The Dual Role of Trust in Creative Global Virtual Teams: Implications for leadership in times of crisis

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1. Introduction

When the harsh reality of the COVID-19 crisis became painfully evident, daily work operations were moved out of the workplace. All types of work, including creative team-based projects and tasks (but excluding those which were necessary to keep society functioning), were to be carried out from home, what we have come to know as the "new normal". When a crisis like this suddenly imposes virtual working conditions on team members, who are ordinarily collocated, it becomes imperative to discuss in what way team leaders can be supportive. This will assure that teams continue to be creative in their new geographically dispersed working arrangement.

Creativity produced by teams, in terms of the development of new and imaginative ideas, products, processes, structures and practices (Yoon, Song, Lim, & Joo, 2010; Kurtzberg & Amabile, 2001), has been found to surpass that of individuals (Boon, Vangrieken, & Dochy, 2016). However, team creativity research has been criticized for not providing insights into the behaviors or processes within teams that lead to creative outputs (Boon et al., 2016). Past research has focused on characteristics of teams that enhance creativity and idea generation, such as team diversity and heterogeneity (Cox & Blake 1991; Garrison, Wakefield, Xu, & Kim, 2010; Martins & Schilpzand, 2011; Stahl, Maznevski, Voigt, & Jonsen, 2010a: Stahl, Mäkelä, Zander, & Maznevski, 2010b). But as noted by Boon et al. (2016), there is (still) too much focus on what the team should look like and not enough on how the team actually "gets there". It is thus time to place team processes at the center of attention when examining creativity.

A focus on team processes takes on additional urgency as the COVID-19 pandemic crisis underscores the challenges encountered by suddenly deploying teams to virtual settings (Feitosa & Salas, 2021; Garro-Abarca, Palos-Sanchez, & Aguayo-Camacho, 2021; Kilcullen, Feitosa, & Salas, 2021). While leadership is of central importance to creativity in teams,

especially when working in virtual global teams compared to working in close geographic proximity (Bartsch, Weber, Büttgen, & Huber, 2020), its importance becomes augmented in the case of hastily launched virtual teams during a crisis, such as the ongoing pandemic. Teams have to quickly adjust to new ways of working, virtually and from home, as the physical distance between colleagues can have a negative effect on within-in team member relations (Jackowska & Lauring, 2021). The influence of leaders is of paramount importance as processes and team norms are to be adapted to the new virtual work environment (Kilcullen et al., 2021). In addition, leaders can help encourage creativity by fostering relational processes in such teams – for example, socio-emotional aspects such as trust building (Han, Chae, Macko, Park, & Beyerlein, 2017; Amabile, Barsade, Mueller, & Staw, 2005).

Trust has been demonstrated to be one of the vital ingredients of team creativity. Intrateam trust has been found to have a positive effect on creativity, whereas distrust and monitoring and controlling leader behaviors have a negative impact on team creativity (Barczak, Lassk, & Mulki, 2010; Garro-Abarca, et al., 2021; Han et al., 2017; Henttonen & Blomqvist, 2005; Zhou, 2003). High levels of trust among team members in a digital working environment help teams to manage high levels of uncertainty and complexity commonly experienced during a crisis (Jarvenpaa & Leidner, 1999; Feitosa, & Salas, 2020). In studies of virtual teams during the COVID-19 pandemic, trust surfaced as one of the most significant links to creativity (Garro-Abarca, et al., 2021), understanding trust-related team processes thus becomes as an important research task to undertake.

In this chapter, we have opted to closely examine our earlier pre-COVID-19 crisis study to obtain a nuanced and crisis-free picture of the demands facing leaders of global virtual teams. We reason that studying trust-related processes relevant to creativity in teams working digitally would provide us with an understanding of how team leaders can be supportive. Fast forward

to today: we aim to discuss what team leaders can do to support trust processes in creative teams, based on our empirical findings with the added urgency of a crisis situation.

In the subsequent sections, we introduce the topic of trust as well as three trust-related team-based drivers of creativity (within-team feedback, team cohesion and team learning) before presenting our empirical illustration of how trust is linked to team creativity in global virtual teams. After this, we proceed to discuss implications for team leadership with practical recommendations for leaders who suddenly, due to a crisis such as the COVID-19 pandemic, must operate digitally in a geographically dispersed virtual environment. We also address how education can help prepare students for such rare but critical situations in the future, before wrapping up with conclusions and looking ahead.

2. Creative global virtual teams

2.1. Trust in creative global virtual teams

Trust has long been argued, and empirically established, to be key to effective teams (Ford, Piccolo, & Ford, 2017). Despite inconsistencies in earlier research regarding the trust-performance link, meta-analyses have yielded robust results as to the positive effect of trust on performance (De Jong, Dirks, & Gillespie, 2016; Feitosa, Grossman, Kramer, & Salas, 2020). When team members trust each other and the team leader, they are more proactive, more focused on the tasks, initiate more interpersonal interaction and provide more feedback, which in turn substantially improves collaboration and produces better team outcomes (Feitosa et al., 2020; Ford et al., 2017).

Trust is particularly important to global virtual teams (Breuer, Hüffmeier, & Hertel, 2016; Ford et al., 2017; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015; Jarvenpaa, Knoll, & Leidner, 1998). In tandem with the development of contemporary digital solutions,

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global virtual teams have become the 'go-to organizational form' for problem-solving and creative solutions in organizations (Kirkman & Malthieu, 2005; Maznevski & Chudoba, 2000). However, digitally-based interaction in cyberspace places extra demands on interpersonal communication and collaboration. Virtual working contexts make it difficult for members of a work group to observe each other and tap into non-verbal cues, as team members lack the interpretative insights that come from face-to-face interaction. Misunderstandings can therefore easily be exacerbated by differences in language, culture and leadership expectations (Ford et al., 2017; Jarvenpaa et al., 1998; Klitmøller & Lauring, 2013; Kramer, Shuffler, & Feitosa, 2017; Maznevski & Zander, 2001; Stahl et al., 2010a; Zander, Mockaitis, & Butler, 2012). When problems occur, conflict-resolution becomes complicated across time zones and geographical distance, especially if a low level of trust in the team hampers, or even halts, virtual team processes. Notably, trust is not only critical for mitigating negative processes but also for generating positive team processes (Han et al., 2017).

Perhaps not surprising, but illustrating, is how Garro-Abarca et al. (2021) found that trust was the most important factor for co-creation in a study of software engineers, who worked remotely from home amid the ongoing COVID-19 pandemic. Trust is important to creative team dynamics, as it leads to an openness among team members, which encourages information sharing and collaboration necessary for interdependent tasks. It also allows for higher risk-taking among team members who need to rely on each other's competence and willingness to contribute to the team (see e.g. Barczak et al., 2010; Feitosa et al., 2020). When virtual teams are formed hastily, however, they often omit important stages in the formation process or give them only cursory attention; time is often needed to ensure stable virtual team dynamics (Feitosa & Salas, 2020). As a consequence, irregularities in process, such as delays in communicating, or lower responsiveness from team members can lead to distrust. As pointed

out by Barczak and colleagues (2010), distrust makes team members more defensive, but team members who trust each other instead engage in creative discovery.

Our understanding of trust is based on Feitosa et al. (2020:2), as "an emergent and dynamic shared state at the team-level whereby team members believe in one another's competence and are willing to be vulnerable beyond task-related issues," and McAllister's (1995:26) assertion that trust provides "…the platform, from which people make leaps of faith." Making that leap of faith in teams tasked with creativity necessitates a belief in each other's expertise and reliability (a cognitive trust component), as well as a willingness and openness to share and discuss ideas by each team member (an affective trust component).

The link between cognitive and affective dimensions of trust and performance in teams has been inconsistent in prior research, but meta-analyses have found that both types of trust are vital to team performance (De Jong et al., 2016; Feitosa et al., 2020). With regard to creative team outcomes, Barczak et al. (2010) found a significant relationship between performance and cognitive trust, interpreted as members' beliefs in each other's competence and reliability, but not affective trust (the creation of emotional bonds and care for each other), in collocated teams. In contrast, Feitosa et al. (2020) put forth that affective trust is more likely to be predictive of team creativity than cognitive trust.

People are currently working in virtual teams in more types of organizations and work and non-work settings than ever before. The virtual experience is new to many, who have previously had little experience in such teams, and suddenly had to shift from collocated to virtual teamwork, or who have been thrust into working virtually from home, removed from their regular work environment. Thus, during the COVID-19 pandemic the issue of trust between team members who work in geographically dispersed virtual teams, is even more precarious (Feitosa & Salas, 2020; Garro-Abarca et al., 2021; Kilcullen et al., 2021; Mangla, 2021).

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2.2. Trust-related drivers of creative team processes

Turning to extant research, we identified three trust-related drivers of creative processes that take place within teams: 1) feedback, 2) team cohesion, and 3) team learning. Feedback, especially task-oriented feedback, from team members and leaders within the team has been found to improve team processes, efficiency and performance (Bartsch et al., 2020; Joo, Song, Lim, & Yoon, 2012; Kilcullen et al., 2021; Mangla, 2021). Within-team feedback is a supportive mechanism that contributes to team members experiencing the virtual teamwork environment as a psychologically safe environment, which is critical to creativity, and especially important in times of crisis (Kilcullen et al., 2021). The link between feedback and creativity is a reflection of the type of feedback provided – whether it is positive in tone, empowering, developmental, or negative and directive or controlling (Zhou, 2003; Kirkman & Rosen, 1999). When team members are supported by positive feedback it gives them relevant information for improving their work, increasing the reliance on the other team members' competence, knowledge and ideas, as well as reinforcing the information exchange (Boon et al., 2016; Kilcullen et al., 2021), but care needs to be taken as feedback in a virtual setting is more prone to misunderstandings (Mangla, 2021). Thus, within-team feedback leads to increasing trust in team members' competence and capabilities, and a willingness to accept improvement and enhance learning that can be converted to team creativity (Feitosa & Salas, 2021; Henttonen & Blomqvist, 2005). In short, a trustful team feedback climate can encourage team creativity (Joo et al., 2012).

Research has also found a positive link between team cohesion and creativity (e.g., Joo et al., 2012). Cohesion has long been studied in the team context; cohesive teams share a sense of belonging, commitment to and identification with the team, collaboration, support and mutual liking between members. The ability to get along may differ in global virtual teams and collocated teams, but the need to develop intra-team cohesion is particularly important in both

types of teams for achieving goal congruence and effective communication (Garro-Abarca et al., 2021; Lu, 2015). High team cohesion provides numerous benefits, such as better coordination and greater willingness to reach agreements. It also brings relational benefits such as team members being more cooperative and friendlier to one another (Lu, 2015). The extant research has demonstrated that team cohesion is positively related to team performance (Brahm & Kunze, 2012), and that team cohesion is positively linked to trust (Garro-Abarca et al., 2021; Lu, 2015). During the Covid-19 pandemic, Garro-Abarca et al. (2021) found that team cohesion was related to trust in creative global virtual software development teams. Fostering team cohesion is thus crucial for positive team trust climate and ultimately for virtual team performance, including team creativity, during times of crisis.

Team learning is another medium through which creativity is enhanced (Han et al., 2017). Collective learning results from social interactions among team members (Boon et al., 2016). As teams develop a positive working climate and members become more trustful of each other, they will have fewer hesitations to try new ideas, rethink, discuss and amend existing ideas or solutions. Sharing ideas and learning from each other also enhances creativity (Han et al., 2017). When team learning is high, members are able to identify strengths and weaknesses in member ideas and suggestions, effectively improving the quality of ideas and achieving team creativity, above and beyond that of the individual team members (Lyndon, Pandey, & Navare, 2020). Team processes, such as knowledge sharing, questioning ideas, reflecting on tasks, goals and team strategies, and adapting to the diversity of ideas, opinions and expertise lead to learning that fosters team creativity (Boon et al., 2016). A psychologically safe team environment enables such team processes that are critical to improving team learning and enhance team creativity (Han, Lee, & Beyerlein, 2019). Team learning is associated with both team cohesion and within-team feedback, both found to be especially critical to trust and

creativity in global virtual teams in times of crisis (Garro-Abarca et al., 2021; Kilcullen et al., 2021).

The three trust-related drivers above (team cohesion, feedback and team learning) are especially valuable to global virtual teams, which are usually characterized by a multicultural team composition, where positive creative processes largely benefit from a plurality of perspectives, breadth of ideas and suggestions, and a willingness to challenge what is put forth by team members (Stahl et al., 2010b). Consequently, it is important to highlight that for virtual teams formed due to crisis like COVID-19 pandemic a psychologically safe environment for team creativity is needed through supportive mechanisms that can create trust through team cohesion, feedback and team learning (Feitosa & Salas, 2020; Garro-Abarca et al., 2021; Kilcullen et al., 2021). In the subsequent section, we will present the details of our empirical illustration of trust and creativity, and the roles played by team cohesion, feedback, and team learning in globally dispersed teams.

3. Empirical illustration

3.1. Sample and variables

During a three-week competition, students organized in global teams had to develop and submit a business proposal for a profitable product or service that addresses one of the UNDP Millennium Goals. In total, 590 students in 95 geographically dispersed teams participated in the competition. Teams of eight students were formed to maximize cultural, geographic and linguistic variance. Links to a questionnaire were sent to all participants, generating an effective response rate of 26 %. The sample consists of 155 respondents of 44 different nationalities with 48.1% female and 49.4% male respondents (2.6% no response). The average age of the

respondents was 23.7 years old, and, notably, 70.5% of the students had prior experience of working in multicultural team projects.

3.2. Measures

All items in our study were rated on a scale from 1, "strongly disagree," to 7, "strongly agree". Age and respondent gender were used as controls.

Our dependent variable, *team creativity (α=.95)*, was measured with nine items based on Joo et al. (2012). Respondents were asked about the extent to which creativity is present in their teams (sample item: "Our team often has new and innovative ideas.").

Team cohesion (α=.92) included four items and measured how closely-knit and interdependent work groups are (Podsakoff, MacKenzie, & Fetter, 1993; Joo et al., 2012). A sample item is: "My work group members know that they can depend on each other."

Feedback (α=.72) was a two-item measure (Scott & Bruce, 1994) about the extent to which members found the feedback received from other team members useful, and the extent to which the team members provided the respondent with information about how to improve one's work in the team.

Trust was differentiated into affective and cognitive trust based on McAllister (1995) and the items in this study adapted by Mockaitis, Rose, and Zettinig (2009) to reflect team trust were used. *Affective trust* (α = .89) is a three-item scale measuring the extent to which team members feel that they can share problems, feelings and ideas with the team and expect empathy from other members. *Cognitive trust* (α = .69) was comprised of two items regarding trust in team members' competence and professionalism (sample item: "My team members approach the task with professionalism and dedication").

Team learning (α=.94) was measured with ten items following Joo et al., (2012). Respondents rated the extent to which elements of a team learning culture were present in the

team. Examples of these elements are: taking time to support learning, helping each other, encouraging diverse perspectives, revising team thinking with new information, providing opportunities to learn through teamwork, and a desire to learn from each other.

3.3. Hypotheses and data analysis

The Hayes PROCESS macro in SPSS provides a robust test for simultaneously measuring the effects of primary relationships and significant indirect and conditional indirect effects. We tested six hypotheses (see Table 1) with mediation analysis using the Hayes macro.

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Using the Hayes Process model 6, we tested for indirect effects via two mediators on the basis of 5,000 bootstrap samples in generating 95% bias-corrected bootstrap confidence intervals (CI). A full description of the Hayes method is provided in Hayes (2013). The results of the PROCESS analyses are shown in Tables 2 and 3.

Results testing Hypotheses 1-3 are presented in Table 2.

------INSERT TABLE 2 ABOUT HERE------

In Table 2, the indirect effects of the mediating variables are provided. The indirect effect of affective trust on the relationship between team cohesion and creativity is significant (Effect = 0.14, 95% Boot CI = 0.19, 0.45) in support of Hypothesis 1, as is the indirect effect of team learning (Effect = 0.14, 95% Boot CI = 0.05, 0.24), supporting Hypothesis 2. Hypothesis 3 is also supported; team cohesion affects creativity via affective trust and team learning (Effect =

0.04, 95% Boot CI = 0.01, 0.09). Team learning mediates the affective trust-creativity relationship as well.

Results testing Hypotheses 4-6 are presented in Table 3.

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Table 3 depicts the analysis of cognitive team aspects. Once again, indirect effects are significant for all of our proposed mediators. The relationship between feedback and creativity through cognitive trust was significant (Effect = 0.13, 95% Boot CI = 0.28, 0.52), supporting Hypothesis 4. Likewise, the indirect effect of team learning on the feedback-creativity relationship was significant, in support of Hypothesis 5 (Effect = 0.23, 95% Boot CI = 0.12, 0.34). Team learning also mediates the cognitive trust-creativity relationship (Effect = 0.05, 95% Boot CI = 0.02, 0.10). These results support Hypothesis 6.

The effects of cognitive and affective processes are not interchangeable; they are distinct. For example, we tested whether affective trust might mediate the feedback–creativity relationship and, alternatively, whether cognitive trust mediates the cohesion-creativity relationship. No such mediation effects were found.

3.4. Results and interpretation

We found that trust and team learning mediate the relationships between team cohesion and creativity as well as feedback and creativity, as hypothesized. Using separate measures for affective trust and cognitive trust generated results that confirm a dual role played by trust in globally dispersed multicultural teams. Although prior research has identified the link between cohesion, learning and creativity, our results demonstrate that trust is not only essential, but it may shape the nature of team processes, depending on what type of trust in teams prevails.

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Our results support two types of creative team processes, one related to cohesion and the other related to feedback. We considered these aspects separately in our analysis. Although both exist to some extent or in some form in all teams, here we think of one or the other as being the dominant driver in a team process. For simplicity, we refer to them as the Affective Team and the Cognitive Team (see Figure 1a and Figure 1b).

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Figure 1a depicts the relationship between affective team processes and creativity. In the Affective Team, team cohesion is positively related to team creativity through the creation of affective bonds or trust that in turn enhance learning. Team members perceive that they can freely share ideas, feelings and hopes, but also talk about problems and difficulties, knowing that others will listen and respond thoughtfully. We can think of the Affective Team as being an emotionally supportive type of team, where team members feel part of a team that they trust and like, and with whom they freely exchange knowledge, which becomes a source of inspiration for creativity. We proposed and found that teams with high levels of cohesion also have higher levels of affective trust. Members in cohesive teams will feel free to openly communicate and exchange ideas, as a sense of belonging will also increase the bond with team members, interpersonal relationships and trust.

Figure 1b depicts the relationship between cognitive team processes and creativity. In the Cognitive Team, where there is a high level of cognitive trust, team members perceive each other as approaching their work task with professionalism and dedication. They can rely on each other not to make each other's work more difficult through carelessness. In the Cognitive Team we find that team feedback in the form of information about how to improve job performance is converted to team creativity through cognitive trust and learning. Help and

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support are also specifically related to the work at hand; the sharing of expertise and knowledge is associated with creativity. This happens through the fostering of cognitive trust that in turn enhances learning, which in turn supports creativity.

Trust thus plays a dual role in team processes. The mediating role of cognitive and affective trust depends on whether the team emphasizes cognitive or affective processes. Within-team feedback in our study enhanced cognitive trust and team learning which led to creativity, while affective trust and team learning mediated the relationship between team cohesion and creativity.

3.5. Theoretical contributions

Our pre-crisis study findings, presented in this chapter, support earlier research demonstrating the importance of trust for creativity in teams (Barczak et al., 2010; Garro-Abarca et al., 2021; Han et al., 2017; Henttonen & Blomqvist, 2005); virtual collaboration in globally dispersed teams depends on both cognitive and affective trust processes for creative team outcomes. Intriguingly, our results support both Feitosa et al. (2020) and Barczak et al. (2010), despite their contradictory assertions as to which type of trust is related to team creativity; both types of trust - affective and cognitive - were found to be significant for creativity in the teams in our study.

We highlight three specific contributions of our study to the literature on team creativity and trust before discussing implications for team leadership in crisis situation. First, we demonstrated that both affective and cognitive trust enhance team creativity but do so through different team processes. The indirect relationship between team cohesion and creativity is mediated by affective trust; the focus is on interpersonal aspects, such as getting along and feeling comfortable sharing ideas and problems. The indirect relationship between feedback and team creativity is mediated by cognitive trust, which highlights work-oriented aspects, such

as approaching tasks with professionalism and relying on each other's competence. Our second contribution was that we could ascertain that these two sets of processes are unique in that the two types of trust are not interchangeable as mediators between team cohesion and creativity, and feedback and creativity respectively. Although, we would expect teams to exhibit both types of trust, one type is more likely to dominate. A third contribution is our finding that that both affective and cognitive processes were, as could be expected, moderated by team learning. This directs attention to the role of learning in teams - the importance of aspects such as questioning, reflecting, discussing, rethinking, considering others' suggestions, and transforming ideas and solutions - as fundamental to creative processes.

These findings have important implications for leadership, especially in a crisis such as COVID-19, where team members suddenly find themselves having to work from home, digitally at a distance, and still having to engage in creative problem solving and to produce creative outcomes. The importance of leadership in times of crisis can thus be appreciated when building on an understanding of the dual trust-drivers in team environments. Influencing and determining the team's trust orientation will have far-reaching implications for how leaders can be effective in a crisis situation where team members are scattered to work from a distance. We will below discuss implications of our findings on affective and cognitive trust for team leadership in practice and leadership-related education.

4. Implications for leadership in times of crisis

Estimates from around five years ago indicate that 50-70% of white-collar employees in the OECD countries have virtual teamwork experience, and that around 20-25% of them work across national borders in global virtual teams (Jimenez, Boehe, Taras, & Caprar, 2017). Although, we can expect that the numbers due to the pandemic have greatly increased since

then (Feitosa & Salas, 2020), it still came as a shock to many to suddenly have to work virtually from home, as pandemic-induced restrictions surged across the world a year ago.

Our findings have implications for team leadership in times of crisis. When team members suddenly and without preparation (as during the COVID-19 crisis) are thrust into virtual work and must produce creative team outputs from a distance, team leaders need to step up to the challenge. They need to understand that trust is vital to the process of creativity, but it is particularly critical to global virtual teams in times of crisis (Garro-Abarca et al., 2021). Team leadership becomes even more essential (Bartsch et al., 2020), and leaders need to focus on developing, sustaining and enhancing trust (Feitosa & Salas, 2020).

Research insights about virtual team research in general (Kilcullen, et al., 2021) and global virtual teams specifically (Makarius & Mukherjee, 2020) have been used to provide much needed recommendations as to how to support team leaders and members to aid rapid transitioning needed due to the COVID-19 pandemic to adapt team work to be conducted virtually. Research suggests that the exceptional circumstances brought by the COVID-19 pandemic have elevated the need to consider the wellbeing of team members (Makarius & Mukherjee, 2020) whose new normal suddenly forced a convergence of formerly distinct routines (Feitosa & Sallas, 2020) in work, family life and leisure into the same physical and psychological space. The crisis responses require leaders to consider performance, organizational processes and relational factors in the teams.

As our findings demonstrate that both affective and cognitive trust play an important role consequential for team creativity, we will in the subsequent section discuss implications for team leadership on how creative outcomes can be supported in the two trust (affective and cognitive trust) antecedent settings when rapid deployment of virtual teams due to crisis situations is enforced.

4.1. Affective trust: implications for global virtual team leaders in times of crisis

To enhance affective trust, team learning and creativity, our findings suggest that team leaders should pay special attention to team cohesiveness. Leaders should create a working atmosphere where team members feel safe (Edmondon, 1999), which is especially critical when transitioning to virtual team work due to contextual crisis (Feitosa & Salas, 2020). Trust has been identified by Jarvenpaa and Leidner (1999) to be both fragile and temporal in geographically dispersed teams. Team leaders are cautioned to be wary of signs of trust deterioration while remaining mindful of supporting trust during such times of crisis (Feitosa & Salas, 2021). In our findings, the link between team cohesion and creativity was mediated by affective trust. Team leaders can use their relational skills to help build (and or restore) trust, and with it the necessary team cohesion, which will improve the effectiveness of crisis management (Kahn, Barton, & Fellow, 2013; Mishra, 1996). Moreover, they can contribute to a supportive team culture by displaying empathy and giving voice (Edmondson, 1999). Psychological safety enables team members to share their ideas and are encouraged to propose what could be perceived as riskier and more unconventional suggestions. Affective trust can also be encouraged through leaders living by example (Kilcullen et al., 2021), exercising empathy and giving voice. By opening up to how a current crisis situation creates uncertainties, leaders can allow and encourage team members to relate and share their own feelings and concerns.

Team cohesion concerns the social, non-task related part of teamwork. Leaders, especially in crisis situations, need to strengthen the personal connections and the extent of interactions among team members. As team cohesion is an outcome of developing relationships among members of a team, socializing and team building activities are seen as an investment into team cohesion and also the well-being of team members (Garro-Abarca et al., 2021). In a virtual environment, this is challenging, as socializing is perceived as difficult for those geographically

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isolated and not used to interaction online, where random encounters and interactions are limited. Therefore, it may be required to develop specific practices for virtual social interaction, which can compensate for lack of face-to-face encounters (Kilcullen et al., 2021). Over the past months, we have witnessed many different ways of how such social practices might be constituted in the form of regular scheduled coffee meetings, online parties, the production of team videos and fun social events. Team members can share their own perspectives, generate common virtual experiences, express their emotions and enact a shared social team space that is not directly related to task completion.

4.2. Cognitive trust: implications for global virtual team leaders in times of crisis

As our findings show, feedback is significantly related to cognitive trust. Team leaders could enhance trust in the team by engaging with the team, communicating in a manner that emphasizes constructive or formative feedback to develop reciprocal trust that improves the chances for positive team results. The importance for these supportive mechanisms has been most recently been stressed in the virtual team literature within the context of COVID-19 (Feitosa & Salas, 2020), advocating for frequent and timely communication (Kilcullen et al., 2021) so as to establish shared understandings and minimize misunderstandings. This takes on an added urgency as working virtually from home was found in a recent study of five Danish multinational organizations to be negatively related to team members' access to and utilization of each other's knowledge (Jackowska & Lauring, 2021). Simply put, physical distance makes locating and retrieving information and knowledge in the team more difficult, and with that comes less feedback and learning opportunities, from which follows that cognitive trust could be hard to build and maintain. Importantly, Jackowska & Lauring (2021) emphasize that the problem is not working virtually per se but working virtually from home. Transitioning to home-based virtual work, instead of workplace-based virtual work is precisely what occurred

during the COVID-19 pandemic. Leaders can thus assist in sharing information to support team learning processes, provide feedback and create feedback mechanisms that are based on transparent knowledge exchange and documentation, which in turn can mitigate the negative association between working from home and knowledge utilization as well as building cognitive trust in the team.

However, if a crisis calls for urgent responses, then cognitive trust constitutes an important mediator to consider, as it can assist in lower uncertainties during times of crisis. Very often, the uncertain nature of crisis demands fast decisive actions on part of leaders that generates guidance and ex-ante frameworks for action. An appropriate first reaction to a crisis should provide support to team members, transform the information given into action plans and allow team members to rationalize the unknown situation and to move forward in the process of problem-solving. These measures have also been found to be effective learning through the COVID-19 pandemic changes, which stresses that trust requires monitoring (Feitosa & Salas, 2020) in order to maintain the existing trust that might be undermined by converting existing team projects into virtual team practices.

In immediate crisis situations, task-focused team leadership that builds cognitive trust might rely on faster processing instructions, emphasize the reliance on team members' competencies, and provide quick and clear feedback to enable early interventions (Killcullen et al., 2021) when they are needed to reduce anxiety, uncertainty and shape team trust processes.

5. Implications for education: Preparation for times of crisis

The COVID-19 experiences prompted elevated interest in two particular outcomes of global virtual teams – task effectiveness and wellbeing (Makarius & Mukherjee, 2020). Transitioning existing teams to a virtual environment requires leaders to enhance supportive mechanisms that

can safeguard these goal accomplishments (Feitosa & Salas, 2020; Kilcullen et al., 2021). Therefore we need to also consider how management training needs to be adjusted to this setting. We have elsewhere developed a course design that provide experiential learning to students who want to become effective leaders of global virtual teams (see Zettinig, Mockaitis, & Zander, 2015) and the suggestions presented in this chapter could without any problems be accommodated in this as well as other courses with a similar focus, to increase the readiness to deal with crisis situations.

Based on insights regarding the levels of affective and cognitive trust needed to enhance the level of team learning and creativity, course designs should specifically address the need to evaluate a team's emerging orientation towards task or relationship preferences and develop contingent strategies that could enhance learning and creativity outcomes. This means that leadership training should incorporate reflections on and development of practices that are focused on the one hand on feedback and cognitive trust development, and on the other hand on team cohesion and affective trust. Part of such learning designs could include a crisis leadership component, where collaborative learning teams have to face unexpected crisis situations with elevated levels of uncertainty. Such assignments would create interesting accounts of crisis handling and creativity and would allow for participants discussing how different situations are affected by feedback or team cohesion in building cognitive or affective trust and subsequently improve creativity and problem solving.

When developing leadership practices, special attention could also be given to affective processes, which some students may find more difficult to address. These processes could be considered in the educational set up by emphasizing to students that relationship development is an important practice that enhances organizational effectiveness. While this may be obvious to many, we often see participants in management programs who do not assign importance to the relational side of leadership. Therefore, specific assignments could increasingly be

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designed around such behavior to raise awareness of its implications related to team cohesiveness and its importance to team creativity. A way to increase leadership learning for unusual situations is to establish virtual team assignments where participants of different programs, for instance bachelor programs and executive education programs, have to work together in teams to carry out challenging creative tasks. Using such an approach would combine the intense experiences by executive training participants with the fresh thinking of tech savvy millennials. This can provide rich cross-fertilization in an experimental setting to engage in playful trial and error to learn how new individually suitable leadership approaches might form based on these virtual team experiences.

6. Conclusions and looking ahead

In our empirical illustration, we demonstrate the roles that different team processes play for creativity and creative problem-solving in global multicultural teams. Team cohesion, feedback, team learning environment, and trust (both cognitive and affective) affect creativity in multicultural virtual teams. We identified that different types of trust exist between team members and that the cognitive and affective components shape the creative team process differently. Teams that value cognitive trust will be inspired more by feedback for team learning and creativity, while teams that value affective processes will be motivated by strong team cohesion for enhanced learning and creativity. Our contention is that when team members unexpectedly become geographically dispersed in troubling times (such as the on-going COVID-19 crisis) and have to rely on working together digitally their need for leadership support will differ depending on what type of trust is most critical to the creative process in their team.

We discuss the implications of these research findings for team leadership, especially in times of crisis. Our results indicate that team leaders should pay attention to the subtle

composition of relationship between team members, as team cohesion increases affective trust which is connected to team learning and creativity. On the other hand, the team leaders also need to consider more tangible task-focused interaction between team members, which leads to cognitive trust, where our findings indicate feedback as a main driver. Cognitive trust among team members is also associated with team learning and creativity. Therefore, the task of leading geographically dispersed teams involves recognizing and implementing both affective and cognitive ties (relations) among team members, and to support these dual-trust conditions necessary for creativity. Notably, one type of trust process may be more prevalent in some teams than the other type, and vice versa. Thus, role of leadership becomes even more critical in environments characterized by geographically separated digital interaction, where team members lack in-real-life opportunity to form affective and/or cognitive ties. The immediate urgency of a crisis where preparation for transition from collocation to virtual collaboration has been mostly non-existent, is a germane example of the type of situation where appropriate leadership action is called for to be supportive of team endeavors.

Future research will benefit from empirical studies of such crisis- or otherwise-driven transitions as well as of how leaders can help foster the necessary team processes working from a distance in a digital environment. The two different team trust processes that we emphasize in our empirical study might not be exclusive trajectories but could instead be necessary to execute sequentially or in parallel depending on the unfolding situation. Further studies might also reveal important contingencies in terms of what type of crises call for what type of leadership behavior to support trust processes essential to creativity in global virtual teams.

Although we have not analyzed team composition in our study, future research might also consider whether preferences for cognitive or affective processes in teams depend on team characteristics, such as the dominance of certain cultural norms or values. Moreover, the handling of uncertainty typical of rushed transitions could also be influenced by cultural

considerations, which would have additional implications for team leadership. In the future, leaders' support to teams in transition, also in crisis, could be researched in detail through longitudinal process studies as the needs concerning leadership may, from the team's perspective, vary and change over time.

Importantly, the relationship between trust, team cohesion, within-team feedback, team learning, and team creativity is more complex than at first thought, and an appreciation of the dual role of trust is pivotal in understanding creativity processes in geographically dispersed teams. Moreover, and as is our contention in this chapter, the two types of trust processes place specific demands on team leadership, which can be expected to become even more critical as new ways of organizing work increasingly, sometimes due to transitions catalyzed by crises, result in creative teams having to work, geographically dispersed, in global virtual teams.

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Figure 1a and 1b. Dual model of team creativity antecedents

a. Affective team processes
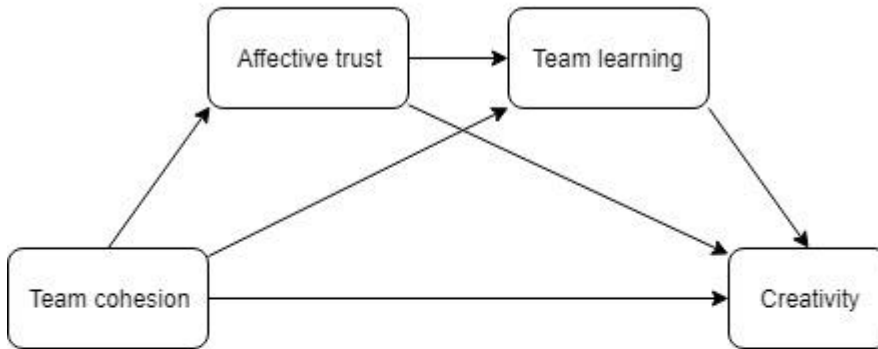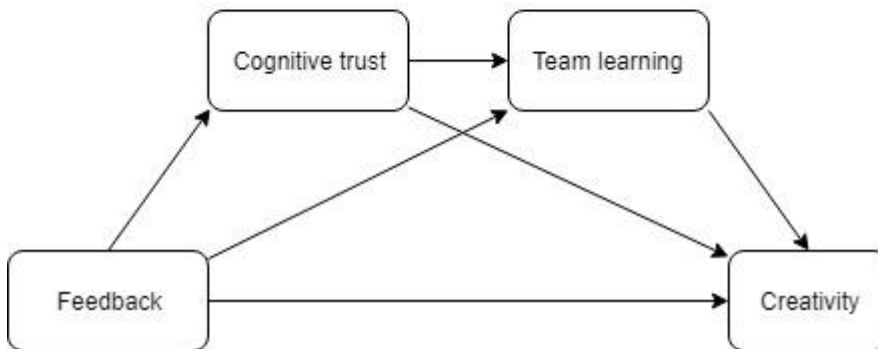

b. Cognitive team processes

Table 1. The six hypotheses.

Affective trust and team creativity		Cognitive trust and team creativity	
Hypothesis 1:	Affective trust will mediate the relationship between team cohesion and creativity.	Hypothesis 4:	Cognitive trust will mediate the relationship between within-team feedback and creativity.
Hypothesis 2:	Team learning will mediate the relationship between team cohesion and creativity.	Hypothesis 5:	Team learning will mediate the relationship between within-team feedback and creativity.
Hypothesis 3:	Team learning will mediate the relationship between affective trust and creativity.	Hypothesis 6:	Team learning will mediate the relationship between cognitive trust and creativity.

Table 2. Results of PROCESS analysis.

	Total effect model				Mediator model			
				DV=Creativity				
	B	*SE*	*t*	CI	*B*	*SE*	*t*	CI
Constant	1.68***	0.35	4.85	0.99 to 2.36	1.15**	0.35	3.33	0.47 to 1.83
Cohesion	0.75***	0.04	20.17	0.68 to 0.83	0.44***	0.07	5.91	0.29 to 0.59
Gender	-0.26*	0.10	-2.56	-0.47 to -0.06	-0.24*	0.10	-2.50	-0.43 to -0.05
Age	-0.01	0.01	-0.51	-0.03 to 0.02	-0.01	0.01	-0.86	-0.03 to 0.01
Mediators								
Affective trust					0.16**	0.06	2.67	0.04 to 0.28
Team learning					0.25**	0.08	3.17	0.10 to 0.41
R^2	0.75***				0.79***			
F	142.09				102.64			

	DV=Affective trust				DV= Team learning			
	B	*SE*	*t*	CI	*B*	*SE*	*t*	CI
Constant	0.73	0.46	1.60	-0.18 to 1.64	1.46***	0.34	4.25	0.78 to 2.14
Cohesion	0.83***	0.05	16.69	0.73 to 0.93	0.55***	0.06	8.63	0.42 to 0.67
Affective trust					0.20**	0.06	3.21	0.08 to 0.32
Gender	0.03	0.14	0.19	-0.24 to 0.30	-0.11	0.10	-1.11	-0.31 to 0.09
Age	0.01	0.02	0.50	-0.02 to 0.04	0.01	0.01	0.60	-0.02 to 0.03
R^2	0.67***				0.74***			
F	94.07				98.92			

Indirect effect through mediator	Boot indirect	Boot SE	Boot CI	
Affective trust	0.135	0.066	0.189 to 0.451	
Team learning	0.138	0.048	0.051 to 0.239	
Affective trust → Team learning	0.042	0.019	0.011 to 0.086	

Notes: N=146; DV = dependent variable; CI = confidence interval. Coefficients are unstandardized. Bootstrap sample size = 5000; 95% bootstrap confidence intervals reported.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ [*p*-values are two-tailed].

Table 3. Results of PROCESS analysis.

	Total effect model				Mediator model			
				DV=Creativity				
	B	SE	t	CI	B	SE	t	CI
Constant	2.25***	0.41	5.52	1.45 to 3.06	1.08**	0.39	2.75	0.30 to 1.85
Feedback	0.64***	0.04	15.37	0.56 to 0.72	0.23**	0.07	3.35	0.10 to 0.37
Gender	-0.11	0.13	-0.85	-0.35 to 0.14	-0.14	0.11	-1.27	-0.35 to 0.08
Age	-0.00	0.01	-0.13	-0.03 to 0.03	-0.01	0.01	-0.41	-0.03 to 0.02
Mediators								
Cognitive trust					0.19***	0.05	3.51	0.08 to 0.30
Team learning					0.43***	0.09	4.76	0.25 to 0.60
R^2	0.64***				0.73***			
F	83.18				76.62			

	DV=Cognitive trust				DV= Team learning			
	B	SE	t	CI	B	SE	t	CI
Constant	1.98***	0.57	3.44	0.84 to 3.11	1.51***	0.34	4.39	0.83 to 2.19
Feedback	0.67***	0.06	11.44	0.55 to 0.78	0.53***	0.05	11.40	0.44 to 0.62
Cognitive trust					0.18***	0.05	3.80	0.09 to 0.28
Gender	0.01	0.18	0.06	-0.34 to 0.36	0.07	0.10	0.65	-0.13 to 0.27
Age	-0.01	0.02	-0.49	-0.05 to 0.03	0.01	0.01	1.20	-0.01 to 0.04
R^2	0.54***				0.74***			
F	40.48				101.09			

Indirect effect through mediator	Boot indirect	Boot SE	Boot CI	
Cognitive trust	0.127	0.062	0.281 to 0.523	
Team learning	0.227	0.055	0.124 to 0.342	
Cognitive trust → Team learning	0.052	0.021	0.017 to 0.098	

Notes: N=146; DV = dependent variable; CI = confidence interval. Coefficients are unstandardized. Bootstrap sample size = 5000; 95% bootstrap confidence intervals reported.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ [*p*-values are two-tailed].