PSYCH 499 Thesis

Camera-On Communication:

Strengthening Virtual Team Cohesion through Nonverbal Cues

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Abstract

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Introduction

In today's globalized work environment, the prevalence of virtual teams has surged due to the rapid advancement of technology, influencing an organizations' choice of communication tools for their virtual teams (Hambley et al., 2007; Thompson & Coovert, 2003). As a result, it has become increasingly crucial to gain a deeper understanding of virtual teams to fully comprehend their dynamics, identify best practices, and optimize their effectiveness (Morrison-Smith & Ruiz, 2020; Powell et al., 2004). Virtual teams, as opposed to traditional, face-to-face (FTF) teams, are geographically, organizationally, and temporally separated but collaborate using information technologies to complete tasks assigned by the organization (Ebrahim et al., 2009; Powell et al., 2004). Virtual team structures have gained popularity due to the natural benefits that come with remote work for employees and organizations and are expected to become increasingly important to organizations as a prevalent form of work unit (Morrison-Smith & Ruiz, 2020; Hertel et al., 2004). However, virtual teams face unique communication challenges that their traditional counterparts do not (DeRosa et al., 2004). The communication constraints that affect the processes and structures of teams who work remotely need to be addressed to ensure team and organizational success (Beldarrain & Diehl, 2019).

Computer mediated communication channels naturally lose important aspects of communication such as nonverbal cues, which play a significant role in determining and conveying meaning in conversations. When people interact, different nonverbal channels are used through body, voice, face, appearance, touch, timing, and physical environment,

collectively contributing to the total communication process (Burgoon et al., 2010). When virtual teams use communication technologies that limit their nonverbal cues, the nuances of those cues are lost, along with a deeper understanding of what is being communicated (Burgoon & Le Poire, 1999). This can lead to miscommunications that slow down project completion times, resulting in organizations spending more time and money on a project than necessary. For instance, in a virtual setting, a team member who is sharing information needs to ensure that the person receiving the message comprehends it, which is commonly done with nonverbal, active listening behaviors (e.g., nodding in agreement, maintaining eye contact). To improve communication effectiveness by accommodating nonverbal cues, many virtual teams use video technologies.

Communication issues in virtual teams can often be alleviated by utilizing technologies that enhance the effectiveness of communication through improved access to nonverbal cues (Burgoon et al., 2010). To mitigate these common communication issues, we look to technology that has capacity to facilitate communication through to increase those key nonverbal cues that are essential to having shared meaning in a conversation (Burgoon, 1996). Implementing Camera-on Communication (COC) introduces more nonverbal cues, creating connection through visual nonverbal communication, arguing that the use of video communication is beneficial in fostering cohesion (Marlow et al., 2017). Access to more nonverbal cues should help virtual teams build stronger relationships and team identity.

In this research we use COC to describe virtual communication between two or more individuals, when using a webcam with video capabilities enabled. The management and communication literatures have not established consistent terminology to describe video-enhanced virtual meeting technology. In the literature, the difference between "videoconferencing," "teleconferencing," or "web conferencing" is unclear, and authors do not

always explicitly state which video functions participants actually used: Audio-Video, Audio Only, or Text Only. When "COC" is used instead of "videoconferencing", we know that the camera is always on, transmitting visual-audio information, compared to when the camera is off. A rich media source can convey information effectively through verbal and nonverbal channels, facilitating an increase in understanding and interpretation of messages (Daft & Lengel, 1986). We explore whether using COC in virtual team meetings can benefit team members. By introducing the COC term, we extend prior research by examining the effect of having video capabilities enabled to allow richer, nonverbal communication and build team cohesion.

Virtual teams often struggle to establish high-quality relationships among team members due to the lack of informal discussions via COC, which are essential for developing collective identity and a sense of belonging, key elements of team cohesiveness (Marlow et al., 2017; Morrison-Smith & Ruiz, 2020). The lack of nonverbal cues in text-based electronic messaging negatively affects social interactions (Walther et al., 2005). As explained by Walther et al. (1994), computer-supported teams require more time to build close relationships than FTF teams, mainly due to the limitations of typing and the time constraints in computer-mediated environments that result in less personal information exchanged. Team members who interact virtually with one another do not informally interact often, so when they do, those interactions need to be rich in communication.

A key indicator of strong team identity is team cohesion. Team cohesion is the tendency for group members to form social connections, leading to unity within the group (Carron & Brawley, 2000). Cohesion has been associated with higher satisfaction and an increase in performance (Powell et al., 2004). In a virtual team, cohesion is increased from relationship building interactions such as attending a training or sending social information to one another.

Relationship building enhances the sense of inclusivity and belonging within a team, a factor that promotes cohesion (Powell et al., 2004). A common recommendation from literature suggests that a virtual team should first meet FTF in the team's "launch phase" as it has been found to foster socialization and improve communication among team members (Maznevski & Chudoba, 2001). Due to the lack of FTF contact virtual teams have, this step is in hopes of mitigating negative effects such as poor understanding and strained communication (Hambley, 2007; Morrison-Smith & Ruiz, 2020; Rhoads, 2010). As mentioned, these solutions are not feasible for those virtual teams that do not have the option of meeting in person for reasons such as the financial strain of team members travelling far distances (Morrison-Smith & Ruiz, 2020). Developing cohesion is important for virtual teams because it will help them to collaborate on projects together efficiently (Powell et al., 2004, Casey-Campbell & Martens, 2009).

While previous research has investigated the use of COC in virtual teams, there remains a gap in the literature regarding the relationship between nonverbal communication and team cohesion, and to what extent COC plays a role in this relationship. This research asks whether attention to nonverbal cues helps virtual teams build cohesion. We predict that when team members report greater attention to nonverbal communication, their teams will report higher cohesion. Further, we test the significance of virtual teams using video technology during their meetings. We predict that teams will report higher attention to nonverbal communication and thus develop stronger cohesion the more often members have their video cameras on during meetings. We test these predictions in a sample of student teams that worked virtually throughout a 4-month semester. Results will inform our understanding of the importance of both nonverbal communication and COC in virtual teamwork.

Theory

Prior literature has focused on comparing virtual teams and FTF teams, measuring interpersonal and performance outcomes and often reporting contradictory results. Some researchers conclude that FTF teams have higher levels of cohesion in every comparison between the two team structures, whereas others conclude that over time virtual team members are able to develop equally strong levels of cohesion through synchronous communication (Chidambaram, 1996; Powell et al., 2004; Olsen et al., 2014). Given the prevalence and cost-savings of virtual teams, rather than focusing on the distinctions between the two groups, organizations would benefit from prioritizing their existing virtual team structure. To this end, the current research examines the degree to which nonverbal communication perception is related to cohesion in virtual teams, and the degree to which COC moderates this relationship.

Communication in Virtual Teams

Virtual teamwork is most commonly defined as "groups of geographically, organizationally and/or time dispersed workers brought together by information technologies to accomplish one or more organization tasks" (Powell et al., 2004). Although virtual teams and FTF team structures differ, they share the fundamental framework of a team where "a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as an intact social entity embedded in one or more larger systems, and who manage their relationship across organizational boundaries" (Cohen & Bailey, 1997). In this research, we understand "virtual teams" to be fully remote, completely dependent on technology with no FTF contact.

Virtual team composition can include team members from highly specialized backgrounds who live in geographically distant locations and opens hiring avenues for

organizations to hire the best talent available (Ebrahim, 2011). The locations in which they work from can vary widely, where all or part of the team's individual team members could be working in different provinces or countries (Ebrahim, 2011). It is common for individuals who work remotely to be in specialized teams on complex projects that require constant reciprocal communication and feedback from other coworkers, needing strong communication channels to be successful (Bell & Kozlowski, 2002). The capability of asynchronous communication is limited, and for teams to be successful, they require video-audio capabilities allowing for immediate feedback and nonverbal cues to convey information accurately and without misunderstandings (Bell & Kozlowski, 2002). Many researchers refer to Media Richness Theory, which considers FTF communication to be the most effective form of communication, in hopes of offering solutions to virtual team communication issues (Van der Kleij et al. 2009; Kahai & Cooper, 2003).

Media Richness Theory posits that various communication media along a spectrum range from "rich" communication to "lean" communication, where FTF communication is the richest compared to email, a lean form of communication. Video communication and voice communication, on the other hand, occupy positions along the spectrum between these two extremes (Daft & Lengel, 1986). This theory proposes that to mitigate the communication challenges faced by virtual teams, those teams should meet FTF intermittently to establish common ground (Morrison-Smith & Ruiz, 2020). Periodic FTF interactions are suggested to be the most effective for virtual team outcomes, although, this solution may not be realistic given the needs of organizations today (Hambly et al., 2007). Media Richness Theory does not fully account for major technological advances in COC, and its solution for common communication

issues in virtual teams is not feasible for fully remote workers (Daft and Lengel, 1984; Rhoads, 2010; Kahai & Cooper, 2003).

Media Richness Theory, developed in 1994, emphasizes the importance of choosing the appropriate communication medium based on the nature of the message and context (Kock, 2005). It suggests that richer media are better for conveying complex information and receiving immediate feedback. Given that this theory was formulated when less advanced technologies were available, evidence suggests that modern technology can now effectively transmit a greater amount of information through both lean and rich media (Kock, 2005). Due to the theory's incomplete scope, we focus instead on Social Information Processing Theory for its application to more modern mediums of communication.

Social Information Processing Theory (Walther et al., 2005) emphasizes the importance of social interaction and relationship development that occur through modern communication channels. It argues that individuals in virtual environments can still develop relationships with each other and communicate effectively despite fewer nonverbal cues being (Walther et al., 2005). Social Information Processing Theory proposes that virtual teams can reach comparable levels of interpersonal interaction with FTF teams, if they have sufficient time to build relationships and establish common ground (Walther et al., 2005; DeRosa et al. 2004). Social Information Processing Theory tells us that individuals are still inherently drawn to develop relationships, even when communicating virtually. Individuals can adapt their language, style, and other cues to compensate for unavailable nonverbal cues that occur in face-to-face (FTF) communication, and computer-mediated technology, such as COC can arguably accommodate the most nonverbal cues when FTF contact is unavailable. The utilization of COC fosters the possibility of increasing positive interaction and communication, leading to similar emotional

and interpersonal quality of connection to that of FTF communication (Walther et al., 2005, Burgoon et al., 2010). Even with COC, virtual teams may initially struggle with reduced knowledge sharing and weaker interpersonal ties, but these disadvantages may dissipate over time as teams work together more frequently (Hill et al. 2009; Walther et al., 2005).

Similarly, Media Naturalness Perspective proposes that virtual teams can achieve comparable levels of trust, communication effectiveness, interpersonal connection, and performance as FTF teams, while considering that adequate time to adapt to the new technology needs to be provided (DeRosa, 2004). Media Naturalness Perspective suggests that human evolution has conditioned a person to prefer the more natural FTF communication, hindering a person's ability to adapt to a new technological tool (Kock, 2009). Although this barrier exists, humans are adaptable and have the capacity to learn and adjust to these new communication technologies (Rhoads, 2010). Limited social and emotional information sharing in virtual communication makes the formation of relationships difficult (Chidambara, 1996). Despite these challenges, as team members continue to work together over time with technological tools that foster interpersonal relationships, those disadvantages become lessened (Hill et al., 2009, Rhoads, 2010). COC offers richer forms of communication than other virtual communication options, allowing virtual teams to have nuanced communication similar to traditional FTF teams (De Rosa, 2004, Morrison-Smith & Ruiz, 2020).

Mention synchrnonicity "As expected, we also found a main effect of synchronicity, where those teams that communicated synchronously more often perceived their team as acting as a single, cohesive group, regardless of having the camera on or off"

Moreover, synchronicity offers

Quickness of feedback-richer communication

Synchronous collaboration

In Kirkman and

Mathieu's (2005) framework, communication modalities such as email are conceptualized as being low in informational richness

whereas videoconferencing tools are defined as being nearly as rich in informational value as face-to-face communication. This is

in accordance with the arguments outlined above, as videoconferencing tools enable team members to send and receive nonverbal

and vocal cues which are features argued to enhance informational richness. This, in turn, is posited to increase communication qual-

ity which ultimately fosters higher team performance (Cramton, 2001; Hertel et al., 2005). Thus, this framework and the theory un-

derlying it suggest that as informational richness increases, communication quality is enhanced; as communication quality is related

to performance, this argument further implies that performance will be enhanced as a result of incorporating virtual tools high in in-

formational value to communicate. On the whole, this theory suggests that virtual teams that cannot incorporate face-to-face com-

munication can implement tools high in informational value to improve communication quality and, ultimately, team

performance. (Marlow et al., 2017)

Synchronicity describes the capability of a communication tool to

concurrently engage all team members in the communication event (Carlson and

> George, 2004, p. 192). Media with a high degree of synchronicity allow the participants to communicate in real time (e.g., video or phone conference). Differences in temporal synchronicity influence the effectiveness of a virtual team (Montoya-West et al., 2001; Kirkman et al., 2004). We will argue that synchronicity is a core factor influencing the knowledge integration in virtual teams. (Curşeu et al., 2008)

Synchronous communication can involve instant messaging, videoconferencing tolls and shared access to other forms of active collaboration to work on joint tasks.

One context variable could be identified in this study:familiarity. It fosters coherence, explicit references, and task orientation. Friends and other well-familiar participants orient their talk more toward their communication partners than toward only identifiable participants who may not expect pro-longed interpersonal interaction.Maybe unfamiliar ad hoc groups need more time to establish routines and interpersonal relationship and thus cannot solely focus on the task.However, the effect offamiliarity is rather small com-pared to the effect of training on coherence, explicit references, and task orientation. (Cornelius & Boos, 2003)

Collaborative technologies differ along the dimension of synchronicity of communications. Some technologies, such as email, are geared to work in an asynchronous setting, while others, such as desktop conferencing, (including audio/video components) can only operate in synchronous settings. Instant feedback and immediate response—hallmarks of traditional face-to-face interactions—are characteristic of synchronous communication, while delayed feedbackand deferred responses are characteristic of asynchronous communication. Thus, this capability can be viewed as one with dichotomous values—some CTs support real time communication while others support deferred communication. (Carte et al., 2004)

In this study, we investigate whether COC and the amount of time a team communicates synchronously increases the positive effect of attention to nonverbal communication on team cohesion.

Attention to Nonverbal Communication

Nonverbal cues are a type of communication that provides information about one's interlocutor, the person they're interacting with such as their level of competence or experience, their status within the team, and emotional tone that conveys whether the speaker is angry, tense, or confident (Driskell et al., 2003).

Nonverbal communication includes behaviors that foster shared understanding and meaning between individuals who are interacting and is an essential part of effective communication (Burgoon et al., 1996; Hale, 2003). According to a meta-analysis, it was found that nonverbal cues account for as much as 63% of the overall social meaning in an interaction (Burgoon, 1996).

Successful communication requires a combination of both verbal and nonverbal cues, with the latter playing a pivotal role in conveying meaning and interpreting messages (Burgoon & Le Poire, 1999). According to Mehrabian's (1971) research, approximately 55% of a message's meaning can be attributed to nonverbal cues like body language, while roughly 38% of meaning can be derived from factors such as tone of voice and other nuanced cues (Beldarrain & Diehl, 2019). Nonverbal communication includes body language such as eye contact, posture, facial expression, and physical movements, (Hannigan et al., 2020). When nonverbal cues are present, it is easier to interpret an intended behaviour. These cues also reveal whether the message is being effectively communicated, such as whether others are paying attention or appear puzzled (Driskell et al., 2003). Nonverbal communication is often ambiguous because a single nonverbal

cue can have multiple meanings (Burgoon et al., 2010). The meaning of a behavior can be better understood when considered with its accompanying verbal and nonverbal cues. This helps to define and clarify its interpretation and avoid misunderstandings (Burgoon & Le Poire, 1999). For example, in a virtual meeting using COC, team members can see each other's faces and recognize if someone needs clarification, or if everyone is nodding along in shared understanding.

Various nonverbal communication channels used together create meaning in the information relayed to another person. Haptics refers to using touch as a means of communication, such as a handshake or hug (Burgoon et al., 2010). In contrast, proxemics involves the use of physical distance, including one's perception of personal space, to convey messages nonverbally. Body movements, such as facial expressions, head movements, eye behavior, gestures, and posture, are examples of a nonverbal communication channel known as kinesics (Burgoon et al., 2010). In virtual team settings haptics and proxemics are not an available nonverbal communication channel that can be utilized as team members are not present in person to engage in touch or notice physical distance. But when video is being used, and team members can see each other, they are able to use kinetics nonverbal communication channels to add meaning and understanding when sending and receiving information virtually. This is important when people present themselves to others, creating impressions when being interviewed, having a meeting, or a conversation with coworkers (Burgoon, 1999). Communicating relational messages is one of the primary functions of nonverbal communication, and signals how team members regard one another in the context of the relationship (Burgoon, 1999). Nonverbal cues help make connections and manage conversations by helping regulate greeting rituals, turn-taking patters, and patterns of matched or mismatched

interactions, such as when team members accidentally start talking at the same time, disrupting the pattern of the conversation. Nonverbal cues can also foster credibility, power, and influence. When a superior exerts dominance over an employee, they may maintain strong eye contact, use an expansive posture and assertive gestures (Burgoon, 1999). The comprehensive understanding and interpretation of these nonverbal communication channels enhances our overall understanding of communication. This is because these channels often convey messages and emotions that extend beyond the limitations of verbal expressions (Burgoon et al., 2010).

Camera-on Communication

In cases where native and non-native language speakers are working on the same team, research has shown that non-native speakers' performance increased when using COC (Veinott et al., 1999). When an individual has low language proficiency and no common ground with their team members, their performance suffers in text-only and audio-only virtual communication because they can't exchange iconic gestures (hand movements used to help understanding) or facial expressions, an important factor in clarifying their communication. However, when they can use gestures and facial expressions and negotiate a shared meaning more efficiently to better understand each other, their performance increases (Veinott et al., 1999). This is especially important for geographically dispersed teams with limited mutual understanding between team members, where being able to understand nonverbal cues can reduce misunderstandings and improve communication (Marlow, 2017). Investing in COC can be highly beneficial in these situations, as team members who have a mutual understanding of each other's backgrounds and perspectives can communicate more effectively and avoid the need for frequent clarification (Olson et al., 2012; Veinott et al., 1999).

Using richer communication technologies like COC can increase the availability of nonverbal cues, feedback, and customization of communication based on context (Olson et al., 2012). COC also accommodates for missing verbal and nonverbal cues that are lost in non-COC technology tools, such as subtle voice inflection, conveying personal feelings and emotions, and natural language (Daft & Lengel, 1986; Kahai & Cooper, 2003). As noted above, nonverbal communication makes up at least 85% of interpersonal communication, while only 7% to 10% is conveyed through spoken words, making COC a valuable resource for virtual team cohesion (Hannigan et al., 2020). The use of COC technology in virtual teams can provide a more comprehensive communication experience by accommodating missing nonverbal cues, improving the team's ability to build interpersonal connections. In other words, the positive benefits of attention to nonverbal communication in virtual teams will be even greater when teams use COC.

Cohesion in Virtual Teams

Team cohesion refers to the collective commitment of members forming social connections, which ultimately leads to a sense of unity and solidarity among team members (Carron & Brawley, 2000). Typically, a positive sense of cohesion and identity is thought to enhance interpersonal communication among group members, leading to heightened engagement, improved acceptance of goals, tasks, and roles (Cartwright, 1968). Highly cohesive teams often report higher satisfaction with their team dynamics and, in many cases, outperform teams with lower levels of cohesion (Mullen & Copper, 1994). Organizations are interested in the antecedents of cohesion as the benefits of cohesion and a strong team identity have been found to be positively associated with team performance (Hung & Gatica-Perez, 2010). Developing strong bonds that encourage cohesion within virtual team dynamics is generally

difficult. This is because virtual teams are more likely to be task-oriented compared to socially oriented due to the inherent computer-mediated communication limitations (Casey-Campbell & Martens, 2009; Tuckman, 1965). One way research has demonstrated to mitigate this is through informal and unplanned interactions, helping build relationships between team members and encouraging group identity and a sense of cohesion (Morrison-Smith & Ruiz, 2020).

Virtual team members have fewer opportunities to engage in casual and spontaneous interactions that often occur FTF in shared physical spaces, such as informal chatting before or after a meeting (Morrison-Smith & Ruiz, 2020). These impromptu, casual interactions play a crucial role in fostering social bonds and cultivating a sense of belonging within the team (Ågerfalk et al., 2005). In virtual team settings there are no opportunities to spontaneously chat with a coworker in passing. Work on the wording here. First say that nonverbals help facilitate communication, then that COC helps facilitate conversations & belonging, it amplifies the impact of nvb. Considering virtual teams have limited options for connecting, COC is a valuable tool that can facilitate casual conversations, fostering feelings of belonging and identity using synchronous video that allows full transmission of nonverbal communication cues. Without the use of COC there is a lack of nonverbal and contextual cues in computer-mediated environments. This results in virtual team members experiencing reduced interpersonal attraction (a key aspect of team cohesiveness) compared to FTF meetings (Ehsan et al., 2008).

The experience of isolation and a sense of alienation can detrimentally impact relationships among workers in geographically dispersed virtual teams, and results in a decreased identification with the group, negatively affecting a team's cohesiveness (Cooper & Kurland, 2002). As mentioned, virtual teams do not always have the opportunity to connect FTF, and is not a viable option for some, including the sample in this study. The consistent use of COC in

virtual teams diminishes feelings of isolation by increasing the capacity to transmit and receive interpersonal impressions and warmth (Culnan & Markys, 1897, Walther et al., 2005). COC serves as a valuable platform for real-time interactions, fostering a sense of presence and immediacy even in virtual settings, enhancing clarity and reducing miscommunications (Klitmøller & Lauring, 2013; Morrison-Smith & Ruiz, 2020).

Virtual teams can utilize COC as an option to better support relational information, spontaneous communication, and nonverbal cues such as voice inflictions, gestures, and facial expressions, and thereby increasing levels of team cohesiveness (Morrison-Smith & Ruiz, 2020, Culnan & Markus, 1987). Synchronous communication, as opposed to asynchronous communication, can host more transmission of nonverbal cues during conversations. Conversely, when using asynchronous communication like email or chat forums, many forms of communication are lost. Those teams that use more synchronous communication will be able to perceive more nonverbal cues more easily. This will strengthen the relationship between nonverbal communication and team cohesion.

Team interactions that are mediated through technology often lead to difficulty establishing relationships among team members, creating an environment that does not encourage team cohesion (Driskell et al., 2003). Although, when virtual teams develop a shared understanding, team members can create a foundation for building relationships and fostering stronger bonds that are a facet of team cohesion (Morrison-Smith & Ruiz, 2020). These stronger relationships within teams contribute to a collective sense of connection within the team and a greater commitment to the team's success, additional facets of team cohesion (Morrison-Smith & Ruiz, 2020).

In sum, we have argued that teams that report greater attention to nonverbal communication will have stronger feelings of team cohesion. Furthermore, as teams use more synchronous communication and COC, the positive relationship between nonverbal communication and team cohesion will be even stronger.

This leads us to the following hypotheses:

H1: In a virtual meeting team environment, there will be a positive relationship between Nonverbal Communication Perception and Team Cohesion.

H2: In a virtual meeting team environment, Camera-on Communication and Synchronous Communication moderate the positive relationship between Nonverbal Communication Perception and Team Cohesion by making it stronger in an additive fashion.

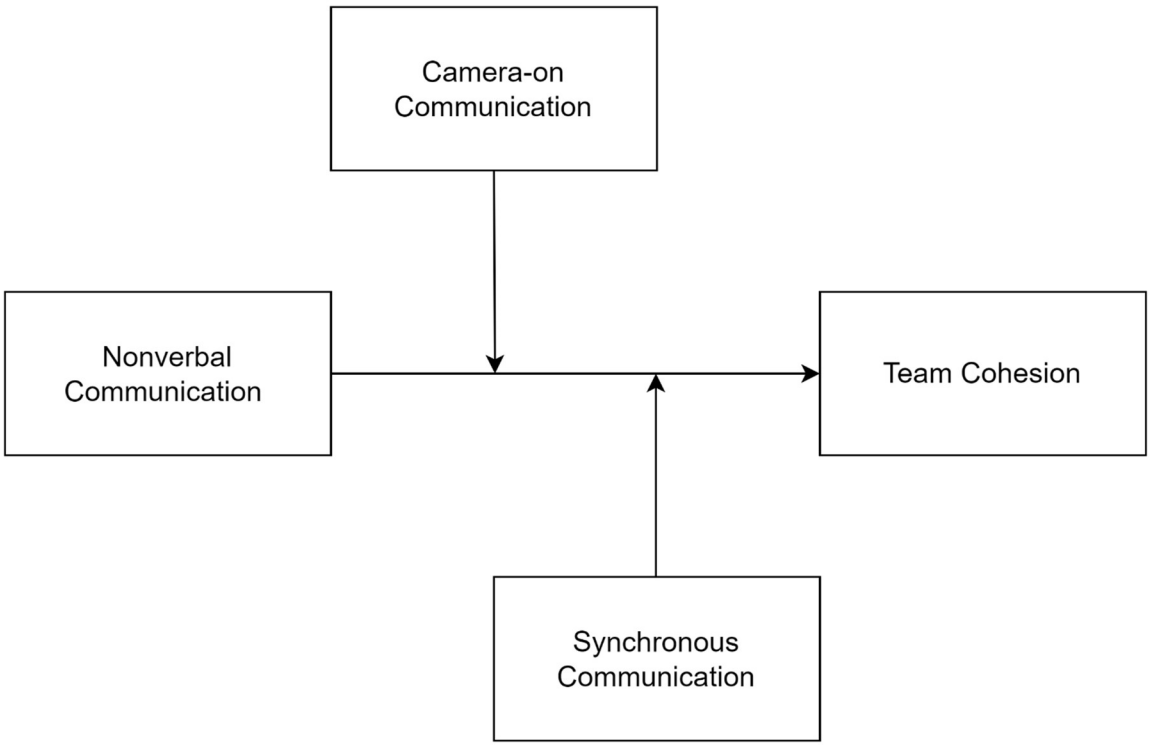

Figure 1. Nonverbal Communication Perception has a positive relationship with Team Cohesion. Camera-on Communication and Synchronous Communication moderate the relationship between Nonverbal Communication Perception and Team Cohesion.

Method

Participants

This study analyzed secondary data from 344 individuals in 95 teams who participated in a study on virtual communication and teamwork. Students were enrolled in an on-line undergraduate international business course in the U.S. They worked in teams of four to six students throughout the term on a series of projects and assignments. Not all group members responded to the survey, resulting in missing data. We analyzed teams that had at least two people in their group respond. Groups that only had one team member respond to the survey were excluded from analysis. It should be noted that 10 individuals were excluded due to 9 individuals being the only participant to respond to the survey in their team and one individual

was excluded due to missing responses. We excluded the teams with one person due to the concept of what a team implies: the presence of two or more individuals interacting and coordinating their efforts to meet a goal.

The primary research examined how synchronous vs asynchronous virtual communication impacted relationship building, trust, and performance in student teams. The current research examines only those teams that used synchronous communication. Participants were asked to identify how often they communicated with their team members solely through COC platforms and asynchronously.

Procedure

Data were collected using three surveys facilitated by the database Qualtrics. At the beginning of the semester (Time 1), participants were asked to provide general demographic information and a general communication style questionnaire (Adair et al., 2016). At Time 2, the participants were asked to report how they virtually communicate and interact with their project team members, including their synchronous and asynchronous communication styles. At Time 3, they reported their perceived team cohesion.

Measures

Predictor: Nonverbal Communication Perception. For the Time 2 survey participants were asked to what extent they understand other team members through nonverbal cues such as tone of voice or body language. The eight questions that measured Nonverbal Communication appear in Appendix A. We used the Nonverbal Communication Scale with Subdimensions: Nonverbal Communication Perception (eg: I am very good at knowing the feelings other people are experiencing by paying close attention to their tone of voice, body language, etc.), Engaged Listening (eg: I listen very carefully to people when they talk.), and Mindful Video Appearance

(eg: I tend to touch up my hair and face to make myself presentable on screen.) Mindful Video Appearance originally included four items, one item was removed due to poor fit and poor reliability (r=.58), reliability increased when the item was removed (r=.70).

Criterion: Cohesion. Researchers created two items to measure team cohesion based on the construct definition from Cohesion was operationalized with two items (Our team has a strong sense of what it is; Our team acted as a single, cohesive group) (Forsyth, 2019, p.129).

Moderators: Camera-on Communication and Synchronous Communication. The moderator, Camera-on Communication was operationalized with a single item. Participants were asked to rate how often they had their camera on while using videoconferencing technology using a 5-point Likert scale, ranging from "never" to "always". The moderator, Synchronous Communication was operationalized also using a single item. Participants were asked to indicate the percentage of the total group work time their team spent synchronously in addition to asynchronously communicating. We used the reported synchronous communication percentage for analyses.

Demographic Variables. Participants were asked to indicate their age, gender, country of primary residence, and number of years lived in their primary residence. Ages ranged from 18 to 46 (M=21.7, SD=4.1). 48% of the participants reported their gender as male, and 52% reporting to be female. Participants were reminded the information they provided will not be evaluated as part of their performance in the course or on their team and would not have any influence on their grades. Participants were asked to indicate the primary COC platform they utilized most frequently throughout the school term (e.g., Zoom, Google Meet, Microsoft Teams, FaceTime, etc.) for synchronously communicating with their team members. Notably, an overwhelming

94% of the participants relied on Zoom to synchronize with their group throughout the entire study duration.

Results

Preliminary Analyses

We conducted a factor analysis to gain insight into the relationships between latent variables in our Nonverbal Communication Scale and see what variables loaded onto which factor. The Structure Matrix showed that the three subdimensions for the Nonverbal Communication Scale were loading onto three factors (Nonverbal Communication Perception, Mindful Video Appearance, Engaged Listening) (Thompson, 2004). The item Message Understood ("I can tell from my counterpart's reactions that my messages are understood.") loaded onto both Nonverbal Communication Perception and Engaged Listening factors. An alpha reliability test was conducted, and we saw that when the item Message Understood was included, opposed to excluded in the Nonverbal Communication Perception subdimension, the reliability only increased from .77 to .79. When the item Message Understood was included in the Engaged Listening Subdimension, Message Understood increased from .70 to .73. Therefore, we chose to include this item in the Engaged Listening Subdimension.

Alpha reliability was computed for the Nonverbal Communication Scale: Nonverbal Communication Perception (r= .77), Engaged Listening (r= .73), and Mindful Video Appearance (r= .69). Alpha reliability for Team Cohesion was (r= .81). COC Frequency is a single item measure and thus did not compute reliability.

All data were aggregated to the team level before analyses. The correlation matrix including all relevant variables can be found in Table 1. We expected the Nonverbal Communication Scale to have a positive correlation with Team Cohesion. We found that the

subdimensions Nonverbal Communication Perception (r= .24, p< .01) and Engaged Listening (r= .51, p< .01) had positive correlations with Team Cohesion. As expected, the subdimensions of Nonverbal Communication Perception were positively correlated.

COC Frequency and Team Cohesion were not correlated with each other (r=.11, p> .01). This wasn't surprising, as our primary interest is in the concept that increasing COC Frequency fosters greater opportunities for nonverbal communication, rather than directly affecting Team Cohesion.

Surprisingly, Mindful Video Appearance was not correlated with Nonverbal Communication Perception (r=.12, p>.01), Engaged Listening (r=.06, p>.01), or Team Cohesion (r=.14, p>.01). Mindful Video Appearance was positively correlated with COC Frequency (r=.22, p<.01) and negatively correlated with Synchronous Communication (r= -.34, p<.01). Although, Mindful Video Appearance is correlated with our two moderator variables COC Frequency (r=), and Synchronous Communication (r=). This could have significance and is looked at closer in our regression model.

Table 1

Correlation Table

Variable	1	2	3	4	5	6
Nonverbal Communication Perception	-					
Engaged Listening	.54**	-				
Mindful Video Appearance	.12	.06	-			
Team Cohesion	.24*	.51**	.14	-		

COC Frequency	.22*	.27**	.22*	.11	-	
Synchronous Communication	-.11	.04	-.34**	.23*	-.13	-

Note: $^{*}p = \leq .05$. $^{**}p = \geq .01$.

Regression Analysis

We used step-wise regression to analyze the three dimensions of Nonverbal Communication: Nonverbal Perception (Table 1), Engaged Listening (Table 2), and Mindful Video Appearance (Table 3). All variables were mean centered before running analyses. The moderators, Synchronous Communication and Camera-On-Communication Frequency were transformed into dummy variables with 0 = all values below the median, and 1 = all values at the median and above. In each analysis, we first entered the three main effects, followed by all 2-way interactions in the second step, and the predicted three-way interaction in the third step.

Nonverbal Perception. We predicted a positive relationship between Nonverbal Perception and Team Cohesion, such that when team members reported greater Nonverbal Perception, their teams would report stronger cohesion, particularly when teams had higher levels of Synchronous Communication and Camera-on Communication.

Table 1, Step 1, shows that Nonverbal Perception has a positive, significant effect on Team Cohesion. For every one-unit increase in Nonverbal Perception, there is a predicted 0.315 increase in Team Cohesion, holding all other variables constant. What this means is that when a team is good at perceiving and understanding each other's nonverbal communication they report stronger Team Cohesion.

We predicted that the moderator, Synchronous Communication, would moderate the relationship between Nonverbal Perception and Team Cohesion. Synchronous Communication

was found to have a positive, significant main effect on Team Cohesion. In Table 1 you can see that for every one-unit increase in Synchronous Communication, there is a predicted 0.20 increase in Team Cohesion, holding all other variables constant. This translates to the more teams communicate synchronously through videoconferencing, the stronger feeling of team cohesion the group had.

Additionally, we predicted that our second moderator, COC Frequency, would moderate the relationship between Nonverbal Perception and Team Cohesion, such that the more often a team had their camera turned on during a videoconferencing meeting, stronger Team Cohesion was reported. Table 1, Step 1, shows the second moderator COC Frequency had a non-significant effect on Team Cohesion. What this means is that when a team is synchronously communicating with one another, having their video turned on does not affect their Team Cohesion.

Table 1, Step 2, shows that when two-way interactions are added, Synchronous Communication no longer has a positive, significant main effect on Team Cohesion. In addition, there were no significant interactions on Team Cohesion.

Table 1, Step 3, shows that when the three-way interaction (COC Frequency, Synchronous Communication, Nonverbal Perception) is added, Nonverbal Perception no longer has a positive significant main effect on Team Cohesion. In addition, all two-way and three-way interactions remain insignificant.

Table 1
Results of Multilinear Regression Analysis Results: Nonverbal Communication Perception

Independent Variable	Bs and βs	*Step 1*	*Step 2*	*Step 3*
Intercept	*B*	-.224*** (.078) $p < .001$	-.197* (.098) $p < .05$	-.227* (.100) $p < .05$
	β	—	—	—

Nonverbal Perception [c]	β	.227* (.141)	.293* (.278)	.122 (.329)
		$p < .05$	$p < .05$	$p = .610$
	B	.315	.406	.169
Synchronous Communication (SC) [b]	β	.232* (.086)	.184 (.125)	.228 (.128)
		$p < .05$	$p = .209$	$p = .128$
	B	.200	.159	.196
COC Frequency [a]	β	.029 (.781)	-.024 (.131)	.000 (.132)
		$p = .781$	$p = .873$	$p = .998$
	B	.025	-.021	.000
Interaction (a)	β		-.014 (.302)	.182 (.397)
			$p = .936$	$p = .421$
	B		-.024	.025
Interaction (b)	β		-.079 (.295)	.146 (.480)
			$p = .548$	$p = .498$
	B		-.178	.327
Interaction (c)	β		.078 (.180)	.059 (.180)
			$p = .654$	$p = .733$
	B		.081	.061
Interaction (d)	β			-.273 (.607)
				$p = .188$
	B			-.806

Note. $N = 5$. Unstandardized coefficients (B), standard errors (in brackets), p values, and standardized coefficients (β) are reported. Grand mean centered before being entered in the regressions.
[a] 0 = off, 1 = on. [b] 0 = less than 50%, 1 = more than 50%.
(a) Interaction = Nonverbal Perception × COC Frequency. (b) Interaction = Nonverbal Perception × Synchronous Communication. (c) Interaction = COC Frequency × Synchronous Communication. (d) Interaction = COC Frequency × Synchronous Communication × Nonverbal Perception.
* p < .05. ** p < .01. *** p < .001; two-tailed tests.

Engaged Listening. We predicted a positive relationship between Engaged Listening and Team Cohesion, such that when team members reported higher Engaged Listening, their teams would report stronger cohesion. Like Nonverbal Perception, we predicted that when teams had higher levels of Synchronous Communication and Camera-on Communication their Team Cohesion would be even stronger.

Table 2, Step 1, shows that Engaged Listening has a positive, significant effect on Team Cohesion. For every one-unit increase in Engaged Listening, there is a predicted 0.762 increase in Team Cohesion, holding all other variables constant. What this means is that when a team listens carefully to others and stays engaged in conversation, they report stronger Team Cohesion.

Table 2, Step 1, shows Synchronous Communication has a positive, significant main effect on Team Cohesion. for every one-unit increase in Synchronous Communication, there is a predicted 0.158 increase in Team Cohesion, holding all other variables constant. This translates to the more teams communicate synchronously through videoconferencing, the stronger feeling of team cohesion the group had. The second moderator COC Frequency had a non-significant effect on Team Cohesion. What this means is that when a team is synchronously videoconferencing, having their video turned on does not affect their Team Cohesion.

Table 2, Step 2, shows that when two-way interactions are added, Synchronous Communication no longer has a positive significant main effect on Team Cohesion. In addition, there were no significant interactions on Team Cohesion.

Figure 2 shows the lack of interaction between Synchronous Communication and Engaged Listening when COC Frequency = 1. This means that for teams that keep their camera on while communicating synchronously less often, the higher their reported Engaged Listening and Team Cohesion. In Figure 2, the blue line represents groups that kept their camera on but did not communicate synchronously often, reporting lower Team Cohesion. The red line represents groups that kept their camera on, communicated synchronously often and reported higher Engaged Listening and Team Cohesion.

Table 1, Step 3, shows when the three-way interaction, COC Frequency, Synchronous Communication and Engaged Listening are added to the model, there is a positive, marginally significant effect on Team Cohesion. Considering this interaction was our only (marginally) significant result, we graphed the three-way interaction to better examine the relationship between COC Frequency, Synchronous Communication, and Engaged Listening. A visual representation of our marginally significant reaction can be seen in Figure 3 below Table 2. This means that for teams that keep their camera on while communicating synchronously less often, the higher their reported Engaged Listening and Team Cohesion. The blue line represents groups that kept their camera on but did not communicate synchronously often, reporting lower Team Cohesion. The red line represents groups that kept their camera on, communicated synchronously often and reported higher Engaged Listening and Team Cohesion, such that regardless of the frequency of Synchronous Communication us, there is a positive influence of Engaged Listening on Team Cohesion. Further analysis is needed to understand the associated relationships within the three-way interaction of COC Frequency, Synchronous Communication, and Engaged Listening, allowing us to explore the nuances of this interaction and its relationship with Team Cohesion.

Table 2

Results of Multilinear Regression Analysis Results: Engaged Listening

Independent Variable	Bs and βs	Variable		
		Step 1	*Step 2*	*Step 3*
Intercept	*B*	-.314*** (.069) *p* < .001	-.297*** (.082) *p* < .001	-.282* (.082) *p* < .001
	β	—	—	—
	β	.501*** (.139)	.576*** (.254)	.407* (.293)

Engaged Listening [c]		$p < .001$	$p < .001$	$p < .05$
	B	.762	.876	.619
Synchronous Communication (SC) [b]	β	.184* (.077)	.096 (.115)	.023 (.120)
		$p < .05$	$p = .473$	$p = .872$
	B	.158	.083	.019
COC Frequency [a]	β	-.042 (.079)	-.043 (.121)	-.104 (.123)
		$p = .649$	$p = .761$	$p = .470$
	B	-.036	-.037	-.089
Interaction (a)	β		-.151 (.286)	.082 (.372)
			$p = .348$	$p = .695$
	B		-.269	.147
Interaction (b)	β		.056 (.287)	.318 (.427)
			$p = .686$	$p = .124$
	B		.116	.664
Interaction (c)	β		.089 (.161)	.257 (.188)
			$p = .566$	$p = .162$
	B		.093	.266
Interaction (d)	β			-.377† (.571)
				$p = .090$
	B			-.806

Note. $N = 95$. Unstandardized coefficients (B), standard errors (in brackets), p values, and standardized coefficients (β) are reported. Grand mean centered before being entered in the regressions.

[a] 0 = off, 1 = on. [b] 0 = less than 50%, 1 = more than 50%.

(a)Interaction = Nonverbal Perception × COC Frequency. (b)Interaction = Nonverbal Perception × Synchronous Communication. (c)Interaction = COC Frequency × Synchronous Communication. (d)Interaction = COC Frequency × Synchronous Communication × Nonverbal Perception.

*p < .05. **p < .01. ***p < .001 †p < .09; two-tailed tests.

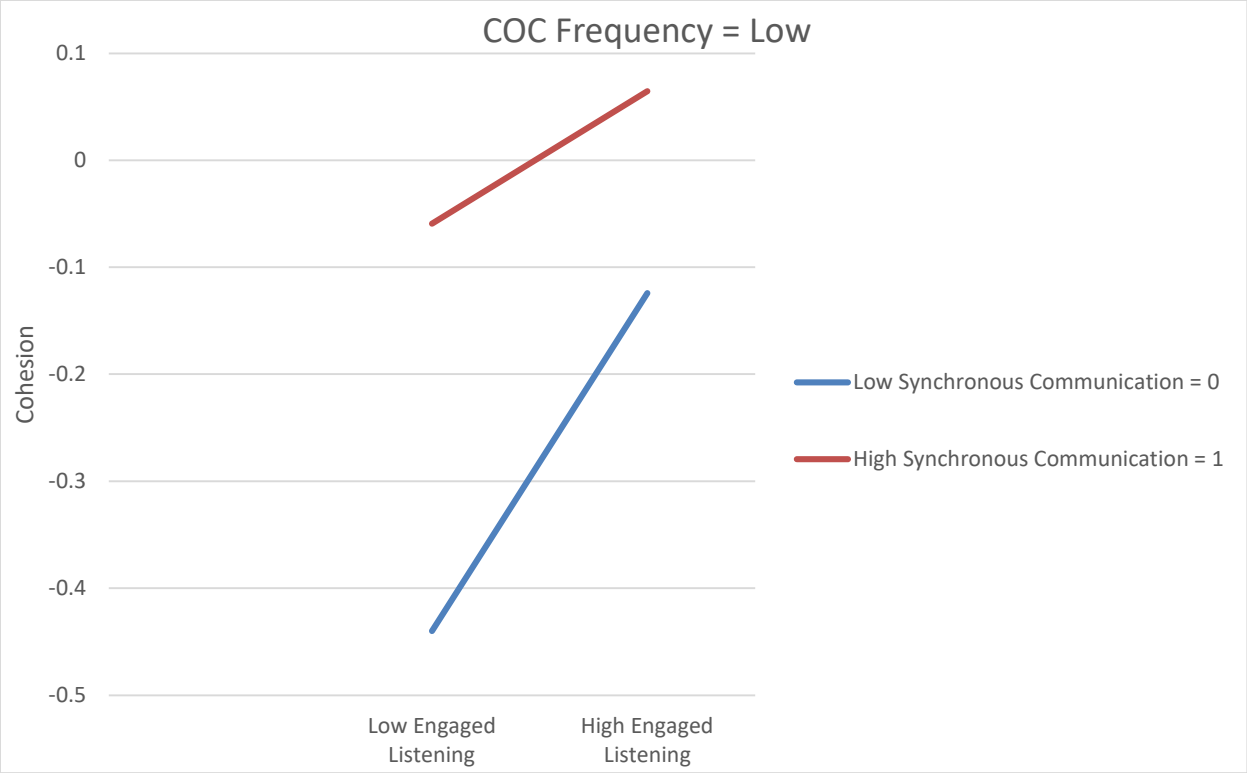

Figure 2. A model representing a marginally significant three-way interaction between Engaged Listening and Team Cohesion when COC Frequency = Low.

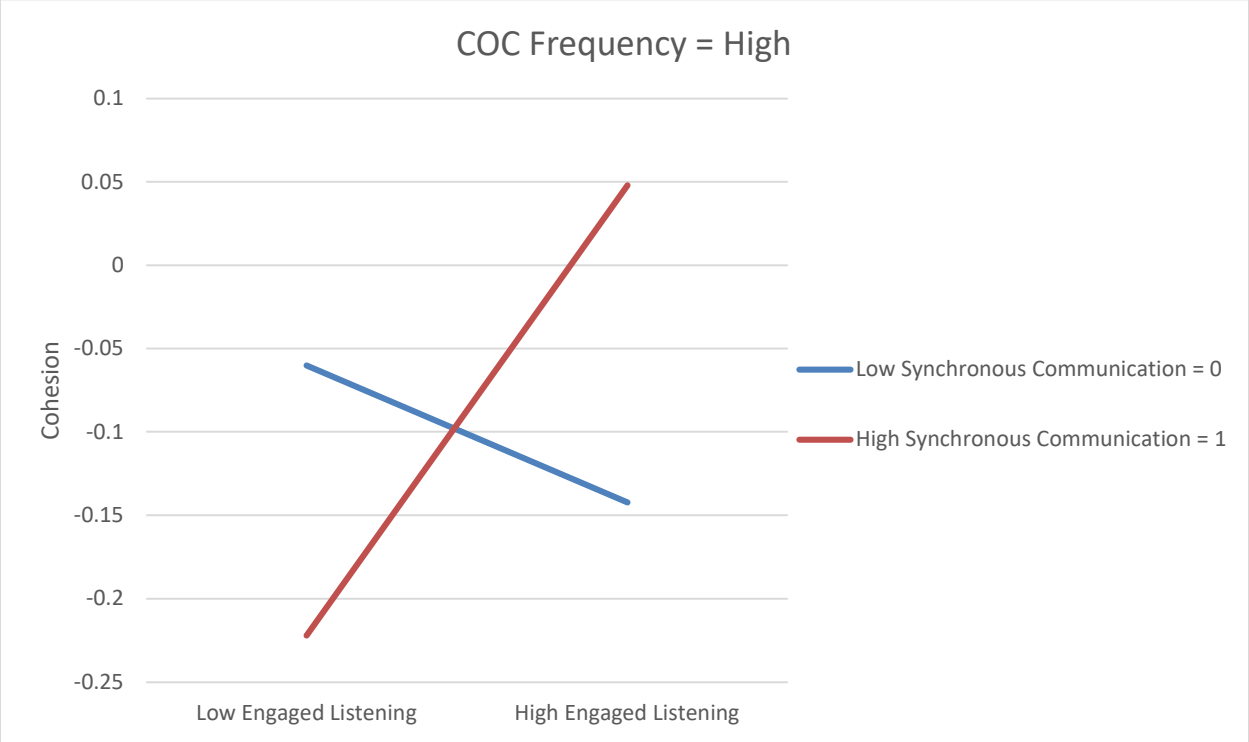

Figure 3. A model representing a marginally significant three-way interaction between Engaged Listening and Team Cohesion when COC Frequency = High.

Mindful Video Appearance. We predicted a positive relationship between Mindful Video Appearance and Team Cohesion, such that when team members reported greater Engaged Listening, their teams would report stronger Team Cohesion. Like the other subdimensions of the Nonverbal Communication Perception Scale, we predicted that when Synchronous Communication and Camera-on Communication moderated the relationship between Mindful Video Appearance and Team Cohesion, teams would have higher perceived levels of Team Cohesion.

Table 3, Step 1, shows that Mindful Video Appearance has a positive, significant effect on Team Cohesion. For every one-unit increase in Mindful Video Appearance, there is a predicted 0.240 increase in Team Cohesion, holding all other variables constant. What this means is that when a team cares more about their professional image on-screen during a video conference meeting, their Team Cohesion is stronger.

In Table 3, Step 1, the moderator Synchronous Communication has a positive, significant main effect on Team Cohesion. Table 3 shows that, for every one-unit increase in Synchronous Communication, there is a predicted 0.265 increase in Team Cohesion, holding all other variables constant. This translates to the more teams communicate synchronously through videoconferencing, the stronger feeling of team cohesion the group had.

Additionally, the second moderator COC Frequency had a non-significant effect on Team Cohesion. What this means is that the more often a team communicates synchronously the more Team Cohesion was reported, and when a team is synchronous videoconferencing, having their video turned on does not affect their Team Cohesion.

Table 3, Step 2, shows that when two-way interactions are added, Synchronous Communication no longer has a positive significant main effect on Team Cohesion. In addition, there were no significant two-way or three-way interactions on Team Cohesion.

Table 3

Results of Multilinear Regression Analysis Results: Mindful Video Appearance

Independent Variable	Bs and βs	Variable		
		Step 1	*Step 2*	*Step 3*
Intercept	*B*	-.087 (.108) *p* = .425	.095 (.154) *p* = .541	.083 (.171) *p* = 629
	β	—	—	—
Mindful Video Appearance [c]	β	.240* (.111) *p* < .05	.492** (.191) *p* < .01	.475* (.221) *p* < .05
	B	.762	.524	.505
Synchronous Communication (SC) [b]	β	.308** (.089) *p* < .01	.112 (.219) *p* = .661	.146 (.279) *p* = .448
	B	.265	.096	.125
COC Frequency [a]	β	.055 (.086) *p* = .583	-.177 (.188) *p* = .422	-.150 (.233) *p* = .581
	B	.048	-.152	-.129
Interaction (a)	β		-.328 (.223) *p* = .158	-.291 (.309) *p* = .364
	B		-.317	-.281
Interaction (b)	β		-.326 (.223) *p* = .225	-.283 (.311) *p* = .450
	B		-.272	-.236
Interaction (c)	β		-.058 (.180) *p* = .739	-.113 (.385) *p* = .761
	B		-.060	-.117
Interaction (d)	β			-.066 (.449) *p* = .867
	B			-.076

Note. N = 95. Unstandardized coefficients (B), standard errors (in brackets), p values, and standardized coefficients (β) are reported. Grand mean centered before being entered in the regressions.
[a] 0 = off, 1 = on. [b] 0 = less than 50%, 1 = more than 50%.
(a)Interaction = Nonverbal Perception × COC Frequency. (b)Interaction = Nonverbal Perception × Synchronous Communication. (c)Interaction = COC Frequency × Synchronous Communication. (d)Interaction = COC Frequency × Synchronous Communication × Nonverbal Perception.

*p < .05. **p < .01. ***p < .001; two-tailed tests.

Discussion

In this study, we investigated the dynamics of virtual nonverbal communication and Team Cohesion within the context of an online undergraduate international business course. We predicted that there would be a positive relationship between Nonverbal Communication and Team Cohesion. We also argued that the more a team used Synchronous Communication and COC, the stronger the effect of Nonverbal Communication on their Team Cohesion would be, such that if a team communicated synchronously and used COC more often, they would perceive more nonverbal cues, and have stronger feelings of cohesion. Our results provided evidence to support our prediction of a positive relationship of a main effect between Nonverbal Communication and Team Cohesion. That is, teams who reported higher perception of nonverbal cues, felt higher levels of cohesion in their team.

As expected, we also found a main effect of synchronicity, where those teams that communicated synchronously more often perceived their team as acting as a single, cohesive group, regardless of having the camera on or off. Contrary to our expectations, there was also a main effect of Camera-on Communication, where teams that used their camera *less* had a stronger feeling of team cohesion. The predicted three-way interaction between Engaged Listening, Synchronous Communication, and COC was non-significant. However, we illustrated the marginally significant interaction between Engaged Listening and Synchronous Communication while the COC frequency was high. In doing so, we explored whether these three variables may be related to the predicted Team Cohesion directions. Together, our results offer several contributions to existing research and suggest avenues for future directions.

Nonverbal Communication and Team Cohesion

As expected, evidence from this study leads us to conclude that Team Cohesion is positively influenced by Nonverbal Communication in a virtual team setting, adding to the vast existing literature that repeatedly shows this relationship (Hung & Gatica-Perez, 2010). It was shown that team members felt like they could connect with their teammates better when applying the nonverbal factors of Engaged Listening, Mindful Video Appearance, and Nonverbal Perception. When team members perceived there to be more nonverbal cues in their conversations, they had stronger feelings of team cohesion. This result replicates the findings of many studies which have shown that nonverbal cues contribute to feelings of connectedness and belongingness between peers in a team (Mullen & Copper, 1994). However, in contrast to the existing literature, this study expands the scope of the impact of nonverbal communication on team cohesion by including three additional nonverbal communication indicators in the virtual team setting.

Future studies can continue examining the nuanced components of nonverbal communication, aiming to gain a more profound insight into the specific elements that influence effective communication in team dynamics. Understanding this would be pertinent in virtual settings where rich communication is lacking. The confirmation of this relationship will hopefully inspire further studies that focus on the nuances of nonverbal communication that influence a team's cohesion which has a relationship with overall team performance (Hung & Gatica-Perez, 2010).

An Exploratory Look into Engaged Listening, Synchronicity, and COC

The analysis of the three-way interaction between Nonverbal Communication, Synchronous Communication and COC Frequency, showed that the amount of Engaged Listening and Synchronous Communication teams perceived did not seem to impact Team

Cohesion when the cameras were off more frequently (Figure 2). Overall, for teams that reported using video less frequently, those with high synchronous communication and low engaged listening reported higher team cohesion than teams with low synchronous communication and low engaged listening. Additionally, it was shown that high engaged listening decreased the team cohesion gap between teams with low synchronous communication and high synchronous communication for all teams that reported using video less frequently.

When teams had their cameras turned on more frequently during virtual meetings, we noticed a marginally significant interaction between Engaged Listening and Synchronous Communication (Figure 3). Overall, in the context of high camera usage during meetings, teams that had high synchronous communication, that is, active communication with real-time feedback, and who were more engaged with listening and attending to nonverbal cues reported stronger perceptions of Team Cohesion. In contrast, teams with lower synchronicity reported worse team cohesion outcomes. Surprisingly, if the synchronous communication is low, increasing the engaged listening tends to decrease Team Cohesion.

These graphs were provided for exploratory purposes and not to draw conclusions. However, it is worth noting that the overall highest levels of Team Cohesion seem to have occurred in two conditions: high engaged listening and high synchronicity- with camera on more often or less often.

What is it about more synchronous communication and more engaged listening that gives better team cohesion whether the camera is on or not? Do theses always require a visual cue?

Why might this be??

SURPRISINGLY, high engaged listening but low synchronous communication leads to lower team cohesion than low engaged listening, with camera on.

It is not clear why increasing engaged listening in a high COC frequency, but low synchronous communication environment tends to lead to worse team cohesion outcomes. One possible explanation could be that if the camera is being used, but real-time, active communication is not occurring, members who are highly engaged and attending to the nonverbal cues of their teammates may feel like the effort is wasted or not being reciprocated which could lead to feelings of lower Team Cohesion.

The Impact of Synchronicity and Camera-on Communication

Based on Social Information Processing Theory, we thought this would occur due to synchronous communication and COC creating more opportunities for nonverbal communications that would then influence the team's stronger cohesion. We did not find support for the prediction that COC communication would amplify the effect of Nonverbal Communication on Team Cohesion. Also, our results showed that there was not a direct effect of COC on Team Cohesion. In other words, even when teams had used COC often, it did not change how they felt about their team's cohesiveness. This result contradicts Olsen et al's., (2012) finding that suggested social connection (a facet of team cohesion) was positively affected by camera use in synchronous meetings. Olsen et al's (2012) study included …This study also included the level of technological knowledge one ha

Rubinger et al's., (2020) recommendation of encouraging team members to use video to foster engagement among a team was also contradicted.

Why might it contradict.

What is different about your study and theirs?

What might explain why you didn't even get a direct effect of COC on cohesion?:

I'm not sure how to answer this question

We did not find support for the prediction that synchronous communication would amplify the effect of Nonverbal Communication on Team Cohesion. However, our results did indicate a direct effect of synchronicity, the more often teams communicated synchronously, the more the more felt like a cohesive group. Our results showed evidence for this, that the element of time, or how often a team communicates synchronously (with or without COC) changes how much cohesion is perceived to be in a team. This outcome reinforces the claims of Social Information Processing Theory and Media Naturalness Perspective, in that, given enough time a team can adapt to technology to foster connections with team members. Our findings support existing evidence showing that temporal factors influence the effectiveness of team cohesion.

This aligns with Walther's (2005) theory, which draws from Social Information Processing Theory, stating that given enough time, adequate amounts of relational communication when comparing Computer-mediated Communication and FTF communication mediums have negligible differences in communication. This evidence also reinforced Wilson and colleagues (2006) study which showed that the negative effects of decreased social information within computer-mediated groups diminished as participants interacted electronically over time. This evidence is important when making decisions about organizational change because teams who work together virtually may benefit from continuing to work with the same team, as it encourages feelings of cohesiveness amongst team members.

Limitations and Future Research

Research on virtual teams is growing, yet our comprehension of the extent to which synchronous communication plays a role within these teams remains an evolving area of study. The lack of support for the predicted impact of COC and Synchronous Communication may be due to multiple factors such as anxiety when using video during videoconferencing meetings, "Zoom" fatigue, and keeping the camera off to complete multiple tasks during virtual meetings (Mamtani et al., 2021).

Anxiety and mental exhaustion when attending virtual meeting occurs for many individuals and can influence the amount, they use their camera during a virtual meeting (Mamtani et al., 2021). Mental exhaustion from the overuse of virtual communication platforms may also be a reason to keep the camera turned off during a videoconferencing meeting. The expectations of multitasking during videoconferences, such as using the chat option, referring to notes, and trying to maintain eye contact via camera all contribute to mental exhaustion. In addition, when individuals are preoccupied by their appearance when in a videocall, have technical difficulties, or are trying to interpret multiple cues, videoconferencing can be anxiety-inducing (Mamtani et al., 2021). This study could be improved by controlling for participant anxiety when videoconferencing. This insight would help determine the true cause for when participants choose to use COC more or less during a videoconferencing meeting. Careful here. You suggest measuring anxiety to understand why a camera is on or off. How would that help you understand COC as a moderator of nonverbal communication on team cohesion? This will take some careful thought to explain your reasoning.

Some employees may turn their camera off to complete other tasks during a videoconferencing meeting. Individuals who multitask meetings attempt to weave in other tasks while maintaining peripheral awareness of the important parts of the team meeting (Stephens &

Davis, 2009). These distractions can result in team members being less engaged in the meeting which could affect performance (Stephens & Davis, 2009). Enhancing our current study could involve incorporating a measure designed to see how often participants turn their camera off to multitask during a meeting. This addition would help us gain insights into why some participants chose to use their cameras more often or less often. The effects of multitasking during videoconferencing meetings are not well known and would be an important new avenue for future research (Marlow et al., 2016).

There are limitations to this study that provide opportunities for future research. First, our reliance on secondary data introduced constraints in our ability to effectively measure or control for certain variables we might have included if we had designed the original study. Second, our sample was limited to a student population, which can have implications when attempting to generalize from a school setting to a workplace.

This study adds to current literature on how organizations can best utilize their employee teams. Virtual teams are becoming more common in organizations, and understanding of how virtual teams communicate best sets organizations up for optimizing productivity and increasing performance in virtual teams.

Implications

As mentioned, the inclusion of COC when synchronously communicating would not be a benefit to teams or organizations. Conversely, increasing the amount teams communicate synchronously through phone, or conferencing calls contributes to positive feelings of cohesion within their team. Knowing this, it would be beneficial to organizations to consider the ways in which to incorporate more synchronous communications, so employees have the opportunity for more nonverbal communication in their day to foster feelings of cohesion between coworkers.

Finish with a section on Implications. Based on what you did find, what would you recommend to virtual teams? Certainly to be aware of and attend to nonverbals because you found those main effects.

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Appendix A

Nonverbal Communication Scale

Synchronicity

CFI=0.987, TLI=0.978, RMSEA=0.043, SRMR=0.041

Subdimensions	Items During our BA310 team's videoconferences:
Nonverbal Perception	1. I can understand what others mean through their tone of voice, body language, etc., even if they do not say it directly. 2. I am very good at knowing the feelings other people are experiencing by paying close attention to their tone of voice, body language, etc. 3. I am able to process verbal and nonverbal cues by group members in our videoconferences in order to give an immediate response.
Engaged Listening	1. I stay engaged in the conversation. 2. I listen very carefully to people when they talk.

Mindful Video Appearance	1. I tend to touch up my hair and face to make myself presentable on screen. 2. When I turn on my video for group meetings, I am sure to dress and look professional. 3. I pay attention to how I look on screen.

N=344. Synchronous only and hybrid communicator sample.

Basic principles of SIP: According to SIP, individuals engage in a systematic process of information exchange to form impressions and develop relationships. The theory emphasizes the importance of nonverbal cues in understanding and interpreting social interactions.

Nonverbal communication and team cohesion: Nonverbal communication, which includes facial expressions, gestures, body language, and vocal tone, plays a crucial role in interpersonal dynamics. Positive nonverbal cues, such as smiling, nodding, and maintaining eye contact, contribute to building rapport and fostering trust among team members.

Team cohesion: Team cohesion refers to the degree of unity, cooperation, and commitment among team members. Positive relationships within a team are associated with higher levels of cohesion, which can lead to improved collaboration, communication, and overall team performance.

Impact of nonverbal communication on cohesion: Positive nonverbal communication acts as a social cue that signals friendliness, openness, and understanding. When team members engage in positive nonverbal behaviors during interactions, it enhances the quality of social information exchanged, promotes positive affect, and strengthens interpersonal bonds. As a result, team cohesion is likely to increase.

Moderating variable: Videoconferencing: Videoconferencing refers to the use of technology to facilitate communication and collaboration between individuals in remote locations. As a moderating variable, videoconferencing can influence the impact of nonverbal communication on team cohesion.

Influence of videoconferencing on nonverbal communication: Videoconferencing platforms have limitations in transmitting nonverbal cues compared to face-to-face interactions. Factors

such as video quality, internet connection, and screen size can affect the perception and interpretation of nonverbal cues. Consequently, team members may rely more on verbal communication, leading to a potential reduction in the impact of nonverbal cues on team cohesion.

Compensatory strategies: To mitigate the limitations of videoconferencing, team members can adopt compensatory strategies. These may include using exaggerated nonverbal cues, such as nodding more emphatically or maintaining strong eye contact, to compensate for the reduced clarity of nonverbal communication. Additionally, utilizing verbal cues effectively and emphasizing clear communication can help bridge the gap caused by the lack of nonverbal cues.

Recommendations for enhancing team cohesion: To enhance team cohesion in videoconferencing settings, it is essential to focus on improving the quality of nonverbal communication. This can be achieved by selecting reliable videoconferencing platforms, ensuring adequate lighting and audio equipment, and providing training on effective virtual communication skills. Encouraging team members to actively engage in nonverbal behaviors and fostering a positive and supportive virtual environment can also contribute to building stronger relationships and increasing team cohesion.

According to SIP, individuals engage in a systematic process of information exchange to form impressions and develop relationships. The theory emphasizes the importance of nonverbal cues in understanding and interpreting social interactions.

Nonverbal cues contribute to building rapport and fostering relationships with team members. Positive relationships within a team are associated with higher levels of cohesion, which can lead to improved communication and overall team performance.

When team members engage in nonverbal behaviors during interactions it enhances the quality of social information exchanged and strengthens relationships. As a result, team cohesion is likely to increase.

To increase team cohesion in virtual setting it is important to focus on the quality of nonverbal communication which can be achieved through Camera-On Communication platforms.