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The role of context in overcoming distance-related problems in global virtual teams: an organizational discontinuity theory perspective

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ABSTRACT

Working at a distance has become a hot topic since the outbreak of the COVID-19 pandemic. One type of work unit that naturally faces both physical and social distance is the Global Virtual Teams (GVT). While distance has been debated in the GVT literature, there is still a scarcity of research on how to deal with distance related problems. Guided by organizational discontinuity theory, we explore the effect of individual-level approaches to overcoming physical distance (time zone adjustment) and social distance (trust in peers) in GVTs. In addition, we assess how these mechanisms are affected by the team context in the form of openness to cultural diversity. We do this by studying 23 GVTs (171 team members and 23 team leaders) in the global R&D department of a Danish engineering company. Our findings demonstrate that trust in peers is positively associated with job role clarity and job performance at the individual-level, and that high team openness to diversity, in the case of performance, makes the individual's level of trust in peers less necessary for achieving performance. Our results also show that time zone adjustment increases job role clarity for the individual team member, but only in GVTs with high openness to cultural diversity. Based on this, we contribute to the organizational discontinuity theory by demonstrating how continuity-creating mechanisms can interact with the team context to ultimately support the individual's potential for handling distance in GVTs.

KEYWORDS

Global virtual teams; distance; openness to diversity; trust; time zones

Introduction

Increasing the understanding of how to work together effectively at a distance has recently become one of the most important and most widespread endeavors across the organizational landscape (Festing, 2020; Saunders, 2020). This is not least due to the COVID-19 pandemic

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forcing millions of workers to refrain from close physical contact (cf. Kniffin, Narayanan, Anseel, Antonakis, & Ashford, 2021; Yawson, 2020). While the pandemic has increased interest in the topic, scholars have studied employees confined to online collaboration for decades, and one focus has been individuals working in Global Virtual Teams (GVTs). Such teams can be defined as geographically dispersed work groups separated by time and space, whose members differ in national, cultural, and linguistic attributes, and whose functioning is heavily dependent on computer-mediated technology (Chamakiotis et al., 2013; Choi & Cho, 2019; Jarvenpaa & Leidner, 1999; Taras et al., 2019). Studying GVTs can enable us to gain insight into the overcoming of distance-related problems during online collaboration and yields implications for virtual work in general.

Working across space often has been conceptualized in simplified terms (see for example Hoegl & Proserpio, 2004), assuming a one-to-one relationship between physical distance and collaboration problems (Asatiani & Penttinen, 2019; Watson-Manheim et al., 2012). Some of the most important insights from the GVT literature, however, question this basic perception of space. First of all, the feeling of distance from colleagues in GVTs is often imprecisely conceptualized when described as a unitary concept based on physical space only (Klitmøller & Luring, 2016; O'Leary & Cummings, 2007). Second, such a basic understanding of space also tends to ignore the context that might impact on how distance affects team functioning (Dixon & Panteli, 2010; Watson-Manheim et al., 2002). Hence, the distance concept includes a substantial degree of complexity that should not be ignored.

In this article, we follow the argument that distance should be seen as having different interrelated dimensions of an instrumental as well as an emotional nature (Kim et al., 2018). More specifically, we conceptualize distance in terms of a physical (location, time zone difference) and a social dimension (national culture, professional culture) (Maloney & Zellmer-Bruhn, 2006; Watson-Manheim et al., 2002). We define physical distance as distance between individual team members in time and space (Lieberman & Trope, 2014). Social distance, on the other hand, describes how close one feels to others in terms of affective (sympathy) and normative (belongingness) connectedness (Karakayali, 2009). As such, social distance can be seen as related to perceived intimacy, social contact, communication, and identification with other GVT members (Antonakis & Atwater, 2002). In this regard, O'Leary and Cummings (2007) argue that any model of geographic dispersion of GVTs should allow scholars to disentangle effects that can be attributed primarily to physical distance from those that stem primarily from social distance. We attempt to follow this notion in our research.

A second important premise in our article is derived from organizational discontinuity theory (Watson-Manheim et al., 2002) and posits that distance does not necessarily pose the same problems for all individuals or groups in all situations. Certain distance-related boundaries such as time zones are tangible conditions that might or might not become disruptive, depending on how a specific team deals with this boundary (Bülow et al., 2019; Wilson et al., 2008). As such, distance can have different consequences under different contexts and can create discontinuities for some, but less so for others (Asatiani & Penttinen, 2019). One example of a boundary that could create difficulties in the communication flows is cultural diversity (Zakaria, 2017). Cultural diversity has been known to lead to disruption in information flows that requires cognitive efforts to overcome, causing discontinuity for some team members (Han & Beyerlein, 2016). However, individuals can also learn to use variation in perspectives and knowledge constructively (Chamakiotis et al., 2013; Dwertmann et al., 2016), meaning that individuals can overcome distance and turn a potential discontinuity into a continuity. As such, the context of cultural diversity can define whether cultural diversity becomes a discontinuity-creating boundary between team members or, on the contrary, an asset in creative collaboration.

The aim of the current study is to extend organizational discontinuity theory by applying a context perspective (Bamberger, 2008) explaining how the GVT context influences different individual level mechanisms for overcoming distance-related problems and thus enables team members to turn discontinuities into continuities.

We first assess individual level continuity creating mechanisms related to the physical distance boundary (time zone adjustment) and continuity creating mechanisms related to the social distance boundary (trust in peers). If physical and social distance between individual GVT members can be overcome, we expect that the individual will receive better communication from other team members and thus get a clearer understanding of his or her job role in the team (role clarity) and be better able to do the job (performance) (cf. Scott & Wildman, 2015). In addition to this first step, we explore the role of openness to cultural diversity as a team-level contextual factor that could moderate the effects of different individual-level continuity creating mechanisms.

This research aim is guided by calls for studies addressing the various underlying principles for overcoming distance-related problems in virtual work under different conditions (Asatiani & Penttinen, 2019; Kniffin et al., 2021; Wang et al., 2020; Watson-Manheim et al., 2012). We respond to those calls by use of a quantitative survey approach including measures at the individual and at the team-level. This allows us to empirically test a model of the contextual effects of distance-bridging that we

base on ideas from organizational discontinuity theory (Watson-Manheim, 2019; Watson-Manheim et al., 2002).

By obtaining insight into the effects of different mechanisms in overcoming distance-related problems and the conditional role of the team context, we expand discontinuity theory (Watson-Manheim et al., 2002, 2012) and add to the ongoing debate about dealing with distance in GVTs in a post COVID-19 era (Kniffin et al., 2021; Wang et al., 2020). By our assessment of both physical and social continuity creating mechanisms, and how these different approaches are conditioned by the team context, we aim to advance theoretical discussions among researchers about the complexity of managing distance work in GVTs and beyond. Furthermore, we emphasize the role of context in GVTs, as a part of their inherent multilevel nature, and argue the interaction of continuities at different levels should be taken into account in future research. By obtaining further empirical insight into the matter and testing concrete assumptions, we also aspire to assist managers in developing ways to create well-functioning GVTs. In particular, team leaders can benefit from a better understanding of the influence of team context as this will provide more appealing (group and organization level) tools to improve GVT work outcomes compared to those only directed towards the single individual (cf. Bamberger, 2008).

Theoretical foundation

Conventional wisdom and years of research hold that physical distance is related to reduced communication and weaker relational ties (Allen, 1977; Kiesler & Cummings, 2002). However, while dispersion is potentially disruptive of interpersonal collaboration individuals and teams can sometimes overcome the distance-related boundaries they face. Team members can, for example, develop routines to deal with different time zones or adjust to cultural heterogeneity. The fact that not all individuals and teams experience the same disruption in connection to distance is accounted for in organizational discontinuity theory (Watson-Manheim et al., 2002). In this theory, the term discontinuity is applied to describe a boundary that has been activated. A boundary, such as differences in time zones, can stay dormant if the team learns how to overcome it and it will thus not hamper information flows within the team and thereby cause disruptions to the work. Boundaries become discontinuities only if they require conscious effort and attention to handle. Such discontinuities are common for members of GVTs to experience and they affect both actual work practices and the perceptions of others in the virtual work environment (Watson-Manheim et al., 2012). Central to the theory is that discontinuities are of perceived nature and not

objective per se (Dixon & Panteli, 2010; Watson-Manheim, 2019). This means that distance in itself is not necessarily a problem, but that contextual factors that shape individual perceptions can make it a problem (Bülow et al., 2019). In other words, a time zone discontinuity can be changed into a continuity, for example, by utilizing the ‘follow the sun’ principle (Colazo & Fang, 2009). Similarly, cultural diversity can become a continuity if heterogeneity is utilized constructively to facilitate debate, complex problem-solving, and creativity (Chamakiotis et al., 2013).

Based on organizational discontinuity theory, two arguments can be made. First, that distance-related challenges experienced in GVTs can be overcome by team members adjusting to the situation and second that contextual factors shared by team members can influence the ability of the individual to cope with potential boundaries. In this article, we focus on personal physical and social distance-bridging behavior and on team openness to cultural diversity as a context enabling this behavior. As such, we explore the interaction of continuities at the individual- and at the team-level.

The role of openness to cultural diversity as team context

In the GVT context, discontinuities often relate to a reduction of information sharing (Coughlan, 2014). It can be especially difficult to share tacit knowledge (Choi & Cho, 2019) and contextual information (Cramton, 2001) over distance. However, if the GVT is able to overcome discontinuities preventing information sharing, the individual knowledge of different dispersed team members can be a rich source of useful information (Brodbeck et al., 2007). In this regard, it has been argued that team diversity can be seen as a proxy for informational differences that provide the team with knowledge assets, enabling more comprehensive analysis, and informed and innovative solutions, due to the integration of different perspectives (Mitchell et al., 2015). As such, members in diverse GVTs have the potential to yield strong performance outputs, provided they are able to exchange and integrate a broader range of information from diverse members to achieve higher quality problem-solving (Dwertmann et al., 2016; Taras et al., 2019). This is because, if the team as a whole is able to overcome inherent discontinuities, diverse GVTs have access to a broader variety of relevant knowledge from dissimilar sources (cf. Batarseh et al., 2017). In this regard, openness to diversity has been described as a way to unlock the potential of GVTs (Lauring & Jonasson, 2018).

Openness to diversity can be described as the valuing and respecting of views from people who are dissimilar (Dwertmann et al., 2016; Lauring & Selmer, 2011). In general it has been argued that openness

to diversity can increase information elaboration so that the individual has access to broader sources of knowledge about the job (Chavez & Weisinger, 2008; van Knippenberg & van Ginkel, *forthcoming*). This is in line with social information processing theory, which predicts that social context is likely to influence the information one acquires from the surroundings (Salancik & Pfeffer, 1978). With a team that is open to, and accepting of, dissimilar others, the general level of communication and information exchange may improve and more information may be available, even to those who are not dealing well with physical and social distance. In this regard, it has been argued that openness to diversity is even more important in virtual teams due to the need for both a positive social atmosphere (Coppola et al., 2004; Luring & Jonasson, 2018) and a sense of connectedness despite dispersion (Boroş et al., 2010). Consequently, openness to diversity is likely to be a crucial condition in developing team-level continuities that allow the GVT members to collectively overcome boundaries connected to cultural heterogeneity.

Based on the above, we present a theoretical model of the interaction between individual-level and team-level continuity creating mechanisms for overcoming distance in GVTs. More specifically, we expect individual-level physical and social continuity creating mechanisms to increase positive work outcomes due to the implied increase in communication that arises from successfully handling distance. We predict that being open towards dissimilarities in the team will be a team-level continuity that provides team members with broader access to information, so that individuals less equipped to deal with distance still can perform their role in the team sufficiently. This is illustrated in [Figure 1](#).

Hypotheses

Physical distance continuity creation: time zone adjustment

An important consequence of physical distance that can have substantial influence over the work of GVTs is time zone differences—at least if the dispersion includes east-west configurations (Lieberman & Trope, 2014; Montoya-Weiss et al., 2001; Nurmi, 2011). This is because time is a frame of reference that organizes work through scheduling meetings and setting agendas (Espinosa & Carmel, 2003). Therefore, time zone differences in GVTs tend to increase coordination costs (O’Leary & Cummings, 2007).

While time zone differences can pose a central challenge for GVTs, it has been found that some individuals have the ability to adjust well to working across them (Wiesenfeld et al., 1999). Many approaches could help create continuity to overcome the time zone boundary.

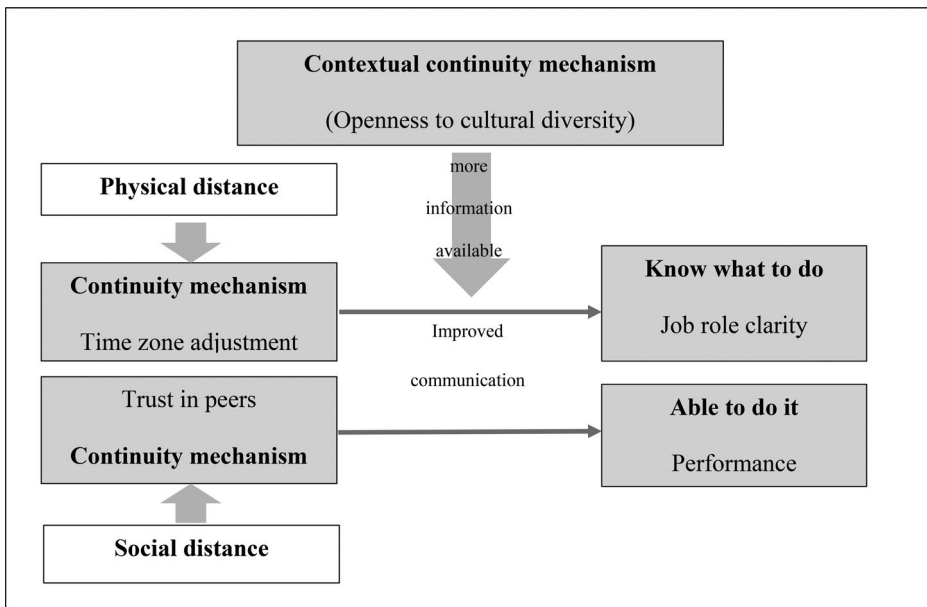


Figure 1. Conceptual model. The interaction between individual continuity creating continuity mechanisms and a contextual continuity creating mechanism to predict work outcomes in GVTs.

According to Nurmi (2011), time zone adjustment involves individual strategies to modify various self-management skills such as setting limits, planning, and prioritizing in relation to a different time frame for the day's work. The 'follow the sun' ideal, relating to a team practice where work is distributed according to the most efficient use of time zones, also needs adjusting to (Colazo & Fang, 2009; Jarvenpaa & Leidner, 1999). Espinosa and Carmel (2003) argue that well-adjusted team members organize the work in a way where independent tasks are conducted during non-overlap time so that overlap time can be devoted to meetings, telephone conversations, and problem-solving. Another tactic would be to package information so that the distant team members can absorb it better. Finally, O'Leary and Cummings (2007) maintain that adjustment to working across time zones also involves reminding new and unaware team members about the time zone gap so that one person is not delayed by another's maladjustment.

Failure to adjust to using asynchronous communication and keeping multiple threads of work active at the same time can easily lead to information overload and confusion, negatively affecting job role clarity (Montoya-Weiss et al., 2001). Moreover, it is not just job role clarity that can be harmed by time zone related discontinuities. Unproductive time spent waiting for the other side to respond with clarification or feedback will harm overall performance (Sarker & Sahay, 2004).

Empirically, Montoya-Weiss et al. (2001) related temporal coordination positively to GVT performance and conflict management behavior. Based on the above, we argue that adjusting to working across time zones can be seen as creating a continuity that will help the individual overcome a distance-related boundary, thus improving their outputs:

Hypothesis 1: The individual's time zone adjustment has a positive association with (a) job role clarity and (b) job performance.

Social distance continuity creation: trust in peers

Social distance in teams is associated with a lower willingness to interact and communicate (Chan & Goto, 2003), lack of identification, and even friction or conflict (Earley & Mosakowski, 2000), and this is found to result in lower team performance (Ayub & Jehn, 2014). According to behavioral economics, in its enacted form social distance can be expressed as perceived trustworthiness (Cox, 2005; Fiedler et al., 2011). In a psychological context, Goto (1996) finds evidence proving that trust reduces the perception of social distance especially in situations characterized by uncertainty, as in the case of GVTs (see also Vahtera et al., 2017).

A number of studies have associated low trust with increased social distance among members in global teams, and in virtual work in general (Bente et al., 2005; Cyr et al., 2007; Jarvenpaa et al., 1998; O'Hara-Devereaux & Johansen, 1994; Snow, Snell, & Davison, 1996). Evidence from research on multicultural teams shows a similar internal process, confirming a relation between social distance, low mutual trust, and lack of communication (Tenzer et al., 2014). Based on such results trust has been argued to remedy social distance in GVTs (Choi & Cho, 2019; Germain & McGuire, 2014).

In line with this assumption, trust is necessary to create continuity in relation to social distance in GVTs, leading to positive outcomes such as role clarity and performance. Without trust there will be less interaction between team member and therefore more role conflict and role ambiguity (Miles, 1975). For example, De Jong et al. (2016) argue that information sharing is often seen as risky by individuals in GVTs with low levels of trust. If team members cannot communicate, there will be more confusion as to the distribution of tasks (cf. Shoemaker, 1999). Trust leads to uncertainty reduction in GVTs (Brahm & Kunze, 2012). With less ambiguity and uncertainty in social perceptions, job processes become clearer (Dirks & Ferrin, 2001), leading to overall job role clarity.

If trust leads to more open communication, it will generally lead to higher performance in GVTs too (Breuer, Hüffmeier, & Hertel, 2020). Empirically Bente et al. (2008) found trust in virtual work to increase

attentiveness to the task. Trust has also been argued to reduce process losses or wasted efforts because the time and effort spent on monitoring each other is reduced (Aubert & Kelsey, 2003). In light of these factors and the extant empirical findings, the following set of hypotheses is proposed:

Hypothesis 2: The individual's trust in his or her peers in the team has a positive association with (a) job role clarity and (b) job performance.

The moderating role of openness to cultural diversity

While distance-bridging through time zone adjustment and trust in peers have the potential to improve job role clarity and performance in GVTs, the need for such individual capacities may also depend on the team context. In GVTs, inclusion and acceptance have been found to function as a moderating factor influencing attitudes and behaviors. For example, Gibson and Gibbs (2006) showed that shared values in relation to psychologically safe communication mitigated negative effects of team-level geographic dispersion, electronic dependence, dynamic structure, and national diversity.

In teams open to cultural diversity, valuing the contributions of all members despite dissimilarities in cultural values becomes the norm (Boehm et al., 2014). This makes the different international members of the team generally more willing to provide and share unique information with each other (Hartgerink et al., 2014).

In general, the broader information availability for team members in GVTs with high openness (van Knippenberg & van Ginkel, 2021) could improve the job role clarity, as team members are likely to receive more cues from their team environment to allow them to interpret events and understand expectations concerning their job (Cheng et al., 2013). Team member performance may also be higher due to the general fostering of positive, performance-relevant group processes and behaviors (Boehm et al., 2014; Luring & Klitmøller, 2017). Hence, the openness towards diversity could make it easier for individuals to achieve favorable work outcomes in spite of inability to bridge physical and social distance. In other words, a team member with little adjustment to time zones and little trust in his or her peers could still be granted an opportunity to acquire the needed information if the team context encourages information flows despite individual differences. As such, team members do not need to put in an effort to build continuity if the team context does this for them. In this regard, openness to cultural diversity reduces the individual's need to overcome physical and social distance. We therefore hypothesize:

Hypothesis 3: Team-level openness to cultural diversity moderates the relation between the individual-level (a) time zone adjustment (b) trust in peers and positive individual-level outcomes (job role clarity, performance), such that positive relations between the individual-level variables become weaker when openness to cultural diversity is high.

Methodology

To reach our research aim, we have chosen a quantitative survey method. This approach applies an objectivist epistemological perspective to social phenomena and thus could have limitations in connection to depicting multiple and contradictory interpretations of social experiences (Denzin & Lincoln, 1998). In spite of such weaknesses there are also obvious virtues related to this approach. By use of survey data, we can provide a more generalizable picture of relations between different participant-rated variables that could not have been achieved with the same precision by the use of interviews or observations, for example. This is especially important in our case because we aim to verify or reject elements of a proposed theoretical model. We thus find that our research method is well suited to our main aim.

Research site

We chose to perform our survey study in a single multinational corporation (cf. Lervik, 2011), that can be considered a typical case of a company using GVTs as a means of cross-border collaboration (cf. Seawright & Gerring, 2008). A typical or representative case is appropriate as our main interest is in understanding relationships between a set of variables concerning teams and individuals *within* this multinational. We thus selected a company with experience in working with GVTs, and with enough teams to enable us to test our theory on the influence of the team context. We also required the company to be of sufficient size and with a geographical reach that ensured team members to be confronted with both physical and social distance in their working practice, which was relevant for testing our hypotheses. Other selection criteria were related to the requirement that the work done in the GVTs should be important for the competitive strategy of the company. We therefore decided to select a company using GVTs for R&D activities. Finally, for pragmatic reasons, we selected a company that is headquartered in Denmark.

The company that fulfilled these selected criteria and that we chose as our research site employs almost 19,000 people, has a revenue of around three billion Euros, and is a world leader in relation to its

manufactured product. This product is merchandised by distributors in more than 50 countries. The case company is strongly influenced by an engineering approach to the industry. While it is headquartered in Denmark, it includes major subsidiary sites with R&D facilities also in USA, China, and Hungary. The R&D investment accounts for almost five percent of the corporate revenue. In total, the R&D department includes, in addition to higher-level managers and administrative and supporting staff, more than 300 engineers and 33 team leaders working in 33 GVTs. In the R&D department, all GVTs have a designated leader and start off with a face-to-face meeting, usually in Denmark. From there on, team members communicate by use of email, virtual meetings, telephone, and Yammer. All employees are organized in a primary GVT with a designated team leader. However, it is also possible for them to be connected more loosely to other, secondary teams for a longer or shorter period. All teams generally have much contact with HQ in Denmark regardless of whether they have any team members from this site or not. This is done through department meetings, for example. Moreover, even in GVTs located within only one time zone (within Europe, or the USA) it was reported that regular contact and information-sharing was maintained with members of other teams in other regions as well. This was expressed in qualitative pilot interviews. Here time zone differences and cultural differences were mentioned as being central nuisances that needed to be overcome in collaborative activities. Illustrative examples of comments from these interviews are displayed in [Table 1](#). Apart from sites in Denmark, China, USA and Hungary our study also included team members located in sites situated in Germany, Finland, Mexico, and India.

Data collection and sample

The Danish multinational company described gave us access so we could electronically survey all 33 R&D teams. Hence, 33 team leaders and their 300 team members were invited to participate in the survey. 23 team leaders responded to the study (response rate: 70%), as well as 220 team members (response rate: 73%). This made it possible to study 23 teams with 3 to 13 respondents, resulting in a total of 171 team members. For the remaining 46 responding team members, we had no data from their team leader and thus had to leave them out of this study. The company also provided us with basic objective information about all team members in the R&D department. For a depiction of team characteristics for the 23 teams included see [Table 2](#).

The 171 GVT members included in this study had an average age of 41.70 years (SD = 9.82). A clear majority of them were male (81%) and

Table 1. Examples of comments in relation to time zones and culture.

Time zone	Culture
'The challenge with time zones is central to feeling part of a team. We feel excluded and neglected. We were invited to a workshop and had to be up to 3.30 in the morning' (Chinese team member)	'Danes often act [like they're] socially handicapped. They have the mentality that because they pay tax on everything, they feel absolutely no obligation to act friendly to others. This is because they think the government will look after you in the end' (American team member).

Table 2. Team characteristics.

Team number	Team leader origin	Team leader gender	Team leader age	Team member average age	Number of team members in total	Number of different nationalities	Number of sites	Largest time zone span
1	China	Male	50	36	16	2	2	7
2	USA	Male	57	45	9	3	3	8
3	Denmark	Male	49	52	7	3	3	7
4	Denmark	Male	39	45	13	2	2	8
5	Denmark	Male	37	41	11	4	3	7
6	Denmark	Male	46	41	8	2	2	7
7	Denmark	Male	40	44	15	3	3	7
8	Denmark	Male	45	43	7	4	4	15
9	Denmark	Male	47	41	12	3	3	7
10	Denmark	Male	60	48	8	3	3	7
11	Hungary	Male	37	32	5	2	2	0
12	Denmark	Male	50	43	13	4	4	15
13	Finland	Male	53	38	5	2	2	1
14	Denmark	Male	42	44	7	2	2	0
15	Denmark	Male	39	43	17	2	1	0
16	Denmark	Male	49	53	7	2	2	0
17	Hungary	Male	37	39	7	3	2	1
18	China	Male	38	35	15	2	2	7
19	USA	Male	43	30	5	3	2	1
20	Denmark	Female	40	22	14	4	4	15
21	Denmark	Female	46	23	10	2	2	7
22	Denmark	Female	39	38	9	2	2	7
23	Denmark	Female	54	44	14	4	4	15

of Danish origin (55.75%). Chinese-national employees accounted for approximately 16% of the sample. Other well-represented nationalities were Americans ($n=18$), Hungarians ($n=12$), Germans ($n=8$), and Finns ($n=4$). There were also individuals of Indian, Mexican, Portuguese, Bosnian, and Taiwanese origin in the sample. While the corporate language in the organization is English, the mean number of languages spoken in the team was 3.2. Languages spoken were mainly Danish, English, German, Mandarin, Hungarian, and Finnish. On average, the team members had worked for 9.97 years ($SD = 9.19$) at the company and for 2.09 years ($SD = 2.71$) in their primary GVT.

Instrument

As Gilson et al. (2015) have raised concerns about the majority of research on GVTs being based exclusively on cross-sectional research

using a single instrument, two different questionnaires were created: one for the team leaders and one for team members. Both questionnaires had to be completed electronically. While the team members were asked questions concerning their individual-level of trust, time zone adjustment, job role clarity and performance, the team leaders had to answer questions concerning openness towards cultural diversity in the GVT.

Individual-level (assessed by team members)

Time zone Adjustment was assessed by a self-developed three-item, seven-point scale. Based on Espinosa and Carmel (2003) and Raghuram et al. (2001), we incorporated items covering instrumental (synchronous and asynchronous) as well as emotional aspects of adjusting to working across time zones. Hence, asking the question 'to what extent do you feel adjusted to' we included the following three items: 'Working at odd times in order to communicate with the remote virtual team members', 'Nuisances that arise due to time differences', and 'Constructive use of time zone differences between the virtual team members' We used similar response categories to those applied by Black and Stephens (1989) whose expatriate adjustment scale goes from (1) 'very unadjusted' over (4) 'neutral' to (7) 'completely adjusted'. ($\alpha=.75$).

Trust in peers was gauged by a four-item, seven-point Likert-type scale by Sarker et al. (2003). Sample items are: 'Team members can be counted on to do what they say they will do' and 'Team members will be honest in describing their experiences and abilities'. Response categories ranged from (1) 'strongly disagree' over (4) 'neutral' to (7) 'strongly agree' ($\alpha = .89$).

Job Role Clarity was assessed by a six-item, seven-point scale by Rizzo et al. (1970). Sample items are: 'I know exactly what is expected of me' and 'I know what my responsibilities are'. Response categories ranged from (1) 'strongly disagree' over (4) 'neutral' to (7) 'strongly agree' ($\alpha=.91$).

Performance was assessed by a four-item, seven-point scale by Earley (1987). Sample items are: 'How would you rate your ability to get required assignments completed on time?' and 'How would you rate the quality of your performance?'. Response categories varied from 'poor' (1) over 'neutral' (4) to 'excellent' (7) ($\alpha = .77$).

Team-level (assessed by team leaders)

The team context variable *Openness to Cultural Diversity* was assessed by a three-item, seven-point scale adapted from Hobman, Bordia, and Gallois' (2004) openness to value diversity scale adding the words 'cultural'. Sample items are: 'Team members are keen to learn from people who have different

cultural values and *'Team members avoid contact with people that hold other cultural values'* (R). Response categories ranged from (1) 'strongly disagree' over (4) 'neutral' to (7) 'strongly agree' ($\alpha=.78$).

Control

We used control variables applied by other GVT studies (Gilson et al., 2015; Morris & Venkatesh, 2000; Raghuram et al., 2001). These were measured by single direct questions to the team members. For example: *'How old were you at your last birthday'* (age), *'Are you (1) male (2) female?'* (gender), *'How long have you worked for your company?'* (company tenure), and *'How long have you worked in your current primary global virtual team?'* (virtual team tenure). To control for time zone difference, we measured this as the sum of the absolute difference between each member's time zone (including the team leader), divided by the size of the team:

$$\text{Time zone difference}_i = \frac{\sum_{j=1}^n |\text{Time zone}_i - \text{Time zone}_j|}{n}$$

Here i is the individual within the GVT, j is a vector of all team members and n represents the size of the GVT. This information was acquired from company data on the GVTs. Similarly, we applied Blau's heterogeneity index to control for cultural diversity within teams. We used team member nationality as an indication of cultural differences.

Hierarchical nature of the data

The sample consisted of more than one respondent per GVT. For this reason, the data of the 171 team members (level 1) were not statistically independent, as they were nested within their 23 GVTs (level 2). As we wanted to test multilevel hypotheses concerning the cross-level effects of team openness to diversity, we decided to conduct multilevel analysis, also known as hierarchical multilevel modelling (Hitt et al., 2007). The goodness-of-fit of our models was therefore judged through the deviance, as well as the Aikake Information Criterion (AIC) and the Bayesian Information Criterion (BIC). These measures do not measure a model's goodness-of-fit in absolute terms, but they allow for a comparison between models: When comparing two models, the lower the absolute value of these measures, the better the model fit. When comparing two models, we also calculated the level 1 Snijders/Bosker R-squared that is an approximately parallel goodness-of-fit measure to the normal R-squared (Snijders & Bosker, 2012).

Results

Table 3 displays sample means, standard deviations, and Pearson correlations of the lower/individual- and higher/team-level variables included in this study. The HLM results are displayed in Tables 4 and 5 for the two dependent variables (job role clarity and performance respectively). In terms of research strategy, we followed the steps advised by Aguinis et al. (2013) for testing cross-level moderation. First, we have fitted the null model (model 1 in Tables 4 and 5), without any predictors, simply looking at the breakdown of variance into between and within variance. Then we have fitted the full model with only fixed effects (model 2 in Tables 4 and 5), meaning all predictors were assumed to have equal effect across the GVTs. We then loosened this assumption and estimated the same model with random effects for trust and time zone adjustment variables, as we expected them to interact with higher-level variables (cross-level interaction). Logically then, their slopes could not be fixed, they would have to vary between the GVTs by definition. The cross-level interactions are then displayed separately (models 3 & 4 in Tables 4 and 5), followed by one model combining all interactions and all predictors for both levels (model 5 in Tables 4 and 5). The interacting variables were grand-mean centered for inference purposes and in order to stabilize the coefficients between the models (Hox, 2010). We chose grand-mean centering over group-mean centering, because that would change the very definition of variables and have an impact on our hypotheses (we are not testing frog-pond hypotheses) (Klein & Kozlowski, 2000). We estimated one variance per every random effect, assuming all covariances between them are 0, as we are not dealing with longitudinal data or repeated measures (Rabe-Hesketh & Skrondal, 2012).

The ICC calculation for null models (Model 1) has confirmed that there is indeed some clustering in the data, with job role clarity having 11% of the variance caused by team clustering. This means that job role clarity is substantially determined by group-level predictors, in comparison to job performance, which scored only 2% and therefore seems to be influenced mostly by individual-level predictors. Nevertheless, there is clustering in the data and therefore we proceeded with multilevel modelling, taking this clustering into account (Hayes, 2006). Testing hypotheses 1 and 2, we first looked at the direct effects of time zone adjustment and trust in peers. Model 2 in Tables 4 and 5 shows the direct fixed effects. It is clear that by itself, individual-level time zone adjustment does not seem to significantly influence either job role clarity or the individual performance of employees in our sample. Hypotheses 1a and 1b are therefore not confirmed. Trust, on the other hand, seems to have strong and positive direct relationship with individual job role

Table 3. Means, standard deviations, and correlations among the lower and higher level variables.

		1	2	3	4	5	6	7	8
Level 1 variables									
1. Team performance	Mean	5.582							
	SD	0.712							
2. Team clarity	Mean	5.238	1						
	SD	1.043	0.311***						
3. Age	Mean	41.696	0.019	1					
	SD	9.820	0.189**	0.009					
4. Gender (Female = 0)	Mean	0.193	0.189**	0.007	1				
	SD	0.396	0.189**	0.007	0.648***				
5. Company tenure	Mean	9.902	0.082	0.017	-0.047	1			
	SD	2.098	0.159**	0.101	-0.16**	0.112			
6. Virtual team tenure	Mean	4.86	0.106	0.102	0.032	-0.051	1		
	SD	1.058	0.235***	0.016	0.11	-0.004	0.097		
7. Time zone adjustment	Mean	5.709	0.855	-0.021	0.11	-0.004	-0.092	1	
	SD	0.170	0.338***	-0.021	0.11	-0.004	-0.092	0.289**	
Level 2 variables									
Team time zone differences	Mean	0.419	2	3					
	SD	0.163	0.032	0.032					
Team cultural differences	Mean	0.397	2	3					
	SD	0.864	-0.032	-0.032					
Openness to cultural diversity	Mean	5.362	-0.045	-0.045					
	SD	0.864	-0.045	-0.045					

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

two-tailed; $N = 171$ team members (level 1) in 23 global virtual teams (level 2)

Table 4. Results of multilevel model with cross-level interactions.

Dependent variable	Job role clarity									
Model										
Level 1 variables	1	2	3	4	5					
Intercept	5.244 *** (0.108)	5.269 *** (0.388)	5.340 *** (0.366)	5.279 *** (0.384)	5.377 *** (0.359)					
Age		0.000 (0.010)	0.007 (0.009)	-0.005 (0.010)	0.002 (0.009)					
Gender (Female = 0)		-0.110 (0.182)	-0.144 (0.164)	-0.135 (0.180)	-0.179 (0.161)					
Company tenure		-0.004 (0.010)	-0.010 (0.010)	0.000 (0.010)	-0.006 (0.010)					
Virtual team tenure		0.048 (0.027)	0.050 (0.027)	0.045 (0.027)	0.046 (0.027)	*				
Trust		0.468 *** (0.089)	0.610 *** (0.158)	0.438 *** (0.089)	0.563 *** (0.160)	***				
Time zone adjustment		-0.029 (0.071)	-0.005 (1.714)	-0.022 (0.070)	0.019 (0.066)					
Level 2 variables										
Team time zone differences		-3.610 (1.537)	** (1.714)	-4.075 (1.714)	** (1.528)	-3.444 (1.689)	**	-4.041 (1.689)	**	
Team cultural differences		3.851 (1.560)	** (1.707)	3.902 (1.707)	** (1.548)	3.884 (1.682)	**	4.041 (1.682)	**	
Openness to cultural diversity		0.259 (0.098)	*** (0.092)	0.256 (0.092)	*** (0.099)	0.301 (0.092)	***	0.306 (0.092)	***	
Cross-level effects										
Openness to cultural diversity*				-0.086 (0.186)				-0.157 (0.188)		
Trust						0.168 (0.084)	**	0.189 (0.078)	**	
Openness to cultural diversity*										
Time zone adjustment										
ICC	0.114									
Snijders/Bosker R ² within-teams		0.2127		0.2254		0.2301		0.2524		
AIC	499.184	480.515		467.552		480.517		465.831		
BIC	508.609	518.215		511.536		524.500		516.098		
Deviance	246.592	228.258		219.776		226.258		216.916		
Df	3	12		14		14		16		

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

two-tailed; $N = 171$ team members (level 1) in 23 global virtual teams (level 2); Trust, Time zone adjustment and Openness to cultural diversity are grand-mean centered as interacting variables

clarity and performance, with a slightly higher coefficient for job clarity. The significant direct effects of trust thus confirmed Hypotheses 2a and 2b.

After testing the direct effects, we proceeded with cross-level interactions, investigating the effect of openness to cultural diversity. First focusing on job role clarity as the dependent variable, we find evidence for both the direct and moderating effects. As visible in Table 4, openness to cultural diversity increases the individual-level job role clarity

Table 5. Results of multilevel model with cross-level interactions.

Dependent variable	Job performance				
Model					
Level 1 variables	1	2	3	4	5
Intercept	5.581 (0.060)	*** 5.108 (0.256)	*** 5.142 (0.254)	*** 5.094 (0.255)	*** 5.136 (0.253)
Age		-0.003 (0.007)	-0.002 (0.007)	-0.003 (0.007)	-0.003 (0.007)
Gender (Female = 0)		0.327 (0.128)	** 0.319 (0.127)	** 0.326 (0.128)	** 0.313 (0.127)
Company tenure		0.007 (0.007)	0.006 (0.007)	0.007 (0.007)	0.007 (0.007)
Virtual team tenure		0.053 (0.019)	*** 0.050 (0.019)	*** 0.052 (0.019)	*** 0.047 (0.019)
Trust		0.198 (0.061)	*** 0.211 (0.064)	*** 0.188 (0.062)	*** 1.192 (0.061)
Time zone adjustment		0.002 (0.050)	0.016 (0.050)	0.009 (0.054)	0.029 (0.055)
Level 2 variables					
Team time zone differences		-0.549 (0.994)	-0.769 (0.995)	-0.502 (0.988)	-0.719 (0.978)
Team cultural differences		0.485 (1.003)	0.619 (1.000)	0.486 (0.997)	0.648 (0.984)
Openness to cultural diversity		0.178 (0.058)	*** 0.18 (0.057)	*** 0.188 (0.059)	*** 0.199 (0.059)
Cross-level effects					
Openness to cultural diversity*			-0.149 (0.082)	* (0.082)	-0.179 (0.081)
Trust					
Openness to cultural diversity*				0.021 (0.064)	0.052 (0.066)
Time zone adjustment					
ICC	0.029				
Snijders/Bosker R ² within-teams		0.1791	0.1973	0.1804	0.2023
AIC	373.290	358.024	356.168	359.456	352.643
BIC	382.715	395.724	397.009	400.298	390.343
Deviance	183.645	167.012	165.084	166.728	164.321
Df	3	12	13	13	12

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.two-tailed; $N = 171$ team members (level 1) in 23 global virtual teams (level 2); Trust, Time zone adjustment and Openness to cultural diversity are grand-mean centered as interacting variables

(models 2, 3, 4 and 5 in Table 4). Moreover, when interacting with team members' time zone adjustment, this individual-level variable becomes significant, although the effect is relatively weak (models 4 and 5 in Table 4). We tested the random slope of time zone adjustment, before proceeding with the interaction and the variance of the slope was very small indeed, so the weak significance of the interaction effect is not surprising. However, the positive interaction coefficient shows that if time zone adjustment brings any benefit at all to individuals in terms of their clarity at work, it will be only in teams that have strong

openness to cultural diversity. This conclusion is in opposition to Hypothesis 3a, as the openness in this case does not reduce the effect of the individual adjustment, but in contrast makes it more relevant.

Turning to job performance as the dependent variable, again openness to cultural diversity in teams seems to have a positive relationship with the dependent variable, although this relationship seems to be a bit smaller in magnitude (+0.178 direct effect in model 2, Table 5). Furthermore, openness to cultural diversity moderates the effect of trust on performance. Again, we tested the random slope of trust first. The fixed effect coefficient of trust (+0.198^{***}) remained significant and grew in size when allowing trust to have a random effect, varying across teams (+0.218^{***1}). This is in line with our expectation that these effects vary across teams. When openness to cultural diversity interacts with trust in peers, it dampens the positive effect of trust, as the coefficient for the significant interaction is negative (model 4 and 5 in Table 5). This is in line with Hypothesis 3b, as openness to cultural diversity in the team does seem to replace, or compensate for, the positive effect of trust. In other words, in teams high on openness to cultural diversity, the positive effect of individuals' trust in their teammates doesn't have an equally strong positive effect on their individual performance.

Simple slope analysis, probing only the significant interactions, was conducted through computational tools designed by Preacher et al. (2006). As seen in Figure 2, for the interaction between openness to diversity and time zone adjustment, the individual-level variable relates positively to job role clarity when the openness to cultural diversity variable is at least at the mean level. The effect of time zone adjustment is stronger and positive when the openness to diversity is at least one standard deviation above the mean. When openness to diversity is under the mean, time zone adjustment does not have a significant influence on job role clarity. As shown in Figure 3, the effect is quite the opposite for the interaction between openness to diversity and trust. The individual-level variable seems to have no real effect on performance when the team openness variable is one standard deviation above the mean, but has a strong positive effect when the openness to diversity variable is one standard deviation below the mean.

Finally, among the control variables, we find the most important results with regard to virtual team tenure, which has significant positive relationships with both dependent variables. This means that team members who have been part of their primary team for a longer period feel more confident about their tasks and their own performance. Gender was also a significant predictor of job performance, men rating their performance higher than women did. Looking at the goodness-of-fit measures, both of our models predicting individual-level job role clarity as well as job

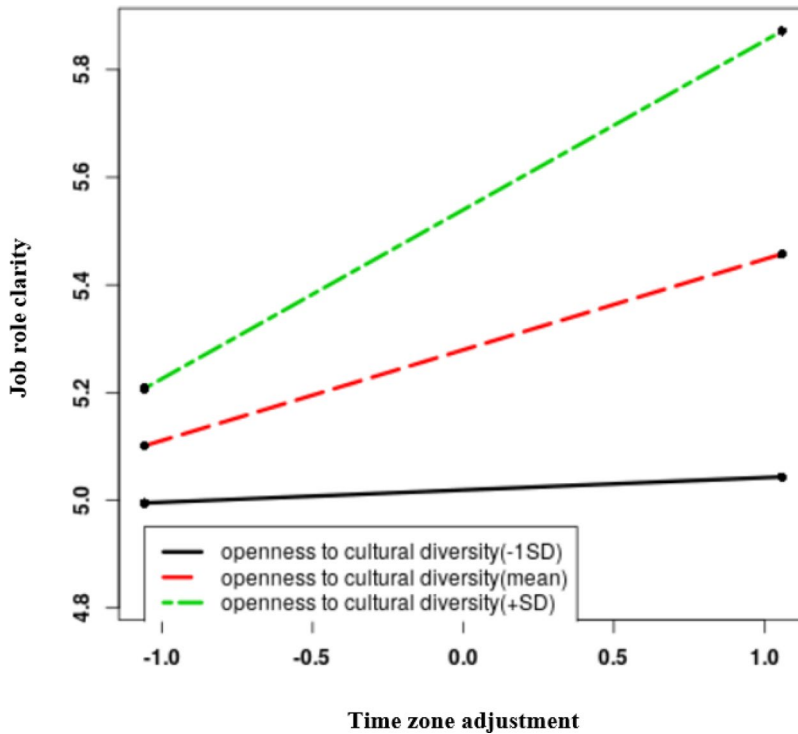


Figure 2. Interaction effect of adjustment to time zone difference by openness to cultural diversity on job role clarity.

performance were improving by adding the significant cross-level interactions, as reflected in the increased level of the within-teams Snijders and Bosker R^2 . However, AIC and BIC do not always show improvement when extra degrees of freedom are sacrificed in order to estimate cross-level interactions. This is most likely a result of their marginal significance. Moreover, we can conclude that the R^2 is generally higher for job role clarity, which is perfectly in line with the higher starting ICC values in the null model. Our multilevel model is better at explaining the variance in job role clarity, because this seems to be affected more by team clustering, while job performance is more of an individual phenomenon. In order to explain more of the job performance variance, we would need to focus extensively on individual-level predictors, which was overall not the focus of this study. All in all, the results of hierarchical linear modelling have provided interesting and surprising results, refuting and confirming some of our hypotheses.

Discussion

The overall purpose of this study was to provide an empirical model that could extend organizational discontinuity theory (Watson-Manheim, 2019),

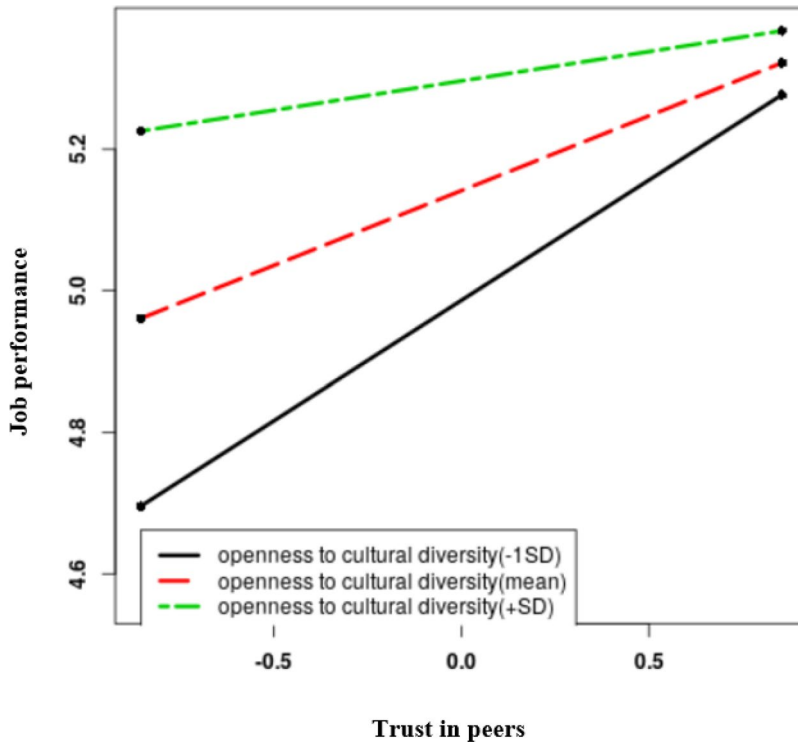


Figure 3. Interaction effect of trust by openness to cultural diversity on job performance.

more specifically to include the interaction of different types and levels of continuities. Here we first focused on two different individual level mechanisms, namely physical distance continuity creation and social distance continuity creation. In this regard, we demonstrated that at the individual level varying effect on work outcomes came from physical versus social distance continuity creation. This supports the argument from O'Leary and Cummings (2007) that we need to distinguish between the handling of physical and social distance in GVTs. More importantly, adding the team-level context to our model showed that it had moderating effects on the relation between continuity creation concerning both physical and social distance and work outcomes. These results allow future researchers to build situational conditions at the team level into theories related to individual level behaviors in GVTs (cf. Bamberger, 2008). While this is not opposed to the original thoughts expressed in organizational discontinuity theory (Chudoba et al., 2005; Watson-Manheim et al., 2002) the focus on the particular environmental factors serving as boundary conditions governing the individual's achievement in GVTs highlight the relation between continuity creation and work outcomes as a multilevel phenomenon. In this theoretical perspective, higher level group processes in a virtual setting influence individuals' potential for handling distance.

In more specific terms, our first theoretical assumption was that time zone adjustment and trust in peers would help the individual overcome discontinuities in relation to physical and social distance in GVTs, so that this person would have a better understanding of how to do the work and also be able to actually do it. In line with much other research (Breuer, Hüffmeier, & Hertel, 2020; Choi & Cho, 2019; Germain & McGuire, 2014) we found trust to have a positive effect on both job role clarity and job performance. As such, our results confirm existing GVT research in this respect. Surprisingly, however, we did not find a significant direct effect of time zone adjustment on either of the two work outcomes. Relatively little empirical research on time zone adjustment exists (e.g. Colazo & Fang, 2009; Nurmi, 2011). Still, the general perception has been that if an individual can create a continuity by adjusting to a time zone related problem in a GVT, this should have favorable consequences for that person's work (Espinosa & Carmel, 2003; Montoya-Weiss et al., 2001). Based on our findings, the effect of the individual's adjustment to working across time zones is not as simple as first anticipated. This became especially clear when assessing time zone adjustment in the context of team-level openness to cultural diversity. Here we found that time zone adjustment only increased job role clarity for GVT members in teams that had strong openness to cultural diversity. A potential explanation for this highly contextualized effect may be related to the incoming information from other diverse team members. Only if the team is tolerant towards each other's differences can an individual actually benefit from being adjusted to time zone differences. For example, it appears to be unhelpful to be synchronized in terms of time zones if the other members of the team are not prepared to work constructively with each other. This is in line with current developments within diversity research (Dwertmann et al., 2016) and in line with information processing theory (Salancik & Pfeffer, 1978). If the team in general has a more negative view of its own heterogeneity, the increased information gained from being well adjusted to time zone differences may actually lead to confusion because the team's pluralism results in ambiguity about how the job should be performed, rather than in informational integration (Mitchell et al., 2015). In this regard, Jarvenpaa and Leidner (1999) talk about role overload as a common consequence of virtual work. Yet, since very few empirical studies on time zone adjustment exist, the complexity of this concept needs to be assessed further in future research.

The contextual effect team-level openness to cultural diversity had on trust was more in line with our predictions. Here we found that trust interacted with team-level openness to cultural diversity such that it reduced the positive effect of trust on performance. When assessing

the results in more detail we could see that the effect of trust on work outcomes was most prominent in teams with low openness to diversity, whereas in teams with high openness to cultural diversity trust did not matter much. This provides support for our theoretical idea predicting that a team-level continuity could potentially make up for the lack of an individual-level continuity. We find that this is a useful and relevant contribution to ongoing debates concerning organizational discontinuity theory (e.g. Asatiani & Penttinen, 2019; Bülow et al., 2019; Watson-Manheim, 2019).

In conclusion, we can return to the two arguments that initially led us to explore further means to overcome discontinuities in GVTs. The first argument was that distance is complex and that there is a need to disentangle the effect of physical distance from effects of social distance (O’Leary & Cummings, 2007). In this article, we have focused on time zone adjustment as a way to bridge physical distance and trust in peers as a way to overcome social distance in GVTs. Our findings show that, although both can be considered continuities, they should not necessarily be perceived in the same way. Effects of time zone adjustment and trust in peers were substantially different, both in relation to individual outcomes and how they interacted with the team context. This takes us to the second argument made at the outset of the article. Namely, that context can play a prominent part when determining the role of a potential boundary as a discontinuity (Bülow et al., 2019; Watson-Manheim, 2019; Watson-Manheim et al., 2002). Here our research clearly supports the mainly qualitative and conceptual research arguing that context matters for the understanding of boundaries, and how to overcome them, in GVTs.

Contribution to practice

Our research also offers new information to be used by practitioners in GVT management, especially in companies where GVTs are used to do complex tasks, like the R&D teams in our research site. First, as trust in peers has a positive effect on performance and job role clarity, firms can develop HR or information systems that support the development of interpersonal trust in GVTs, especially in teams with (highly) diverse members. Although this has been found to be somewhat difficult, it can be done. For example, Kirkman et al. (2002) found that this was accomplished by team-member performance consistency rather than social bonds.

We did not find time zone adjustment to have a direct effect on either role clarity or performance. Still, time zone adjustment could be worth paying attention to among GVT leaders. Our results indicate

that for GVTs high on openness to cultural diversity, time zone adjustment improves job role clarity. This means that for well-functioning and open GVTs, managers should try to facilitate time zone adjustment. However, in the case of teams with a low degree of openness to cultural diversity, team leaders may prioritize stimulating the development of an open team culture, because without such context a focus on time zone adjustment may only result in more confusion concerning the job.

An important lesson companies and team leaders can take away from our study is the role of team context, in particular openness to diversity. As high team openness to cultural diversity benefits individual GVT members' job role clarity and performance, team leaders should try to promote such attitudes. A way of improving openness to cultural diversity could be by providing diversity awareness training during the initial face-to-face meeting that most GVTs have. There is some empirical support for the use of behavioral modeling as an effective technique for improving team openness to diversity (Strauss et al., 2008). On a general scale, organizations will need to design training programs to develop attitudes and skills in their employees that foster understanding and interaction across demographic differences. Moreover, managerial rewards associated with managing diversity successfully, and group-based strategies that encourage and reward cooperation among different nationalities in achievement of team goals could be used as a tool to promote openness to cultural dissimilarities (Kirchmeyer & Cohen, 1992). We expect these learnings to be of particular interest to GVTs that include members from diverse cultural backgrounds, as was the case in our research setting.

Our results could also provide guidelines for distance work in a more general sense. After its outbreak in December 2019, the COVID-19 pandemic rapidly moved from Asia to Europe, and further to North and South America. This affected many millions of knowledge workers as well as students, forcing them to quickly adapt to digital replacements for daily work activities as a more or less permanent solution (Cheng, 2020; Christie, 2020). Thereby, the virtual work that was enforced on all due to social distancing measures has now become a new norm for work (Handke et al., 2020).

In relation to the COVID-19 crisis, our results concerning trust and openness to diversity in GVTs could be applied in the debate around the subject of distance work in a more general sense. As we found interpersonal trust to be useful for overcoming social distance in virtual work, this should also be promoted outside GVTs, in teams working remotely, but not necessarily spread over different countries. However, it can be difficult to facilitate trust over a distance and in that instance,

groups performing distance work should preferably be open to each other's differences, so that information will be offered more readily. However, it also seems that if the group is not able to capitalize on its differences, role clarity and performance can still be relatively high if there is strong trust between team members. For example, this could be a more cognitive type of trust, where team members rely on each other's reputation and merits. Thus, informing work group members about the strengths and accomplishments of others in the group could be beneficial to its work outcomes, also for teams that are working at a distance, but are not necessarily global. This could be relevant to the many employees performing remote work in the aftermath of the COVID-19 crisis.

Limitations and directions for future research

Although this study uses different raters to assess the different variables connected to our hypotheses, it is not without its limitations. First, we surveyed only GVTs in one business organization headquartered in Denmark. Hence, the generalizability of results to other firms in other national settings is unknown. Second, although we were able to collect a unique multi-level dataset of teams and team members in a relevant work setting, the sample size is relatively small. However, with regard to the upper level, we follow the recommendations put forth by Rabe-Hesketh and Skrondal (2012) about a minimum of 10–20 clusters for a random effect estimation. Third, we measured both independent and dependent variables using the same rater. This may have caused common method variance (CMV), leading to inflated results. We applied some techniques to lessen the risk of CMV. For example, the measurement of many variables is mixed together in such a way that it may not be evident to respondents which groups of items measure predictor variables, and which groups of items measure criterion variables. Besides, the electronic questionnaire also prevented respondents from going back to previous pages and editing answers once they had entered a new page. To further lessen the potential bias of CMV, the anonymity and confidentiality of the respondents were assured. Additionally, a few of the items also had reverse polarity. These design procedures may all have contributed to diminishing the effects of CMV (Podsakoff et al., 2003). To investigate the potential for remaining CMV biases, Harman's single factor test was applied (Aulakh & Gencturk, 2000). Harman's single factor estimated the shared variance between items as only 26%, well below the classic threshold of 50% (Harman, 1976), suggesting that common method biases did not significantly influence our findings. The differential effects of the two independent variables (time zone

adjustment as insignificant and trust in peers as positive) also do not indicate a CMV problem. Finally, our main results are based on multilevel moderation effects that cannot be caused by CMV (Siemsen et al., 2010). Therefore, common method variance should not be a great concern in this study. Fourth, we used self-rating items to measure team members' performance. This could be problematic as individuals may have a subjective and biased perception of themselves, even though studies designed to test this showed that self-report performance measures have been found to be fairly accurate (Goffin & Gellatly, 2001). Future studies could improve the design of this research by using team leader ratings for each individual employee. This, however, could result in other methodological problems such as lower response rates. Fifth, while this study focused on individual-level outcomes, it would have improved the value of the research if we had been able to also assess team-level outcomes. Our sample, however, was not sufficiently large to do this. Future research could try to develop a suitable sample to assess also team-level outcomes. Finally, instead of using aggregated values to assess the teams' openness to diversity we relied on the team leaders' assessment as a single rater. While this has also been done in a number of prominent team studies (e.g. Chang et al., 2014; Kearney et al., 2009), it could represent a problem regarding the construct validity of openness to diversity. Although this rating may contain the true variance regarding GVT member openness to diversity, it may also contain the method variance due to supervisors' rating leniency. As a result, future research could use aggregated values to increase the reliability and validity of higher-level variables. This, however, could pose other problems as not all team members may respond to the survey and a skewed result could be obtained.

Theoretically, a number of studies have explored the role of team leader inclusion in diverse teams including GVTs (Lauring & Jonasson, 2018; Mitchell et al., 2015). While we did not include this concept in our model, team leader inclusiveness could potentially assume the same role as team member openness to diversity and as such would represent a way for the team leader to compensate for a lack of openness among GVT members. This, however, would need to be explored further in coming research. Finally, quantitative research has limitations in relation to assessing the processual dynamics of the interplay between individual and contextual factors, i.e. vicious or virtuous cycles. By use of qualitative research, the initial ideas indicated by this research could be explored in a qualitative design, applying our correlational results as a point of departure for developing a process model of the interaction between different mechanisms for bridging various types of distance in GVTs.

Note

1. The random slopes are not displayed in the tables, largely because this did not affect estimates of any other coefficients except the coefficient for the variable that was allowed to vary across the teams and the results for this are reported in the main body of the article.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Disclosure statement

No potential conflict of interest was reported by the authors.

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