EXAMINING PREDICTORS AND OUTCOMES OF IDENTITY COMMUNICATION IN VIRTUAL TEAMS

Research in Progress

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Abstract

Virtual teams play an increasingly important role in the modern economy, and many organizations struggle to overcome the weaknesses inherent in technology-mediated work. Identity communication has been shown to greatly improve individual- and group-level outcomes in offline settings, but these benefits have not been investigated in the context of virtual teams, where mediated interaction can affect the opportunity for identity communication. This research-in-progress paper proposes a theoretical model and experimental design that investigates the predictors and outcomes of identity communication in virtual teams. Our anticipated findings should have important implications for researchers seeking to understand identity communication via technology and for practitioners hoping to improve virtual team communication and collaboration.

Keywords: virtual teams, identity, media theories, self-presentation

1 Introduction

Virtual teams provide many benefits to organizations, allowing them to access diverse labour pools, lower costs, and to more effectively compete in the global marketplace (Lipnack and Stamps, 2000; Townsend et al., 1998). Such virtual teams span temporal, spatial, and organizational boundaries and are very common in the modern economy (Minton-Eversole, 2012). The benefits provided by virtual teams are not without trade-offs, however. The team diversity and space-time dispersion inherent in virtual teams can lead to communication difficulties and even team conflict (Kankanhalli et al., 2007). Furthermore, virtual teams that depend primarily on technology-mediated communication are hindered by the limitations of the media available to them (Chidambaram and Tung, 2005). These difficulties must be overcome in order for organizations to reap the benefits of virtual collaboration.

The influence of identity communication and verification in virtual environments is not well understood (Ramarajan, 2014) and has rarely been considered in designing the technology that enables effective virtual teams. Identity communication comprises the various methods a person uses to convey self-identities (Thatcher et al., 2003) and identity verification refers to the process of bringing others to confirm one's identity (Swann, 1983). Virtual environments can heighten (Walther, 2008) or hide (Weisband, 2002) identities. This technological deficiency creates a social barrier to participation in virtual teams, influencing individual and group outcomes such as career development (Ibarra et al., 2005), psychological withdrawal (Hobfoll, 1989; Wrzesniewski et al., 2003), and overall team success (Gomez et al., 2009; Polzer et al., 2002; Swann et al., 2003; Swann and Pelham, 2002). To design systems that promote positive identity communication and verification processes, one must first understand what technology characteristics enable these processes, and how these processes influence out-

comes in virtual teams. Despite the proliferation of teams working together in virtual environments, neither research nor design principles exist that address these needs.

To address this gap, this research-in-progress paper investigates technology characteristics that enable identity communication and verification in virtual teams, and seeks to explain how these identity-related processes impact relevant team outcomes. We first review relevant literature on identity and communication media. We then build and justify a theoretical model to explain how technology can support identity communication and verification, and ultimately virtual team outcomes. The theory developed in this paper will lead to specific design guidelines that can be easily applied to the design and functionality of technologies supporting virtual team collaboration.

2 Related Literature

In this section, we first discuss theories associated with identity communication and verification. We then discuss the media theories that inform our study of technology characteristics relevant for identity communication and verification in the virtual team context.

2.1 Identity Communication and Verification

An identity is a definition of one's self (Gecas, 1982). People have a natural desire to communicate their identities and have them verified by others (Swann, 1983). Identity verification facilitates a sense of continuity, a sense of coherence, and a feeling of being understood (Swann et al., 2000). Identity communication and verification are strong predictors of individual and group outcomes, and can ultimately determine the overall success of a team (Polzer et al., 2002; Swann et al., 2003).

Prior work in face-to-face group settings indicates that identity communication and verification may produce individual and group benefits. For example, identity communication and verification have been shown to build social resources for individuals and facilitate career development and growth (e.g., Ibarra et al., 2005). Positive identity communication and verification can increase individuals' capacity to deal with adversity and stress (Hobfoll, 1989), predict judgments (Reed and Aquino, 2002), improve creativity (Beyer and Hannah, 2002; Cheng et al., 2008), and promote social integration (Polzer et al., 2002). Individuals who experience positive identity communication and verification have more satisfaction, meaning, and self-worth at work (Thatcher and Greer, 2008; Wrzesniewski et al., 2003), and thus are more motivated to promote positive outcomes for teams (Polzer et al., 2002) and their organization (Dutton et al., 2010). Identity verification has been shown to lead to more information sharing and trust (Dutton et al., 2010). Members of groups who verify one another's personal identities perform better (Polzer et al., 2002; Swann et al., 2003; Swann et al., 2000), cooperate more (Milton and Westphal, 2005), feel more connected and immersed (Thatcher et al., 2003), behave authentically, and focus energies on improving group outcomes. Successful identity communication and verification has been suggested as one of the key mechanisms determining whether diversity helps or hinders a group (Polzer et al., 2002).

Although identity verification has been studied in a myriad of face-to-face contexts (Swann et al., 2003), relatively little research has studied it in virtual environments, in which technology provides the only conduit for identity communication and verification. In a notable exception, Ma and Agarwal (2007) examined how four IT-enabled characteristics (virtual co-presence, persistent labelling, self-presentation, and deep profiling) influence identity verification in online communities. They found that these characteristics positively influenced identity verification, which led to increases in member satisfaction and knowledge contribution. However, this prior research may have limited generalizability for the broader realm of virtual environments, due largely to the differences between online communities and virtual teams. First, members of virtual teams are often *assigned* to a team, rather than given the ability to choose a team with similar interests. Second, members of virtual teams in organizations are often labelled by their actual name and title, rather than an anonymous id. Third, virtual teams are goal- and task-driven, rather than driven by voluntary knowledge contribution. Fourth, inter-

actions among virtual team members can be supported by a much wider variety of technologies (e.g., video conferencing, voice conferencing, email, group support systems) than large online communities. As a result of these differences, we seek to build on the related research in online communities to understand characteristics of technology that enable identity communication and verification in virtual teams.

This research topic is particularly important to address as virtual environments are becoming more pervasive and virtual teams are often formed to bring diverse individuals together at a low cost. It is anticipated that identity communication and verification in virtual teams could yield many of the same benefits that are realized in face-to-face groups, and the proposed model will investigate this possibility.

2.2   Media Theories

In virtual teams, where communication happens primarily or exclusively through a technology, characteristics of the communication medium should play an important role in determining whether or not team members can communicate and verify their identities with each other. Several theories related to media characteristics have been generated in the literature, including media richness theory (MRT; Daft and Lengel, 1986) and media synchronicity theory (MST; Dennis et al., 2008). Media richness (Daft and Lengel, 1986) refers to a communication medium's ability to facilitate changes in understanding. The components of richness that contribute to differences across media are immediacy of feedback, number of cues and channels utilized, personalization of the message, and language variety employed (Daft and Lengel, 1986). On a continuum of richness, face-to-face would be considered very rich, whereas text-based communication would be considered less rich. According to MRT, communication is most effective when the richness of the medium matches the requirements for a communication task.

As an extension to MRT, Dennis, Fuller, and Valacich (2008) proposed MST, which predicts shared patterns of behaviour (media synchronicity), fit, and shared understanding (i.e., successful communication of desired information). MST is relevant in our context because identity communication and verification may better facilitate shared understanding among team members. MST introduces key media characteristics such as transmission velocity, symbol sets, parallelism, rehearsability, and reprocessability. Transmission velocity refers to the speed with which messages are exchanged. Symbol sets are associated with the number of cues that can be transmitted via the medium (e.g., Daft and Lengel, 1986), including audio, visual, and text-based representations. Parallelism addresses the number of messages that can be transmitted simultaneously (e.g., Carte and Chidambaram, 2004). Rehearsability is the extent to which the sender can practice the message before it is communicated, while reprocessability is the ability of a communicator to review prior interactions. These characteristics may play important, and potentially differing, roles in the context of identity communication and verification. Our theoretical model leverages relevant media characteristics from MST to predict identity communication and verification processes in virtual teams.

Identity communication and verification produce positive outcomes in face-to-face settings, but their effects are not well understood in technology-mediated contexts. In reviewing the media richness and synchronicity theories, we find several relevant media characteristics that may inform our understanding of how identity information can be communicated and verified. In the section that follows, we justify several hypotheses regarding the extent to which several such characteristics support identity communication and verification.

3   Theoretical Model and Hypotheses

The theoretical model developed in this section (see Figure 1) draws from media theories and the identity literature to 1) hypothesize several media capabilities that facilitate the communication and verifi-

cation of identity, and 2) hypothesize positive outcomes of these identity-related processes relevant to virtual teams.
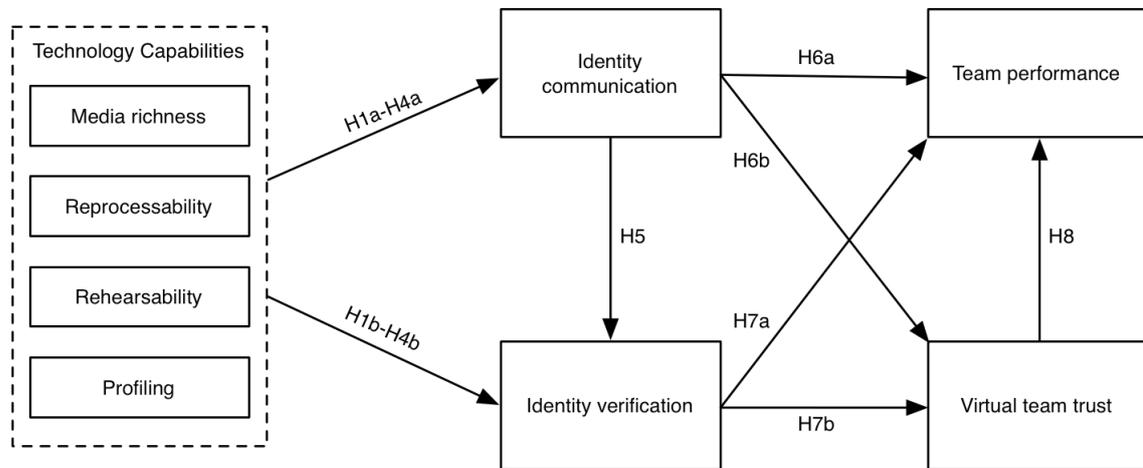

Figure 1.   Theoretical Model – Identity Communication in Teams

Although definitions of virtual teams vary somewhat, we follow previous literature and define a virtual team as one "whose members rely on technology-mediated communication in working across geographical, organizational, and/or time boundaries to accomplish team tasks and achieve team goals" (Wakefield et al., 2008, p. 435). We assume the virtual team to be one in which team members are assigned and where most, if not all, communication is virtual. This type of team is increasingly common in modern organizations, and such teams may benefit greatly from the ability of team members to communicate and verify their identities.

3.1   Media Capabilities

Media richness (Daft and Lengel, 1986) is a medium's capacity for transmission of multiple cues and rapid feedback. MRT is one of the most widely used media theories in IS research (Dennis et al., 2008), and has been applied in numerous contexts. According to MRT, richer media should be more effective in contexts where the goals of communication are ambiguous.

Given our focus on how virtual team members share and verify identities with each other, media richness should be relevant in determining whether team members are able to reveal their identities and judge whether their co-workers are correctly interpreting them. Identity communication is complex and ambiguous, and the multiplicity of cues and immediate feedback available in richer media (Trevino et al., 1990), should allow team members to better present themselves and assess others' reception of their self-presentation. We thus propose media richness as a positive predictor of identity communication and verification.

>   *H1a: A medium's richness is positively related to its users' perceived identity communication.*

>   *H1b: A medium's richness is positively related to its users' perceived identity verification.*

Building on MRT, MST (Dennis et al., 2008) focuses on the ability of a medium to support *synchronicity* – a shared pattern of coordinated behaviour among collaborating individuals. MST introduced five media capabilities that support synchronicity: transmission velocity, parallelism, symbol sets, rehearsability, and reprocessability. Three of these capabilities (velocity, parallelism, and symbol sets) overlap conceptually with the media richness construct (i.e., via immediacy of feedback, number of channels, and number of cues and language variety, respectively). Rehearsability and reprocessability, however, each add unique concepts that are particularly relevant in our context.

Rehearsability is the extent to which the sender can practice and/or modify the message before it is communicated (Dennis et al., 2008). Rehearsability should be highly relevant for identity communication, since media supporting rehearsability would allow users to carefully construct and control the identity-related messages they send. If a user desires to communicate a certain identity, it should be beneficial to be able to refine or edit the message prior to sending. Such control would allow the individual to precisely present the desired identity (Cornelius and Boos, 2003; Kock, 1998; Treem and Leonardi, 2012). An example of such behaviour would be the careful reading of an email prior to sending to ensure proper grammar and spelling, which could communicate competence, writing ability, or attention to detail. Accordingly, we propose that a medium that provides rehearsability to its users will increase users' identity communication and verification.

> *H2a: A medium's rehearsability capability is positively related to its users' perceived identity communication.*

> *H2b: A medium's rehearsability capability is positively related to its users' perceived identity verification.*

Reprocessability is the ability for a communicator to review prior interactions (Dennis et al., 2008). This capability improves information processing on the receiving end and should also influence users' identity communication and verification processes. A technology that makes prior communications accessible to users would allow other team members to carefully interpret and re-examine identity-related information. Similar capabilities in online communities increase community members' perceptions of identity verification (Ma and Agarwal, 2007), and have been identified as relevant features in organizational use of social media (Treem and Leonardi, 2012). We also propose that a medium high in reprocessability will increase users' perceptions of identity communication and verification.

> *H3a: A medium's reprocessability capability is positively related to its users' perceived identity communication.*

> *H3b: A medium's reprocessability capability is positively related to its users' perceived identity verification.*

Though it may seem counterintuitive, we purposefully predict simultaneous positive impacts of media richness, rehearsability, and reprocessability. Richer media (e.g., video conferencing technologies) are generally low in rehearsability and reprocessability, and vice versa. We argue, however, that each of the three capabilities will separately contribute to identity communication for the reasons outlined above. Following this logic, the hypothetical, rich medium that is also high in both rehearsability and reprocessability (e.g., a video messaging service) would better facilitate identity communication and verification as compared to a typical rich medium, such as standard video conferencing technology.

Many collaboration technologies provide users a profile page where they can list personal interests, attributes, skills, and sometimes upload a picture of themselves, and is a primary way in which identity information is communicated (Döring, 2002; Schau and Gilly, 2003; Wynn and Katz, 1997). Profiles provide a conduit through which an individual can communicate traits or skills that might otherwise not be easily communicated (Treem and Leonardi, 2012), including social or professional connections with other individuals (Treem and Leonardi, 2012). Online communities that make profile information accessible to users have been shown to increase identity verification within the community (Ma and Agarwal, 2007). In the context of virtual team collaboration, a technology with this capability—which we term *profiling*—should better facilitate identity communication and verification among its users.

> *H4a: A medium's profiling capability is positively related to its users' perceived identity communication.*

> *H4b: A medium's profiling capability is positively related to its users' perceived identity verification.*

3.2   Identity Communication and Verification

Identity communication is the numerous methods (e.g., verbal, written, and behavioural) a person uses to convey self-identities (Thatcher et al., 2003). Identity verification refers to the process of bringing others to confirm one's identity (Swann, 1983). We adapt these concepts to the virtual teams context, and we limit our theory to users' *perceptions* regarding these two processes. We argue that most, if not all, of the positive team outcomes in our model are caused by users' perceptions that their identities are being communicated and verified. While these perceptions might not align perfectly with actual communication and verification, we reserve this possibility as a potential topic for future research.

For identity verification to occur, an individual must first communicate that identity (Ma and Agarwal, 2007). This is particularly true in mediated contexts such as ours. In non-mediated contexts, the receiver may perceive many signals or messages that the sender is not purposely sending. For example, the receiver may notice and draw conclusions about a wedding ring on the sender's finger. This identity information is more easily communicated in a face-to-face setting, while in mediated settings such information is hidden from other users unless it is specifically communicated. Greater perceived identity communication thus leads to increases in perceived identity verification.

> *H5: Perceived identity communication positively influences perceived identity verification.*

Research has shown identity communication and verification in a face-to-face context to be beneficial for groups. Members of groups who verify one another's personal identities perform better (Polzer et al., 2002; Swann et al., 2003; Swann et al., 2000), cooperate more (Milton and Westphal, 2005), feel more connected and immersed (Thatcher et al., 2003), and focus energies on improving group outcomes. These compelling findings have not been tested in the virtual-teams context. We test this possibility, and propose that perceived identity communication and verification will facilitate greater trust and stronger group performance among virtual groups.

> *H6a: Perceived identity communication positively influences virtual team performance.*

> *H6b: Perceived identity communication positively influences virtual team trust.*

> *H7a: Perceived identity verification positively influences virtual team performance.*

> *H7b: Perceived identity verification positively influences virtual team trust.*

A multitude of prior research has examined the positive effects of trust on virtual team performance in mediated environments (e.g., Coppola et al., 2004; Jarvenpaa and Leidner, 1998; Jarvenpaa et al., 2004; Kanawattanachai and Yoo, 2002; Piccoli and Ives, 2003). To fully examine the impact of identity communication and verification on team performance, including its proposed influence through trust, we replicate this relationship within our model.

> *H8: Trust positively influences virtual team performance.*

4   Proposed Methodology

The methodology for this research will involve two stages. The first will be a measurement development effort to produce a set of measurement items to measure our focal constructs—perceived identity communication and perceived identity verification—using conventional scale development practices (MacKenzie et al., 2011). Item generation will be informed by careful literature review and structured interviews with professionals who work as members of virtual teams. The items will be pilot-tested and refined through an iterative process in preparation for their use in the second phase of the research.

Stage two will consist of a series of controlled experiments, during which specific technology capabilities will be enabled or disabled to examine their downstream effects on the other constructs in the model. In each experiment, participants will be randomly assigned to team-pairs and asked to complete several collaborative tasks using a collaboration technology we are developing for this study. The operationalizations for each of the independent variables will be integrated into the interface and

are summarized in Table 1. Team performance will be operationalized objectively, depending on the nature of the task. For example, performance in a brainstorming task will be operationalized as the number of unique ideas produced, while performance in a problem-solving task would be operationalized as the correctness of the group's proposed solution. The constructs of perceived identity communication, perceived identity verification, and the remaining virtual teams outcomes will be measured using a survey instrument completed after the experimental procedure.

Construct	Description
Media richness	Collaborative communication will occur either through a two-way audio channel (high richness) or a text-based chat interface (low richness). This manipulation will be tested separately from those of the reprocessability and rehearsability constructs, since two-way audio communication is inherently low in both reprocessability and rehearsability.
Reprocessability	The messages sent among the team members will either be archived for later inspection (high reprocessability) or deleted immediately after they are initially read (low reprocessability).
Rehearsability	The participants will either be able to think about, edit, and manipulate their messages prior to sending (high rehearsability) or their messages will be transmitted character-for-character as they are typed (low rehearsability).
Profiling	Users will either be able to select and manipulate a personalized avatar and username and provide a few facts about their hobbies/interests (high profiling) or they will be assigned generic avatars and usernames and not be enabled to provide bits of personal information (low profiling).

Table 1.   Detail on Experimental Manipulations

5   Expected Contributions

The completion of this research will produce several theoretical and practical contributions. First, the theory developed here is among the first to suggest how to improve identity communication and verification through the use of specific characteristics of the communication technology. We have argued that people have a natural desire to communicate their identities and have them verified by others (Swann, 1983). We draw from both MRT and MST to theoretically derive media characteristics that should facilitate identity communication and verification during virtual team collaboration. This constitutes an important addition to our understanding of how virtual teams use technology, and how technology can better support effective group processes.

This study is the first to theorize how identity communication and verification influence outcomes in virtual teams. Given the positive outcomes of identity communication and verification identified in non-mediated contexts, our study will further contribute to the virtual teams literature. Our theory lays the groundwork for a range of future research that examines identity in virtual teams. Other possible outcomes of identity communication and verification that could be addressed include creativity (Beyer and Hannah, 2002; Cheng et al., 2008), satisfaction (Thatcher and Greer, 2008; Wrzesniewski et al., 2003), and motivation (Dutton et al., 2010; Polzer et al., 2002). Identity communication and verification may also moderate the effect of team diversity on performance (Polzer et al., 2002). Clearly we are just scratching the surface in understanding how identity plays a role in virtual teams.

Our research will also result in practical contributions. First, we hope to reveal the importance of identity communication in virtual teams, something that would be highly relevant for organizations seeking more effective ways to leverage virtual teams. Our expected findings will provide managers a new strategy to pursue in trying to increase performance of, and overcome the difficulties associated with, a distributed workforce. Further, our experimental manipulation strategy will allow us to provide specific design guidelines for systems that facilitate identity communication and verification in virtual environments. We have theoretically derived several media characteristics that should facilitate positive identity communication and verification, and these can be directly applied by designers of collaborative systems hoping to facilitate these processes with technology.

6 Conclusion

This research-in-progress paper argues that identity communication and verification are important and under-researched in the context of virtual teams. Drawing from a strong empirical foundation for identity-related outcomes in non-mediated settings, we propose that identity communication and verification will positively impact virtual team trust and performance. We propose specific technology capabilities that should facilitate positive identity communication and verification. The conclusion of the proposed research will make significant contributions to the virtual teams literature, as well as provide relevant, actionable guidelines for practitioners wishing to increase the effectiveness of virtual teams.

7 Acknowledgements

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