distributed teams because it prevents that physical distance may lead to psychological distance [11]. Trust among teams typically grows through close face-to-face (F2F) interaction but this is also the very activity that distributed teams see reduced [1].

Handy [8] has questioned if trust can arise in the absence of F2F interaction, while Jarvenpaa & Leidner [10] have pointed out that technology is not perceived as useful to create trust-based relationships. Despite these challenges, teamwork has become more and more distributed. Due to this paradox, to date the following question still remains open: *How do we strengthen or build trust among members of virtual teams who have few or no chances to meet?*

In this paper, we take a first step towards answering this research question. We ground our investigation on the distinction between cognitive and social trust [12]. According to Wilson et al., [18] cognitive trust, or rational trust, may be defined in terms of expectations about others' competence and reliability in performing important actions that the trustor cannot monitor. Conversely, social trust, or affective trust, relates to reciprocal emotional ties, concerns,

and care between the trustee and the trustor, which push the latter to do something for the former because it is perceived as a moral duty.

Among the various kinds of group awareness that can be modeled, we focus on the concept of *social awareness* as a potential enhancer of affective trust. Social awareness refers to the information that a person maintains about others in a social or conversational context [7] as well as the information and the understanding that teammates have about their social connections within a group [13]. Social awareness typically grows during (informal) F2F interaction and, as such, it is impaired by distance in virtual settings. In our previous research [5], we have argued that the information shared on social networks can help gain social awareness when F2F interaction is unavailable, by surrogating the perception of those personal, behavioral cues that represent the basis for its establishment. Several empirical studies have found some initial evidence to support our hypothesis that higher amount of social awareness may support trust building [2, 3, 4, 6, 17].

Our study proposal partially replicates a former experiment [16] about fostering initial trust in virtual distributed teams through information provision. In particular, the original experiment showed that presenting static information about team members, such as expertise and hobbies, enhances initial trust. Other than adding further empirical evidence to the original study findings, our replication also aims at comparing the differences on initial trust building when, rather than presenting static data, information about others is dynamically retrieved from self-reported posts and activity published on social media. In particular, we are interested in assessing whether the access to others' profile and the monitoring of their behavior on social media may have a stronger effect than static information on trust building. This expectation is based on our assumption that, in virtual settings, this kind of dynamic information works as a surrogate of the 'social awareness' typically gained during informal F2F interaction.

In the next section we describe the original study, reporting its setting, design, and main findings. Then, we describe the research questions, hypotheses, and design of our replicated study, highlighting the differences from the original experiment, such as new independent variables, and hypotheses retained or discarded.

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THE ORIGINAL STUDY

The original study [16] aimed at understanding how initial trust in virtual teams may be enhanced by information provision. In particular, the study was designed to investigate how initial trust builds on first impression. The experiment involved 36 students, equally distributed by gender. Each participant took part in a simulation of the starting stage of a project, composed by two main tasks: brainstorming for idea generation and subsequent idea evaluation. Each participant was requested to interact with a remote partner in order to produce innovative ideas and then, select the most original and feasible ones. All interactions were performed using a web-based interface without any F2F communication.

To foster initial trust in participants, different information about the remote team member were provided. The information elements provided were able to affect trust in terms of either cognitive- or affect-based trust building.

The original study followed a 2 (gender) x 2 (idea generation and idea evaluation) x 2 (topics of brainstorming) x 3 (information element conditions N, P, and E) design. In N condition, no information was provided. Under conditions P and E, personal and professional expertise information was provided, respectively, under the general hypothesis that personal information would have enhanced the affective trust. Conversely, expertise information was hypothesized to have a higher impact on cognitive trust.

The main findings of the study show that the more the information provided, the higher the level of initial trust established. With respect to specific tasks, knowing professional information induces higher overall trust (both cognitive and affective) during the idea generation session. On the contrary, during idea evaluation, personal information leads to higher affective trust while professional information affects more cognitive trust. This is probably due to the perception of the evaluation task as an activity highly related to professional experience rather than to creativity. In fact, expertise information has been observed to lead people to adopt a more critical attitude towards their own evaluation criteria.

REPLICATION

The original study has two main research goals: first, determining how knowing personal and expertise information of other team members affects initial trust in a distributed environment; second, determining how trust influences the two tasks of idea generation and evaluation.

As regards the second goal of the original study, it is not of interest for our research. Besides, the authors failed to find general support for the related hypotheses, which were therefore discarded in our partial replication. As regards the first goal, instead, in our replication we retain the same hypotheses on the role of information provision, here merged for the sake of readability:

H1 (originally H1a+H3a): Knowing personal information of an individual leads to higher affective trust during both the idea generation and the idea evaluation distributed sessions.

H2 (originally H1b+H3b): Knowing expertise information of an individual leads to higher cognitive trust during both the idea generation and the idea evaluation distributed sessions.

In our replication we also want to analyze the role of social awareness in affective trust building. Thus, we add the following research hypothesis:

H3: Social awareness enhances affective trust in virtual teams.

Our assumption is that social media surrogates social awareness in virtual settings. Hence, H3 can be verified by determining if the provision of personal information and activity, dynamically retrieved from social media, may enhance initial affective trust in virtual teams. In the original study, instead, subjects could only access others' personal information through static profile pages. Therefore, H3 is reformulated as follows:

H3': The provision of personal information and activity of an individual retrieved from social media leads to higher affective trust than static personal information provision.

Thus, if H3' is confirmed, we will be able to confirm our idea that social awareness gained through social media can be effectively used to strengthen affective trust in virtual teams.

Table 1. Replicated study design

| Idea Generation (IG) & Idea Evaluation (IE) | | | | | | | | | | | |
|---|---|---|-----------------------|---|---|-----------------------|---|---|-----------------------|---|---|
| Male | | | | | | Female | | | | | |
| Topic A => Topic B | | | Topic B => Topic A | | | Topic A => Topic B | | | Topic B => Topic A | | |
| SN | P | E | SN | P | E | SN | P | E | SN | P | E |

Analogously to the former study, the replication will follow a 2 (gender) x 2 (idea generation and idea evaluation) x 2 (topics of brainstorming A and B) x 3 (information element conditions) design (see Table 1). The only difference we plan to introduce relates to the information provision conditions. Since one of the main finding of the original study was that "providing any information is better than providing no information at all", we will replace the no information condition (N) with the Social Network-based provision of personal information (SN). In the SN condition, subjects will be able to access both the other party information on the profile (static information analogous to the information provision in the original study) and status updates as well as any shared audiovisual content (information derived from the behavior). Instead, conditions P (personal static information) and E (expertise information) will be maintained.

As for data collection, at the end of the experiments, participants will be asked to fill out questionnaires to assess the overall level of trust, of affective and cognitive trust, and how trust was affected by information provision conditions along the six dimensions of the TWAN schema [15]. Likewise, the questionnaire will be structured according to Rusman's guidelines [14] as in the original study.

CONCLUSIONS

Compared to the original study, this replication has the specific goal of evaluating whether social awareness can further enhance trust building in virtual teams. Thus, we hope to receive valuable comments from workshop participants about the additional goal and the revised experimental design.

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REFERENCES

1. Al-Ani, B., and Redmiles, D. In Stranger We Trust? Findings of an Empirical Study of Distributed Teams. *Proc. 4th Int'l Conf. Global Software Engineering (ICGSE '09)* (2009), 121-130.
2. Ali-Hassan, H., Nevo, D., Kim, H.M. and Perelgut, S. Organizational Social Computing and Employee Job Performance: The Knowledge Access Route. *Proc. HICSS'2011* (2011), pp.1-10.
3. Bougie, G., Starke, J., Storey, A.M., German, D.M. Towards Understanding Twitter Use in Software Engineering: Preliminary Findings, Ongoing Challenges and Future Questions. *Proc. Web2SE'11* (2011) 31-36.
4. Bradner, M., and Mark, G. Why Distance Matters: Effects on Cooperation, Persuasion and Deception. *Proc. CSCW'02* (2002), 226-235.
5. Calefato F. and Lanubile F., "Augmenting Social Awareness in a Collaborative Development Environment", 5th Int'l Workshop on Cooperative and Human Aspects of Software Engineering (CHASE'12), Zurich, Switz., 2 Jun. 2012, pp. 12-14
6. DiMicco, J., Millen, D.R., Geyer, W., Dugan, C. Brownholtz, B., and Michael, M. Motivations for Social Networking at Work. *Proc. CSCW'08*, 711-720.
7. Gutwin, C., Greenberg, S., Roseman, M., "Workspace Awareness in Real-Time Distributed Groupware: Framework, Widgets, and Evaluation", *HCI 1996*
8. Handy, C. Trust and the virtual organization, *Harvard Business Review*, 73(3) (1995), 40-50.
9. Hung, Y.C., Dennis, A.R., and Robert, L. Trust in Virtual Teams: Towards an Integrative Model of Trust Formation. *Proc. HICSS '37* (2004).
10. Jarvenpaa, S. L., and Leidner, D.E. Communication and Trust in Global Virtual Teams, *Journal of Organization Science* 10(6), (1999) 791-815.
11. Marlow, J. and Dabbish, L. Designing interventions to reduce psychological distance in globally distributed teams. *Proc. CSCW '12*, 163-166.
12. McAllister, D.J. Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal* 38(1) (1995), 24-59.
13. Omoronyia, I., Ferguson, J., Roper, M., and Wood, M. A review of awareness in distributed collaborative software engineering. *Software: Practice and Experience* 40 (2010), 1107-1133.
14. Rusman, E. The Mind's Eye on Personal Profiles – How to inform trustworthiness assessments in virtual project teams. Doctoral Thesis. Open Universiteit Heerlen, The Netherlands.
15. Rusman, E., van Bruggen, J., Sloep P., and Koper R. Fostering trust in virtual project teams: Towards a design framework grounded in a TrustWorthiness Antecedents (TWAN) schema. *International Journal of Human-Computer Studies* 68, (2010), 834-850.
16. Schumann, J., Shih, P., Redmiles, D., and Horton, G. Supporting Initial Trust in Distributed Idea Generation and Evaluation. In *Proc. GROUP '12* (2012), 199-208.
17. Shami, N.S., Ehrlich, K., Gay, G., and Hancock, J.T. Making Sense of Strangers' Expertise from Signals in Digital Artifacts. *Proc. CHI'09* (2009), 69-78.
18. Wilson, J.M., Strausb, S.G., and McEvily, B. All in due time: The development of trust in computer-mediated and face-to-face teams. *Organizational Behavior and Human Decision Processes*, 99(1) (2006), 16-33.