8-1-2017

Some Things Are Better Left Unseen: Toward More Effective Communication And Team Performance In Video-Mediated Interactions

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Accepted version. *Computers in Human Behavior*, Vol 73 (August 2017): 200-208. DOI.

Some Things Are Better Left Unseen: Toward More Effective Communication And Team Performance In Video-Mediated Interactions

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Abstract: By default, most video-mediated communication systems show the user his or her own video feed, yet there is no prior research to show if this helps or hinders communication. In general, virtual teams desire richer media to improve team interaction. However, in this case more information may not

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

be helpful. Drawing on Objective Self Awareness theory in social psychology and theories of cognitive overload from communication, hypotheses are proposed concerning how viewing oneself influences virtual team interaction. It is argued that viewing oneself will lead to lower team performance and other negative outcomes. The hypotheses are tested in a laboratory experiment, manipulating whether participants were able to view their own feeds during video-mediated communication. The results suggest that viewing oneself leads to a reduction in team performance and individual satisfaction. The findings, in terms of several theoretical explanations, and implications for managers and systems designers are discussed in the paper.

Keywords: Computer-mediated interaction, Virtual collaboration, Distributed teams, Video-mediated communication

1. Introduction

One of the major changes over the last two decades in how work is conducted has been the growth of virtual teams. A recent survey found that 46% of organizations utilize virtual teams (Minton-Eversole, 2012), and the use of these teams is expected to grow (Dobson, 2011, p. 3). Given the growing importance of virtual teams, and the difficulties of group process within these teams (Lin, Standing, & Liu, 2008), it becomes critical to develop methods to improve how they operate. Video mediated communication (VMC) systems are increasingly utilized to improve group processes in virtual teams (Townsend, Demarie, & Hendrickson, 2001). Although these systems vastly enhance the experience of virtual teams, we want to investigate whether aspects of these systems may also have a negative impact on their effectiveness. This negative influence may come from seeing oneself while interacting with the team.

Because virtual teams have become a staple of organizational work, it is essential to ensure that these teams are as effective as possible. Research has shown that virtual teams are less effective, take more time to complete tasks, and have lower member satisfaction than face-to-face teams (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002). In terms of team process, virtual teams are seen as being deficient to face-to-face teams in regards to communication (Lin et al., 2008), relational links (group cohesion, satisfaction, etc.) (Beranek & Martz, 2005), conflict resolution (Bergiel, Bergiel, & Balsmeier, 2008) and trust (Lin et al., 2008). In general, two approaches have been taken in attempting to improve the

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

performance of virtual teams. A number of authors have examined principles for better managing virtual teams (Hertel, Geister, & Konradt, 2005; Lurey & Raisinghani, 2001; Rice, Davidson, Dannenhoffer, & Gay, 2007). It is thought that by improving the group processes in these teams, not having face-to-face interaction can be ameliorated. The second approach has been improving technology in an attempt to move towards the natural state of face-to-face interaction. Current systems show high definition video and have very little noticeable latency (Enderle, 2016). Companies have also created systems that use multiple cameras and displays to more closely mimic the ways individuals look around or at a person who is speaking (Zhang, Rotkin, & Schulze, 2011). More recent efforts have focused on creating systems that allow participants to maintain eye-contact or for the monitor to show the natural line of sight of the participants. These efforts include the use of mirrors ("ProPrompter Desktop," n.d.) or placing a camera in the line of sight of the screen (Fritsch & Sabety, 2014). Finally, the use of virtual reality, although still in development, has potential for approaching the feel of face-to-face interaction (Zhang et al., 2011).

Due to the growth of virtual teams, there has been considerable research on how these teams operate differently from face-to-face teams and how virtual teams can be made to be more effective. Virtual teams tend to focus more on task aspects, and place less attention on social-emotional aspects (Powell, Piccoli, & Ives, 2004). Because of this focus, and the lack of unplanned opportunities for interaction, relationships, group cohesion and trust are all less developed in virtual teams than traditional teams.

As online team tools have become more sophisticated and bandwidth has expanded, virtual teams are able to meet in a fashion that more closely resembles face-to-face interaction. In this way, virtual teams have been improved through technology. These new methods of computer-mediated teamwork have allowed team members to share information, and with video services, the ability to see each other while they are interacting. It is assumed that this ability to see each other will improve both the effectiveness of the team as well as team members' attitudes about the team experience. In fact, the use of video may mean that previous research on text-based virtual teams is no longer relevant or accurate.

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

There has been some research examining how video mediated communication (VMC) can improve a variety of virtual team processes. Olson, Appunn, McAllister, Walters, and Grinnell (2014) found that adding video to an existing virtual team increased trust and collaboration, however, there were wide variations across time and across individuals. In addition, other outcomes (institutional trust, reputation and stereotyping) were not affected. An opposite argument was made by Walther (1996), who argued that adding video eliminates the asynchronous advantage of virtual teams, and also eliminates the increased "democratizing effects of strategically impersonal CMC" (p. 32).

Several studies have compared VMC groups with face-to-face groups, typically focusing on group task outcomes. Credé and Sniezek (2003) found that VMC groups had less effective solutions, less confidence in their decisions and less enjoyment by group members. However, there were no differences between the two types of groups on other variables, such as commitment to the group decision or overconfidence.

An interesting byproduct of the ability to see others in a virtual team is the ability to view oneself during interaction. Popular software like Skype allows a team member to view his or her image as well as the images of the persons with which they are speaking. Is this ability to view oneself also an asset in team interactions? This is the central question of our study.

Why should we expect that viewing oneself may impact the process in a virtual team? There are two areas of theory that might predict this outcome, one, Objective Self-Awareness from social psychology, the other, Communication Overload, from communication studies.

2. Theoretical background

2.1. Objective self-awareness

In 1972, social psychologists Duval and Wicklund (1972) developed a theory of objective self-awareness. They argued that

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

people vary across two states of conscious attention, either focusing on themselves (objective self-awareness) or focusing on their environment (subject self-awareness). This state of awareness has implications for individual motivation and performance, self-evaluation and self-esteem, conformity and opinion change (Duval & Wicklund, 1972). We explore how objective self-awareness may influence the interactions of virtual teams.

Research on self-awareness has shown that when a person observes him/herself in a mirror or on a video monitor, this produces the state of objective self-awareness, where the individual is concentrating on him/herself as an object. Normally, people tend to be focused outward, on their environment, a state that Duval and Wicklund (1972) labeled subjective self-awareness. When objective self-awareness is triggered the individual recognizes gaps between his/her expectations and how he/she actually appears.

Research has demonstrated that objective self-awareness can impact performance in a fashion similar to that of test anxiety. Liebling and Shaver (1973) found that objective self-aware subjects demonstrated higher performance than subjective self-aware subjects on a task under non-evaluative conditions, but had lower performance when being evaluated. These authors argued that there was limited "cognitive space", and that individuals could not direct attention towards both the evaluated task and objective self-awareness. In a non-evaluative context, Geller and Shaver (1976) found that performance on a perceptual conflict task (the Stroop color-word task) was also influenced by objective self-awareness. Again, the state of objective self-awareness appeared to add to the cognitive load of the subjects, reducing their performance on a task that required concentration.

Self-awareness has also been utilized to explain both pro- and anti-social behavior in computer-mediated communications. Yao and Flanagin (2006) conducted two studies where objective self-awareness was generated by the presence of a web cam and the participant's image in a small window on their monitor. Objective self-awareness influenced perceptions of their virtual partner's attractiveness, politeness, and social versus task orientation. However, it did not influence perceptions of intimacy or group identification.

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

Objective self-awareness has also been found to influence a number of other outcomes relevant to computer-mediated teamwork. Joinson (2001) found that self-disclosure in computer-mediated communication was higher when participants were objectively self-aware. Duval (1976) found that individuals in a state of objective self-awareness conformed more than subjective self-aware individuals. Macrae, Bodenhausen, and Milne (1998) found that objectively self-aware subjects were less likely to use stereotypes when describing other individuals in several studies. Finally, cross-cultural research by Heine, Takemoto, Moskalenko, Lasaleta, and Henrich (2008) demonstrated that manipulations to produce objective self-awareness (e.g. a mirror) had an impact on North American participants, but not on Japanese, a culture with strong concerns about how one is evaluated by others.

2.2. Communication Overload in virtual teams

Many of the theories that explain and predict the impacts of communication media on communication and performance focus on the amount or richness of information, cues, or symbols that are conveyed by the medium. The argument in these theories is that when communication media convey more information, individuals are better able to understand and decipher ambiguous or complex messages (Daft & Lengel, 1986; Short, Williams, & Christie, 1976).

In the context of virtual teams, videos of the other communicators provide high levels of information richness because of the visual and audio cues and symbols. Howevernearly all of today's systems, such as elaborate video conferencing systems or Skype, also display a feed of one's own video to himself or herself. In one sense, this self-feed could also be considered additional information, adding to the richness of the media. And this, theoretically, should lead to improved communication. Nevertheless, this self-feed does not provide any additional information about the other communicators or the message and instead only provides feedback or self-information to the individual. Seeing one's own video should not increase information related to the message and, therefore, may not increase task performance.

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

Additionally, it is possible that seeing one's own video feed actually has some negative implications for the team performance. The theory of objective self-awareness (described above) suggests that the view of oneself shifts individuals' focus from the environment and task and onto themselves. If individuals see their own video feeds when using VMC, they are likely to experience greater objective self-awareness, and objective self-awareness has been shown to contribute to reduced performance (Geller & Shaver, 1976; Liebling & Shaver, 1973). People put a lot of effort and energy into being liked and appreciated (Bell & Daly, 1984) and into managing others' perceptions of them (Walther, 2007; Xu & Behring, 2014).

When individuals can see themselves when communicating via VMC, it is likely that objective self-awareness leads them to focus more on self-presentation and impression management. This can lead to reduced task performance and more mistakes because of the distraction of focusing on themselves (Xu & Behring, 2014) and because of the increased sense of pressure or desire to perform well for others (Strauss, 2002). Moreover, when individuals are managing impressions, they may be more hesitant to be critical, evaluative, or negative toward others and their opinions or contributions. In a complex team task, this may lead teams to accept inferior decisions or paths because they are less willing to fully critique the suggestions or ideas of others. Team performance will be poorer in this case, because of poorer decisions and ideas.

Communication via VMC requires many cognitive resources (Hinds, 1999). In studies comparing video mediation versus audio or other mediation, researchers found that the cognitive load on participants was higher for video than it was for other media (Hinds, 1999; Homer, Plass, & Blake, 2008). In VMC contexts, we argue that the cognitive load will be even higher when individuals are able to see their own video feeds compared to when they are not. This is because they must allocate additional cognitive resources toward viewing and analyzing themselves on video in addition to the videos of the other communicators. Furthermore, attempts to focus on both the task and oneself increases the cognitive load that individuals experience (Liebling & Shaver, 1973). Increased cognitive load is associated with reduced mental performance (Miller, 1956; Sweller, 1988), increased errors (Mousavi, Low, & Sweller, 1995), and more biases in

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

perceptions (Hinds, 1999). In a complex team task, these issues will contribute to lessened performance on the task.

3. Hypotheses

Based on these arguments and findings, we offer the following hypothesis:

H1

Teams that use VMC in which the members see their own video feeds will demonstrate lower performance than will teams that use VMC in which the members do not see their own video feeds.

As argued above, when members of a team use VMC in which they see their own video feeds, they are more likely to experience objective self-awareness and engage in behaviors of self-presentation and impression management. Objective self-awareness causes individuals to shift some of their focus away from the task. This reduction in task focus will generally lead to more overall time spent on the task, as energy and efforts are directed toward the self instead of the task. Also, efforts toward self-presentation and impression management will require communication and behavior to be directed toward presenting oneself favorably. When poorly done, these behaviors are often talking too much and disclosing too much personal information (Vohs, Baumeister, & Ciarocco, 2005). This involves time and communication that is unrelated to accomplishing the team task, resulting in a longer time spent on completing the task.

Therefore, we propose the following hypothesis:

H2

Teams that use VMC in which the members see their own video feeds will take more time to reach consensus than will teams that use VMC in which the members do not see their own video feeds.

Whether or not individuals see their own video feeds will also likely affect their participation in VMC meetings. Those who see their

own feeds will generally experience greater cognitive load during the task. If there is higher cognitive load, there will be less cognitive attention and resources available for the task itself. This will likely inhibit individual participation such as sharing information and making suggestions as well as asking questions.

As discussed previously, those who see their own video feeds are more likely to experience objective self-awareness. It is probable that greater objective self-awareness will contribute to reduced participation by individual team members. This is because a focus on oneself results in less attention and interest in others. Individuals may also be hesitant to make suggestions or share information if they do not think it will be received favorably by others.

Consequently, we hypothesize:

H3

Individuals that use VMC in which they see their own video feeds will experience lower levels of participation than will individuals that use VMC in which they do not see their own video feeds.

We also look at two aspects of satisfaction, process and solution, and hypothesize how the VMC setup will affect these aspects. Process satisfaction is concerned with how satisfied individuals are with the processes that their team used to complete the task. Solution satisfaction is concerned with how satisfied individuals are with their team's solution. The proposed effects are also based on behaviors and consequences of objective self-awareness and cognitive load, which we argue are higher when individuals see their own video feed. More self-focus and less task-focus will contribute to less-efficient and less-effective team processes. This will lead to less satisfaction with the team's processes. If individuals are more concerned with self-presentation and fail to properly voice their critiques or negative opinions of others ideas and suggestions, we expect that they will recognize that the team has likely chosen a weak or poor solution. This will lead to less satisfaction with the team's solution.

Based on these arguments, we propose the following two hypotheses:

H4

Individuals that use VMC in which they see their own video feeds will experience lower process satisfaction than will individuals that use VMC in which they do not see their own video feeds.

H5

Individuals that use VMC in which they see their own video feeds will experience lower solution satisfaction than will individuals that use VMC in which they do not see their own video feeds.

4. Method

This study required a task in which large amounts of information processing and sharing could take place. It was also necessary to identify performance outcomes of teams in order to determine the effects of the different VMC configurations. Based on these requirements, we conducted a lab experiment where teams completed an information-intensive task using one of two VMC conditions.

4.1. Task

The task used in this study is an adaptation of the International Institute Task (Zigurs, Poole, & DeSanctis, 1988). The objective of the task is for team members to share and discuss enough information about applicants for an international program to determine which applicant should be admitted to the program. The task is a hidden-profile task where all the members of a team possess small amounts of common information and large amounts of private information related to the task. In order for teams to make an optimal choice, the individuals on the teams must effectively process and share the private information that they each possess (Stasser & Titus, 1985). The private information alone is not enough to solve the task. The objective behind hidden-profile tasks is to simulate situations where individuals in teams possess different information and expertise. Teams that communicate effectively will be better able to evaluate the information and alternatives and determine the optimal solution.

In the current task, it was necessary for teams to share and discuss large amounts of information in order to make the best decisions. Because of this, we allowed team members to keep possession of the common and private information for the duration of the task. This allowed individuals to reference and review pertinent information, and it reduced errors based on poor information recall and information inaccuracy. In studying hidden-profile tasks, Lightle, Kagel, and Arkes (2009), found that outcomes were susceptible to information bias and recall issues. By allowing individuals to maintain possession of all task materials, we minimized these potential issues.

In this task, each team member was given information about an international studies program sponsored by a university. The team assumed the role of an admissions committee that had to select only one student from a set of highly-qualified applicants. All of the applicants were well-qualified and had strong academic ability, so the teams had to consider additional factors beyond academic performance. In the task instructions, individuals were instructed to consider and look for certain personality traits in the applicants. They were told that these personality traits were linked to success in the program, and that they should choose the individual that best exemplified these traits.

Within each team, each individual was given complete application information about only one of the applicants. Complete application information consisted of three essays written by the applicant and two letters of recommendation written by others. From these essays and recommendations, individuals each had to process and share the information that they possessed in order to help the team evaluate the personality traits and important qualities of each candidate. In addition to this private information, each team member also received basic facts about all of the applicants. This information was common across all team members and slightly favored an inferior applicant. However, one of the applicants possessed superior attributes and qualifications, as conveyed through her essays and recommendations. The best applicant could only be identified when information about all of the applicants was properly processed, shared, and integrated.

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

The complete task instructions and a sample essay and recommendation for an applicant are included in Appendix A.

4.2. Procedure

Three participants signed up for a study session time slot. When a participant arrived, he or she was placed in a team with two other participants who also signed up for the same time slot. Because individuals were able to self-select time slots, the assignment to teams was not random.

Teams were assigned to one of two VMC groups (described below). Each team member was given a complete application packet for a single applicant. An application packet contained three essays written by the applicant and two letters of recommendation provided by others. All team members were also given a one-page summary of facts about all three of the applicants. Complete application information for each applicant was very similar in length. Within each team, each participant was randomly assigned an application packet.

The entire team received a brief introduction to the task, then each individual was assigned to a private room. Each private room had the rest of the task information and documents as well as the VMC system that was used for team communication.

Each participant was given time to read the full instructions and the complete application packer for his or her applicant. After each individual was comfortable with the instructions, the lab assistant arranged the VMC system for the team. This web-based VMC application provided multi-point audio and video. Each individual viewed a screen with video and audio of each member of his/her team. After teams arrived at consensus, the VMC application was closed and individuals were directed to the online survey where they answered questions about their perceptions and experiences. The lab assistant recorded each team's solution and the amount of time that each team spent on the task.

4.3. Participants

For our study, we recruited individuals associated with a southern university in the United States. Participants were recruited using flyers, email announcements, classroom invitations, and word-of-mouth. Most of the participants were undergraduate business students. However, there were also some graduate business students, undergraduate and graduate students from other colleges, employees of the university, and other adults who participated. The participants received a small payment for participating and/or a small amount of extra course credit.

There were 96 participants that completed the study; however, one participant failed to fully complete the survey. Therefore, the individual-level analysis is based on a sample size of 95. The average age of the participants was 22.02 years. There were almost the same number of male participants as there were female participants (49% female). A large majority of the participants were undergraduate students (83%), with some graduate students (12%) and some non-student adults as well (5%). In total, there were 32 teams that completed the study, with 22 teams in the self-viewing feed condition, and 10 teams in the no self-viewing condition. Every team had three members.

4.4. VMC setup

In this experiment, all of the teams communicated through a web-based VMC system, however, we used two different VMC setups for the experiment. In one, each individual was able to see his or her own video feed along with the videos of his or her other team members (self-viewing). In the other, the VMC system was arranged so that each individual saw the video feeds of his or her other team members, but he or she could not see the video feed of himself or herself (no self-viewing). The instructions, system setup, task information, and all else were identical for both groups.

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

4.5. Measures

At the team level, we assessed team performance by comparing each team's admission decision against the optimal solution for the task. One of the applicants to the international institute was strongest in each of the necessary personality and social attributes. These attributes matched those given in the task instructions for the desired applicant. The other applicants possessed some levels of the desired attributes, but they were inferior to the optimal candidate. Teams that selected the optimal applicant received a 3 for their performance score. Teams that chose the second best applicant received a 2, and teams that chose the poorest candidate received a 1. We also recorded the actual amount of time that each team took to complete the task. Teams were not given any limits on the amount of time they could take to reach consensus.

At the individual level, all measures used seven-point, Likert-type scales. We measured how individuals perceived their levels of participation using a five-item scale (Green & Taber, 1980). This scale is anchored by the end points of "not at all" to "very much." The reliability of this measure was acceptable (Cronbach's alpha = 0.750). Process satisfaction was measured using a five-item scale (Green & Taber, 1980). The items measured several aspects of the meeting processes, such as efficiency, coordination, etc. This scale also possessed acceptable reliability (Cronbach's alpha = 0.825). Solution satisfaction was measured using a five-item scale (Green & Taber, 1980). The points were either "very dissatisfied" to "very satisfied" or "not at all" to "very much." The reliability of this scale was acceptable (Cronbach's alpha = 0.876). The complete list of measures is included in Appendix B.

5. Analysis and results

5.1. Team level variables

The team level variables of performance and time were analyzed using ANOVA. Table 1 shows the descriptive statistics for performance and time.

Table 1. Descriptive statistics of team-level variables.

Variable	Mean	Stan. Dev.	n	
Performance	2.156	0.767	32	Correlation with Time = 0.062
Time (minutes)	41.375	10.292	32	Min = 23, Max = 68

Table 2 shows the ANOVA analysis for performance. The mean performance score for the self-viewing teams was compared with that of the no self-viewing teams. The self-viewing teams had a mean performance score of 1.95, while the no self-viewing teams had a mean performance score of 2.60. The results show that there is a significant difference between the mean performance scores and that teams performed at a lower level when individuals were able to see their own video feeds. The first hypothesis was supported.

Table 2. Analysis of variance table for team performance.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.864	1	2.864	5.596	0.025
Within Groups	15.355	30	0.512		
Total	18.219	31			

Table 3 shows the ANOVA analysis for the time teams took to complete the task. The mean time for the self-viewing teams was compared with that of the no self-viewing teams. The self-viewing teams had a mean time of 38.73 min, while those that did not view themselves had a mean time of 47.20 min. The results show that there is a significant difference between the amount of time that teams took to complete the task and that teams took more time when individuals did not see their own video feeds. This finding is opposite of what we had hypothesized, as we had argued that the self-viewing teams would take more time to complete the task. Therefore, the second hypothesis was not supported.

Table 3. Analysis of variance table for time.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	493.536	1	493.536	5.307	0.028
Within Groups	2789.964	30	92.999		
Total	3283.500	31			

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

5.2. Individual level variables

To analyze the individual-level variables, we used hierarchical linear modeling. In this study, individuals are nested within teams and teams are nested within experimental groups. Therefore, hierarchical linear modeling allows for us to account for these nesting effects (and subsequent related error terms). The analysis software that we used was HLM version 7. The means, standard deviations, and correlations of the individual-level variables are shown in Table 4 below.

Table 4. Means and correlations of individual-level variables.

n = 95	Means (SDs)	Process Sat.	Solution Sat.	Participation
Process Sat.	6.425 (0.598)	1		
Solution Sat.	6.354 (0.753)	0.558**	1	
Participation	6.204 (0.715)	0.414**	0.253*	1

Note. * = $p < 0.05$; ** = $p < 0.01$.

With the experimental groups, teams, and individuals, there are three logical levels in this study. However, because the sample size of the VMC setup groups is only two, this would be problematic for the level 3 analysis (Garson, 2013). In order to overcome this issue, we added the VMC setup as a dummy variable in level 2, the team level, with the self-viewing teams coded as 0 and the no self-viewing teams coded as 1. Doing this allows us to accurately test the effects of the media type while still retaining the hierarchical nature of the model for the analysis (Garson, 2013).

There were three individual-level outcome variables in this study: participation, process satisfaction, and solution satisfaction. We evaluated each of the outcome variables separately. We used the Restricted Maximum Likelihood estimation technique because the level 2 sample size is relatively small (Garson, 2013). For each analysis, we included VMC setup as a level 2 predictor. We also controlled for the effects of the time each individual's team spent on the task (as this may affect perceptions of participation and satisfaction) and for individuals' ages.

Whether or not individuals could see their own video feeds did not have a significant effect on participation perceptions. The

unstandardized coefficient was 0.137 (p = 0.311). The third hypothesis was not supported.

VMC setup did have a significant effect on process satisfaction. The unstandardized coefficient was 0.322 (p = 0.009). The results suggest that individuals that saw their own video feeds experienced lower satisfaction with the process, and the fourth hypothesis was supported.

VMC setup also had a significant effect on solution satisfaction. The unstandardized coefficient was 0.406 (p = 0.020). The results suggest that individuals that saw their own video feeds experienced lower solution satisfaction, and the fifth hypothesis was supported.

6. Discussion

We hypothesized that seeing one's own video feed would generate a state of objective self-awareness, increase the cognitive load, and negatively impact participants' interactions in a virtual team. In our laboratory study we found generally positive support for this proposal. When participants viewed themselves as part of the virtual team, team performance went down, but they took less time to complete the task. In addition, the participants reported lower satisfaction with both the process and with the solution when they saw themselves on the display. However, there was no significant effect on perceived participation levels between the two VMC setups.

After finding that the no self-viewing teams took more time to complete the task, we carried out some additional analyses to better test and understand the relationships between the VMC setup, time, and performance. We wanted to make sure that the performance of teams that did not view themselves was not better just because they spent more time on the task. As shown in Table 1 above, time was only weakly correlated with performance (0.062) and, the relationship between time and performance was not significant (p = 0.737). Additionally, we ran a regression analysis with both VMC setup and time regressed on performance. The standardized coefficient for Time was −0.108 (p = 0.561), and the standardized coefficient for VMC setup was 0.438 (p = 0.024). Based on these results, we can conclude that even though the teams where participants did not view

themselves took more time to complete the task, their higher performance was not a function of the amount of time spent on the task.

When discussing virtual teams, the general recommendation is that more information is better (Daft & Lengel, 1986). Virtual teams using richer media (e.g., videoconferencing versus email) are expected to be more effective and more satisfied than teams employing less rich media. However, the present study demonstrates that more information is not always better. Viewing oneself led to less effective team decision making, and less positive individual reactions to the team process and decision.

Several researchers have looked at objective self-awareness and the consequences of being mindful of oneself. As technology and VMC systems have progressed, the capability of watching one's image may be triggering objective self-awareness. When individuals are focused on themselves and how they are perceived by others, they cannot focus as much on the task. These behaviors and experiences have negative consequences for communication, behavior, and performance.

Another possibility is that the theorists concerned with cognitive load in regards to virtual teams are correct. Simply increasing the amount of information that virtual team participants receive is not always a positive thing. Of course, one's own image may not be considered valuable information. Therefore, participants may be increasing their cognitive load without adding to their useful information for working on the team task. If adding the input of watching oneself exceeds the ability to process the cognitive load of someone viewing the VMC, what will happen when video feeds and bandwidth become even larger? Research tells us that when people are cognitively overloaded they will tend to use heuristics rather than process incoming information systematically (Chaiken, Libeman, & Eagly, 1989). This suggests that as technology and system bandwidth increase, individual virtual team members may actually become less effective.

Computers in Human Behavior, Vol 73 (August 2017): pg. 200-208. DOI.

6.1. Limitations

One limitation with our study is that the context and task are laboratory based. Participants are aware that the virtual team is temporary and that the task is certainly not a typical undertaking for them. The effect of seeing oneself on video may be different if participants know and work with the others in the team. Therefore, we cannot generalize our findings to long-term teams or tasks that are repeated and familiar.

A second limitation is that we have no manipulation check to assess how much participants actually watched their own image. Some participants may not have been looking at their own image; others may have filtered out that information because they didn't see it as valuable. This makes it impossible to distinguish between the self-objective explanation and the cognitive overload explanation of the effects.

It may seem to be a small issue that most video systems show the user his or her own feed. However, this is the default setting and most desktop video conference systems do not include the functionality to hide or shutoff a viewer's feed from him or herself. In addition, they probably do not realize that watching themselves would have any type of impact. The research on objective self-awareness finds that simply looking into a mirror can produce negative effects in certain situations. Our research extends that and demonstrates that this small aspect of virtual team communication can have significant and negative consequences on team performance and team member satisfaction. As a practical concern, we suggest that members of virtual teams not view themselves while meeting via VMC systems.

7. Conclusion

Most of the current video mediated communication systems in use prominently display a person's own video feed so that he or she can view it right along with the video feeds of his or her communication partners. In this research, we conducted a laboratory experiment to study the impacts of seeing oneself during video mediated communication. We looked for differences in performance,

time, participation, and satisfaction when individuals could see themselves versus when they could not. We found that performance was lower for teams when the members were able to see their own video feeds. We also found that process and solution satisfaction were lower for individuals when they were able to see themselves. Based on these results, our conclusion is that seeing one's own feed during video mediated communication does make a difference, and it can be detrimental to task performance. We recommend that VMC systems should be designed with the functionality for users to disable self-viewing or minimize their view of their own video feeds. We also suggest that individuals hide or shutoff their own view of themselves, when possible, during virtual team communications.

Appendix A. Task Information

International Institute Task

Background to the Study

Many universities and other organizations sponsor a variety of special programs that attract large numbers of applicants. These programs are highly sought after, and the competition for them is high. An important problem faced by these organizations is how to decide among the many qualified people who are interested in these programs.

In such situations, most organizations try to be as objective as possible, and use quantifiable criteria wherever they can. Criteria such as previous grade point averages and aptitude and ability test scores make it easier to compare individual applicants. However, organizations also must rely on information about applicants that is less quantifiable and more subjective.

This study is designed to further our understanding of the way people communicate and go about making decisions in this type of situation. For this study, we have created a scenario very similar to an actual admissions decision. The decisions that you will be making in this study are typical of those faced by organizations that sponsor special programs like the one used for this study. The applicants to the

program in this study have varied qualifications, and you may find that some criteria for admission are more important than others.

By your participation in this study, you can make a contribution to our knowledge of how teams communicate and make decisions in these types of situations. Please participate to the best of your ability.

This study is comprised of three parts. Part 1 introduces you to the university's international studies program and provides you with the information about the applicants. In part 2 you will work with other members of an admissions committee to decide whom to admit to the program. Finally, in part 3 you will answer questions about this experience.

Thank you so much for your participation.

Part 1

A. Program Overview

The International Institute

Four leading universities, including the ABC University, are participating in the development of the International Institute, a special program for academically and socially successful students interested in applying traditional majors in international settings. Students in the program will specialize in applying their chosen field in a specific country or region of the world, and they will spend one year at a university in a foreign country. Students will take courses offered by those schools as well as courses offered by professors from the ABC University and other participating schools who will visit the foreign schools. They will return to their American schools for at least their final year of study. They will get intimate exposure to the ways of thinking and working in another country. It is anticipated that graduates of the program will find employment in foreign embassies, international government, and international business.

If the program is to be successful, the students must do a good job of representing the U.S. at the foreign universities. To apply for admission, all students must have a Grade Point Average of at least

3.50. Aside from academic achievement, students will also need to have good social skills and the right personality.

International Success

International success is based on academic ability and several personality characteristics. In addition, there are other factors that can be helpful such as previous international exposure, foreign language skills, and personal interests.

Based on the study of other international studies programs, researchers have identified personality characteristics which help to predict international success:

1. Independence (The degree to which an individual is free from the influence of others)
2. Social Success (The degree to which an individual is well liked and has friends in different social groups)
3. Self-Concept (The degree to which an individual is confident with their own intellectual and interpersonal skills)
4. Awareness (The degree to which an individual is conscious of others' thoughts, feelings, and behavior)

Of course, it can be difficult to determine which factors are the most important and how to balance these characteristics with academic ability. It can also be difficult to assess the personality traits when only given applications.

In this study we will ask you to make judgments about whether or not various applicants should be admitted to the International Institute. You will base these judgments on the students' background information, written essays, and recommendations.

Section 2: Application Overview

A preliminary screening has reduced the number of applicants under consideration to a few very strong candidates. From this set of candidates, you must select the best one for the International Institute. The selected applicant should have the greatest likelihood for international success, and he or she should represent the university and the United States well.

In order to make the best decision, your team will have to share important information about each of the applicants with one another.

For each applicant you will be given the following summary information:

1. Age
2. Gender
3. GPA
4. Major
5. Foreign language exposure
6. International exposure

To help keep the workload manageable, each team member has received complete application portfolios for only one applicant. Therefore, it is important that you read the application materials carefully because your team members will depend on you for important information about your applicant. You must also make sure you provide the other members of your team with enough information for them to be able to assess all the candidates accurately.

The information that you personally have for one of the applicants includes three essays written by the applicant and two recommendations provided by others.

If you are to make good decisions, you will have to combine your own judgment with the information that you have and gain about the applicants.

You should be guided by two goals when making your decision:

1. To make an optimal admission decision that selects the student with the greatest likelihood of success
2. To select the student who will represent the university and our nation well in foreign settings

It is important that you make this decision as a group. You should work together and try to take advantage of your diverse talents and resources. Your team must agree on one candidate to accept to the program. Please give this your best effort.

Sample Common Information.

	Haley Bryant
Age:	20
Gender:	Female
GPA:	3.90
Major:	Psychology
Foreign Language:	Two years HS Spanish
Traveled Abroad:	No

Sample Essay

In 500 words or less, please answer this question: How has your background prepared you for success at the International Institute?

Our food certainly wasn't authentic, but we always gave it our best try. I know a little about the kinds of foods people eat in Norway, Germany, and Indonesia because we sampled many of those foods at our dinner table. My mom came up with this great idea when I was little to give us exposure to ethnic foods and to give us some excitement during dinner. One Friday a month we would choose a different country from around the world and try to make their food for our dinner. Sometimes we randomly chose a country, and other times we coordinated a dinner because of an event or a person.

Sometimes the dinners didn't taste very different from what we were used too. Other times, however, they were more exciting. I can still remember the smell of some of the cheeses that we tried. They smelled terrible, but I was always willing to try a little of them.

Along the way my family and I developed a greater understanding of many other countries and cultures. On the nights we made food from other countries, we also learned about the geography of the countries, and we talked about many of the facts and customs of the countries. This exposure gave me a desire to visit many of the places we learned about.

Even though making and eating foods from other countries may not appear to be a big deal, it has helped me. The result of this practice is that I can eat about anything, and I know something about

other countries. This experience will help me while I am in Spain to fit in better with the people. It also gave me a desire to experience the food and culture of Spain first-hand. Even though I haven't actually lived out of the U.S., I don't feel like living in a new place would be too difficult for me.

Eating the real food in Spain may be different than what I am expecting, but because of the time I spent learning about other countries at the dinner table, the overall experience won't be as big of a shock to me. I have been prepared to work with other people and their unique ways. For this reason, I will be successful at the International Institute.

Appendix B. Measurement Items

Participation – (Green & Taber, 1980)

"Please indicate the level to which you participated."

Made suggestions about doing the task (Not at all-Very much)

Gave information about the problem (Not at all-Very much)

Asked others for their thoughts or opinions (Not at all-Very much)

Showed attention and interest in the team's activities (Not at all-Very much)

Asked for suggestions from others on the team (Not at all-Very much)

Process Satisfaction – (Green & Taber, 1980)

How would you describe your team's problem solving process? (Inefficient-Efficient)

How would you describe your team's problem solving process? (Uncoordinated-Coordinated)

How would you describe your team's problem solving process? (Unfair-Fair)

How would you describe your team's problem solving process? (Confusing-Understanding)

How would you describe your team's problem solving process? (Dissatisfying-Satisfying)

Solution Satisfaction – (Green & Taber, 1980)

How satisfied or dissatisfied are you with the quality of your team's solution? (Very dissatisfied-Very Satisfied)

To what extent does the final solution reflect your input? (Not at all-Very much)

To what extent do you feel committed to your team's solution? (Not at all-Very much)

To what extent are you confident that your team's solution is correct? (Not at all-Very much)

To what extent do you feel personally responsible for the correctness of your team's solution? (Not at all-Very much)

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