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Telework Uptake and COVID: Will it be Back to Normal? - A Preliminary International Comparison

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Full research paper

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Abstract

To date research on telework has predominantly focused on aspects related to organisations and employees, however, research currently falls short of cross-cultural studies investigating how cultural differences may vary the adoption and use of telework. COVID-19 has demonstrated the demands for working from home and countries with different cultures have expanded telework use as part of the COVID 'new normal'. We identify patterns on the uptake of telework through pre-and post- COVID-19 and apply Hofstede's 6-Dimension model to investigate how cultural consequences may interact with the use of telework in the post-pandemic practice. We evaluate how cultural dimensions influence the acceptance of telework, thereon discuss our preliminary insights on future development needs for better cultural appropriate practices. Our study aims to provide a shared understanding for telework across cultures, shedding light on the potential for further in-depth explorative research on the use of information systems for telework in different cultural settings.

Keywords Telework, Remote Work, Telecommuting, Cross-cultural, COVID-19, Hofstede, International

1   INTRODUCTION

The history of telework can be traced back to the 1970ies when the rapid increase in energy cost led to the idea that instead of workers travelling to a central office they could 'telecommute' using information and communication technologies (ICT). Since then a steady stream of research has developed identifying numerous benefits and drawbacks of telework for employees and organizations (Bloom et al. 2015; Boell et al. 2013; Delanoeije and Verbruggen 2020; Messenger and Gschwind 2016).

By comparison cultural barriers and enablers of telework are under researched (Peters et al. 2016). Moreover, when cultural differences are researched studies are often made within similar cultural spheres as the majority of earlier research was conducted in countries which are assessed as having low cultural barriers on telework acceptance (Peters et al. 2016). What is therefore currently lacking is research investigating differences between cultural clusters and the uptake of telework and how cultural differences may explain any observed patterns across countries.

This paper uses the COVID pandemic as an opportunity to conduct telework research across cultures, investigating how cultural differences may impact the adoption and persistence of telework on an international scale. Using publicly available data we compare telework adoption rates from 11 countries across three broad cultural clusters including continental Europe, Anglo speaking countries, and Asia. Using Hofstede (2011) and the GLOBE project to group and analyse results from different countries we found differences across the three cultural clusters. While our results confirm the applicability of Hofstede for comparing telework across cultures and countries, they also question the applicability of Hofstede as primary means for cross-cultural comparison.

Our findings indicate the presence of broader cultural aspects underlying the aptitude to adopt and continue to use telework. We thus question the applicability of results across different cultural settings from earlier telework research identifying factors at the individual and organizational level. Our results indicate, for instance, that the acceptance of telework is related to Hofstede's cultural dimensions of individualism and power distance, thus broad cultural differences underlie how individuals and organizations engage with work. This questions benefits and drawbacks identified in earlier studies undertaken in North America or Europe to be directly transferable to other cultural settings. What strategies and interventions individuals and organizations may choose in order to make telework work for them are likely to be different across cultural settings. Our result, thus provides insights that information systems potentially need to be adjusted across cultural settings to best facilitate telework.

2   BACKGROUND

Telework refers to work arrangements where work is undertaken remotely supported by various ICTs (Sullivan 2003). There are different types of teleworkers and telework is also often interchangeably used with 'telecommute', 'remote work', or 'working from home (WHF)' (Garrett and Danziger 2007). Therefore, there are different types of telework that need to be distinguished (Sullivan 2003). For instance, there is a growing consensus on a definition separating between 'teleworker' and 'homeworker', defining teleworkers as organization-affiliated who work permanently or occasionally from sites other than the office provided by employers to carry out work through ICTs, whereas 'homeworker' is a broader term that include both 'teleworker' and home-based self-employed workers (ILO 2021). In our research we are interested in teleworkers defined as employed staff working remotely by means of ICT instead of a regular office set up.

With the increasing investment in ICT the capacity to telework has increased (Nakrošienė et al. 2019), allowing teleworkers to collaborate through so called virtual offices from any place at any time (Messenger and Gschwind 2016). Telework has distinct advantages such as retaining talents, reducing business real estate costs, maintaining employee's work-life balance (Messenger and Gschwind 2016; Morganson et al. 2010) and cutting down environmental impacts (Lier et al. 2014). Therefore, many businesses have adopted telework as one of their flexible working arrangements already before the COVID outbreak. However, the consequences for implementing telework was inconclusive (Boell et al. 2016), resulting in a varying level of prevalence of telework across the world with particularly low rates in low-income economies (ILO 2021). Because of the outbreak of COVID-19, telework has come back in the spotlight as it enables working from home during confinements. Importantly, COVID-19 has pushed the use of telework across different cultures and therefore provides scholars with a rare opportunity to further investigate telework across countries and cultures by looking at the adoption and use of telework in response to COVID-19.

Much is already known about the adoption and use of telework in different settings and several barriers to telework from an organizational or managerial perspective are well understood. For instance, telework creates barriers for its wider expansion as organizations struggle to transform their internal functions and relations to suit telework arrangement (Pérez et al. 2002).

Unsupervised autonomy and uncertain productivity are reasons why managers hesitate to adopt telework (Bloom et al. 2015). Attributed to the spatial and temporal separation, telework increases the fear of losing control over employees who work remotely (Mukherjee et al. 2012), pressing greater efforts for trust-building between superiors and subordinates (Kim et al. 2021). Telework requires managers to reorganize work to increase telework effectiveness (Shin et al. 2000) or transform the traditional behaviour-based supervision to result-based controls to ensure performance (Kim et al. 2021).

Notwithstanding academic literature having discovered managerial approaches to enhance telework productivity, the outcomes from current empirical studies are inconclusive. In some studies, the productivity is lower for teleworkers (e.g. Lippe and Lippényi 2020; Solís 2017), whereas other studies report a positive performance compared with their peers working in the office (e.g. Bloom et al. 2015; Delanoeije and Verbruggen 2020). Others argue that knowledge based, and ICT-intensive jobs show a higher telework-ability (Milasi et al. 2021), implying that some sectors/jobs are inherently more suitable to telework than others.

Additionally, the expansion of telework is also impacted by employee's preferences. Telework arguably further blurred the work-life boundary, producing work-related stress caused by work-to-life conflicts (Morganson et al. 2010; Sarker et al. 2012). Work-life conflicts and unavoidable professional isolation damage employee's well-being thereby reduces the teleworker's job satisfaction and willingness to adopt or continue telework arrangements (Bloom et al. 2015). Further, as teleworkers are invisible to their managers (Hafermalz 2021), there is potential promotion discrimination against teleworkers which further reduces their job satisfaction (Bloom et al. 2015).

2.1 Culture and Telework

In addition to barriers to the adoption of telework discussed above, there are also studies on cultural barriers that can explain different attitudes towards telework across countries and regions. Research has found considerable variations across countries on the uptake of flexible work arrangements, with Stavrou and Kianiotis (2010) reporting that cultural difference can either encourage or discourage the use of telework. This, however, makes it difficult to use research findings on telework derived in one cultural setting to another (Wang et al. 2021). So far, most studies are conducted in the Western context, whereas publications for Asian countries are scarce (Solís 2016).

When culture is currently considered in telework research is often interested in investigating the effects of organizational cultures (Baruch and King Joan Yuen 2000; Harrington and Ruppel 1999). Hence to date insufficient studies investigate broader cultural differences and how they may influence the aptitude for adopting telework (Peters and den Dulk 2003). Cultural variation may, however, explain inconclusive outcomes and consequences of telework, due to results being affected by the cultural environment where studies were carried out (Wang et al. 2021). For example, teleworkers' perspectives on work-life balance may vary between cultures, because cultural reactions to work and family demands differ (Chandra 2012), leading to work-life conflicts being more often reported in Western contexts, thereby potentially lacking generalization when applied to the other cultural settings.

What makes the current research landscape further problematic is that when cross-cultural studies are conducted, they are normally among Western countries thus comparing a narrow cultural scope on the use of telework (Peters et al. 2016; Stavrou and Kilaniotis 2009). Therefore, the current literature addressing cross-cultural variances is limited. However, such research is particularly important in the COVID-19 and post COVID-19 world as the uptake of telework during the pandemic was a global phenomenon including large parts of the world that are currently under-researched. During the pandemic telework has become important in Eastern countries, however, the insights provided by earlier researchers do not necessarily readily apply to these settings (Wang et al. 2021).

2.2 Hofstede's Model on Cultural Differences and Telework

Hofstede (2011; Hofstede and Minkov 2010) provides a framework for assessing cultural consequences based on six-dimensional measurements into various cultural attributes (Venaik and Brewer 2010). This model enables researchers to make comparisons across cultures by positioning cultures, that are naturally intangible and difficult to define, with scores along six dimensions (Table 1). Hofstede (2011) therefore is a widely used model for cross-cultural research (Venaik and Brewer 2010), providing a framework for deciphering cultural differences (Leung and Morris 2015).

	Presentation of culture	**Impacts on telework**
Low/ high power distance (PD)	Power distance evaluates power distribution and hierarchical structure and how less empowered members accept such distribution. It applies to the organizational structure and management styles, where high power distance is associated with more centralised management and direct control (Raghuram et al. 2001).	Earlier research postulated that cultures with low power distance are more likely to delegate decision-makings autonomy to subordinates and prefer open communication among teleworkers (Peters and den Dulk 2003). Enterprise IT systems used in telework can enhance task delegations, facilitating a wider use of telework (Peters and den Dulk 2003). High power distance emphasizes managerial functions and value direct supervision. Telework settings dilutes the internal hierarchical structure, showing show greater hesitance to use telework (Raghuram et al. 2001).
Collectivism / individualism (IND)	This dimension measures the degree to which people in a society or organization are integrated into groups. In work settings, individualism culture regard employees as separate individuals, whereas collectivism culture appreciates belonging to a group.	Previous research argues individualism value self-direction and individual achievement in the workplace, which mitigate teleworking risk (Peters et al. 2016). However, telework erodes the solidarity of the workgroup valued by collectivism (Raghuram et al. 2001). Hence, countries with higher values for individualism have higher acceptance of teleworking in contrast to countries with high collectivism scores (Peters et al. 2016; Raghuram et al. 2001).
Uncertainty tolerance/ Avoidance (UA)	Uncertainty avoidance cultures show the need for clarity and structure, whereas uncertainty tolerance cultures show more acceptance of ambiguity unstructured situations and novel events.	Uncertainty avoidance value the clarity in internal reporting relationships, the predictability of procedures and output (Raghuram et al. 2001). Telework practice increase uncertainties as teleworkers are invisible to direct control (Peters and den Dulk 2003). Higher tolerance on uncertainty shows a higher proportion of flexible work arrangements in place, including telework (Raghuram et al. 2001).
Femininity/ Masculinity (MAS)	Assesses the value distribution between genders in society. Masculinity is on the assertive pole showing disparity of responsibilities between genders, emphasizing workplace performance whereas femininity minimizes differences in social roles between genders.	Femininity is associated with reduced stereotypes on gender roles and emphasize the integration between work and non-work roles (Ashforth et al. 2000), which facilitates a higher rate of telework (Raghuram et al. 2001). On the other pole, masculinity places greater importance on earning, recognitions and gender role segmentation (Raghuram et al. 2001; Ashforth et al. 2000), being less accepting of flexible work arrangements, including telework (Raghuram et al. 2001).
Short term/ long term orientation (LTO)	Short term orientation cultures show more steadiness and values traditions, whereas cultures with long term orientation appreciate personal enhancement for achieving growth in the workplace.	Long term orientation emphasize internal employee mobilization rather than external human resource(HR) flexibility, thereby preferring full-time employment and long-term contracts as the main HR construct (Stavrou and Kilaniotis 2009;Raghuram et al. 2001). As such, long term orientation can conceptually conflict with telework resulting in reduced aptitude for telework (Stavrou and Kilaniotis 2009).
Restraint/ Indulgence (IDU)	Focuses on perceptions towards personal control over gratification of desires and the needs for social norms. Indulgence places greater importance on freedom and enjoyment of life, whereas restraint pole shows higher needs for regulation.	Indulgence is manifested in the enjoyment of WLB and the freedom from work pressure, therefore ,indulgence culture has a positive correlation with higher use of telework (Beno 2021). However, as this dimension was only added in 2010 to Hofstede, studies on this dimension in relation to telework are scarce.

Table 1. The application of Hofstede 6-D model on telework adoption.

2.3 COVID-19 and Telework

As the onset of COVID-19 accelerated the transition to telework across the world, this global scale pandemic provides a unique angle for studying telework across cultures. The unprecedented lockdown restrictions and social distancing orders encouraged the uptake and expansion of telework by many governments, thereby driving the ongoing transformation for new workplace norms post COVID (Parker 2020). However, current studies on cultural variances and implications are insufficient to understand this massive teleworking transition. Literature on empirical research into the impact of culture on telework is scarce and often limited to Western English-speaking countries (Solís 2016) hence lacking empirical grounding for understanding varying teleworking behaviours, particularly lack of insights into Eastern cultures on their value and practice on telework (Solís 2016). As a result, our research aims to provide preliminary answers to the following research questions:

(1) Are there differences between cultural clusters in how COVID-19 affected the uptake of telework?
(2) Are there any trends in how cultural clusters continue their use of telework as the COVID-19 pandemic becomes increasingly controlled?
(3) Given the prevalence of Hofstede's 6-D model in earlier research on cultural difference, can this model explain any observed patterns across countries?

3 METHODOLOGY

Our study uses existing secondary data to investigate how national culture affected the uptake of telework before, during and after the initial COVID-19 outbreak. Data from EU-27 countries are extracted from Eurostat (2020) and Eurofound (2021), which contain representative data for different countries in Europe. Pre-COVID data are collected from 2019 EU-27 Labour Force Survey (Eurostat 2020) while data for 2020 and 2021 are sourced from Working During COVID-19 e-survey (Eurofound 2021). For ensuring data quality, we exclude countries with low reliable survey results as indicated in the survey, such as France and the Netherlands. The data for the USA (US Bureau of Labour Statistics), UK (Office for National Statistics), Australia (Australian Bureau of Statistics) and Singapore (Ministry of Manpower) are collected from their respective official statistic authorities. Although China's data is also collected from its official agency the Cyberspace Administration of China, their data collection method does not differentiate types of teleworkers readily applicable to our definition of telework. CAC uses the general term telecommuter without further separation between teleworkers and self-employed home-workers. Nonetheless, we decided to include data from China noting that the real figure of the telework take-up rate may be lower due to the inclusion of self-employed teleworkers in the dataset. Japan's data is collected from newspaper articles, suggesting their outcomes are referred from a survey conducted by Japan Productivity Centre, however, we could not gain direct access to the original survey results. To ensure we have correct data we obtained and compared the results from several major newspapers including the Manichi (2021), the Japan times (2021) and Fortune (2021).

For data on national cultural differences, we use Hofstede-insights.com to acquire scores for all countries. This website has longstanding research based on Hofstede's 6-Dimension model, measuring national index individually from 0 to 100. As our research aims to investigate the difference patterns on major cultures, we choose to use GLOBE project theory from globeproject.com as the guidance to group the cultures that can best align with our acquired datasets. The GLOBE project differentiates cultures with 10 important clusters for sharing highly similar cultural characteristics, we only study on 6 clusters that are most relevant to teleworking, including Anglo, Confucian Asia, Eastern Europe, Latin Europe, Nordic Europe and Germanic Europe. Because the EU-27 data does not differentiate cultural groups in Europe, we combine the 4 clusters from Europe as the 'European cluster'. Hence, our study grouped countries into 3 cultural clusters as Anglo cluster (Australia, UK, USA), Asian cluster (China, Japan, Singapore) and European cluster (Denmark, Finland, Germany, Italy, Sweden).

For our temporal analysis we worked with four phases for collecting data as 'pre-COVID', 'amid-COVID', 'post-outbreak' and 'vaccination roll-out'. According to the daily new confirmed cases in different regions tendency diagram by World Health Organization, we have further narrowed down the time period. The pre-COVID phase is set as before 2020 and our data are collected from various research projects conducted between 2017 to 2019. The amid-COVID period is ranging from February 2020 to May 2020, when most countries had their initial COVID-19 outbreak and uptake of telework arrangements. The post-outbreak dataset is from June 2020 to October 2020, when most economies began re-opening. Last but not least, vaccination roll-out phase is set as February 2021 onwards.

To further compare our results with previous findings, we analysed correlations between teleworking rates of 'vaccination roll-out' phase and each of the six dimensions by calculating Pearson's correlation

coefficient using country level data. These results are then visualized by means of regression lines in Tableau shown in the figures below.

4   RESULTS

We first analysed telework trends of three identified cultural clusters throughout the four phases of the COVID outbreak outlined above. The European cluster, the Anglo cluster and the Asian cluster all show clear trends towards teleworking as a result of the pandemic as teleworking rates at least double for all three cultural clusters (Figure 1). This is not surprising as a major response to the COVID out-break around the globe was trying to minimise the spread by reducing workplace interactions. As a consequence, most countries encouraged employees to work from home instead of travelling to a cen-tral office where possible in order to adhere to lockdown orders. Interestingly, the maximal rates of telework in all three clusters range from 44.3% to 49.3% indicating a general ceiling of the percentage of the workforce that can work from home. We speculate this teleworking ceiling is determined by the overall telework-ability in that cluster, constrained by the national industrial structure and technology infrastructure (European Commission 2020). Sectors that require physical presence, such as retail businesses or manufacturing, cannot effectively work from home. Therefore, unless the procedures of those jobs can be digitalized in telework-able ways, the thresholds are unlikely to increase.
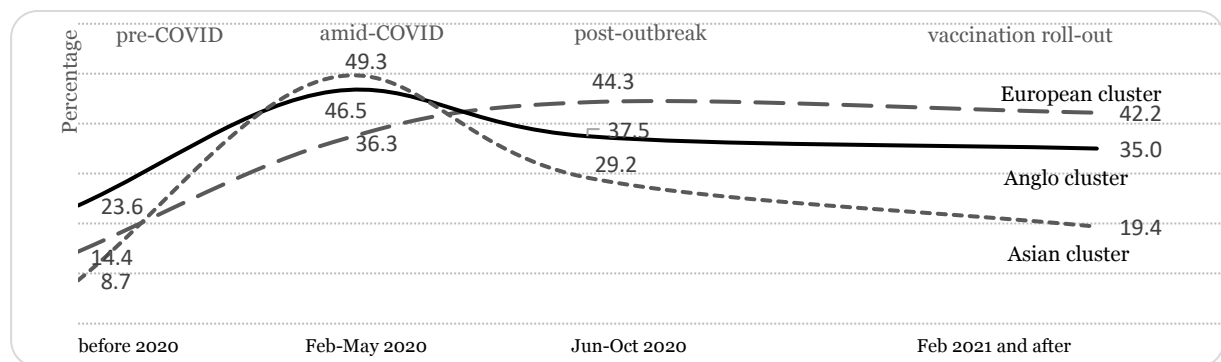

Figure 1. The prevalence of teleworking in three cultural clusters.

However, different patterns are discernible after the initial outbreak. In particular the Asian cluster shows the clearest trend of employees returning to their offices after the initial COVID outbreak. In contrast data from the European cluster and the Anglo cluster indicate a more lasting transformation towards teleworking arrangement. Our results thus provide insights on how cultural differences affect the acceptance and desire for telework. The Anglo and European clusters show a comparatively higher acceptance rate than the Asian cluster after lockdown orders being gradually relaxed, indicating their stronger persistence to telework after the COVID outbreak is brought under control.

These findings therefore address our first two research questions, as they demonstrate that cultural clusters show different aptitude regarding their adoption and ongoing use of telework. Data for all three clusters show that nearly half of the work can be performed completely or at least occasionally away from the conventional office. However, both the Anglo and the European cluster indicate a more permanent shift towards telework, whereas countries in the Asian cluster adopt telework more as a temporary work arrangement in response to the pandemic. As such, cultural acceptance may be one of the main barriers that affect the acceptance or hesitance to continue telework in the post-COVID workplace particularly in Asian countries.

In order to answer our third research question, we use country level data to analyse to what extent Hofstede's 6-D model can explain findings in relation to cultural differences. Our analysis focuses on the vaccination phase as it is during this phase where we see the biggest differences among countries and speculating that the observed difference indicates a trend for the future of telework (see Figure 1). As shown in Figure 2, most countries in the same cultural cluster are distributed close to each other, hence confirming the relevance of Hofstede's dimension for understanding the acceptance of telework across individual cultures. In particularly the dimensions of individualism-collectivism and high-low power distance also seem to offer good indicators for the acceptance or hesitance to adopt telework across cultural clusters since countries in the same cultural cluster are distributed close to each other (Figure 2). However, other dimensions show a less clear pattern regarding the relevance of Hofstede's model regarding the acceptance of telework across cultural clusters, in particular the UA dimension (Figure 2).
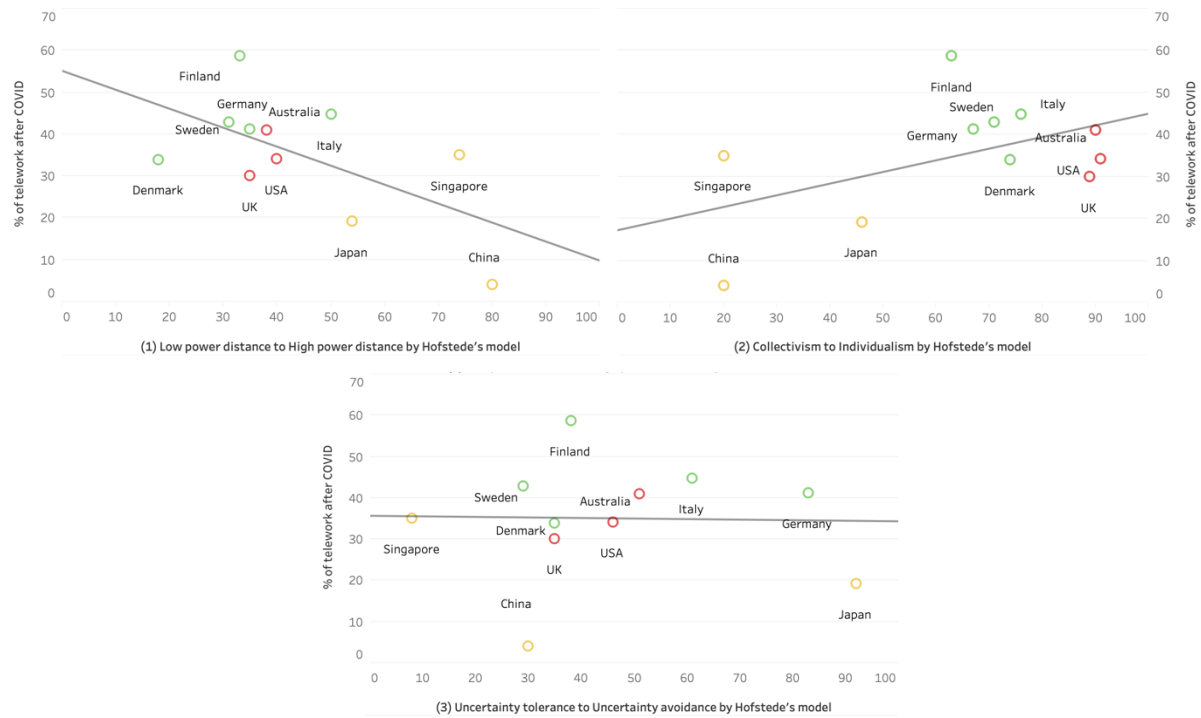
Figure 2. The visualisation for individualism-collectivism, high-low power distance, and uncertainty avoidance.

To further test these results we calculated correlation for each country between its telework uptake rate and the coefficients for each of the six dimensions provided by Hofstede. The results are shown in Table 2 confirming that varying adoption rate of post-COVID telework are largely influenced by cultural differences due to 5 of the 6 correlations are significant (>0.4 or <-0.4).

Dimension	Correlation Coefficient	Description of Relationship
PD	-0.597	Power distance is associated with lower use of telework.
IND	0.498	Higher individualism is associated with higher use of telework.
UA	0.023	No relationship discovered for uncertainty avoidance.
MAS	-0.478	Masculinity is associated with lower use of telework.
LTO	-0.502	Long term orientation is associated with lower use of telework.
IDU	0.400	Higher indulgence is associated with higher use of telework.

Table 2. Pearson's correlation coefficient between telework rate and Hofstede's 6-D.

5   DISCUSSION

Our results confirm that cultural dimensions correlate with the uptake of telework. The Asian cluster represented by Hofstede with collectivism, high power distance, long term orientation and high masculinity, saw employees returning back to the office to presume face-to-face collaboration and direct supervision at a much higher rate than the European cluster or the Anglo cluster. Hofstede thus offers one possible explanation why the Asian cluster sees weaker continuation of telework in our result.

However, unlike findings in earlier research, our results do not indicate a relationship of uncertainty avoidance with the telework rate. Peter and den Dulk (2003) indicated the willingness to adopt telework is largely connected to the avoidance of ambiguity. Referring to the previous literature, uncertainty avoidance is exercised on imposing behavioural codes, rules and procedures (Venaik and Brewer 2010). Hence, uncertainty avoidance cultures prefer using a structured manner to make events interpretable and predictable (Venaik and Brewer 2010). Aiming to reduce uncertainty, strong uncertainty avoidance cultures attempt to avoid flexible work arrangements due to the higher perceived risks on performance and output being unpredictable. In contrast, uncertainty tolerance cultures are more

emotionally acceptable for embracing a higher proportion of flexible work arrangements, even though the impact is modest for telework (Ragheram et al. 2001). Hence, high uncertainty avoidance cultures prefer formal teleworking arrangement, therefore telework is unlikely to expand without clear regulation and rules (Peters and den Dulk 2003). Nevertheless, our result does not support these previous findings, countries in all 3 cultural clusters are distributed discursively around the average line (Figure 2), indicating uncertainty avoidance as irrelevant to the telework rate. It is also worth noting that the possible patterns in the 3 clusters are also varying, where Anglo dots are scattered closely while the other 2 clusters are distributed dispersedly (see Figure 2).

Although the literature indicates uncertainty avoidance connect with telework uptake, organizational policies or informal rules that control telework processes could satisfy the emotional needs for avoiding uncertainties (Peters and den Dulk 2003). Hence, one possible explanation for why our result is different with previous research is that teleworking rules by either formal or informal way can be easily established through HR practice. Managers who allow employees to telework may have qualified performance measurements to control and measure teleworkers by results (Martínez Sánchez et al. 2007). As such, ambiguities and uncertainties are offset by rules, policies, laws and telework regulations reducing the relevance of this dimension compared to earlier studies. Our results therefore question previous research finding that uncertain productivity impedes managers in adopting telework (Bloom et al. 2015). When uncertainties can be resolved by imposing rules and policies, avoiding uncertainties in telework may no longer be a factor hindering the uptake of telework. Importantly, this also implies that cultural barriers may be potentially overcome by putting in place appropriated measures to address associated concerns in the workplace.

Moreover, our dataset has clear outliers that cannot be explained by Hofstede's 6-D model, such as Finland and Singapore. According to Hofstede's 6-D model, both Finland and Singapore are marked the highest on collectivism in European and Asian clusters respectively, they nevertheless record the highest penetration rate of telework in their cluster where we would expect them based on earlier research to be the lowest (Peters et al. 2016; Raghuram et al. 2001). Some explanations for Finland come from the European Commission (2021), arguing that the high prevalence of telework in Finland is due to its ICT-intensive industrial structure which is inherently fit for telework. However, with a similar industrial structure, Sweden and Denmark have a lower rate of telework, therefore, questioning that the observed result can be explained as a consequence of industrial structure and telework-ability alone. Among the Asian cluster, Singapore shows a considerably high cultural acceptance. Thus, our results do indicate that Hofstede's 6-D cannot completely explain aptitude for telework at a cultural level. Therefore, supplementary cultural models are needed to help telework scholars to understand the cultural implications on telework as COVID-induced workplace 'new normal' is likely to continue.

Future research could expand beyond Hofstede's 6-D model by using the GLOBE project framework for cross-cultural studies. Although there are debates on the comparisons between the two prevailing models (Venaik and Brewer 2010), we choose Hofstede's 6-D for its simplicity and adoption by earlier cross-cultural studies on telework, which made comparison of our findings with earlier studies possible. In contrast, the GLOBE project examines culture with 9 dimensions, and each dimension has a value score as well as a practice score. This may overcome criticism towards the use of Hofstede using surveys designed in a US-centric nature (Venaik and Brewer 2010). Future studies thus need to conduct in-depth qualitative studies into organizations in the Asian clusters to explore more deeply what cultural barriers to the adoption and continued utilization of telework may exist and how organizations can overcome them. Moreover, a closer look at additional teleworking societies in Asia, such as Taiwan or South Korea will be useful for better understanding cultural aspects from this region of the world.

6 CONCLUSION

COVID-19 put telework into a global-scale experiment, providing scholars a rare opportunity to conduct cross-cultural research on telework. Firstly, COVID-induced telework has a clear effect on the use of telework after the pandemic, with our dataset indicating an overall increase in the penetration of telework in all 3 cultural clusters. This unprecedented massive transition to telework provided companies with an opportunity to "try" telework in order to comply with lockdown orders (Bloom et al. 2015). Second, prior to the pandemic, telework predominately prevailed in high-income earners and ICT or knowledge-intensive occupations that are technically more teleworkable (Wang et al. 2021). COVID led to a widespread implementation beyond economic and occupational barriers, which provides insights into cultural barriers showing that cultural dimensions impact telework adoption and use. Although all 3 clusters teleworked at their maximum potentials in the outbreak phases, they soon show disparate patterns when outbreaks got increasingly under control. Further, post-COVID econo-

my seem to polarize the acceptance of telework between the three clusters, seeing the Anglo cluster and the European cluster on a more permanent telework transition (Parker 2020; Vyas and Butakhieo 2020) whereas the Asian cluster shows lower aptitude to continue to telework.

Our results also demonstrate that cultural preferences are related to the uptake of telework in a measurable way, 5 dimensions of Hofstede's 6-D model show a linear relationship with the telework rates. Individualism, femininity, and indulgence have a positive impact on the adoption of telework, whereas power distance and long term orientation are associated with lower adoption rates for teleworking. These cultural implications conform with previous theoretical studies.

Our result also questions the relationship between uncertainty avoidance and the use of telework reported in earlier research. One possible explanation is that companies may use policies, guidelines and other approaches to reduce uncertainty associated with telework. For instance, AI enabled people analytics tools used to supervise the performance and output for teleworkers can reduce uncertainty by managers about the productivity of teleworkers. Finding technological and managerial solutions to overcome cultural barriers, thus, may be one possible way to future telework practice.

Our study also provides insights into cross-cultural analysis between the Anglo, European and Asian clusters, addressing the current lack of studies on telework in Asian countries. Importantly the clear presence of cultural aspects on the adoption and acceptance of telework pause us to question if results for employees and organizations reported in earlier studies may hold up across different cultural settings. For instance, the value on individualism and the desire for work-life separation varies across cultural settings, indicating that results regarding work-life balance will vary across cultural settings.

Apart from theoretical implications, our research indicates that in some cultural contexts the aptitude for telework is reduced. In these settings, strategies for mitigating cultural barriers will be necessary to increase the adoption and acceptance of telework in the post-COVID workplace. For instance, businesses in collectivism cultures could emphasize communication and connection between teleworkers, such as using organizational-wide social networking platforms to strengthen not only collaboration but also for fostering a sense of belonging to a collective (Weiss et al. 2015). In high power distance cultures, businesses may consider the use of electronic performance monitoring systems to enable managerial supervision in a virtual setting while reassuring employees of the visibility and recognition of their engagement to their superiors (Panina and Aiello 2005). In long term orientation cultures, businesses could provide rigid compensation and promotion schemes to ensure teleworkers' are rewarded for their long-term commitments to an organization. Furthermore, in femininity and indulgence cultures, organizations might need to focus more on well-being and work-life balance, conferring the 'right to disconnect' for teleworkers. Future research should seek to understand how support for telework can be tailored in such a way that information systems support telework by taking into account specific cultural interactions, preferences and values.

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