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Virtual (freedom from) reality: Evaluation apprehension and leaders' preference for communicating through avatars

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ABSTRACT

Virtual reality is spreading rapidly as an emerging communication tool in organizations. The present research examines when and why leaders might prefer interacting with their subordinates virtually, via computer avatars (graphical computer representations of humans), rather than through face-to-face interactions. We examine this question in the context of monitoring and seek to understand the underlying psychology that drives leaders' preference for interacting via avatars. Across two experiments, we tested our predictions that (1) contexts that require frequent monitoring increase leaders' preference for interacting via avatars, and (2) this preference is driven by concerns about negative social evaluation. Results supported our predictions, indicating that contexts requiring frequent monitoring increase leaders' preference for interacting via avatars (Experiment 1), and this effect was due to increased concerns about negative social evaluation (Experiment 2). We also explored the role of personality on this effect (Experiment 2). Theoretical implications for the psychology of leadership in the digital era and the adoption of novel technologies are discussed.

One of the most interesting applications of emerging technologies – and one that is becoming increasingly common in social and work settings – is virtual reality. Virtual reality (VR) technology can be described as a computer-generated simulation of a three-dimensional (3D) environment “that surrounds a user and responds to that individual’s actions in a natural way” (Gartner, 2013). In a recent survey of 18,000 professionals and students from 19 countries, respondents cited VR as the technology that is most likely to revolutionize their work in the coming decade (INSEAD Emerging Markets Institute, 2017). Indeed, the utility and popularity of VR is evident in the numerous ways in which people use this technology in their work and personal lives. For example, in 2017, a couple in the UK hosted their wedding in a virtual reality social platform where their friends and family from across the globe joined them using VR headsets (Fortson, 2017). In the workplace, VR is already used for hosting conferences as well as recruiting and training in a variety of organizations, including the US Navy, the British Army, and Walmart (Chandler, 2017). VR is also used extensively for research in various fields including social psychology (e.g., Bombari, Schmid Mast, Canadas & Bachmann, 2015), medicine (e.g., Persky and Eccleston, 2011), communication (e.g., Yee, Bailenson and Ducheneaut, 2009),

marketing (e.g., Schmitt, 2019) and information systems (e.g., Suh, Kim, & Suh, 2011). The rising popularity of this technology is also reflected in forecasts suggesting that worldwide spending on VR will increase from \$13.9 billion in 2017 to over \$143 billion in 2020 (IDC, 2017).

VR replaces physical reality with computer-generated environments and allows users to experience these virtual environments visually through devices such as VR headsets, in a tactile manner through devices such as VR gloves, and in a fully immersive manner through avatars – real-time, digital representations of human beings (Bailenson & Blascovich, 2004). The popularity of avatars in the workplace is evident from the increasing number of ways in which they are being used. For example, avatars are used by employees to engage in immersive virtual meetings and to access a shared virtual workspace (Colbert, Yee, & George, 2016). Avatars are also used for training employees in high-risk professions in virtual environments, for enabling remote employees to collaboratively work together, and for providing diversity and sensitivity training by asking employees to virtually experience life through avatars of another gender or race (e.g., Bessiere, Ellis & Kellogg, 2009).

The emergence of VR technology – and, in particular, avatars – as a management tool in organizations raises an important research

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question: When and why might leaders prefer to communicate with their employees through an avatar as opposed to via face-to-face interactions? In the present research, we examine this question in the context of monitoring and seek to understand the underlying psychology that drives leaders' preferences for monitoring subordinates through avatars. We begin by examining the idea that technology may attenuate the strength of social evaluative pressures by acting as a psychological buffer. Building on this notion, we posit that leaders will prefer to monitor their subordinates through avatars in situations where they feel socially threatened, because doing so allows them to distance themselves from their subordinates and avoid psychological discomfort. This study is among the first to examine when and why leaders will choose virtual reality technology as a tool to communicate with employees in the workplace. We contribute to this emerging research area by developing an explanation based on a psychological model of evaluation apprehension stemming from both situational and personality factors.

1. Frequent monitoring as a source of negative evaluation

Monitoring is a critical aspect of leaders' jobs that allows them to obtain information about the performance of subordinates (Komaki, Zlotnick, & Jensen, 1986), differentiate between high and low performers, and appropriately administer contingent rewards (Komaki, 1986). Monitoring influences several key leader and employee outcomes, such as perceived leader effectiveness (Komaki, 1986), employee performance (Chalykoff & Kochan, 1989), individual accountability (Brewer & Ridgway, 1998), organizational citizenship behaviors, and perceptions of justice (Niehoff & Moorman, 1993). Due to the consequential effects associated with monitoring, scholars have included the construct in various taxonomies of effective leader behaviors (e.g., Komaki et al., 1986; Yukl, 1989).

Although monitoring is a critical aspect of the leadership role, it is an act that can elicit negative responses from subordinates. In fact, too much monitoring of employee behaviors leads to distrust and negative evaluations of the leader (Adams, 1976; Alge & Hansen, 2014, pp. 209–237; Schweitzer, Ho, & Zhang, 2016). Consequently, leaders may recognize that excessive monitoring can create negative social or psychological outcomes and they may not always feel comfortable doing it. In spite of this reticence, however, frequent monitoring is sometimes necessary. For example, leaders may be required to closely and frequently monitor poor performers, subordinates who are new at their jobs, or individuals completing important tasks where mistakes could be especially costly. Indeed, a study on project management styles revealed that frequent monitoring was needed for reducing uncertainty during the early stages of a project, as well as for pushing the project to completion during the later stages (Lewis, Welsh, Dehler, & Green, 2002). Additionally, while working on an important project, leaders may be pressured from above to monitor every aspect of the project in order to ensure success. For example, supervisors at Walt Disney World were encouraged to monitor employees closely to ensure that employees displayed desired emotions, as a rude employee could potentially cost Disney future guests. Disney supervisors, therefore, recognized that close monitoring was necessary and mandated (Van Maanen; Kunda, 1989).

As these examples illustrate, leaders may have to engage in frequent monitoring even if they may not personally choose to closely monitor their subordinates. We theorize that, in such contexts, leaders will anticipate significant discomfort, stemming from the belief that frequent monitoring may signal a lack of trust (Adams, 1976; Langfred, 2004) and, consequently, lead subordinates to judge them negatively. Being subject to negative judgment can be psychologically aversive, especially for individuals in positions of power (e.g., Fast, Burris, & Bartel, 2014; Fast & Chen, 2009). In the following sections, we offer a psychological account of why leaders may be particularly motivated to avoid interactions that could lead to negative judgment, and explore how technologies such as VR could potentially serve as a psychological buffer

in such situations.

2. Leadership roles and evaluation apprehension

Social situations, in which people interact with others or operate in the presence of an audience, trigger concerns about being negatively evaluated by others (Schlenker & Leary, 1982). These concerns about negative evaluation arise when people perceive that their actions will create undesired impressions of themselves or garner unsatisfactory reactions from their audience (Schlenker & Leary, 1982). The perception that one may be negatively evaluated by others in a social situation is psychologically aversive, as it affects how others perceive, evaluate and treat one (Goffman, 1959; Leary & Kowalski, 1990) and also how people view themselves (Leary & Baumeister, 2000). Negative social evaluation is also psychologically aversive as it leads to a range of negative feelings including feelings of embarrassment (Miller, 1995; Modigliani, 1971), social anxiety (Schlenker & Leary, 1982), and shame (Tangney, 1992).

The possibility of negative evaluation can be especially aversive if one is in a position of power. Such positions inherently come with higher expectations for people to behave in ways that inspire positive social evaluation. For instance, studies show that individuals in positions of power experience salient expectations that they possess and display high levels of competence (Fast et al., 2014; Mintzberg, 2009), and failing to meet these expectations leads to ego threat (e.g., Cho & Fast, 2012; Fast & Chen, 2009). Moreover, when individuals in positions of power are evaluated negatively, they face the possibility of severe repercussions in the form of loss of status and influence (Marr & Thau, 2014), experience negative relationship outcomes (Anicich, Fast, Halevy, & Galinsky, 2015) and may even be perceived as illegitimate occupants of those positions (Magee & Galinsky, 2008). People in positions of power are also more likely to accurately sense their subordinates' reactions and nonverbal cues in social interactions (Schmid Mast, Jonas & Hall, 2009), an effect that might lead them to pay even more attention to situations where subordinates might possibly judge them negatively. Taken together, these studies suggest that the possibility of negative evaluation may be quite salient for leaders, given their positions of power over others.

One context in which leaders may be particularly concerned about negative evaluation is when communicating with subordinates. A survey of 616 leaders conducted by Interact and Harris Poll in 2016 revealed that 69% of them were uncomfortable communicating with their employees (Interact Report, 2015.; Solomon, 2016). The survey also revealed that 37% of leaders were especially uncomfortable in situations where they were expected to give direct feedback or criticism about their employees' performance, a situation in which employees might respond negatively. Moreover, 20% of leaders reported feeling uncomfortable to demonstrate vulnerability (e.g., sharing that they might have made a mistake), and 16% reported feeling uncomfortable communicating with their employees face-to-face (Interact Report, 2015.; Solomon, 2016). These results highlight that leaders are uncomfortable communicating with employees, especially in situations where they might be judged negatively.

3. VR technology, psychological distancing, and social presence

Given that the possibility of negative evaluation can be aversive, leaders who need to engage in frequent monitoring may be motivated to minimize the psychological aversion it engenders. As a result, they may resort to distancing themselves from the situation to minimize the psychological consequences of potential negative social evaluation. This hypothesis is consistent with research showing that evaluative concerns lead to defensive distancing more generally. For example, a study examining intergroup interactions revealed that participants who believed they were more enthusiastic about a possible relationship than their interaction partner were more likely than others to distance themselves from the situation to avoid potential embarrassment

(Vorauer & Sakamoto, 2006; also see Curtis & Miller, 1986; Snyder, Lassegard, & Ford, 1986). Such defensive distancing can alleviate the evaluative threat posed by the situation (Peetz, Gunn, & Wilson, 2010) and, thus, help people restore self-integrity by downplaying the significance of the threat for the self (e.g., Harris & Napper, 2005).

In the modern workplace, one way in which leaders today (and increasingly in the future) can distance themselves from subordinates in uncomfortable situations is to communicate in VR settings via avatars, as opposed to interacting in person. When people interact with each other face-to-face, they experience higher levels of evaluation concerns (Carnevale, Pruitt, & Seilheimer, 1981). Technology can mitigate these risks for the interacting parties by reducing the availability of relevant social contextual cues that may be evident in face-to-face interactions such as facial expressions, moods, demeanor, and body language (e.g., Ang, Cummings, Straub, & Earley, 1993; Kiesler, Siegel, & McGuire, 1984; Sproull; Kiesler, 1986). We propose that, in addition to attenuating relevant social contextual cues, using an avatar could ameliorate concerns about negative evaluation by reducing people's perceptions of social presence.

Social presence refers to the degree of perceived tangibility and proximity of other people in a given context (Short, Williams, & Christie, 1976). Extant research suggests that, in general, social presence is lower when people interact through technology compared to when they interact face-to-face (e.g., Bailenson, Blascovich, Beall, & Loomis, 2003; Joinson, 2004; McLeod, Baron, Marti, & Yoon, 1997; Postmes, Spears, Sakhel, & De Groot, 2001). When social presence is high, as opposed to low, people pay more attention to their interaction partners' behaviors and are more likely to be influenced by them (Short et al., 1976). Studies comparing face-to-face communication and technology-mediated communication have offered support for this idea across various contexts. For example, shy individuals are reported to be more comfortable engaging with others in a virtual environment due to reduced social presence (Joinson, 2004). In another study, McLeod and colleagues argued that when social presence is low, and people are least likely to feel others' negative reactions as a result, they are more likely to display deviant minority expressions (McLeod et al., 1997). Thus, by reducing perceived social presence, technology reduces the strength of evaluative pressures and acts as a buffer that individuals can use to distance themselves from situations in which they anticipate negative evaluation.

Consistent with our prediction that leaders will use avatars as a buffer from situations with a higher likelihood of potential negative evaluation, studies on interpersonal communication and disclosure have found that people prefer to disclose negative, personally sensitive information about themselves or their behaviors to technological tools such as behavior tracking algorithms and embodied conversational agents (ECAs) over humans (e.g., Lucas, Gratch, King, & Morency, 2014; Pickard, Roster, & Chen, 2016; Raveendhran & Fast, 2020). These results indicate that interacting with or through computer avatars could reduce anticipated concerns about negative evaluation that may be present in face-to-face interactions. In fact, scholars have suggested that "the possibility that people would tell an impartial machine personal or embarrassing things about themselves, without fear of negative evaluation, has been raised since the first uses of computers for communication" (Weisband & Kiesler, 1996, p. 3).

Building on these ideas, we posit that in contexts that require frequent monitoring and, thus, pose the risk of negative evaluation, leaders will be less likely to choose traditional face-to-face interactions with subordinates. Rather, we suggest they will be more likely to use computer avatars in VR settings as a medium to interact with their subordinates. As such, one (unintended) consequence of introducing these tools into the workplace is that they may be used by leaders as a psychological buffer from situations that might otherwise produce negative evaluation. It is intriguing to note that these may be the very situations that most strongly call for face-to-face presence. Based on the arguments outlined above, we hypothesize that:

Hypothesis 1. Contexts that require frequent monitoring increase leaders' preferences for interacting via avatars (versus face-to-face interactions).

Hypothesis 2. This preference is driven by the extent to which leaders anticipate being negatively evaluated by their subordinates in contexts that require frequent monitoring.

4. Overview of the present research

In this research, we examine the following question: when and why might leaders prefer to interact via avatars as opposed to via face-to-face interactions? Exploring this question in the context of frequent monitoring, we conducted two experiments seeking to test the following predictions: (a) contexts that require frequent monitoring increase leaders' preference for interacting via avatars, and (b) this effect is mediated by the extent to which leaders anticipate being negatively evaluated by their subordinates in such contexts. For each experiment, we collected all data in single, complete batches and did not conduct any analyses until all data for a given experiment were collected. We report all measures, manipulations and exclusions.

5. Experiment 1

In Experiment 1, we tested our first hypothesis that contexts that require frequent monitoring increase leaders' preferences for interacting via avatars (as opposed to interacting face-to-face). Participants were asked to place themselves in the role of a leader who would be overseeing a subordinate working on a project. They then read detailed descriptions of the project requirements and were informed that they would be required to monitor their subordinate either infrequently (i.e., one check-in) or frequently (i.e., every 30 minutes) during the length of the project. Following this, they were asked to choose their preferred method for overseeing the subordinate – either face-to-face or via a computer avatar.

5.1. Method

5.1.1. Participants

One hundred and one U.S. adults (41.6% female; $M_{age} = 34.75$) recruited from Amazon's Mechanical Turk (mTurk) participated in exchange for a small payment. This data source is shown to yield research data that is as reliable as those obtained via traditional methods and includes a large participant pool that is more diverse than typical American college students (Buhrmester, Kwang, & Gosling, 2011). A majority (82.5%) of the participants in our sample reported that they were currently employed. Additionally, 58.5% of the participants reported that they held at least a bachelor's degree and 79.8% reported that they had managerial experience. Participants were randomly assigned to one of the two conditions – minimal monitoring ($n = 50$) and frequent monitoring ($n = 51$).

5.1.2. Materials and procedure

We informed participants that, in this study, we would be simulating typical interactions between leaders and subordinates in organizations. We asked participants to vividly picture that they were in the role of leader in the marketing department of an organization, and that they were to oversee a subordinate who would be working on a marketing project. Then we provided detailed descriptions of the company and the project that the subordinate would allegedly be working on. The project involved creating a print advertisement for a new product (a smart watch) that the company was about to launch. Following this, we informed participants that their subordinate would have four hours to work on the project and that it was their responsibility as a leader to ensure that the project was of high quality.

Participants then received specific instructions pertaining to

monitoring their subordinates. Participants in the *minimal* monitoring condition read: "In this scenario, you want to check in on your subordinate once during the 4-h period." Participants in the *frequent* monitoring condition read: "In this scenario, you want to check in on your subordinate every half hour, for a total of 8 times during the 4-h period."

After reading these instructions pertaining to how frequently they would need to monitor their subordinates, participants in both conditions read the following descriptions of the different methods of monitoring that were available to them. Importantly, we sought to control for one obvious potential difference (i.e., ease/convenience of using the avatar relative to approaching an employee for a face-to-face conversation) in order to rule it out as a possible reason for why participants may prefer the avatar over monitoring subordinates in person. To do this, we specified that for both methods of monitoring, participants would need to walk down the hall, either to the subordinate's room (in the face-to-face method) or to the computer room (in the computer avatar method) to monitor their subordinate. Following this, we asked participants to select between the face-to-face method and the computer avatar method to accurately reflect their most preferred method for monitoring their subordinate in this context. The two options were described as follows:

5.1.3. Face-to-face

"You may walk up to your subordinate's office down the hall and ask him/her for an update on the project face-to-face. Your subordinate will be able to respond to your update request face-to-face."

5.1.4. Computer avatar

"You may walk up to the computer room down the hall and send your avatar to ask him/her for an update on the project. Your avatar is a personalized computer video graphic that represents you and can be seen on your subordinate's computer screen. Your subordinate will be able to respond to your update request with their own avatar that will appear on your computer screen."

Participants also reported their age, gender, employment status, educational level, managerial experience, and ethnicity.

5.2. Results and discussion

Consistent with our hypothesis, a chi-square test revealed significant differences between conditions in participants' preference for using the computer avatar to monitor subordinates. Whereas only 10% of the participants in the minimal monitoring condition indicated a preference for using the computer avatar method to monitor their subordinates, this preference nearly tripled to 27.5% of participants in the frequent monitoring condition, $\chi^2(1, N = 101) = 5.034, p = .025$. This provides evidence that leaders who find themselves in contexts that require frequent monitoring are more likely to move away from face-to-face interactions and instead gravitate toward interacting through a computer avatar. Importantly, this difference emerged in spite of the fact that the same level of physical effort (i.e., walking over to a different room down the hall) was required in the avatar condition. In situations where individuals can use VR technology without moving from their computer, we would expect an even higher percentage of people choosing that option.

6. Experiment 2

In Experiment 2, we sought to replicate our findings using a different contextual manipulation of monitoring frequency. We also tested our second hypothesis that leaders' preference for interacting via avatars in contexts that require frequent monitoring is mediated by the extent to

which they anticipate being negatively evaluated in those contexts.

In addition to the above, we addressed a possible limitation in Experiment 1 by manipulating how the need to monitor was framed. Although results from Experiment 1 suggest that in contexts that require frequent monitoring, leaders show an increased preference for interacting via computer avatars (versus interacting face-to-face), participants were asked to make this choice with no information about the extent to which frequent monitoring would be perceived as acceptable in that context. In fact, the perception that frequent monitoring is atypical in a given context and/or situationally inappropriate, could steer people away from face-to-face interactions and lead them to prefer monitoring via computer avatars in that context. To address this potential limitation and to examine (and potentially rule out) situational appropriateness of frequent monitoring as an alternative mechanism of this effect, we manipulated typicality of monitoring in this experiment by describing whether frequent monitoring was considered typical or atypical in that context.

Finally, we sought to extend our findings from Experiment 1 by exploring how leaders' personality characteristics influenced their preference for using avatars to monitor subordinates in situations that require frequent monitoring. We discuss this in greater detail below.

6.1. Personality differences

Personality differences influence how people use and interact with technology (Rosengren, 1974). As research on technology use burgeoned, numerous scholars have examined the influence of personality traits on individuals' use of newer forms of technology including social media (e.g., Hughes, Rowe, Batey, & Lee, 2012; Ross et al., 2009; Ryan & Xenos, 2011), blogging and personal websites (e.g., Guadagno; Okdie; Eno, 2008; Marcus, Machilek; Schutz, 2006), and computer avatars (Fong & Mar 2015). Given the importance of personality traits in the context of studying technology use, we sought to examine how personality differences influenced leaders' preferences for using avatars to monitor subordinates. Specifically, we focused on differences in the Big-Five personality factors (extraversion, agreeableness, conscientiousness, neuroticism and openness to experience), dominance motivation, and need for belonging.

The five-factor model of personality (McCrae & Costa, 1997) has been widely used in research pertaining to technology use. Numerous studies show that extraversion and neuroticism were significantly related to internet use (e.g., Amichai-Hamburger, 2002; Amichai-Hamburger & Ben-Artzi, 2003; Amichai-Hamburger, Wainapel, & Fox, 2002). Individuals low in extraversion and high in neuroticism used the Internet more heavily than their more extraverted, less neurotic counterparts as they felt that they could express their real selves better when communicating with others online rather than offline (Amichai-Hamburger et al., 2002). Moreover, studies show that individuals high in extraversion (compared to introverts) are more likely to use social media and other forms of technology as social tools but not as a substitute for real world interactions (e.g., Amiel & Sargent, 2004; Ross et al., 2009). Studies also show that individuals high in neuroticism (compared to those low in neuroticism) preferred online tools (e.g., chat rooms, social media etc.) for communication over face-to-face interactions as such tools offered more time to contemplate their responses and control their communication with others (e.g., Butt & Phillips, 2008; Correa, Hinsley & de Zuniga, 2010). Based on these findings, we expect that extraversion will be negatively related and neuroticism will be positively related to preference for using avatars to monitor subordinates.

Conscientiousness reflects the degree to which an individual is diligent and scrupulous. Prior research has shown that conscientiousness is negatively related to the use of Internet and other forms of computer mediated communication (e.g., Butt & Phillips, 2008) as individuals high in conscientiousness are dutiful and responsible and may consider social media and computer-mediated communication tools as sources of distraction (e.g., Ross et al., 2009). Based on this idea, we expect that

individuals high in conscientiousness will be less likely to prefer using avatars to monitor subordinates. Prior research suggests that the relationship between agreeableness and technology use is quite unclear. Some researchers show that agreeableness is negatively related to Internet use (Landers & Lounsbury, 2006) while others show that agreeableness has no effect on social media use (e.g., Ross et al., 2009). In the context of monitoring subordinates, we expect that agreeableness may be negatively related to preference for using avatars as individuals high in agreeableness may feel more secure expressing themselves in face-to-face interactions where they can minimize the possibility of misunderstanding. Finally, given that computer avatars are a fairly novel form of technology in the context of monitoring subordinates, we expect a positive relationship between openness to experiences and preference for using avatars to monitor subordinates. This is consistent with prior research showing that openness to experience positively predicted blogging behavior (Guadagno, Okdie, & Eno, 2008) and social media use (Correa et al., 2010).

In addition to the Big-Five personality factors, we sought to examine how differences in dominance motivation influenced preference for using avatars to monitor subordinates. Dominance is a social influence strategy in which people use their power to control others, irrespective of others' desire to follow (Mead & Maner, 2012). Individuals high in dominance motivation use social interaction as a channel to exert their power to control others and maintain their dominance. In the context of monitoring subordinates, we expect that dominance motivation will be negatively related to preference for using avatars to monitor subordinates. We reason that individuals high in dominance motivation will seek opportunities to exert their power to control others, and face-to-face interactions offer more salient opportunities for such a display of power compared to interactions through technology.

Need for belonging is another personality factor that might influence preferences for using avatars to monitor subordinates because individual differences in belonging motivation are shown to drive behaviors focused on obtaining/maintaining interpersonal acceptance and is associated with people's concerns with others' evaluations of them (Leary, Kelly, Cottrell, & Schreindorfer, 2013; Rios, Fast, & Gruenfeld, 2015). Given our prediction that leaders' preference for using avatars to monitor subordinates in contexts that require frequent monitoring will be mediated by the extent to which they anticipate being evaluated negatively in that situation, we expect that individuals with a high need for belonging will be more likely to use avatars to monitor subordinates when they feel concerned about others' evaluations of them (such as in contexts that require frequent monitoring).

6.2. Participants and design

One hundred and ninety-six undergraduates recruited from the business school of a large U.S. West Coast university (40.1% female; $M_{\text{age}} = 20.50$) participated in this experiment for course credit. We screened for incomplete responses ($n = 4$) and excluded participants who did not complete the study. In this experiment, we included an attention check (cf., Oppenheimer, Meyvis, & Davidenko, 2009) that asked participants to report information they directly received in order to make sure they were reading the information we provided, and excluded participants who failed the attention check ($n = 28$, 14.3%), for a final sample size of one hundred and sixty-four (37.8% female; $M_{\text{age}} = 20.52$).

Participants were randomly assigned to one of four conditions in a 2 (Monitoring frequency: minimal vs. frequent) \times 2 (Typicality of frequent monitoring: typical vs. atypical) between-subjects design. (n s: minimal monitoring, frequent monitoring is atypical = 41; minimal monitoring, frequent monitoring is typical = 39; frequent monitoring, frequent monitoring is atypical = 40; frequent monitoring, frequent monitoring is typical = 44).

6.3. Materials and procedure

We informed participants that we would be simulating typical classroom interactions that occur between students who work together on in-class projects. Participants were asked to vividly picture that they were to complete an in-class team project for their Marketing class. Before beginning work on the project, we informed participants that they were to complete a personality survey so that we could better understand how students' personality characteristics impacted the way they worked together on projects. Following this, participants completed the Big Five Personality Measure (BFI-10; Rammstedt & John, 2007). The BFI-10 is an abbreviated version of the BFI wherein each of the five personality factors – extraversion, agreeableness, conscientiousness, neuroticism and openness – is measured using two items (one true-scored item and one reverse-scored item). The BFI-10 has been demonstrated to have good convergence with the Big-Five Inventory-44 (BFI-44) and has good test – retest reliability (Rammstedt & John, 2007). Participants were asked to rate themselves on a scale from 1 (Strongly disagree) to 7 (Strongly agree) to accurately describe how they generally see themselves on a total of ten items – two items pertaining to each of the five personality factors.

Next, we asked participants to complete the seven-item dominance motivation subscale ($\alpha = .91$) of the Achievement Motivation Scale (AMS) (Cassidy & Lynn, 1989; Maner & Mead, 2010). The dominance subscale consists of seven items that assess a person's desire for power and authority ("I like to give orders and get things going," "I would enjoy having authority over people," "I prefer to direct group activities myself rather than having someone else organize them," "I would make a good leader," "I am usually leader of my group," "People take notice of what I say," and "I enjoy planning things and deciding what other people should do"). Participants provided their ratings on a scale from 1 (Strongly disagree) to 7 (Strongly agree).

Following this, we asked participants to complete the ten-item Need to Belong scale ($\alpha = .75$; Leary et al., 2013). This scale measured a person's need to belong motivation, a trait that is said to go beyond a mere desire to affiliate/socialize to reflect one's "desire to be accepted, form relationships and belong to social groups" (Leary et al., 2013, p. 611). Sample items include: "I want other people to accept me", "I have a strong 'need to belong'", "My feelings are easily hurt when I feel that others do not accept me". Participants provided their ratings on a scale from 1 (Not at all) to 5 (Extremely) to indicate the degree to which each statement is characteristic of them.

Next, we provided additional detail about the in-class project and informed participants that they were assigned to be the team leader of a team of four students and that they needed to complete the in-class project in one class session. They were informed that one of the main responsibilities associated with the role of team leader was to oversee other students in their team to ensure the timely completion of the project. We also indicated that their projects would be graded on four criteria: the timely completion of the project, the quality of the project, team members' contributions, and effectiveness of the team leader. Following this, we described the specific tasks involved in completing the project – i.e., to create a print advertisement for a new product that an organization was about to launch.

After providing instructions about the project, we informed participants that they would be sent to another room at the end of the hall with the other team leaders and that their teams would be working in the classroom. We manipulated the typicality of frequent monitoring in the following way: Participants in the *atypical* condition read: "Team leaders typically check in on their teams at least one time during the 1 h and 20-min period." In contrast, participants in the *typical* condition read: "Team leaders typically check in on their team at most ten times during the 1 h and 20-min period." Through this manipulation, we intended to convey that a certain degree of monitoring (minimal vs. frequent) was considered typical and would be acceptable in this situation (i.e., situationally appropriate). We sought to rule out typicality of frequent

monitoring as an alternative mechanism that might drive leaders' preferences for interacting via computer avatars to monitor subordinates in contexts that require frequent monitoring.

Following this, we manipulated the frequency of monitoring: Participants in the *minimal* monitoring condition read: "In this scenario, you decide that you want to check in on your team one time during the 1 h and 20-min period." Participants in the *frequent* monitoring condition read: "In this scenario, you decide that you want to check in on your team every 10 min, for a total of 8 times during the 1 h and 20-min period."

After reading these instructions, participants responded to the following set of two items that we included to measure anticipated negative evaluation ($r = .60$): "I will worry that team members will think negatively of me" and "I will be concerned that my team members will think that I don't trust them". All ratings were made on a scale from 1 (Strongly disagree) to 7 (Strongly agree).

After answering these questions, participants read about the two possible methods for monitoring team members – face-to-face and computer avatars. The descriptions for each of the methods was the same as in Experiment 1. Participants then rated their preference for using the face-to-face method and the computer avatar method in this scenario on a scale from 1 (Not at all) to 7 (Very much). We combined the two items ("To what extent do you prefer checking in on your team face-to-face" (reverse-coded); "To what extent do you prefer checking in on your team via the computer avatar") to create the preference for using avatars for monitoring measure ($r = .42$) – our primary dependent variable of interest. In addition, we included a dichotomous measure of preference for using avatars for monitoring and asked participants to choose between monitoring their team members face-to-face or via a computer avatar (same as the dependent measure included in Experiment 1).

7. Results and discussion

We conducted a series of 2 (monitoring frequency: minimal vs. frequent) \times 2 (typicality of frequent monitoring: atypical vs. typical) ANOVAs on the dependent measures – (a) preference for using avatars for monitoring, and (b) anticipated negative evaluation. Consistent with our predictions, and with Experiment 1, results revealed a significant main effect of monitoring frequency on preference for avatars, $F(1,160) = 6.84, p = .01, \eta_p^2 = .04$. Participants in the frequent monitoring condition had a greater preference for using avatars for monitoring compared to those in the minimal monitoring condition ($M_{\text{frequent monitoring}} = 2.63; SE = .12$ vs. $M_{\text{minimal monitoring}} = 2.18; SE = .12$). Typicality of frequent monitoring, however, did not have a significant main effect on preference for avatars, $F(1,160) = .36, p = .55, \eta_p^2 = .002$. Moreover, there was no interaction between monitoring frequency and typicality of frequent monitoring on preference for avatars, $F(1,160) = .27, p = .60, \eta_p^2 = .002$. This suggests that the extent to which a certain degree of monitoring (minimal vs. frequent) was considered typical in a given situation did not affect people's preferences for using avatars for interacting with their subordinates in that situation, thus ruling this out as an alternative mechanism driving our findings.

We also examined the effect of monitoring frequency on preference for avatars through the dichotomous outcome variable. As expected, and replicating the results of Experiment 1, while only 2.5% of the participants in the minimal monitoring condition indicated that they would prefer monitoring their team members via a computer avatar, this increased almost four times to 13.1% of the participants in the frequent monitoring condition, $\chi^2(1, N = 164) = 6.30, p = .012$.

Following this, we conducted a 2 (monitoring frequency: minimal vs. frequent) \times 2 (typicality of frequent monitoring: atypical vs. typical) ANOVA to examine differences between conditions on anticipated negative evaluation. Consistent with our predictions, results revealed a significant main effect of monitoring frequency on anticipated negative evaluation, $F(1,160) = 20.23, p < .001, \eta_p^2 = .11$. Participants in the

frequent monitoring condition anticipated being evaluated more negatively ($M_{\text{frequent monitoring}} = 3.89; SE = .15$) than those in the minimal monitoring condition ($M_{\text{minimal monitoring}} = 2.92; SE = .15$). Once again, typicality of frequent monitoring did not have a significant main effect on anticipated negative evaluation, $F(1,160) = 1.08, p = .30, \eta_p^2 = .007$. There was also no interaction between monitoring frequency and typicality of frequent monitoring on anticipated negative evaluation, $F(1,160) = .07, p = .80, \eta_p^2 < 0.001$. Thus, we find further evidence to rule out typicality (i.e., situational appropriateness) of frequent monitoring as an alternative mechanism that could influence people's perceptions of anticipated negative evaluation, and ultimately, their preference for interacting via computer avatars in contexts that require frequent monitoring¹.

7.1. Mediation analyses

We predicted that the effect of monitoring frequency on preference for using avatars for monitoring would be mediated by the extent to which participants in leadership roles anticipated being evaluated negatively in frequent monitoring situations. Given that we used a measurement-of-mediation design to test our prediction, we wanted to ensure that our process measure and our outcome measure were seen as distinct constructs theoretically. Anticipated negative evaluation measures the extent to which one expects that others will judge them negatively in a given situation. On the other hand, preference for avatars pertains to the degree to which one chooses avatars over face-to-face interactions to monitor and interact with subordinates. In this mediation design, we predict that anticipated negative evaluation will be the triggering factor in a situation (i.e., frequent monitoring) to which people respond by preferring to use avatars over face-to-face interactions.

We conducted bootstrapping analyses following procedures for testing direct and indirect effects using the PROCESS macro (model 4) (Hayes, 2013) to test whether team leaders' preference for using avatars to monitor their team members in frequent monitoring situations was mediated by anticipated negative evaluation. The bootstrap results based on a resampling size of 5000 indicated that the total direct effect of monitoring frequency on preference for using avatars for monitoring ($b = .44, SE = .17, p = .01$) decreased to non-significance ($b = .19, SE = .17, p = .27$) when anticipated negative evaluation was included as the mediator. Moreover, the 95% bias-corrected confidence intervals for the indirect effect through anticipated negative evaluation did not include zero (0.13, 0.45). These results suggest that team leaders' preference for using avatars to monitor team members in situations that called for frequent monitoring is mediated by anticipated negative evaluation. In line with recommendations for reporting unstandardized coefficients when independent variables are dichotomous (Darlington & Hayes, 2016), we have presented the unstandardized regression coefficients for each pathway in Fig. 1. The 95% bias-corrected confidence intervals for the direct and indirect effects are presented in Table 1.

¹ We also examined whether managers' hesitance about seeing their team members react to their frequent monitoring could be a possible alternative mechanism that may explain the relationship between monitoring frequency and increased preference for avatars in situations that called for frequent monitoring. There were no significant main effects of either monitoring frequency ($F(1,160) = .87, p = .35, \eta_p^2 = .005$), or typicality of frequent monitoring ($F(1,160) = .07, p = .80, \eta_p^2 < 0.001$) on participants' ratings of hesitance about seeing team members' reactions to their level of monitoring. Moreover, there were no significant interaction effects of monitoring frequency and typicality of frequent monitoring on this dependent measure, ($F(1,160) = 1.96, p = .16, \eta_p^2 = .012$).

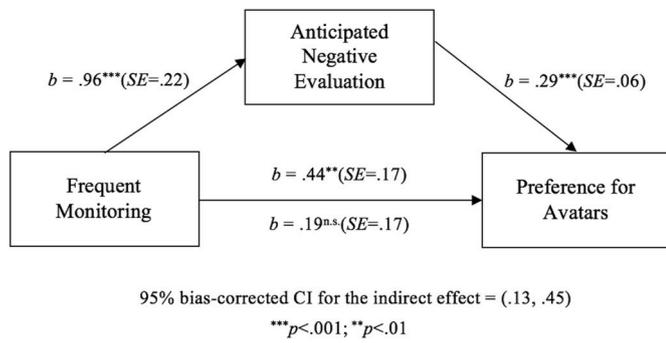


Fig. 1. Anticipated negative evaluation mediates the effect of frequent monitoring on avatar preference. Unstandardized regression coefficients and standard errors for each path are reported. $R^2 = .39$ (Experiment 2).

Table 1
Mediation results for the hypothesized frequent monitoring → anticipated negative evaluation → preference for avatars path (experiment 2). Direct and indirect effects.

Predictor	B	SE	t	p	95% LLCI	95% ULCI
<i>Anticipated Negative Evaluation</i>						
Constant	2.93	.15	19.02	.000	2.62	3.23
Frequent Monitoring Condition	.96	.21	4.48	.000	.54	1.39
<i>Preference for Avatars</i>						
Constant	1.41	.21	6.81	.000	.99	1.81
Anticipated Negative Evaluation	.26	.06	4.56	.000	.15	.38
Frequent Monitoring Condition	.19	.17	1.10	.27	-.15	.52
<i>Direct Effect of Frequent Monitoring Condition on Preference for Avatars</i>						
Frequent Monitoring Condition → Preference for Avatars	.19	.17	1.10	.27	-.15	.52
<i>Indirect Effect of Frequent Monitoring Condition on Preference for Avatars through Anticipated Negative Evaluation</i>						
Total Indirect Effect: Anticipated Negative Evaluation	.26	.08	.13	.45		

7.2. Personality effects

We were also interested in exploring how individual level personality differences affected the relationship between monitoring frequency and preference for using avatars for interacting with subordinates. In particular, we examined how the Big Five personality dimensions – extraversion, neuroticism, conscientiousness, agreeableness, and openness, and two other personality factors relevant for this context – dominance motivation and need for belonging influenced our effects. We describe the results of these exploratory analyses below:

7.3. Extraversion

To examine whether extraversion predicted preference for avatars, we conducted multiple linear regression analyses with extraversion, monitoring frequency, and typicality of frequent monitoring as predictors. Results revealed that extraversion had a significant negative effect on preference for avatars, $\beta = -.15, p = .047$, along with

monitoring frequency, $\beta = .18, p = .018, R^2 = .07$. Typicality did not significantly predict preference for avatars, $\beta = -.03, p = .66$. Next, we sought to explore whether extraversion influenced the relationship between monitoring frequency and preference for avatars. On including the interaction terms in the regression model, results revealed that extraversion did not significantly interact with monitoring frequency to predict preference for avatars, $\beta = -.04, p = .68$, whilst both extraversion ($\beta = -.17, p = .03$) and monitoring frequency ($\beta = .18, p = .019$) retained their significant effects on preference for avatars, $R^2 = .08$.

7.4. Neuroticism

Next, we examined whether neuroticism predicted preference for avatars. Results of multiple linear regression analyses with neuroticism, monitoring frequency, and typicality of frequent monitoring as predictors revealed that neuroticism had a significant positive effect on preference for avatars, $\beta = .21, p = .006$, along with monitoring frequency, $\beta = .19, p = .015, R^2 = .09$. Again, typicality did not significantly predict preference for avatars, $\beta = -.05, p = .49$. We also sought to explore whether neuroticism influenced the relationship between monitoring frequency and preference for avatars. On including the interaction terms in the regression model, results revealed that neuroticism did not significantly interact with monitoring frequency to predict preference for avatars, $\beta = .12, p = .14$. However, both neuroticism ($\beta = .23, p = .004$) and monitoring frequency ($\beta = .19, p = .015$) retained their significant effects on preference for avatars, $R^2 = .10$.

7.5. Conscientiousness

To examine whether conscientiousness predicted preference for avatars, we conducted multiple linear regression analyses with conscientiousness, monitoring frequency, and typicality of frequent monitoring as predictors. Results revealed that conscientiousness had a significant negative effect on preference for avatars, $\beta = -.17, p = .028$. Monitoring frequency had a significant positive effect, $\beta = .18, p = .022, R^2 = .07$. Typicality did not significantly predict preference for avatars, $\beta = -.02, p = .77$. We also explored whether conscientiousness influenced the relationship between monitoring frequency and preference for avatars by including the interaction terms in the regression model. Results revealed that conscientiousness did not significantly interact with monitoring frequency to predict preference for avatars, $\beta = .03, p = .71$, whilst both conscientiousness ($\beta = -.17, p = .03$) and monitoring frequency ($\beta = .18, p = .022$) retained their significant effects on preference for avatars, $R^2 = .08$.

7.6. Agreeableness

We conducted multiple linear regression analyses with agreeableness, monitoring frequency, and typicality of frequent monitoring as predictors to examine whether agreeableness predicted preference for avatars. Results revealed that agreeableness did not significantly predict preference for avatars, $\beta = -.06, p = .43$, nor did it significantly interact with monitoring frequency to predict preference for avatars, $\beta = .08, p = .32$. In these analyses, only monitoring frequency significantly predicted preference for avatars, $\beta = .20, p = .012, R^2 = .06$.

7.7. Openness

Finally, we examined whether openness predicted preference for avatars by conducting multiple linear regression analyses with openness, monitoring frequency, and typicality of frequent monitoring as predictors. Results revealed that openness had a significant negative effect on preference for avatars, $\beta = -.15, p = .047$. As expected, monitoring frequency positively predicted preference for avatars, $\beta = .18, p = .018, R^2 = .07$. Typicality did not significantly predict preference for avatars, $\beta = -.03, p = .66$. Next, we explored whether openness

influenced the relationship between monitoring frequency and preference for avatars. On including the interaction terms in the regression model, results revealed that openness did not significantly interact with monitoring frequency to predict preference for avatars, $\beta = -.04$, $p = .68$. However, both openness ($\beta = -.17$, $p = .03$) and monitoring frequency ($\beta = .18$, $p = .019$) retained their significant negative and positive effects on preference for avatars respectively, $R^2 = .08$.

ANCOVA with the Big Five Personality Factors as Covariates.

In addition to independently exploring the effects of each of the Big Five personality dimensions on preference for interacting via avatars and their interactions with monitoring frequency, we sought to test the full model where we examined the effect of monitoring frequency and typicality of monitoring on preference for avatars, while controlling for the five personality factors. To do so, we conducted an ANCOVA with monitoring frequency and typicality of monitoring as predictors and the Big Five personality dimensions as covariates. Results revealed a significant main effect of monitoring frequency on preference for avatars after controlling for the Big Five personality dimensions, $F(1,156) = 4.55$, $p = .035$, $\eta_p^2 = .03$. There was neither a significant main effect of typicality, $F(1,156) = .16$, $p = .69$, $\eta_p^2 = .001$, nor a significant interaction between monitoring frequency and typicality, $F(1,156) = .17$, $p = .68$, $\eta_p^2 = .001$. Among the Big Five personality dimensions, only neuroticism had a significant effect on preference for avatars when controlling for the other Big Five factors, $F(1,156) = 4.18$, $p = .043$, $\eta_p^2 = .03$.

7.8. Dominance motivation

Next, we explored the role of dominance motivation in predicting preference for avatars. Multiple linear regression analyses with dominance motivation, monitoring frequency, and typicality as predictors revealed that dominance motivation had a significant negative effect on preference for avatars, $\beta = -.17$, $p = .029$, and monitoring frequency had a significant positive effect, $\beta = .21$, $p = .008$, $R^2 = .07$. Consistent with our findings in this study, typicality was not a significant predictor of preference for avatars, $\beta = -.05$, $p = .55$. Regression analyses including interaction terms revealed that dominance motivation did not significantly interact with monitoring frequency to predict preference for avatars, $\beta = -.03$, $p = .83$, while dominance motivation ($\beta = -.17$, $p = .027$) and monitoring frequency ($\beta = .21$, $p = .008$) significantly predicted preference for avatars, $R^2 = .08$.

We also conducted an ANCOVA where we examined the effect of monitoring frequency and typicality on preference for avatars while controlling for dominance motivation. Results indicated a significant main effect of monitoring frequency on preference for avatars, $F(1,159) = 7.14$, $p = .008$, $\eta_p^2 = .04$. Typicality did not have a significant main effect on preference for avatars, $F(1,159) = .38$, $p = .54$, $\eta_p^2 = .002$, and there were no significant interaction effects, $F(1,159) = .25$, $p = .62$, $\eta_p^2 = .002$. Dominance motivation had a significant effect on preference for avatars, $F(1,159) = 4.79$, $p = .03$, $\eta_p^2 = .03$.

7.9. Need for belonging

Finally, we examined the role of need for belonging in predicting preference for avatars. We conducted multiple linear regression analyses with need for belonging, monitoring frequency, and typicality as predictors. Results revealed that need for belonging did not significantly predict preference for avatars, $\beta = .05$, $p = .51$. In these analyses, only monitoring frequency had a significant positive effect, $\beta = .20$, $p = .01$, while typicality was not a significant predictor, $\beta = -.05$, $p = .57$, $R^2 = .05$. Need for belonging also did not significantly interact with monitoring frequency to predict preference for avatars, $\beta = .07$, $p = .34$, $R^2 = .06$.

We also conducted an ANCOVA with monitoring frequency and typicality as predictors of preference for avatars while controlling for need for belonging. Results indicated a significant main effect of

monitoring frequency on preference for avatars, $F(1,159) = 6.70$, $p = .01$, $\eta_p^2 = .04$. Typicality did not have a significant main effect on preference for avatars, $F(1,159) = .34$, $p = .56$, $\eta_p^2 = .002$, and there were no significant interaction effects, $F(1,159) = .22$, $p = .64$, $\eta_p^2 = .001$. Need for belonging also did not have a significant effect on preference for avatars, $F(1,159) = .38$, $p = .54$, $\eta_p^2 = .002$.

7.10. Discussion

In this study, we examined both Hypotheses 1 and 2 using a different contextual manipulation of monitoring frequency, sought to rule out typicality of frequent monitoring as an alternative mechanism that might drive our effects, and explored the role of various personality factors on our effects including the Big Five personality dimensions, dominance motivation, and need for belonging. Results from this study offered further evidence suggesting that, in contexts that require frequent monitoring, leaders show a greater preference for using avatars to interact with subordinates (relative to interacting face-to-face). This effect was mediated by the extent to which leaders anticipated being negatively evaluated by subordinates in those contexts. These results also allowed us to rule out typicality of frequent monitoring as an alternative mechanism of this effect. Finally, exploring how various personality dimensions influenced this effect revealed that, among the Big Five personality dimensions, only neuroticism had a significant positive effect on preference for avatars while controlling for the other four dimensions. Dominance motivation had a significant negative effect on preference for avatars. Importantly, none of these personality dimensions significantly interacted with monitoring frequency to predict preference for avatars.

8. General discussion

In this research, we addressed our key question – when and why might leaders prefer to interact with their employees through an avatar as opposed to via face-to-face interactions? Specifically, we examined this question in the context of monitoring and explored whether leaders used computer avatars in contexts that require frequent monitoring. We also examined the role of personality factors in influencing leaders' preference for monitoring via avatars. The present findings indicate that, in contexts that require frequent monitoring, leaders prefer to interact with their subordinates using avatars (Experiments 1 and 2). Notably, this is a relative preference in contexts that require frequent monitoring (relative to those that do not require frequent monitoring). Therefore, it is important to interpret these findings as indicating that leaders prefer monitoring via avatars more when they have to frequently monitor their subordinates than when do not, rather than as an overarching preference for using avatars for monitoring in general. Examining the psychological mechanism driving this effect, we find that this preference is driven by the extent to which they anticipate being negatively evaluated in contexts that require frequent monitoring (Experiment 2). Thus, our results suggest that, at least in some cases, leaders use technology to buffer themselves from negative evaluation. Our results also suggest that typicality of frequent monitoring in a given context did not influence either the extent of negative evaluation leaders anticipated or the relationship between frequent monitoring and leaders' preference for using avatars in those situations (Experiment 2). Thus, our findings also allowed us to cast doubt on typicality (i.e., situational appropriateness) of frequent monitoring as an alternative mechanism driving leaders' preference for using avatars in contexts that require frequent monitoring. On exploring the role of personality differences, we found that, among the Big Five personality dimensions, only neuroticism was positively related to leaders' preference for using avatars when controlling for the other dimensions; dominance motivation was negatively related to leaders' preference for using avatars. Finally, none of the personality factors significantly interacted with monitoring frequency to predict preference for avatars.

The present research offers several contributions to both theory and practice. First, by elucidating the psychological process that underlies leaders' preferences for using novel technological tools such as avatars for monitoring, we seek to provide a clear psychological account for the increasing prevalence of technology-mediated management in modern workplaces. In doing so, we move beyond factors such as ease and convenience of use (e.g., Davis, 1989), individual attitudes, and social norms (e.g., Bonnefon; Shariff; Rahwan, 2016; Venkatesh, Morris, & Ackerman, 2000) to shed light on the role of an important psychological determinant of technology adoption – anticipated negative evaluation.

Second, by highlighting the role of technology as a psychological buffer that reduces anticipated negative evaluation, we contribute to the literature on psychological safety (e.g., Edmondson, 1999). We offer a novel perspective on how leaders might use technology to feel psychologically safe by effectively navigating evaluative concerns through tools such as avatars. Psychological safety is experienced in a given context when the context offers the feeling that one can express oneself freely and take interpersonal risks without fear of negative consequences such as embarrassment, rejection, or punishment (e.g., Edmondson, 1999; Kahn, 1990). The anticipation that one's behaviors may engender potential negative evaluation creates the sense that the context is psychologically unsafe for expressing oneself freely. Our findings suggest that individuals may be able to create a psychological buffer to distance themselves from psychologically unsafe contexts by using technology to interact with others. In this way, the use of novel technological tools such as avatars can influence the extent to which employees feel psychologically safe in the workplace and, consequently, have numerous positive effects such as increasing their likelihood of speaking up with suggestions for organizational improvement (e.g., Burris, 2012; Detert & Burris, 2007) and engaging in activities related to innovation and learning (e.g., Baer & Frese, 2003; Edmondson, 1999).

Third, we aim to contribute to the growing body of scientific knowledge in the emerging area of the psychology of technology (e.g., Epley, Schroeder, & Waytz, 2013; Fast & Schroeder, 2020; Waytz & Norton, 2014). As technology is increasingly becoming a substitute for humanity, research in this area has primarily focused on increasing people's sense of connectedness to their social environments through technology. For example, studies show that anthropomorphizing technology by ascribing a human-like mind to it increases the extent to which people trust technology to competently perform its function (Waytz, Heafner, & Epley, 2014). In addition to engendering greater levels of trust, technologies which incorporate a certain degree of humanness are known to elicit more positive attitudes (e.g., Li, Kizilcec; Bailenson; Ju, 2016) and greater user enjoyment (e.g., Weibel; Wissmath; Habegger, Steiner & Groner, 2008). We aim to extend this line of work by highlighting how novel technologies such as avatars might also serve as a distancing tool that can be used to create a psychological buffer in threatening situations.

As virtual reality is becoming increasingly common in the workplace (Future Workplace Study, 2016), the present research also has important implications for practice. The buffering tendencies shown in our studies may motivate the use of novel technological tools such as avatars in organizations for recruitment, training, team work, and performance evaluations to enable individuals to express themselves more freely in interpersonal interactions that may be perceived as psychologically threatening. However, it will be essential for future research to investigate whether VR technology truly buffers people from uncomfortable interactions or whether this is merely a misguided perception.

Our findings also have implications for designers and marketers of novel technologies such as VR. Given that one of the possible reasons people adopt these technologies is to psychologically buffer themselves from undesirable situations, designers and marketers may be well served to highlight the distancing aspect of these technologies in addition to focusing on the immersive experiences that they might offer. As the line between technology and humanity becomes more blurred in many fields such as business, medicine, law enforcement, and the armed forces, our

findings have implications for decision makers considering whether to replace humans with technology to perform certain functions. Organizational decision makers may consider using technological tools in place of humans in situations where open communication might be uncomfortable. For example, using computer avatars in medical or psychological interviews might encourage people to be more honest and disclose more information about themselves, without evaluative concerns. Using technological tools in these situations can enhance the quality of interpersonal interactions, while also offering economic benefits by reducing costs.

8.1. Limitations and future directions

The present research offers numerous opportunities for future research. The proposition that leaders may hide behind technology stems from the notion that interactions with subordinates in certain situations can be awkward and the preference for the technology reflects a desire to assuage that awkwardness. If so, it suggests an interesting paradox in technology preference: the choice to interact via technology could lead to additional awkwardness, the very thing that it was deemed to avoid. For example, using an avatar may create the impression that the leader is avoiding the interaction and the problem. This may upset the subordinate, producing a spiral of awkwardness and social distance afforded by hiding behind the technology. Future studies may more directly examine the degree of expected awkwardness in the leader-subordinate interaction. With higher degree of awkwardness (e.g., having to give pointed, negative performance feedback), there should be greater reliance on distancing technology. Future studies may also directly explore employees' responses to being subjected to avatar-based monitoring, especially in contexts that require frequent monitoring. It would be interesting to examine whether subordinates' preferences for monitoring methods are aligned or misaligned with leaders' preferences in such contexts. Furthermore, it would be important to understand how subordinates perceive leaders who might turn to technological tools for monitoring in these contexts and the extent to which these perceptions influence the leader-subordinate relationship and related outcomes.

In our experiments, we examined the relationship between monitoring frequency and preference for avatars in the context of monitoring. It was important to use the same type of technology in both studies so that we could control for unique technological features. However, this limited us from exploring important characteristics of technology that can act as moderators or boundary conditions for the current findings, such as the agency of virtual humans. Research has specified the distinctive behavioral impact of two types of virtual humans – embodied agents and avatars – distinguished by their level of agency (e.g., Bailenson et al., 2003). Agency, in this context, refers to the extent to which users believe they are interacting with another human being (Guadagno, Blascovich, Bailenson, & Mccall, 2007). Avatars – virtual, real-time representations of humans – are considered high in agency, and embodied agents – virtual representations controlled entirely by computers – are considered low in agency (Bailenson et al., 2003). Future research can explore how agency of virtual humans may influence the extent to which individuals feel buffered from evaluative concerns when using such technologies.

9. Conclusion

The influx of new technologies in the workplace is dramatically changing how employees interact with each other. With a majority of employees believing that face-to-face interactions will become obsolete in the near future due to the integration of novel technologies in the workplace (Future Workplace Study, 2016), it is imperative to understand the psychological determinants of technology use in work contexts. The present research identifies anticipated negative evaluation as an important psychological factor that drives leaders' preference for using computer avatars – a novel technological tool – in contexts that

require frequent monitoring and suggests that technology could potentially serve as a psychological buffer in evaluative situations. As organizations continue to spend billions of dollars on creating smart offices with novel technologies, we hope that our work will allow organizational decision makers to consider the psychological underpinnings of technology adoption in the workplace.

CRedit authorship contribution statement

Roshni Raveendhran: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Visualization, Writing - original draft, Writing - review & editing. **Nathanael J. Fast:** Conceptualization, Methodology, Validation, Writing - review & editing, Resources, Supervision. **Peter J. Carnevale:** Conceptualization, Writing - review & editing, Supervision.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chb.2020.106415>.

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