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Zooming in and Zoning out: Remote Deliberation Impairs Team Decision Quality

Anoop A. Javalagi[1], Alexandra M. Harris-Watson[2], and Leslie A. DeChurch[1]

Abstract

The sudden shift to remote work offered a unique opportunity to investigate the effect of meeting modality on team decisions. We present data on classroom teams solving a classic team decision task type, the hidden profile, where members each have unique information that must be combined to arrive at the correct solution. Owing to the COVID-19 pandemic, we collected data on teams solving hidden profiles in-person, over Zoom, and then in-person while wearing face masks. We first demonstrate the efficacy of the decision task, a space-themed hidden profile where team members bring to bear data on exoplanets to choose which of three planets can best support human colonization. Once validated, the task was implemented as part of a team effectiveness course over four years: two years before the COVID-19 pandemic (2018–2020), one year of remote work (2020–2021), and one year of masked in-person work (2021–2022). Students were randomly assigned to teams and roles within each course and deliberated for 30 minutes to choose the best option. Examining the quality of team decisions shows marked differences based on the modality of team deliberations. Teams deliberating in-person had the greatest chance of solving the hidden profile, followed by

[1]Northwestern University, Evanston, IL, USA
[2]University of Oklahoma, Norman, OK, USA

Corresponding Author:
Anoop A. Javalagi, Department of Communication Studies, Northwestern University, 2240 Campus Drive, Evanston, IL 60201, USA.
Email: anoop@northwestern.edu

teams meeting in-person with face masks; teams deliberating over Zoom were least likely to solve the hidden profile. Practical implications of team decision modalities for hybrid work design are discussed.

Keywords
virtual teams, team decision making, remote collaboration, face masks, hidden profile

Introduction

Over the past two decades, as the digital revolution has taken hold in organizations, teams have increased their reliance on technologies that facilitate working together from afar. Early work on virtual teams considered the degree to which virtual tools provided comparable levels of social presence (Kirkman & Mathieu, 2005). Later work moved on to the effects of distribution and global and cultural factors (Hinds & Bailey, 2003; Gibson & Gibbs, 2006; Olson & Olson, 2012). Taken together, this work suggests virtual teams may be at a disadvantage relative to in-person teams, owing to issues stemming from technology, physical dispersion, and cultural differences that typify these teams.

The question of how virtuality affects collaboration took on a new, urgent importance with the onset of the COVID-19 pandemic. Many organizations shifted as much as possible to remote work, and it is now clear that for many organizations, remote work is a long-term, if not permanent, reality. Many managers are currently grappling with this issue as they look for an evidentiary basis on which to make decisions about work arrangements. While some organizations may adopt entirely remote or entirely in-person policies, others are opting for hybrid arrangements that balance some in-office work with the flexibility of work-from-home (or work-from-anywhere). Organizational leaders would benefit from having clear insights about virtuality in order to design and implement policies to successfully navigate increasingly virtual and hybrid work practices. For example, organizational teams may need to opt for in-person communication for highly complex and collaborative tasks. On the other hand, they may be able to allocate virtual modes of communication for more routine and straightforward tasks that require minimal collaboration and information sharing.

In the current study, we aim to provide such insight by systematically examining how virtual meetings are affecting team decisions and comparing team decision quality with teams in more traditional work contexts (e.g., in-person work). We provide concrete information about how meeting modality

affects team decision making. Specifically, we present data on classroom teams solving a classic team decision task type, the hidden profile, in which members each have unique information that must be combined to arrive at the correct solution (Stasser, 1988). If the communication modality is indeed impacting team decisions, hybrid work types—and the nature of the task—may be important factors for leaders to consider.

Notably, our study differs from, and extends, the current literature on remote work and virtual teams. Although prior studies have examined remote working and virtuality from an *individual* level of analysis (e.g., Bartel et al., 2012; Delanoejie & Verbruggen, 2020; Parker et al., 2020), we explicitly investigate virtuality from a *team* level of analysis. Thus, results of the current study are particularly well-positioned to provide critical insights pertaining to the impact of work modality on complex team-level processes. Below, we provide an overview of the extant virtual teams and remote work literature and raise research questions that pertain to creating policies around remote working based on the teamwork requirement of jobs.

Virtual Teams and Remote Work

One stream of research suggests distributed virtual teams offer advantages to organizations (e.g., Leonardi, 2011; Mesmer-Magnus et al., 2011; Treem & Leonardi, 2013) by enabling culturally diverse and geographically distributed individuals to collaborate. Other potential advantages include opportunities to access employees and teammates from a wider talent pool, reduction in the time and cost associated with travel, and flexibility enabling employees to concurrently be members of several teams (Bergiel et al., 2008). Research examining technology affordances (e.g., Leonardi, 2011; Treem & Leonardi, 2013) also offers a potential explanation for virtuality's favorable effect on team functioning, suggesting that virtual tools can enhance group processes through affordances like visibility, editability, association, and persistence (Treem & Leonardi, 2013). Interestingly, Mesmer-Magnus et al.'s (2011) meta-analysis of the virtual teams' literature finds that the effect of virtuality on information sharing is curvilinear, rather than linear, such that moderate levels of virtuality—compared to face-to-face and high virtuality—can maximize information sharing.

On the other hand, virtual team research documents several important performance decrements suggesting virtual collaboration can impose co-ordination costs. For instance, virtual teams experience greater conflict (Hinds & Bailey, 2003), and diminished psychologically safe communication climate and team innovation (Gibson & Gibbs, 2006). Additionally, virtual teams struggle to find "common ground" to develop the trust, shared context, and

meaning that is essential for remote collaboration (Olson & Olson, 2012). Recently, research conducted during the COVID-19 pandemic also found remote working teams incur costs such as siloed and suppressed communication networks and difficulties in sharing information (Yang et al., 2022). Thus, within the extant virtual teams' literature, it remains unclear whether virtuality hinders team functioning; it is possible that a moderate level of technology use may benefit team performance (e.g., Mesmer-Magnus et al., 2011), whereas a complete reliance on virtuality may hinder it (e.g., Gibson & Gibbs, 2006; Hinds & Bailey, 2003; Olson & Olson, 2012).

The COVID-19 Shift to Remote Work. During the first quarter of 2020, many organizations shifted the majority of their teams to work from home to decelerate the spread of COVID-19. Instantaneously, the percentage of teams working virtually increased dramatically, and this sudden increase in virtuality was dramatic not just for pre-existing in-person teams but also for pre-existing virtual teams. Before the pandemic, most virtual teams had the option of meeting in-person at least periodically, and teams could use a mix of digital tools and in-person interaction. Once stay-at-home orders were issued and companies shifted to remote work, many teams began interacting using only digital tools. The technology, no longer just a tool, was embedded in all collaborative work by most teams. As two notable examples, applications like Zoom and Microsoft Teams, which were just taking hold prior to the pandemic, saw rapid and widespread adoption in many otherwise traditional organizations whose teams relied primarily on in-person interactions (Ittelson, 2021; Puttaswamy & Sisson, 2022).

Remote Deliberation and Team Decision Quality. Prior research on teams finds that unique information sharing is one of the strongest predictors of team effectiveness (Mesmer-Magnus & DeChurch, 2009). We set out to discover the degree to which deliberation method affects team decision making. Using the hidden profile paradigm, we compared teams who deliberated in-person and remotely over Zoom. Given the pervasive present—and forecasted future (e.g., Global Workplace Analytics.com, 2020b; Lund et al., 2020)—adoption of remote work, as well as the inconsistent findings of previous virtual teams research, this shift raises a timely and important question with implications for how organizations design their next normal:

> **RQ1:** To what extent does team deliberation modality (in-person and remote) affect decision quality?

We also explore information sharing and team decision making in teams that deliberated in-person while wearing face masks. This distinction is important because the return from a remote working modality back to in-person work during 2021 was accompanied by many organizations' mandating face masks, in an effort to minimize exposure to the coronavirus. The in-person with face mask modality differs from in-person deliberation without face masks because masks can restrict team members' ability to clearly interpret some non-verbal communication (e.g., facial expressions and gestures). Teams deliberating in-person without face masks can share information not just through verbal communication but also through non-verbal communication. In addition to restricting non-verbal communication, nuanced sound intonations can also be muffled when the speaker is masked. Thus, wearing a face mask reduces the amount of information that teammates are able to convey (e.g., Mheidly et al., 2020) but not as severely as fully remote communication, especially when it occurs without video. Therefore, wearing face masks may not be as conducive to information sharing and team decision making as in-person deliberation without face masks but may still fare better than fully remote deliberation. In essence, in-person without face masks and fully remote deliberation may permit greater non-verbal and nuanced communication, whereas deliberating in-person with face masks may fall somewhere in between.

RQ2: To what extent does deliberating in-person with masks affect decision quality?

Method

Participants and Procedure

We first developed and validated a hidden profile decision task (Stasser, 1988). See the Team Decision Task section in the supplementary materials for a detailed description of the validation procedures of the hidden profile task. Team decision performance was operationalized as a binary variable based on the exoplanet selected by the team (1 = correct decision; 0 = incorrect decision). We administered the team decision task in classroom teams as part of a controlled, timed exercise to teach team decision making. The exercise was administered in seven courses (across four higher educational institutions) over a period of four years.

In-Person Deliberation. Prior to January 2020, the teams were in what we now call *Condition 1*, in-person deliberation (Condition 1 $N = 60$ teams, $N_{individual} = 248$ members).

Remote Deliberation. On March 20, 2020, the universities where the task was being administered shifted to fully remote instruction, and the exercise was conducted on the Zoom platform. These teams completed the task following the same procedure and time limit, but over Zoom. We call this *Condition 2,* remote deliberation (Condition 2 $N = 96$ teams, $N_{individual} = 416$ members).

In-Person Deliberation with Face Masks. On September 21, 2021, the university where the majority of data were collected returned to in-person instruction, requiring face masks to be worn at all times. We call this *Condition 3,* in-person deliberation with face masks (Condition 3 $N = 19$ teams, $N_{individual} = 82$ members).

Each team included between four and seven members (there were a grand total of $N_{individual} = 746$ members in the current dataset), and each team had at least one member with each information profile. In teams larger than four members, two members had the same information profile. The procedure and materials were identical in the three conditions, and all 175 teams were given 30 minutes to deliberate.

Results

Examining team decisions as a function of meeting modality (see Figure 1) shows that more in-person teams reached the correct decision than did remote teams or teams meeting in-person while wearing face masks. The results also show that masked in-person teams performed better than remote teams. A Pearson chi-square test of independence—using a contingency table of all three deliberation conditions (in-person, remote, and in-person with face masks)—was performed to examine the relationship between virtuality and team decision making (Table 1). In essence, this test is used to assess whether at least one statistically significant difference exists between all of the cells contained in the 3×2 matrix. The relationship between virtuality and team decision making was statistically significant, X^2 (2, $N = 175$) = 12.5, $p < .05$. We followed the chi-square test with three pairwise post hoc Pearson chi-square tests of independence (Table 1): (1) in-person vs. remote, (2) in-person vs. in-person with face masks, and (3) remote vs. in-person with face masks. Results show a statistically significant effect of in-person vs. remote modality on team decision making, X^2 (1, $N = 156$) = 12.5, $p < .05$. Teams who met in-person made better decisions than those who met remotely. The difference in decision quality between teams meeting in-person with and without masks was not statistically significant, X^2 (1, $N = 79$) = 1.5, $p > .05$; nor was the difference in decision making between teams meeting remotely vs. those who meet in-person with face masks, X^2 (1, $N = 115$) = 1.0, $p > .05$.

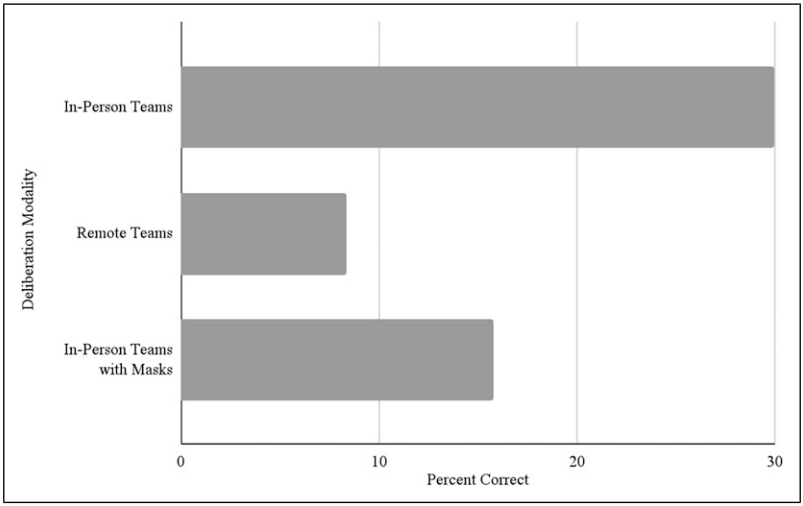

Figure 1. Percentage of Teams Correctly Solving a Hidden Profile Task Based on Deliberation Modality. *Note:* The in-person deliberation (N = 60) occurred before January, 2020; the fully remote deliberation (N = 98) occurred between March, 2020 and June, 2021; the in-person with face mask deliberation (N = 19) occurred between September, 2021 and January, 2022.

Discussion

As organizations navigate the challenges of post-pandemic work arrangements, they face competing pressures to support the hybrid and remote work arrangements employees are pressing for while also ensuring high-quality team decisions. The present study offers an important look into the implications of fully remote work. Thus, our findings are useful to organizations considering future work modalities. Effectively leading teams that operate in a hybrid environment necessitate offering adequate support for team decision-making processes. This support may manifest in various forms, such as arranging critical decisions to be made in the context of in-person meetings, or enhancing support for the exchange of unique information during remote team meetings. The findings of this study demonstrate that teams with distributed expertise make inferior decisions when meeting remotely, as compared to teams who meet in-person. It is important to underscore that all teams in this study were solving the same decision task—with the same amount and distribution of information—under the same time constraints. This result underscores that team conversations commencing over digital video software

Table 1. Pearson Chi-Square Tests of Independence.

	Overall Test (Contingency Table)		
	Incorrect Decision	Correct Decision	Row Totals
In-person	42	18	60
Fully remote	88	8	96
In-person (with masks)	16	3	19
Column totals	146	29	175 (grand total)
Pairwise test 1 (in-person vs. remote)			
In-person	42	18	60
Fully remote	88	8	96
Column totals	130	26	156 (grand total)
Pairwise test 2 (in-person vs. in-Person with masks)			
In-person	42	18	60
In-person (with masks)	16	3	19
Column totals	58	21	79 (grand total)
Pairwise test 3 (remote vs. in-Person with masks)			
Fully remote	88	8	96
In-person (with masks)	16	3	19
Column totals	104	11	115 (grand total)

Note. Overall Test X^2 (2, N = 175) = 12.5, p < .05. Pairwise Test 1 in-person vs. remote X^2 (1, N = 156) = 12.5, p < .05. Pairwise Test 2 in-person vs. in-person with masks X^2 (1, N = 79) = 1.5, p > .05. Pairwise Test 3 remote vs. in-person with masks X^2 (1, N = 115) = 1.0, p > .05.

and those occurring in-person are not the same. This is not to say teams should not meet remotely to make critical decisions, but rather, that remote teams need to be especially vigilant in sharing and integrating members' diverse perspectives. Using meeting facilitation practices that prompt team members to share their different perspectives, and then ensuring that unique information is factored into decisions, seems especially prescient for remote teams.

We also explored the effect of face masks on team decision making. Though the results are not significant, the direction of effects suggests making team decisions masked in-person may be superior to making them remotely. The continuing uncertainty of the pandemic and changing guidance on exposure often present workplaces with this more nuanced choice of which is better: meeting in-person with some or all members wearing masks, or shifting back to fully remote meetings. Our data suggest that in-person may be preferable.

These findings should not be interpreted as advising against hybrid work. Rather, they suggest that interdependence is an important factor that should govern what kinds of work tasks are carried out remotely, and what kinds may

benefit most from being complete in-person. Important decisions made by teams of experts benefit from in-person interaction. Taken together, these findings suggest that team decisions may benefit from in-person communication, or by vigilant facilitation that encourages openly sharing unique information. The finding that teams who met in-person were more likely to make better decisions than those who met remotely suggests hybrid teams could benefit from deliberative facilitation.

Practical Implications

Whereas prior research has suggested that virtuality may incur some benefits, results from the current research suggest that extreme levels of virtuality are not conducive to information sharing and team decision making. The results reported herein imply that in-person teamwork may be most conducive to team decision making. Organizations may consider the findings from this study as preliminary evidence to create policies around remote working based on the teamwork requirement of jobs. The current findings help inform these policies by pointing to the importance of scheduling some in-person teamwork days where unique information can be openly shared as teams make important decisions.

In particular, these findings document an advantage to in-person work. Teams who met in-person made better decisions that incorporated members' unique information. Given this, organizations pursuing hybrid arrangements could designate particular recurring days for team members to all work in-person together, and to prioritize these days for meetings that involve complex and/or high-consequence decisions. This approach to hybrid work would not only ensure that individuals benefit from having some flexible days but also ensure collocation of team members on certain days in order to promote unique information sharing and quality decision making.

Furthermore, directing attention to teams and organizations who have opted to permanently switch to remote or work-from-home configurations, these findings are also useful for managers leading fully remote teams without an in-person option. Remote managers should be especially vigilant in facilitating team processes that support unique information sharing including structuring discussions, framing the decision as one with a quantifiable best option, and cultivating a cooperative team climate (Mesmer-Magnus & DeChurch, 2009).

Future Directions

Findings from the current study pose important questions about mechanisms by which modality affects team decision making. What are the intervening

processes that explain why teams convening over highly rich media are less able to integrate unique information? One potential mediating mechanism of virtuality and performance is reduced information sharing. Prior research on teams demonstrates unique information sharing is one of the strongest predictors of team effectiveness (Mesmer-Magnus & DeChurch, 2009). Moreover, as noted previously, meta-analytic evidence also shows full virtuality (e.g., deliberation via remote communication only) may impede—rather than enhance—information sharing (Mesmer-Magnus et al., 2011). This work suggests moderate levels of virtuality (e.g., hybrid modes of communication that use both face-to-face and virtual interactions) result in higher levels of information sharing. As such, scholars seeking to further understand this phenomenon in the future may want to incorporate information sharing as a component of their empirical examinations. For example, future research might incorporate an explicit measure of information sharing that could be tested as a mediator in the causal chain linking virtuality and performance. Establishing information sharing as a key mediating mechanism would yield novel and useful insights for academics, practitioners, and organizations at large.

There are a variety of ways that virtuality may lead to reduced information sharing, and therefore, reduced team performance. The first is what is commonly known as Zoom fatigue, which may directly suppress unique information sharing by increasing cognitive strain. Bailenson (2021) explained the phenomenon as resulting from some combination of (1) excessive amounts of close-up eye gaze, (2) cognitive load, (3) increased self-evaluation from staring at video of oneself, and (4) constraints on physical mobility. To the extent that team decisions are impaired by Zoom fatigue, potential interventions may include spacing Zoom meetings and/or using audio-only formats to reduce cognitive evaluation, eye-gaze, and self-evaluation. Ensuring physical activity immediately prior to a remote meeting, and not scheduling back-to-back remote meetings, could be possible strategies for improving remote decisions.

The second potential explanation is multitasking, which could also reduce unique information sharing vis-a-vis reduced attention. Whereas in-person team meetings invoke norms to focus and pay attention to the task at hand, remote meetings offer some privacy in that actions are not all viewable to others on the team. Thus, it may be that lack of attention explains the diminished team decision quality of remote as compared to in-person teams. In a large-scale study of multitasking during the COVID-19 pandemic, Cao et al. (2021) found that individuals are more likely to multitask during large meetings, long meetings, morning meetings, and recurring meetings, thus suggesting that when essential team decisions must be made remotely, team

norms and scheduling practices directly target these factors to prevent multitasking.

Taken together, the above findings suggest a host of new variables to consider in team decision research, particularly in laying out an empirical basis to ground recommendations for hybrid work. In addition to Zoom fatigue and multitasking, there are likely to be many other ways that virtuality may lead to limited information sharing relative to in-person teams. In addition to incorporating an explicit measure of information sharing, we encourage future researchers to consider antecedents of information sharing itself, perhaps through experimental manipulation of different virtuality factors.

Limitations

While providing an important first look at the practical question of how best to design hybrid work arrangements, it is important to recognize four limitations of the current study.

First, in addition to remote work, there were extraneous factors during this time period, which might influence team performance. It was a time of generally elevated stress levels, and even when participants returned to in-person interaction, this coincided with the arrival of the Omicron strain. As such, virtuality and strain may both have affected the findings. Distress may have been greater earlier in the pandemic, with a turbulent transition to remote learning, which could explain the performance decline.[1] To explore this possibility, we conducted a post hoc analysis in which we compared two time periods—using a pairwise chi-square test—of fully remote work, one at the pandemic onset (in April 2020, during the Spring academic term) and one after some adjustment had occurred (in October 2020, during the Fall academic term). The difference in decision quality between teams meeting remotely in Spring 2020 vs. Fall 2020 was not statistically significant; X^2 $(1, N = 96) = 0.4$, $p > .05$ (see Table 2). We did not find an improvement in team decision quality between these periods, suggesting no influence of the pandemic phase. Rather, virtuality itself seems to be the primary driver of the current findings. Nonetheless, it is important to recognize the effects of the general distress participants were experiencing.

Second and relatedly, the quasi-experimental research design leveraged data arising from a natural experiment. Teams were not randomly assigned to modalities, and as such, causal relationships between virtuality and team decision making cannot be inferred. Future studies may direct attention toward conducting true experiments with both random assignment and control conditions to establish a causal link between virtuality and team functioning.

Table 2. Pearson Chi-Square Tests of Independence (within Condition 2: Fully Remote).

	Pairwise Test 4 (Spring 2020 vs. Fall 2020)		
	Incorrect Decision	Correct Decision	Row Totals
Spring 2020	6	1	7
Fall 2020	82	7	89
Column totals	88	8	96 (grand total)

Note. Pairwise Test 4 Spring 2020 vs. Fall 2020 within the remote deliberation condition X^2 (1, N = 96) = 0.4, $p > .05$.

Third, this study has a relatively small sample size ($N = 19$) for the in-person with face mask condition. This influences the statistical power of the tests involving comparisons of the in-person with mask condition with the remaining two conditions (fully remote and in-person). Future studies could focus on obtaining more team-level data from in-person teams with face masks, which would offer higher statistical power and the ability to detect statistically significant effects.

Finally, although the participants represented a range of education levels, including professional master's students who were employed full-time, all participants in the current study were students located in the US, which may limit the current study's generalizability to other contexts. It would be insightful for researchers to direct attention toward conducting similar studies using non-student and non-US samples.

Conclusion

As the titles of recent media reports highlight, "The Office's Last Stand," (Goldberg, 2022) or "The Office is Dying. It's Time to Rethink How We Work" (Petersen & Warzel, 2022), organizations are facing an urgent question of how to weigh the value of in-person work. This study offers one helpful benchmark in the debate: that teams whose members each possess unique information make superior decisions when the discussion occurs in person, relative to when they meet over video conference. These findings provide empirical support for policies that encourage employees to work in the office on at least some of the same days as their teammates, as compared to those where employees come work hybrid but are in-person on different days. In conclusion, this work highlights the importance of considering the goals of in-person work when weighing the relative merits of work modalities and hybrid scheduling practices.

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ORCID iD

Anoop A. Javalagi https://orcid.org/0000-0002-4221-3456

Supplemental Material

Supplemental material for this article is available online.

Note

1. We would like to thank an anonymous reviewer for suggesting this possibility and the corresponding analysis.

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Author Biographies

Anoop A. Javalagi is a Postdoctoral Researcher at Northwestern University. He received a Ph.D. in Human Resources & Industrial Relations (minor: Statistics) from the University of Illinois at Urbana-Champaign. His research leverages quantitative approaches to examine trait/behavioral approaches to leadership, technology-enabled future work forms (e.g., virtual/remote work arrangements, human-AI teams), and deep space exploration teams. He teaches undergraduate and graduate courses in management, psychology, and research methods/statistics.

Alexandra M. Harris-Watson is an Assistant Professor of Psychology in the industrial/organizational area at the University of Oklahoma. Her research interests include applied psychometrics and individual difference measurement, trait configurations, and the role of individual differences in interpersonal dynamics at work, including leadership, teams, and collaboration between humans and artificially intelligent teammates.

Leslie A. DeChurch is Professor and Chair of Communication Studies and Professor of Psychology at Northwestern University. She is a leading scholar in the area of leadership and team effectiveness. Her research explores leadership and team dynamics in virtual teams, human-AI teams, deep space exploration teams, and the teams behind the Renaissance.