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Trust Formation Across Multiple Levels of Virtuality

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Abstract

This study looked at the formation of trust in relation to different levels of group virtuality. Undergraduate students worked in pairs on the game, Command and Conquer: Generals. Teams either worked together face-to-face; met first and then were separated to work together; or were completely separated for the duration of the activity. Face-to-face groups were expected to have higher levels of trust than virtual groups, while the groups that met first were expected to have higher levels of trust than the completely virtual group. Results showed that face-to-face and meeting first groups had higher levels of trust than completely virtual groups. Therefore, seeing each other, whether it be for the duration of group work or only initially, will increase trust.

Trust Formation Across Multiple Levels of Virtuality

Many organizations utilize groups or teamwork with individuals located in different, offices, cities, or even countries. Often termed “virtual,” this type of group work is possible because of technological advances such as the internet and web-based communication services (Hung, Dennis, & Robert, 2004). Virtual teams provide an easy way to form groups with the best people for the job, without the high costs of time and travel (Cascio, 2000). Compared to face-to-face groups, geographically dispersed virtual groups can meet at any time in almost any place. Along with this and other benefits of virtual teams also come some challenges. Specifically, research has shown performance detriments and lack of trust between members in virtual teams due to challenges associated with being separated by time, culture or distance (Orvis, 2004; Halphen, 2005). If these challenges pose too much of a threat, the convenience of virtual groups may not be worth the effort. The purpose of this research is to better understand how varying levels of virtuality affect team member trust and performance.

Virtual Teams

Virtual teams are defined as, “groups of geographically and/or organizationally dispersed coworkers that are assembled using a combination of telecommunications and informational technologies to accomplish a variety of tasks” (Townsend, DeMarie, & Hendrickson, 1998). According to Driskell, Radtke, and Salas (2003), the primary characteristic of a virtual team is that interdependent group members work together on a common task while they are spatially separated.

Virtual teams are able to offer greater flexibility, openness, and diversity of perspectives than traditional groups (Jarvenpaa, Knoll, & Leidner, 1998). By creating groups of individuals that are spread across the world, organizations can combine the points of view from all around

the globe. Virtual teams also make it possible to choose the best candidates for the job and place them together in a group even when candidates are in different areas. Additionally, virtual teams allow the employees to create flexible schedules. They are not bound by the traditional workday or workplace (DeRosa, Hantula, Kock, & D'Arcy, 2004). Individuals in a virtual group are able to complete tasks according to his or her own schedule. Another benefit of virtual groups is that geographic location does not create a boundary; individuals can be members of more than one virtual group at one time (Cascio & Shurygailo, 2003). Individuals can use their flexibility to go from one team to another more easily than with face-to-face teams.

Geographically dispersed teams can use different sources of communication to bridge the gap between the group members. Further, new technology is promoting the advancement of virtual teams. Teams now have the option of using virtual tools such as, telephone, email, instant messaging, and video conferencing for group collaboration (Kirkman & Mathieu, 2005). This computer-mediated communication has entered the business world making virtual teams possible (Simon, 2006). Resources such as these bring group members together when in reality they may be thousands of miles apart. This means that individuals can interact with one another quickly and easily even when his or her group member is halfway across the world.

Although virtual teams work separately for the most part, there are different levels of virtuality (Kirkman & Mathieu, 2005). First suggested by Kirkman and Mathieu (2005), multiple levels of virtuality implies that researchers consider virtuality as a continuum since not all groups are completely face-to-face or completely virtual; there can be a mix of the two. Groups with a mix of face-to-face and virtual characteristics are common. For example, in an organization, a project group may meet face-to-face initially and then work through virtual means, via e-mail or

telework. Other groups may have periodic face-to-face meetings while making use of virtual tools to work together as well (Kirkman & Mathieu, 2005).

Trust

Because of teamwork issues associated with communication over a distance, both researchers and management practitioners are interested in the formation of trust within virtual teams. Trust has been defined as “a psychological state compromising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another” (Rousseau, Stikin, Burt, & Carmerer, 1998, p. 395). Mayer, Davis, and Schoorman define trust as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (1995, p. 712). Both definitions highlight the importance of an individual making himself or herself vulnerable to the other in order to explain trust formation. For trust to form, an individual must allow for a loss of his or her own control.

Traditionally trust is thought to develop gradually over time and is based on multiple face-to-face interactions (Lewicki & Bunker, 1995, Mayer et.al, 1995). In virtual environments, the time needed to allow for multiple face-to-face interactions is not always available. Depending on environmental considerations, time limitations will cut back greatly on the number of face-to-face interactions and may eliminate them altogether. This is a concern for virtual groups because by definition, they may not allow for face-to-face interactions.

However, researchers have found that in the absence of face-to-face interactions, trust can still form in virtual groups (Jarvenpaa, et. al., 1998). This type of trust is referred to as “swift trust” (Meyerson, Weick, & Kramer, 1996). Swift trust is trust that develops when people interact more in a role-based manner than in a person-based manner (Costa, 2004). When swift

trust develops its forms based on individuals' roles within a group rather than on the personal characteristics of the individual. With the face-to-face interactions eliminated from a group, trust cannot form in a person-based manner. The trust of virtual groups must be formed based on the roles that are taken by the individuals within the group. The role of each group member is important to the success of the group and therefore becomes the basis of trust.

The formation of swift trust is essential for virtual teams. Trust has been shown to be positively related to performance (Cascio, 2000; Jarvenpaa et. al., 1998). Trust is a necessary characteristic for high performing groups since important team processes like coordinated action and communication are dependent on the formation of trust (Mayer et. al., 1995). When trust exists in a group, group members can have confidence that commitments will be met by their colleagues and that group members can be counted on to be dependable and reliable (McCallister, 1995). The formation of trust will allow team members to be more willing to coordinate and plan with one another, resulting in better performance. Therefore, without swift trust there is a good possibility that the performance of a virtual team will suffer.

Although trust is important in all groups, it is especially crucial in virtual groups. If a virtual group has a deficient amount of trust, geographical distance may lead to psychological distance (Snow, Snell, & Davison 1996). This psychological distance is the individual's perception of separation from his or her group members; this may be perceived as physical distance or emotional distance.

Team Performance

Team performance is more complex than individual task performance. Rather than just one person working towards a goal as in individual task performance, team performance includes multiple individuals mutually working towards a common goal (Guzzo & Dickson, 1996). Team

performance also involves the processes a team must go through to get to the outcome (Henderson & Lee, 1992). Communication and coordination are two important processes that teams must excel at in order to be successful.

Communication is an important team process. Virtual teams have a disadvantage when it comes to communication since they must communicate through virtual tools rather than face-to-face. Communication is an important factor in team performance, yet clear communication is much more difficult for virtual teams (Lu, Watson-Manheim, Chudoba, Wynn, 2006). The inability to see each other while communicating, or the inability to contact an individual may contribute to the difficulty. These and other challenges in communication for virtual teams can lead to conflict escalation, misunderstandings, or difficulties with team building (Cramton, 2001).

Coordination is another process that is important to team success. Coordination is the organizing and timing of team actions (Marks, Mathieu, & Zaccaro, 2001). Groups must coordinate activities in order to accomplish team goals in the appropriate amount of time. Coordination is important for virtual groups so each member knows what is expected of him or her.

Present Study

The present study examines the affect of different levels of virtuality on trust. It also looks at the affect of trust on performance. Three different levels of virtuality are considered. The first level is face-to-face teams, the second level is a team that meets first and then works separately, and the third level is a team that is completely virtual for the duration of the activity.

The first hypothesis states that face-to-face groups will form higher levels of trust than the virtual groups. This means that groups who work together face-to-face for the duration of the

activity will produce higher levels of trust than those groups in the second two levels who work together through virtual means.

The second hypothesis states that teams that are part of the second level who meet initially before working together will form higher levels of trust than the groups that work completely virtual the entire time. This is to test whether face-to-face contact, if only to briefly meet one another, has a positive effect on the formation of trust.

Finally, the third hypothesis states that higher levels of trust will produce higher levels of performance. It is expected that as the formation of trust increases, performance will also increase. This will help to confirm that higher levels of trust are a benefit to team or group work.

Method

Participants

Participants included 70 undergraduate psychology students from Minnesota State University, Mankato. Fifty-seven of the participants were females and 13 were males. The ages of the participants ranged from 18 to 65 with the mean age being 21 and the median age being 20. Participants worked in two-person teams and were randomly assigned to one of three experimental conditions. Participants signed up for the study using either Experimentrak or signups that were available to classes. They earned extra credit towards their psychology classes for participating in the study.

Materials

The materials for the study included the game “Command and Conquer: Generals.” This multiplayer, computer-based video game has been used in similar previous research to assess team process and performance (e.g., Koles, 2001, Rittman, 2004). The simulation requires team

members to work interdependently and trust each other in order to complete the task successfully in the time allocated.

Networked computers were utilized in order to allow participants to work together on the same task, while each used his or her own computer. The networked computers made it possible for the participants to work together on the same game while being at separate computer workstations.

Measures

Participants filled out a series of paper and pencil questionnaires during the study. A measure of trust, was adapted from Pearce, Sommer, Morris, and Frideger (1992) (See Appendix A). The measure asked participants to rate the items on their level of agreement, on a five-point scale ranging from strongly disagree to strongly agree. The reliability of the trust measure was found to be adequate ($\alpha = .88$). Participants also filled out a questionnaire of demographic information (See Appendix B). To measure performance, researchers used a behaviorally anchored rating scale and provided ratings based on observations of the team's performance as they completed the performance missions (See Appendix C). Along with the questionnaire dealing with performance, the number of buildings destroyed, the number of enemies destroyed, and the number of surviving participant units was recorded using an output screen created by the game following the missions.

Procedure

Upon arriving at the research session, participants completed an informed consent. The informed consent explained that they would be participating in a team-based study using the game "Command and Conquer: Generals." They were also informed that their participation was

voluntary and they could choose not to participate at anytime without the risk of losing credit. At this time, the participants also filled the demographic questionnaire.

Three different experimental conditions were tested. In the first condition, participants worked face-to-face. Participants in the second condition met one another initially and then were separated. The third condition had participants work completely separated for the duration of the session.

Depending on the experimental condition, participants were placed in the room differently. For condition one (face-to-face) and condition two (meeting first) participants were placed at chairs next to one another with computers on the table in front of them. Condition three (completely virtual) participants were brought in one at a time, with the first being placed at a computer with a barrier around it. When the first participant was seated at the computer, a curtain was shut and the second participant was placed at another computer on the other side of the barrier. In this manner, participants never saw one another.

Condition one groups sat at the computers with no barriers between them and worked together on the game. Condition two groups were given five minutes to talk to one another. They were supplied with questions to ask one another if they wanted, but it was not required that they use the questions (See Appendix D). After the team members had a chance to talk, they were asked to sit at the computers separated by a barrier. Since they would work together on the game at the computers separated by the barrier, they would not be able to see one another after the initial meeting. Condition three groups remained at their own computer the entire time, working together without seeing each other once. In each research session, the condition being tested was assigned at random, so any group had the chance to be any one of the three conditions.

Following the informed consent and basic demographic questionnaire, task training was conducted to help participants learn how to play the game. Training for the game was scripted and was read each time to ensure that all groups received the same training and practice. Participants learned the actions necessary for performing the upcoming mission. They learned how to use the mouse to control and move their units as well as how to attack enemy units and buildings. They also learned what type of enemy tank was harmful to each of their units, whether it was tanks or helicopters.

After the training, researchers set up the performance mission. Before the mission began, participants were told that their goal was to destroy the enemy buildings while defending themselves against the enemy. Participants were asked if they had any additional questions: Once those had been answered, the mission began. One group member was assigned six tanks to use during the mission and the other group member was assigned six helicopters to use. The mission consisted of a battlefield with 11 enemy buildings to destroy. During the mission, the teams were attacked by enemy tanks. There were two types of enemy tanks, one would destroy the participant's tanks, and the other would destroy the participant's helicopters. In order for the participant teams to be successful, they would need to work together to destroy the enemy, each attacking and destroying the correct type of enemy tank. If a team member attacked the wrong tank, the enemy would quickly destroy his or her units. This forced the two group members to work together and to trust one another in order to be successful. The teams had six minutes to perform the mission.

Upon completion of the first mission the groups were given a minute to plan with one another before they were given a chance to do the mission again. The participants remained in their seats during the planning, if they were at computers with no barrier they could plan face-to-

face, if there was a barrier between them, they needed to remain in their seats and plan with the barrier between them. After the planning time a second mission was started. The second mission was identical to the first and the participants each had the same set of units (either tanks or helicopters) for each mission.

The trust measure was given to the participants following the second mission. When the participants had completed the trust measures, they were allowed to leave their computers and in the case of the condition three groups, they met their teammate. The participants were debriefed on the study and told who to contact with any questions or concerns.

Results

To test hypothesis one and two, a one way analysis of variance (ANOVA) was conducted with trust as the dependant variable and level of virtuality (face-to-face, meeting first, or completely virtual) as the independent variable. Results showed that the difference of trust between the different levels was significant, $F(2,67) = 5.567, p < .01$. Post hoc tests using Tukey HSD indicated significant differences in trust between face-to-face ($M = 4.20, SD = .53$) and completely virtual ($M = 3.69, SD = .59$). There were also significant differences in trust between meeting first, then working virtually ($M = 4.10, SD = .54$) and completely virtual ($M = 3.69, SD = .59$). However, trust did not differ significantly between face-to-face ($M = 4.20, SD = .53$) and meeting first, then working virtually ($M = 4.10, SD = .54$) (See Table 1).

Using a Pearson correlation at the alpha level of .05 to determine the relationship between trust and performance, hypothesis three was partially supported. Some of the items on the performance scale showed a positive correlation between trust and performance, while others were not significant. For the first mission, only one item was significant. Item number seven showed a positive relationship ($r = .302, p < .05$). The second mission showed five of the nine

items with a significant relationship. Items four ($r = .487, p < .01$), five ($r = .357, p < .05$), seven ($r = .413, p < .01$), eight ($r = .469, p < .01$), and nine ($r = .332, p < .05$) all showed a positive relationship between trust and performance (See table 2). The performance items that had a significant relationship all dealt with discussing, planning, and coordinating team actions, which are important processes to team performance.

Discussion

The purpose of the present study was to determine the extent to which trust is affected by different levels of virtuality and to confirm that performance is affected by trust in virtual teams. Previous research has suggested that trust formation within virtual groups is an important topic to research (Jarvenpaa et al., 1998; Meyerson et al., 1996; Halphen, 2005). The possibility of different levels of virtuality rather than either virtual or not is also an important variable to research (Kirkman & Mathieu, 2005). Using this previous research, it was hypothesized that face-to-face groups would have higher levels of trust than virtual groups and that virtual groups with the chance to meet first would have a higher level of trust than completely virtual groups. It was also hypothesized that higher levels of trust would produce higher levels of performance. It was supported that face-to-face groups and initially meeting groups had higher levels of trust, and it was partially supported that trust correlates positively with performance.

Trust and Levels of Virtuality

There was a significant difference in the mean trust score between face-to-face groups and completely virtual groups. The difference between the meeting first and then working separately group and the completely virtual group was also significant. The difference between the face-to-face and the meeting first group was not significant, however. This suggests that

when team members see each other, whether it be for the duration of the time a group works together or if it is only for an initial meeting, trust will significantly increase.

These findings suggest that it would benefit companies who use virtual teams to bring all group members together in one place for an initial meeting prior to working together.

Organizations can still enjoy the benefits of virtual groups, but by allowing the group members to see each other face-to-face for an initial meeting, they will help build trust between virtual group members, perhaps to levels comparable to face-to-face groups.

Trust and Performance

This research found performance processes like discussing and planning of team actions are correlated with trust. This suggests trust is important in order for groups to take part in the necessary actions for team progress. By increasing trust and allowing for better communication, organizations can eliminate the problems otherwise associated with the communication of virtual groups (Cramton, 2001).

Results from this study show that virtual groups are a practical means through which businesses can form groups without sacrificing performance. As long as trust is formed at a level comparable to that of a face-to-face group, a virtual group should be able to perform just as well. By bringing all group members together to meet one another instead of having a completely virtual group, adequate trust can be formed.

Limitations and Recommendations

There were a few limitations presented by this study. One is that due to the time constraints there were only 11 groups in the first condition and 12 in both the second and third condition. It would be beneficial to gather more data to get more precise results. Also with the

small sample size we were unable to control for individuals who had played the game before or for those individuals who knew their team member before they participated in the study.

Another limitation was the performance measure. The measure used in the study recorded team processes well, but it did not say much about the overall performance. Therefore, it is hard to see if the amount of trust really has an influence on overall performance. In addition, since a researcher rated the participants on their performance, the measure became more subjective.

An additional limitation was that only the groups of condition two were given time to have a conversation with their team member before the start of the training. This lack of the opportunity of communication for the teams of condition one and condition three may have affected the level of trust developed.

Future Research

This study has shown that face-to-face interaction significantly increases trust. In order to build on this idea, future research should incorporate the idea of different levels of virtual groups. A study that takes place over a longer period of time could incorporate not only initial interaction of team members, but periodic face-to-face meetings. Other studies may want to include more than two group members to see how trust is affected when there are more individuals on a team.

Other research should focus more closely on the affects of trust on performance or other variables of team performance such as communications, coordination, and implementing action. Ideally, future research will use additional measures of team performance to better support the propositions presented in this study. It is also important for future research to continue to focus on how trust forms in virtual groups, and ways to promote its formation in virtual groups to facilitate performance effectiveness. Determining the affects of the time given to communicate

before working together on the amount of trust formed should also be a goal of future research. Whether or not completely virtual groups can form trust at the same level as a face-to-face groups given enough time to communicate virtually remains to be seen.

In conclusion, this study showed the benefit of face-to-face interaction on trust. It promotes future research in the different levels of virtuality; however, further study in trust formation is required to better grasp the ways in which it is forms and the reasons it is important. Future research should also find other benefits to initial face-to-face interactions beyond the benefit of trust.

Table 1a

ANOVA

Trust scale from Pearce et al.

	Sum of Squares	df	Mean Square	F	Significance
Between Groups	3.445	2	1.723	5.5569	.006
Within Groups	20.725	67	.309		
Total	24.170	69			

Table 1 b

Multiple Comparisons
Tukey HSD

(I) Experimental Condition	(J) Experimental Condition	Mean Difference (I-J)	Std. Error	Sig.
Face-to-face	Meet first	.1004	.16416	.814
	Completely virtual	.5118**	.16416	.007
Meet first	Face-to-face	-.1004	.16416	.814
	Completely virtual	.4115*	.16055	.033
Completely Virtual	Face-to-face	-.5118**	.16416	.007
	Meet first	-.4115*	.16055	.033

*Mean difference is significant at .05 level

** Mean difference is significant at a .01 level

Table 2 a

Mission One
Performance and Team Trust Correlations

Performance Item	Pearson Correlation	Significance
1. Attack targets using groups of multiple units at the same time.	.225	.097
2. Avoid enemy defenses harmful to their units.	.121	.245
3. Direct and keep track of at least two groups of units at the same time attacking more that one target.	.167	.168
4. Discuss where they are planning to travel, and what they are planning to attack.	.264	.063
5. Immediately announce when its units are being destroyed and when a target has been destroyed.	.188	.140
6. Attack targets that will help your team earn points.	.199	.126
7. Ask teammates about their progress, request help if needed, and respond to teammates' requests.	.302*	.039
8. Specify the order/process of coordinated team actions, integrate the timing of one's own actions with teammates' actions.	.273	.056
9. Engage behaviors that are related to the accomplishment of the team's objectives.	.059	.368

*Correlation is significant at the .05 level (1-tailed)

** Correlation is significant at the .01 level (1-tailed)

Table 2 a

Mission Two
Performance and Team Trust Correlations

Performance Item	Pearson Correlation	Significance
1. Attack targets using groups of multiple units at the same time.	.264	.063
2. Avoid enemy defenses harmful to their units.	.053	.382
3. Direct and keep track of at least two groups of units at the same time attacking more that one target.	-.007	.485
4. Discuss where they are planning to travel, and what they are planning to attack.	.487**	.002
5. Immediately announce when its units are being destroyed and when a target has been destroyed.	.357*	.018
6. Attack targets that will help your team earn points.	.200	.125
7. Ask teammates about their progress, request help if needed, and respond to teammates' requests.	.413**	.007
8. Specify the order/process of coordinated team actions, integrate the timing of one's own actions with teammates' actions.	.469**	.002
9. Engage behaviors that are related to the accomplishment of the team's objectives.	.332*	.026

*Correlation is significant at the .05 level (1-tailed)

** Correlation is significant at the .01 level (1-tailed)

References

- Cascio, W. F. (2000). Managing a virtual workplace. *Academy of Management Executive*, 14(3), 81-90.
- Cascio, W. F. & Shurygailo, S. (2003). E-Leadership and virtual teams. *Organizational Dynamics*, 31(4), 362-376.
- Costa, A. C. (2004). Trust. *Encyclopedia of Applied Psychology*, 3, 611-620.
- Cramton, C. (2001). The mutual knowledge problem and its consequences for dispersed collaboration. *Organization Science*, 12, 352-364.
- DeRosa, D. M., Hantula, D.A., Kock, N., & D'Arcy, J. (2004). Trust and leadership in virtual teamwork: A media naturalness perspective. *Human Resource Management*, 43, 219-232.
- Driskell, J.E., Radtke, P.H., & Salas, S. (2003). Virtual teams: Effects of technological mediation on team performance. *Group Dynamics: Theory, Research, and Practice*, 7(4), 297-323.
- Guzzo, R.A. & Dickson, M.W. (1996). Teams in organizations: Recent research of performance and effectiveness. *Annual Review of Psychology*, 47, 307-338.
- Halphen, Tina L. (2005). *You Must Be Just Like ME! Effects of Percieved Similarity of Trust in Dispersed Teams*. Unpublished Master's Thesis, Minnesota State University, Mankato.
- Henderson, J.C. & Lee, S. (1992). Managing I/S design teams: A control theories perspective. *Management Science*, 38(6), 757-777.
- Hung, Y. C., Robert, L. & Dennis, A. R. (2004). Trust in virtual teams: Towards an integrative model of trust formation. *37th Hawaii International Conference on System Sciences*.
- Jarvenpaa S. L., Knoll, K., & Leidner, D.E. (1998). Is anybody out there?: The implications of trust in global virtual teams. *Journal of Management Informational Systems*, 14(4), 29-64.

- Kirkman, B.L. & Mathieu, J.E. (2005). The dimensions and antecedents of team virtuality. *Journal of Management*, 31(5), 700-718.
- Koles, K. L. K. (2001). *The impact of feedback-induced self-attention on antecedents of team performance*. (Doctoral dissertation, George Mason University, 2001). *Dissertation Abstracts International*, 62, 1127.
- Lewicki, R.J. & Bunker, B.B. (1995). Trust in relationships: A model of trust development and decline. In Bunker, B.B., and J.Z. Rubin (Eds.), *Conflicts, Cooperation, and Justice*. Jossey-Bass: San Francisco.
- Lu, M., Watson-Manheim, M.B. Chudoba, K.M., & Wynn, E. (2006). Virtuality and team performance: Understanding the impact of variety of practices. *Journal of Global Management*, 9(1), 4-23.
- Marks, M., Mathieu, J.E., & Zaccaro, S.J. (2001). A temporally based framework and taxonomy of team processes. *The Academy of Management Review*, 26(3), 356-376.
- Mayer, Roger C., Davis, James H., & Schoorman, David F. (1995). An integrative model of organizational trust. *The Academy of Management Review*, 20(3), 709-734.
- McCallister, D.J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal*, 38(1), 24-59.
- Meyerson, D., Weick, K.E., & Kramer, R. (1996). Swift trust and temporary groups. In R.M. Kramer & T.R. Tyler (Eds.), *Trust in Organizations: Frontiers of theory and research*. Thousand Oaks: Sage.
- Orvis K.L. (2004). Leadership and team performance in collocated and distributed teams. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 65(3-b) 1587.

- Pearce, J.L., Sommer, S.M., Morris A., & Frideger, M. (1992). A configurational approach to interpersonal relations: Profiles of workplace social relations and task interdependence. Graduate School of Management, University of California, Irvine.
- Rittman, A. L. (2004). A Comparison of team training strategies for team effectiveness. *Dissertation Abstracts International*, 65, 05B. 2679. (UMI No. AAI3134093).
- Rousseau, D.M., Sitkin, S.B., Burt, R.S., & Camerer, C. (1998). Introduction to special topic forum: Not so different after all: A cross-discipline view of trust. *The Academy of Management Review*, 23(3), 393-404.
- Simon, A.F. (2006). Computer-mediated communication: Task performance and satisfaction. *The Journal of Social Psychology*, 146(3), 349-379.
- Snow, C.C., Snell, S.A., & Davison, S.C. (1996). Use transnational teams to globalize your company. *Communication Research*, 19, 52-90.
- Townsend, A M., DeMarie, S. M., & Hendrickson, A.R. (1998) Virtual teams: Technology and the workplace of the future. *Academy of Management Executive* 12(3), 17-29.

Appendix A

Directions: Please indicate the degree to which you agree or disagree to the following statements, using the scale below. Circle the response that best represents your level of agreement with each statement.

My team member shows a great deal of integrity

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

I can rely on my team member

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

Overall, my team member is very trustworthy

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

We are usually considerate of one another's feelings in this work group

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

The people on our team are friendly

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

There is no "team spirit" in my group

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

There is a noticeable lack of confidence among our team

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

We have confidence in one another in this group

Strongly Disagree Disagree Neither Disagree
Nor Agree Agree Strongly Agree

Appendix B

Instructions: Please complete the following information.

Team ID Number _____

Sex (circle one): M or F

Age: _____

Overall GPA: _____

ACT/SAT scores: _____

Ethnicity:

- _____Caucasian/ white
 _____African American/black
 _____Hispanic
 _____Asian American
 _____American Indian
 _____Other (please specify) _____

Academic year:

- _____Freshman
 _____Sophomore
 _____Junior
 _____Senior
 _____Other (please specify) _____

How much experience do you have working in a team setting?

- _____No experience
 _____Hardly any experience
 _____Some experience
 _____Frequent experience
 _____A great deal of experience

How well do you know your teammate?

- _____I have never met him/her
 _____I hardly know him/her
 _____He/she is a casual acquaintance
 _____He/she is a friend
 _____He/she is a close friend

Have you ever played the game "Command and Conquer: Red Alert"?

- _____yes
 _____no

Have you ever played the game “Command and Conquer: Generals”?

- yes
 no

How much have you played either of these games?

- I have never played it
 One time
 A few times
 I play the game several times a month
 I play the game almost daily

How do you prefer to work?

- Alone
 With others

How often do you use online chat or instant messaging?

- Never
 A couple of times a week
 Once a week
 A few times during the week
 Every day

How often have you worked on projects communicating with people mostly through technology (using e-mail, chat, group systems software, etc.)?

- Never
 A couple of times a month
 Once a week
 A few times during the week
 Every day

Would you rather work with a group face-to-face or mediated through computers?

- No preference
 Face-to-face
 Computer Mediated (i.e. email, instant messaging, video conferencing, etc.)

Instructions: In the past year, on average, how many hours per week have you spent doing the following activities listed. Please use the following scale for answering the three items below:

- 0 = None at all
 1 = Less than 1 hour
 2 = 1-2 hours
 3 = 2-3 hours
 4 = 3-4 hours
 5 = 4-5 hours
 6 = 5-6 hours
 7 = 6-7 hours
 8 = 7-8 hours

9 = 9 hours or more

- _____ Playing any type of computer game
- _____ Playing Nintendo, Sega, or Playstation type games
- _____ Playing video games

Appendix C

Team ID #: _____

Rater Name _____

Experimenter Performance Record Sheet

1 Never	2 Rarely	3 Sometimes	4 Usually	5 Always
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1. Attack targets using groups of multiple units at the same time (Targets include primary or secondary objectives and enemy defenses.)

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

2. Avoid enemy defenses harmful to their units.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

3. Direct and keep track of at least two groups of units at the same time attacking more than one target.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

4. Discuss where they are planning to travel, and what they are planning to attack.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

5. Immediately announce when its units are being destroyed and when a target has been destroyed.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

6. Attack targets that will help your team earn points.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

7. Ask teammates about their progress, request help if needed, and respond to teammates' requests.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

8. Specify the order/process of coordinated team actions, integrate the timing of one's own actions with teammates' actions.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

9. Engage behaviors that are related to the accomplishment of the team's objectives.

Tanks:	1	2	3	4	5
Aircraft:	1	2	3	4	5
Overall team:	1	2	3	4	5

Appendix D

1. What year are you?
2. What's your major?
3. What are your favorite pizza toppings?
4. What are your pet peeves?
5. What makes you laugh?
6. Who is your hero?
7. When you were young, what did you want to be when you grew up?
8. What do you want to do now?
9. What's your dream job?
10. If your house were burning down what three things would you save?
11. What's your favorite place to shop?
12. Would you rather be too hot or too cold?
13. What was the last movie you watched?
14. Do you have any pets?
15. What is one thing you can't live without?
16. If you could live on a different planet, which planet would you choose?
17. If you could relive one day what would it be?
18. What is your favorite vegetable?
19. If you could be anywhere right now, where would you go?
20. What is your favorite board game?

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