

# Coping with Collaboration Hindrances in Mobile and Virtual Work

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Johanna Koroma



# Coping with Collaboration Hindrances in Mobile and Virtual Work

**Johanna Koroma**

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**Aalto University**  
**School of Science**  
**Department of Industrial Engineering and Management**

**Supervising professor**

Professor Matti Vartiainen, Aalto University School of Science, Finland

**Thesis advisor**

Professor Niina Nurmi, Aalto University School of Business, Finland

**Preliminary examiners**

Professor Petra Bosch-Sijtsema, Chalmers University of Technology, Sweden

Senior Lecturer, Ph.D. Carolyn Axtell, Sheffield University Management School, United Kingdom

**Opponent**

Professor Liisa Mäkelä, University of Vaasa School of Management, Finland

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**Abstract**

This dissertation aims to understand how mobile and virtual workers experience and manage their collaboration-related job demands in cross-boundary work in multinational companies (MNC), and how this affects their well-being and performance. Successful collaboration in mobile and virtual work is demanding, as mobile information and communication technology (mICT) and a common company language, usually English has enabled collaborating from afar, frequently changing locations and working across time zones.

Prior research on mobile and virtual work shows that the knowledge regarding context-specific collaboration hindrances, the coping strategies used, and their outcomes is limited and calls for further investigation. This dissertation contributes to the discussion of well-being in mobile and virtual work and builds on the Job Demands-Resources (JD-R) model and the coping theory. This multi-methods study uses a qualitative research approach, applying the systematic review method, individual and focus group interviews, diary entries of individual workers and field observations. The data used in the studies were mainly obtained from two different sources: empirical articles and relevant studies published in two leading textbooks (n = 17), as well as interviews of individual knowledge workers employed by MNCs (n = 170).

The results show that knowledge workers often experience novel contextual collaboration-related job demands as hindrances, which act as antecedents to individual and collective coping strategies and their varying outcomes. These hindrances are generated from collaboration across geographical, temporal and language boundaries in changing work locations, made possible by the usage of mobile information and communication technologies (mICTs) and a common company language. The individual strategies include the usage of a multipresence strategy and a simple, discipline-specific common company language, flexible work practices, and adjusting, rescheduling and adapting actions according to collaboration needs. The collectively applied strategies include building a psychologically safe language climate and a common global mindset. Applying coping strategies results in both emotional and performance outcomes that can be either beneficial or detrimental.

This dissertation proposes new perspectives to both the JD-R model and the coping theory, as well as to the occupational well-being literature, and further develops the theories to cover well-being and performance in mobile and virtual work. It offers practical implications, including both managerial and work design suggestions, to enable more favourable conditions for cross-boundary collaboration in mobile and virtual work.

**Keywords** Mobile work, virtual work, job demands, coping

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Väitöskirjan tavoitteena on lisätä tietoa siitä, miten kansainvälisten organisaatioiden mobiilia ja virtuaalista työtä tekevät työntekijät kokevat ja hallitsevat rajoja ylittävään yhteistyöhön liittyviä työn vaatimuksia ja kuinka se vaikuttaa heidän hyvinvointiinsa ja työssä suoriutumiseensa. Onnistunut yhteistyö mobiilissa ja virtuaalisessa työssä on haasteellista, koska yhteistyötä tehdään hajautetusti vaihtuvissa työskentelypaikoissa ja eri aikavyöhykkeillä kannettavan tieto- ja viestintäteknologian sekä yhteisen yritys kielen (yleensä englannin) avulla.

Lisätutkimusta tarvitaan, koska tutkimustietoa mobiiliin ja virtuaaliseen työhön liittyvistä yhteistyön esteistä, käytetyistä stressinhallintastrategioista (coping) ja niiden seurauksista on vain vähän. Väitöskirja hyödyntää työn vaatimukset ja voimavarat -mallia sekä coping-teoriaa ja antaa kaivattua lisätietoa hyvinvoinnista mobiilissa ja virtuaalisessa työssä.

Tässä monimenetelmä tutkimuksessa käytetään laadullisia tutkimusmenetelmiä, joihin kuuluvat systemaattinen katsausmenetelmä, yksilö- ja ryhmähaastattelut, henkilökohtaiset päiväkirjamerkinnot ja kenttähavainnot. Aineisto koostuu pääosin kahdesta erilaisesta aineistosta: empiirisistä tutkimusartikkeleista ja aihealueen tutkimuksista, jotka on julkaistu kahdessa keskeisessä kirjassa (n = 17) sekä kansainvälisissä yrityksissä työskentelevien tietotyöntekijöiden yksilöhaastatteluista (n = 170).

Tulokset osoittavat tietotyöntekijöiden kohtaavan usein erityisesti mobiiliin ja virtuaalisen työn vaatimuksiin liittyviä työn esteitä, jotka johtavat tarpeeseen käyttää sekä yksilöllisiä että yhteisiä stressinhallintastrategioita ja vaikuttavat hyvinvointiin sekä työssä suoriutumiseen. Esteitä syntyy, kun kannettavan tieto- ja viestintäteknologian ja yhteisen yritys kielen avulla tehdään aikaeroja, maantieteellisiä ja kielellisiä rajoja ylittävää yhteistyötä vaihtuvissa työskentelypaikoissa. Yksilöllisinä stressinhallintastrategioina käytetään 'multipresence' -strategiaa, joustavia työtapoja sekä omien tehtävien mukauttamista, uudelleen aikatauluttamista ja sopeuttamista yhteistyön tarpeisiin. Yhteisiin stressinhallintastrategioihin kuuluvat turvalliseksi koettu kielenkäyttöilmapiiri ja globaali ajattelutapa. Käytetyt stressinhallintastrategiat vaikuttavat sekä emotionaalisiin kokemuksiin että työssä suoriutumiseen ja voivat olla työntekijän kannalta joko hyödyllisiä tai haitallisia.

Väitöstutkimus tuo uusia näkökulmia työn vaatimukset ja voimavarat -malliin, coping-teoriaan ja työhyvinvointikirjallisuuteen ja kehittää mobiiliin ja virtuaalisen työn työhyvinvoinnin sekä työssä suoriutumisen teoriaa. Se tarjoaa käytännön sovellusmahdollisuuksia hajautetun rajoja ylittävän yhteistyön johtamiseen sekä työn muotoiluun mobiiliin ja virtuaalisen työn kehittämiseksi.

**Avainsanat** Mobiili työ, virtuaalinen työ, työn vaatimukset, coping**ISBN (painettu)** 978-952-60-8529-6**ISBN (pdf)** 978-952-60-8530-2**ISSN (painettu)** 1799-4934**ISSN (pdf)** 1799-4942**Julkaisupaikka** Helsinki**Painopaikka** Helsinki**Vuosi** 2019**Sivumäärä** 209**urn** <http://urn.fi/URN:ISBN:978-952-60-8530-2>



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This dissertation is the outcome of a long, persistent and multifaceted journey, and at the same time, the realisation of a dream from my adolescent years. This dream was to study interesting phenomena, challenge myself, have stimulating intellectual conversations, and work as a researcher in a university. For this dream and the persistence to fulfil it, I would like to thank my grandparents Alli and Eero, who studied for academic, creative professions, remained curious throughout their lives, and planted the same curiosity in me during our lively conversations at the many family Sunday lunches in their welcoming home, where they always approvingly treated us children as equals. Their influence on me has been long lasting, and because of them I am still eager and motivated to ask questions and to endeavour to pursue answers to them. I will forever be grateful to them both.

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Espoo, 8 April 2019  
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# List of Abbreviations and Symbols

HR	human resources
ICT	information and communication technology
JD-R	the Job Demands and Resources model
mICT	mobile information and communication technology
MNC	multinational company
R&D	research and development

# List of Publications

This doctoral dissertation consists of a summary and the following publications:

**1.** Koroma, Johanna; Hyrkkänen, Ursula; Vartiainen, Matti. 2014. Looking for people, places and connections: hindrances when working in multiple locations: a review. *New Technology, Work and Employment*, volume 29, issue 2, pages 139-159. ISSN 0268-1072. DOI 10.1111/ntwe.12030.

**2.** Koroma, Johanna; Vartiainen, Matti. 2018. From presence to multipresence: mobile knowledge workers' densified hours. Cham. Palgrave MacMillan. The 'new normal' of working lives: critical studies in contemporary work and employment, pp. 171-200. *Dynamics of Virtual Work*, 14954. ISBN 978-3-319-66037-0. DOI 10.1007/978-3-319-66038-7

**3.** Nurmi, Niina; Koroma, Johanna. The emotional benefits and performance costs of having a psychologically safe language climate in MNCs. Submitted (third round) for publication in the *Journal of World Business* in December 2018. 39 pages.

**4.** Sivunen, Anu; Nurmi, Niina; Koroma, Johanna. 2016. When a one-hour time difference is too much: Temporal boundaries in global virtual work. In: Tung X. Bui and Ralph H. Sprague, Jr. *Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS 2016)*, Kauai, Hawaii, 5-8 Jan. 2016. The Institute of Electrical and Electronics Engineers (IEEE) Computer Society. Pages 511-520. ISBN 978-0-7695-5670-3. DOI 10.1109/HICSS.2016.70.

# Author's Contribution

**Publication 1:** Looking for people, places and connections: hindrances when working in multiple locations: a review.

Mrs. Koroma was the primary author of the paper. She produced the final wording of the paper together with Prof. Vartiainen. Mrs. Koroma conducted the search of the journal articles. Data analysis was a joint effort between Mrs. Koroma, Dr Hyrkkänen and Prof. Vartiainen. Dr Hyrkkänen and Prof. Vartiainen scrutinised the publication in general and participated in joint discussion on its contents and structure. Processing the paper during the review rounds was Mrs. Koroma's responsibility.

**Publication 2:** From presence to multipresence: mobile knowledge workers' densified hours.

Mrs. Koroma was the primary author of the paper. She produced the final wording of the paper. Data analysis was conducted as a joint effort, Mrs. Koroma being responsible for the analysis process. Prof. Vartiainen scrutinised the publication in general and participated in joint discussion on its contents and structure. Processing the paper during the review rounds was Mrs. Koroma's responsibility.

**Publication 3:** The emotional benefits and performance costs of having a psychologically safe language climate in MNCs

The data analysis that Mrs. Koroma and Dr Nurmi conducted together revealed that non-native English speakers cope collectively when using English as a common company language. Mrs. Koroma, together with two other students, collected data from KONE Corporation, and Dr Nurmi gathered data from NOKIA Mobile Phones. Mrs. Koroma interviewed 31 of the 93 participants and conducted 16 observations. Data analysis was a joint effort between Mrs. Koroma and Dr Nurmi. Both authors participated in joint discussions on the content and structure of the publication and made several improvements and rewritings.

**Publication 4:** When a one-hour time difference is too much: Temporal boundaries in global virtual work.

The initial idea for the paper's topic – the effects of small time zone differences on collaboration – came to Mrs. Koroma during the collection and inductive analysis of the data. Mrs. Koroma, Dr Sivunen and Dr Nurmi collected the data

separately from different organisations. Data analysis was a joint effort between Mrs. Koroma, Dr Sivunen and Dr Nurmi. Mrs. Koroma conducted Case Organisation Beta's data collection, analysis and delivered the findings. She conducted 31 out of the 93 interviews. Mrs. Koroma's inductive analysis revealed an emerging theme of small time zone differences, which became the central finding of the paper. Mrs. Koroma participated in writing the paper and in joint discussions on the contents and structure of the paper.

# 1. Introduction

*Collaboration is the key to effectiveness in the virtual organization. Effective collaborations are the wellspring of knowledge and creativity, key strategic resources for performance success in all modern organizations, but particularly in the virtual organization. Therefore, how to facilitate and support these collaborations should be the starting point for modern organizational and technological design.* (Cohen & Mankin, 1999, p.1)

Successful collaboration in mobile and virtual work is demanding, due to diverse contextual hindrances when collaborating at a distance, frequently changing locations and across time zone differences. All this is made possible by mobile information and communication technology (mICT) and a common language, usually English. Virtual teams are defined as interdependent and physically distributed teams that collaborate and coordinate work using information technologies to achieve a common goal (Caya, Mortensen & Pinsonneault, 2013; Cramton, 2001; Järvenpää, Knoll & Leidner, 1998; Maznevski & Chudoba, 2000; Townsend, DeMarie & Hendrickson, 1998). Hence, collaboration performed in virtual teams and networks is a joint effort that requires the effective active participation of all parties. This makes it a collective phenomenon, resulting in collective experiences, and it requires both individual and collective coping with possible hindrances in order to complete interdependent projects and tasks.

As technological developments have enabled working across spatial, geographical and temporal boundaries, multinational corporations (MNCs) have started to use global teams and networks to leverage remote expertise and create competitive advantage in a demanding, dynamic global market place (e.g., Cummings, 2004). ‘Virtual communication’ denotes the social use of mICT, which enables cross-boundary work and collaboration while at different and changing locations. The properties and capabilities of advanced mICT enable individuals to communicate virtually with locally or globally distributed partners in different locations and while on the move (e.g., Gareis, Lilischkis & Mentrup, 2006; Hyrkkänen & Vartiainen, 2005). These ubiquitous communication possibilities are pivotal for distributed and mobile workers. Collaboration across various boundaries is perceived as an essential strategic tool to enable operations in global markets (Wilemon, 2014). It creates opportunities to, for example, access new, critical resources (Rothaermel & Boeker, 2008) and manage knowledge (Doz, 1996; Hamel, 1991). Because of these opportunities, global collaboration



and inter-organisational arrangements are increasing rapidly (Kelley & Kel-loway, 2012).

Despite these tempting business opportunities and promises of technological developments collaborating in mobile and distributed settings can be complicated. Mobile and virtual work is largely executed by teams and networks of professionals striving to be both productive and creative, often in a highly international environment. Their partners and co-workers are temporally and geographically (often globally) distributed, which creates challenges in daily work arrangements such as collaboration schedules (Carmel, Espinosa & Dubinsky, 2010; Saunders, Van Slyke & Vogel, 2004). To be able to succeed in these circumstances, professionals need to use a common language (Marschan, Welch & Welch, 1997) and recurrently extend their working hours to be able to work across time zones (Fenner & Renn, 2004; 2010). As a result, MNCs are increasingly using flexible working hours and mandating English as a common company language to enable the required knowledge transfer and endorse collaboration between people who speak different native languages (Neeley, 2017; Piek-kari, Welch, & Welch, 2014). As these changes in work and collaboration develop new possibilities for businesses, they also create novel job demands which need to be clearly identified, addressed and managed by team leaders and management, not to mention the dispersed employees themselves. Employees' experiences of and responses to these demands affect their ability to use their full capacity to complete tasks and their potential to be creative (Bakker, Schaufeli, Leiter & Taris, 2008).

According to the European Working Conditions Survey (Eurofound, 2017), in 2017 the percentage of mobile and virtual workers in Finland was 24%, 8% of which were highly mobile. In European countries, the average percentage was 8%, but this varied considerably between countries and was the highest in Scandinavian countries and in managerial and knowledge work. In the USA, 37% of all workers reported that they regularly did mobile and virtual work in 2015. This marked a rise from 30% in the previous decade (Eurofound and the International Labour Office, 2017). As virtual and mobile work seems to be increasingly common, it is important to understand how to effectively and sensibly manage its demands. It is clear that managing collaboration across boundaries needs somewhat closer empirical scrutiny.

This dissertation makes three contributions to research on collaboration in mobile and virtual work. First, I identify novel, context-specific, both individual and shared collaboration hindrances in mobile and virtual work. Secondly, I show how distributed and mobile workers use not only individual but also collective coping strategies as shared action modes to support collaboration tasks. The third contribution lies in the duality of the consequences of individual and collective coping strategies, which results in both benefits and costs. My findings draw attention to the effects of the selected coping strategies on performance and well-being in mobile and virtual work.

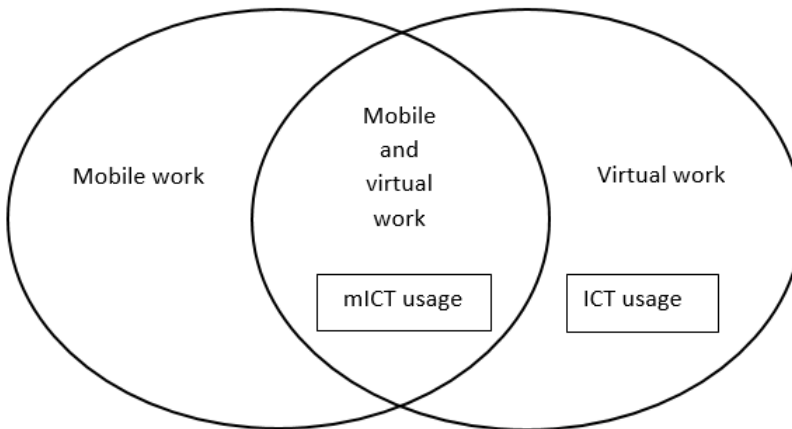
## 1.1 Background and research environment

mICTs allow workers to communicate across geographical and temporal boundaries from different locations, allegedly '*anytime, anywhere*'. Since the 1990s, this change in work practices has become the interest of several different disciplines, for example, work and organisation psychology, information technology, communication and organisation studies (e.g., Allen & Shoard, 2005; Gibson & Gibbs, 2006; Herbsleb & Mockus, 2003; Herbsleb, Mockus, Finholt & Grinter, 2000; Hinds & Bailey, 2003; Järvenpää & Leidner, 1999; Lipnack & Stamps, 1999; Ruppel, Gong & Tworoger, 2013). Prior research on mobile and virtual work in its multiple modes has been discussed in various fields. Even within virtual work research, the literature has channelled its interests into virtual work (e.g., Huws, 2009; Watson-Manheim, Chudoba & Crowston, 2012; Watson-Manheim, Crowston & Chudoba, 2002), virtual and distributed teams (e.g., Gibson & Cohen, 2003; Griffith, Sawyer & Neale, 2003; Järvenpää, Knoll & Leidner, 1998; Järvenpää & Leidner, 1999; Lipnack & Stamps, 2000; Townsend, DeMarie & Hendrickson, 1998) and computer-mediated communication (CMC) (e.g., Markus, 1994; Sproull & Kiesler, 1986; Straus, 1996). Although this attention to multiple disciplines offers several perspectives to approaching mobile and virtual work, it may also make gaining a comprehensive, consistent understanding of the phenomenon challenging.

Gradually, studies have broadened their focus from telecommuting (Nilles et al., 1976a; 1976b) and telework (Lindström, Rapp & Lindström, 1996; Olson & Primps, 1984) to more versatile spatiality by describing distributed workplaces (Harrison, Wheeler & Whitehead, 2004), varying locations of knowledge work (Felstead, Jewson & Walters, 2005; Hislop & Axtell, 2007; 2009) and mobile virtual work (Andriessen & Vartiainen, 2006; Gareis, Lilischkis & Mentrup, 2006; Vartiainen, 2006). The social sciences have largely ignored the topic of spatial mobility at work (Hislop & Axtell, 2007; Kesselring, 2015) and it is primarily reported in facilities management and corporate real estate literature (e.g., Becker & Steele, 1990; Earle, 2003; Kojo & Nenonen, 2015; Van der Voordt, 2004). Even today, in this era of widely implemented virtual collaboration, the physical mobility of workers is crucial for sharing and building resources and knowledge in order to thrive in a highly competitive global marketplace (Boden & Molotch 1994; Urry, 2002). This has led to inconsistencies in the literature, and consequently to a conceptual challenge because the terms used to describe mobile and virtual work, as well as the operational definitions in research, vary across disciplines and countries.

In my dissertation, I use Watson-Manheim and her colleagues' (2002, p. 6) definition of virtual work, which is based on the discontinuities created when crossing boundaries '*including temporal work location (e.g., working asynchronously across time zones), geographic work location, work group member membership (who you work with), organizational affiliation, and cultural backgrounds, either national or professional*'. By mobility, I refer to qualities in work that require frequent moving from one physical place to another, the use of different physical locations for working, and the use of mICTs for communicating with others (e.g., Gareis, Lilischkis & Mentrup, 2006; Hyrkkänen &

Vartiainen, 2005). Mobile and virtual work is a combination of virtuality and mobility (Figure 1).



**Figure 1.** Mobile and virtual work.

The generally agreed and widely spread definition distinguishes mobile workers as *‘those who work at least 10 h per week away from home and from their main place of work, e.g., on business trips, in the field, travelling or on customers’ premises, and use online computer connections when doing so’* (ECATT, 2000). By assuming that over 25% of weekly working time is spent away from the main workplace and from home, this definition includes a wide variety of industries and an increasing number of occupations (Kesserling, 2015).

Even though the research stream of mobile and virtual work is burgeoning, it is still in its development phase. Only a limited amount of research results is available on context-specific job demands and their effects on workers collaborating virtually and at changing locations while working (e.g., Nurmi, 2010; Vartiainen, 2006). Whereas, the research based on the job demands and resources model has mostly neglected the questions of context-specific demands and resources in mobile and virtual work (Nurmi, 2010). The similar situation applies to the coping research. Empirical coping research on collective experiences and actions within organisations is rare (Dubé & Robey, 2008; Espinosa & Carmel, 2003; Länsisalmi, Peiró & Kivimäki, 2000; Nurmi, 2011; Pearsall, Ellis & Stein, 2009; Peiró & Rodríguez, 2008; Rodríguez, Kozusznik, Peiró & Tordera, 2019; Rousseau, 1998; Torkelson et al., 2007), despite the fact that many organisational activities require collective efforts. Therefore, there is a clear need for empirical studies clarifying both individual and collective employee experiences of and responses to collaboration in mobile and virtual work. The available research on the demands, benefits and costs of mobility (e.g., Bosch-Sijtsema, Ruohomäki & Vartiainen, 2010; Felstead, Jewson & Walters, 2005; Harrison, Wheeler & Whitehead, 2004; Hill, Ferris & Mårtinson, 2003; Hislop & Axtell, 2009; Ruostela et al., 2015; Uhmavaara et al., 2005; Vartiainen & Hyrkkänen, 2010; Verburg, Testa, Hyrkkänen & Johansson, 2006), the usage of mICT (e.g.,

Barley, Meyerson & Grodal, 2011; Belotti et al., 2005; Gonzalez & Mark, 2004; Hill, Hawkins, Ferris & Weitzman, 2001; Jackson, Dawson & Wilson, 1999; 2001; 2003; Manger, Wiklund & Eikeland, 2003; Mark, Gonzalez & Harris, 2005; Thomas et al., 2006), a common company language (e.g., Harzing & Feely, 2008; Luring & Klitmøller, 2015; 2017; Liu & Jackson, 2008; Marschan-Piekkari, Welch & Welch, 1999a; 1999b; Neeley, 2013; Neeley, Hinds & Cramton, 2012; Sanden & Lønsmann, 2018; Šliwa & Johansson, 2014; Welch, Welch & Marschan-Piekkari, 2001), and working across temporal boundaries (e.g., Espinosa & Carmel, 2003; Espinosa, Nan & Carmel, 2007; Nicholson & Sahay, 2004; Nurmi, 2010; Ruppel, Gong & Tworoger, 2013) are controversial.

These new job demands require that organisations rethink and reorganise their work practices. However, despite the awareness of these challenges, practitioners and researchers have paid little attention to resolving how to manage these demands (Schotter, Mudambi, Doz & Gaur, 2017). For more than two decades, scholars have studied collaboration challenges arising from difficulties in transferring information and knowledge that are implicitly communicated in traditional face-to-face settings (Townsend, DeMarie & Hendrickson, 1998), but still little is known about the impacts of cross-boundary work demands on collaboration and the ways of coping with these demands. My dissertation answers a call for more knowledge about these issues by investigating employee behaviour when experiencing context-specific collaboration hindrances and the related consequences for mobile and virtual workers.

## **1.2 Objectives and study context**

The aim of this dissertation is to understand how mobile and virtual workers experience and manage their collaboration-related job demands in cross-boundary work, and how this affects their well-being and performance. More specifically, I investigate:

1. the collaboration-related hindrances arising from the job demands specific to mobile and virtual work
2. how workers cope with these hindrances, and
3. the outcomes of coping.

The organisational context of this study is framed as collaboration in mobile and virtual work carried out in MNCs. Because mobile and virtual workers collaborate across geographical, temporal and language boundaries by using mICT, it is relevant to study how they experience and manage the usage of mICT, multiple and changing physical work locations, the usage of a common company language, and time zone differences between collaborating partners.

The dissertation builds on two theoretical frameworks. The Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner & Schaufeli, 2001) scrutinises the experienced hindrances, and the transactional coping framework (Lazarus, 1966; Lazarus & Folkman, 1984) investigates coping strategies and their outcomes.

The JD-R model is a heuristic model that explains employee well-being regardless of occupational group. It divides the qualities of work and working conditions into job demands and resources. Job demands '*represent characteristics of the job that potentially evoke strain, in case they exceed the employee's adaptive capacity*' (Bakker, Hakanen, Demerouti & Xanthopoulou, 2007, p. 275) and are considered context specific (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). According to extant research, the JD-R model is suitable for studying processes that have the potential to consume employees' mental and physical energy and are experienced as work strain (Hakanen & Roodt, 2010).

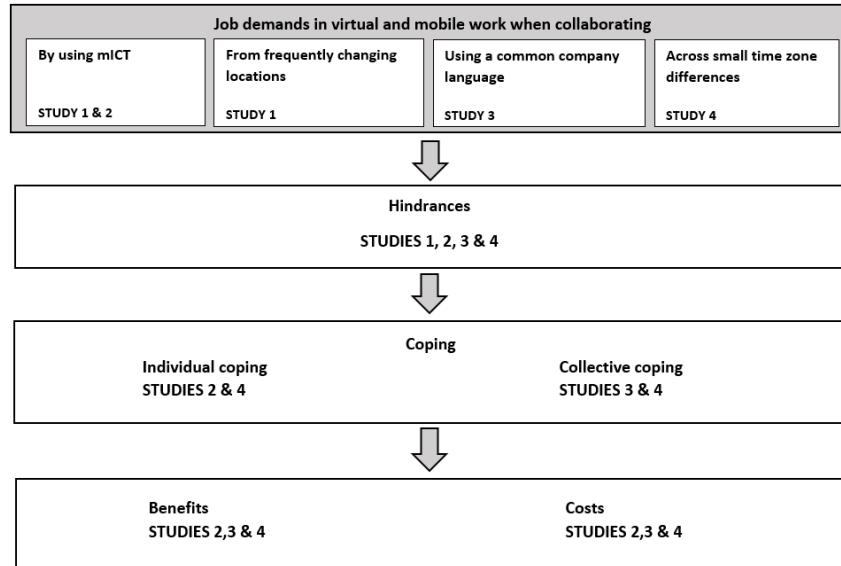
Coping strategies are a resource that an individual can use to reduce the effects of strain. Effective coping strategies are the result of appraisal processes that help individuals manage the psychological stress arising from varying internal or external demands (Lazarus & Folkman, 1984). The coping theory has been applied in organisational settings to examine the stress and coping of individual workers (Lazarus, 1995; Lazarus & Folkman, 1984), and also more recently, of teams as a collective experience and a resource to protect team performance (Driskell, Salas & Johnston, 1999; Kamphuis, Gaillard & Vogelaar, 2011; Pearsall, Ellis & Stein, 2009).

Research focusing on job demands and resources has a strong history of concentrating on human service and locally executed work, including professional fields of health care and social work, teaching and police work (Schaufeli, Leiter & Maslach, 2008). However, very few studies have examined virtual or mobile work-specific demands and resources, and none of these have particularly concentrated on collaboration hindrances. The JD-R model has been used in studies on telework (Biron & van Veldhoven, 2016; Sardeshmukh, Sharma & Golden, 2012), new ways of working (Gerards, de Grip & Baudewijns, 2018), and the usage of mobile technology (Derks & Bakker, 2010; Fujimoto, Ferdous, Sekiguchi & Sugianto, 2016). Only the studies of Kokko and Vartiainen (2007), and Nurmi (2010; 2011) have used the model together with the coping theory in the distributed work context. Dubé and Robey (2008) studied coping with several hindrances, which they called paradoxes in virtual work. Wiesenfeld, Raghuram and Garud (1999) as well as Verburg, Bosch-Sijtsema and Vartiainen (2013) have concentrated on coping with managerial challenges in virtual work.

The research on well-being and the performance effects of collaboration in mobile and virtual work is scarce. Thus, our understanding of the context-specific demands, which cause hindrances to successful collaboration, and consequently affect well-being and performance, is limited. My goal in this dissertation is to identify hindrances and investigate coping processes and their outcomes when collaborating across geographical, temporal and language boundaries in mobile and virtual work.

### 1.3 Research process and dissertation structure

Based on both previous research and the research conducted in this dissertation, I proceed by using the following model as a structure and framework.



**Figure 2.** Dissertation framework.

As outlined in Figure 2, new emerging job demands have an effect on how workers collaborate in mobile and virtual work. These demands can be experienced as hindrances (Van den Broeck, de Cuyper, deWitte & Vansteenkiste, 2010). Individuals and groups adopt specific coping methods to manage hindrances that emerge in varying circumstances. Even if coping is successful, the consequences can be either useful (benefits) or harmful (costs), or both.

In the first study, we used the JD-R model (Demerouti et al., 2001; Bakker & Demerouti, 2007) to review previously published empirical studies and identify hindrances in mobile work. The review approach enabled us to investigate previous research and to form a comprehensive understanding of the context-specific hindrances relevant to this dissertation. The main contribution of the review was the identified hindrances that distinguish the requirements of mobile work from collocated work.

In the second study, we used the event system approach (Morgeson, Mitchell & Liu, 2015) to identify mobile multi-locational knowledge workers' collaboration events. We identified mobile work-related hindrances leading to technology-enabled multipresence strategies as a coping method, which resulted in both benefits and costs. By using multipresence as a coping strategy, workers were able to be present in multiple spaces (physical, virtual, and social) concurrently and to use several technologies when changing physical locations.

The third study built on the transactional coping theory (Lazarus & Folkman, 1984), investigating how non-native English-speakers cope with common company language-related collaboration hindrances, and what benefits and costs the coping has in distributed settings. Study 3 continued the discussion on global collaboration by addressing the importance of an organisation-wide common language proficiency level.

In the fourth study, we used the organisational discontinuity theory (Watson-Manheim, Chudoba & Crowston, 2012) to examine workers' responses to crossing temporal boundaries in virtual work. In doing so, we were able to distinguish temporal boundaries from their effects by investigating the visibility of these boundaries. We concentrated on the emergence of discontinuities, i.e., hindrances, when working across small time zone differences, and the construction of continuities, i.e., coping, related to working across temporal boundaries.

Ultimately, this dissertation contributes to the occupational well-being literature by introducing new context-specific hindrances and revealing the benefits and costs stemming from the coping strategies that workers and work units create to overcome hindrances.

This doctoral dissertation contains two parts and is structured as follows. The first part comprises an overall outline of the dissertation (Chapter 1), its theoretical foundation (Chapter 2), the research questions (Chapter 3), the research design and methodological choices (Chapter 4), the main findings of the original research articles (Chapter 5), and the conclusions and discussion (Chapter 6). The four original research articles presented in the second part (appendix) describe the experienced hindrances and their consequences for individuals and organisations.

## 2. Theoretical foundation

In this section, I first introduce the JD-R model and propose that strain is a response to job demands that are experienced as hindrances when collaborating across boundaries. I review the research on the usage of mICT and a common company language as well as working in multiple physical places and across time zone differences in the context of job demands related to crossing boundaries in mobile and virtual work. Then I present the coping theory, explaining the personal resources used to tolerate or minimise the effects of strain, and the known outcomes. I introduce the research on mobility- and virtuality-specific coping strategies and their outcomes. By focusing on these topics, I bridge the mobile and virtual work-specific hindrances and the individual and collective coping mechanisms and their consequences.

### 2.1 Job demands and resources in mobile and virtual work

The JD-R model is a theorisation of the parallel processes of work-related stress and motivation. According to this model (Demerouti et al., 2001), every occupation has specific physical, psychological, social, and organisational characteristics that can be classified as job demands and resources. Job demands are the characteristics that require continuous effort and management of the use of an individual worker's physical or mental energy. The JD-R model illustrates the process of negative consequences resulting from the job demands as a health impairment pathway. Job resources, on the other hand, refer to the specific qualities of a job that support work goal achievement, reduce job demands and their negative consequences and/or stimulate personal development (Schaufeli & Bakker, 2004). This process is characterised as a motivational pathway. One of the pivotal components of the JD-R model is the context specificity of demands and resources, which makes it applicable to diverse occupational settings (Bakker & Demerouti, 2007). Until now, studies applying the model have mainly been interested in locally executed human service jobs (e.g., Bakker et al., 2003; Bakker et al., 2007; Hakanen, Bakker & Demerouti, 2005; Hakanen, Bakker & Schaufeli, 2006; Schaufeli & Bakker, 2004), and so far, very little is known about virtual or mobile work-specific job demands and resources.

Although mobile and virtual work have become 'the new normal' of working life (Taylor & Luckman, 2018), surprisingly few studies have focused on identifying these job demands. Like other types of work, mobile and virtual work have distinctive job demands and resources. However, in their seminal book on mobile and virtual work (2006), Andriessen and Vartiainen, for example, describe



six dimensions of contextual complexity. The dimensions of geographical location, the extent of mobility, temporal dispersion, the temporariness of collaboration, employee diversity and mode of interaction (use of ICT) may create either demands or resources among individuals and teams. Richter and his colleagues (2006) present the coordination of labour, the distance to team members and changing tasks as demands of mobile and virtual work. In her study of virtual teams, Nurmi (2010) applied the JD-R for the first time model to understand stress in virtual settings and identified electronic dependence and spatial and temporal distances as job demands. In response to the call for further studies focusing on job demands in mobile and virtual work, I use the JD-R model as a framework in my dissertation to identify context-specific hindrances in mobile and virtual work. The next two chapters specify collaboration-related job demands and hindrances in this field.

### **2.1.1 Collaboration-related job demands**

Collaboration-related resources and demands in mobile and virtual work are somewhat of a paradox. While crossing geographical, temporal and language boundaries are commonly agreed to be fundamental for collaborating in mobile and virtual work, these factors may also constitute job demands (Watson-Mannheim, Crowston & Chudoba, 2002). Even though virtual mobility and technological advancements make it possible to collaborate with others from multiple locations (Andriessen, 2012; Lipnack & Stamps, 2000; Montoya, Massey, Hung & Crisp, 2009), an alarming number of studies indicate numerous concerns regarding the effectiveness of collaboration among dispersed virtual teams (e.g., Anantatmula & Thomas, 2010; Bell & Kozlowski, 2002; O'Leary & Cummings, 2007; Schweitzer & Duxbury, 2010; Townsend, DeMarie & Hendrickson, 1998). In particular, the need to cross temporal, geographical or cultural boundaries, and very often a combination of these boundaries, presents considerable hindrances in virtual collaboration (Järvenpää & Leidner, 1999; Nemiro, Beyerlein, Bradley & Beyerlain, 2008; Watson-Manheim, Chudoba & Crowston, 2012). Therefore, the job characteristics I present in my dissertation as potential demands include the usage of mICT, collaboration while at frequently changing locations, the usage of a common company language, and working across time zones. These are all vital resources for cross-boundary work and successful collaboration within teams and networks in MNC environments, but they may simultaneously include demands that are experienced as hindrances (Watson-Manheim, Chudoba & Crowston, 2012). The effects of experienced hindrances turning into job stressors are well documented in the JD-R model (Demerouti et al., 2001).

### **2.1.2 Hindering and challenging job demands in mobile and virtual work**

The JD-R model divides job stressors into two categories, challenge-related and hindrance-related stressors (e.g., Cavanaugh, Boswell, Roehling & Boudreau, 2000; Podsakoff, LePine & LePine, 2007; Van den Broeck et al., 2010). Challenge-related stressors motivate us to put effort into a task. They are achievable

and interesting, and therefore help us achieve set goals. They relate positively to well-being but do not protect from negative effects such as health consequences (Van den Broeck et al., 2010). In contrast, hindrance stressors are negatively associated with vigour (Van den Broeck et al., 2010) and engagement (Crawford, LePine & Rich, 2010), and positively associated with exhaustion (Van den Broeck et al., 2010). The extant literature has presented similar phenomena which have also been described widely in social science literature. Hindrances (Crawford, LePine & Rich, 2010), discontinuities (Watson-Manheim, Chudoba & Crowston, 2012; Watson-Manheim, Crowston & Chudoba, 2002), daily issues (Mark, Gonz  les & Harris, 2005; Zohar, 1999), discrepancies (Jett & George, 2003; Mandler, 1990), and interruptions (Perlow, 1999; Zijlstra, Roe, Leonova & Krediet, 1999) have been found to hinder goal-directed activities, task accomplishment, action regulation and, subsequently, to affect employee well-being. These factors all restrain work-related accomplishments (Bailey & Konstan, 2006; Mansi & Levy, 2013; Zijlstra et al., 1999) and are common in distributed virtual and mobile knowledge work (Barley, Meyerson & Grodal, 2011; Belotti et al., 2005; Manger, Wiklund & Eikeland, 2003; Thomas et al., 2006).

Crossing geographical, temporal and cultural boundaries is a useful conceptual tool for understanding the hindrances that emerge from the demands of mICT usage, changing work locations, a common company language usage and time zone differences in mobile and virtual work settings. Boundaries are contextual and changing, and therefore workers and teams might respond differently to a similar boundary. According to Watson-Manheim, Chudoba and Crowston (2012), a boundary only becomes problematic if an individual recognises a discontinuity (i.e., hindrance) related to it.

Job demands may develop into job stressors if meeting them involves substantial effort from which the worker is unable to sufficiently recover or when the work does not provide adequate job resources to counterbalance the strain (Bakker & Demerouti, 2007). A job stressor is an external stimulus and one potential human response to it is a stress reaction (Lazarus & Folkman, 1984). Cooper and his colleagues (2001) conceptualise job stressors as unmanageable job demands. Job stressors can originate from various contextual job-specific demands, for example, physical, organisational, social (Bakker & Demerouti, 2007; Demerouti et al., 2001), and technological (Mortensen & Neeley, 2012) demands. Prior research on mobile and virtual work has recognised and reported some hindrances associated to collaboration using mICT, from changing work locations, using a common company language and across time zone differences.

#### *Hindrances related to the demand of mICT-enabled collaboration*

Even though technologies are developed to facilitate collaboration, i.e., communication, coordination, efficiency, mobility, and sociability with different internal and external stakeholders and groups across time zones and geographical locations in MNCs, their usage can be challenging in some conditions (Espinosa, DeLone & Lee, 2006; Hinds & Kiesler, 1995; J  rvenp    & Lang, 2005; Levina &

Vaast, 2008). Research on the sociomaterial theory has investigated the connections between technology, work and organisation that is *'the constitutive entanglement of the social and the material in everyday organizational life.'* (Orlikowski, 2007, p. 1438). The roots of the sociomaterial theory lie in social constructivism (Kukla, 2000) and in the sociotechnical approach in particular (Trist & Bamforth, 1951). This approach addresses the interaction between materiality and organisations, which enables a researcher to understand how the organisation of everyday work life is connected to materiality (Orlikowski, 2000; 2007). It sees the material as integral to organising and does not separate it from the social when, for example, adopting and using technologies (Orlikowski, 2009). Therefore, it is a suitable approach for studying mICT-enabled collaboration, in which both the material and the social are evidently entangled. According to the sociomaterial theory (Orlikowski, 2000; 2007; 2009), practical actions in digital work are organised in the physical and digital contexts as well as through face-to-face and online virtual social interactions. The material properties of the used technology, as well as current social expectations, influence users' collaboration and communication behaviour (Barley, Meyerson & Grodal, 2011). For example, ubiquitous access to mICT and the increased use of smart mobile technologies has strengthened the demand to be available around the clock (Belotti et al., 2005; Gonzalez & Mark, 2004; Jackson, Dawson & Wilson, 1999; 2001; 2003; Mazmanian, Orlikowski & Yates, 2013; Perlow, 2012; Ruppel, Gong & Tworoger, 2013). Derks and Bakker (2010) in turn conclude in their review of the impact of email usage provided by mICT paradoxically: *'technology in itself is neither a demand nor a resource; it is how we deal with it'*.

Mobile workers in distributed organisations need both virtual online (synchronous) and delayed (asynchronous) communications for collaborating with their contacts (e.g., Cousins & Robey, 2005; Gareis, Lilischkis & Mentrup, 2006; Hyrkkänen & Vartiainen, 2005) and coordinating their work with dispersed colleagues and partners (Belotti, Cuchenaud, Howard & Smith, 2003; Belotti et al., 2005). Although the ubiquitous access to mICT offers resources that are essential for maintaining collaboration with distributed partners, it paradoxically places demands on mobile and virtual workers. These demands arise especially when workers use mICT for communicating and collaborating from different physical locations, or while they are on the move and trying to complete their tasks and reach their goals.

Email, especially mobile email, has been generally adopted worldwide in varying businesses and sectors (Middleton & Cukier, 2006), and is therefore a widely studied asynchronous technological medium (e.g., Barley, Meyerson & Grodal, 2011; Bellotti et al., 2005; Fisher & Moody, 2001; Middleton & Cukier, 2006; Thomas et al., 2006). The material properties of asynchronous technologies influence users' behaviour by making it possible to send messages at any time of the day or night, seemingly without disturbing the recipient, as they are stored until handled. The asynchronous nature of communication technology thus gives the receiver some flexibility in when to respond, but also results in an accumulation of messages if the receiver is occupied with other tasks (Barley,

Meyerson & Grodal, 2011; Middleton & Cukier, 2006). Thomas and his colleagues (2006) revealed in their study of email practices that workers could (to a certain extent) decide when to handle emails, but not their amount or contents.

The pressure to be constantly available, resulting from the use of virtual tools, can cause disruptions and fragmented work, especially for those engaged in global work (Green, 2002; Mazmanian, Orlikowski & Yates, 2013; Ruppel, Gong & Tworoger, 2013; Vartiainen & Hyrkkänen, 2010) or who spend a significant percentage of their work days in meetings, teleconferences or on the phone (Barley, Meyerson & Grodal, 2011). Technology-enabled communication often has an impact on the quality of collaboration if, in addition to regular online contacts with colleagues, opportunities for face-to-face meetings with them are insufficient (Brown & O'Hara, 2003). People may also be hesitant to contact colleagues or partners whom they have not met or do not know well (Axtell & Hislop, 2008).

When travelling, the most common hindrances include the accessibility of networks and facilities such as electrical power and the reliability and functionality of the technologies used, which can lead to inefficient communication and collaboration with remote colleagues and partners (e.g., Axtell, Hislop & Whittaker, 2008; Brown & O'Hara, 2003). When on the move or visiting secondary places, it can be difficult to find information on the availability, operability or quality of local infrastructure or resources, for example, Wi-Fi (Mark & Su, 2010; Perry et al., 2001). Different company-specific policies and rules regulating the usage of internal networks may also restrict visitors' collaboration possibilities. Sometimes, if visitors are unable to attend online meetings or fail to contact remote colleagues with important information, these situations may have critical effects (Mark & Su, 2010; Perry et al., 2001).

The research results also indicate that some ICT policy and compatibility issues hinder collaboration (Vartiainen & Hyrkkänen, 2010). Sufficient technical and overall corporate support are not always available, despite the fact that they are vital for successful communication and collaboration (Venezia & Allee, 2007; Verburg, Bosch-Sijtsema & Vartiainen, 2013). A company's IT support service hours can also significantly slow down problem-solving and therefore hinder collaboration, especially when a mobile worker is travelling in different time zones. mICT-related collaboration hindrances may occur even more frequently when work is done in different locations and while on the move, because workers need to rely more on technology-mediated communication and are susceptible to interruptions created by situational circumstances in changing physical locations.

#### *Hindrances related to the demand to collaborate from changing work locations*

Although collaboration from frequently changing physical locations and while on the move enables flexible work practices, it can also be demanding. Electronic work environments, infrastructures, devices and media are increasingly utilised for collaboration and knowledge sharing in varying physical locations.

In mobile and virtual work, the workplace is not only a physical place but also *'an integration of physical, virtual and mental spaces where work and communicative actions take place'* (Vartiainen, 2007, p. 27). Each location used for working has specific contextual features that may either enable or possibly hinder the necessary work and collaboration of virtual and distributed teams and networks (Hyrkkänen & Vartiainen, 2005; Lipnack & Stamps, 2000). Furthermore, the contextual constraints arising from cross-boundary work play a significant role when work is done in various locations. New job demands are arising from the combination of the embedded contextual factors of various physical locations, electronic work environments and infrastructures (Gareis, Lilischkis & Mentrup, 2006; Hyrkkänen & Vartiainen, 2005; Vartiainen, 2006).

The multiple physical workplaces of mobile workers can be divided into five categories (Hyrkkänen & Vartiainen, 2005; 2007; Nenonen, 2005; Vartiainen, 2006): non-traditional places, such as (1) various means of transportation including cars, trains, planes and ships ('moving places'); (2) a customer or partner's premises or the company's remote, satellite or telework offices ('secondary places'); (3) hotels, cafés, parks, etc. ('third places') as well as more traditional places; (4) the main workplace ('main office'); and (5) home. Recently, Messenger and Gschwind (2016) added a new concept of intermediate spaces, which have become available for work activities through new mICT features, to their coverage of physical workplaces. These spaces, which lie between the employer's, customer's or partner's premises, employees' homes, and moving and third places, include elevators, hallways, car parks, and pavements that can be used for collaborative activities. As mobile and virtual workers use many places that are not originally designed as work sites for work purposes, they have little control over their work environment and accessible resources (Perry et al., 2001).

While on the move, mobile and virtual workers report interruptions to collaboration and other tasks due to unpredictable work situations (Breure & Van Meel, 2003; Laurier & Philo, 2003; Perry et al., 2001; Vartiainen & Hyrkkänen, 2010) and uncontrolled noise (Breure & Van Meel, 2003; Forlano, 2008; Lyons, Holley & Jain, 2008). Collaboration in public places can be limited for several reasons: confidential discussions may be overheard or overseen, and buses, trains, lounges and cafes, for example, lack the required privacy or facilities and may cause disturbances by being noisy and restless (Axtell, Hislop & Whittaker, 2008; Breure & Van Meel, 2003; Forlano, 2008; Lyons, Holley & Jain, 2008). Mobile workers may, in some situations, feel that their own work-related phone calls are disruptive to others and therefore restrict their calls (Perry & Brodie, 2006).

Consequently, mobile and virtual workers report having difficulties finding times and places to collaborate with colleagues. In addition, it is common that available resources, including technological and physical resources in the different locations used for working and collaborating, are limited (Felstead, Jewson & Walters, 2005; Olson & Primps, 1984). Workers describe difficulties finding, for example, appropriate places in which to work (Bosch-Sijtsema, Ruohomäki & Vartiainen, 2010) or locating local people who can facilitate task completion

while visiting partners' or clients' premises (Mark & Su, 2010). Travelling colleagues' or team members' absences decrease collaboration and informal interactions when workers return to the main office (Bosch-Sijtsema, Ruohomäki & Vartiainen, 2010). While working in different locations and moving between them, mobile workers lack the social support they need and have to make decisions on their own on how and where to collaborate (Vartiainen & Hyrkkänen, 2010). In addition to technology-mediated collaboration from changing physical locations, mobile and virtual workers need a common language for collaborating and communicating, as their collaborating partners are geographically, often globally, distributed.

#### *Hindrances related to the demand to use a common company language*

MNCs that carry out geographically dispersed operations have workers from several language areas, who are separated by language boundaries. Communication in these circumstances is by definition multilingual, and a common company language to enable communication and collaboration across language boundaries is inevitably required (Luo & Shenkar, 2006). The aim and purpose of a common company language policy is to enable and promote knowledge transfer and collaboration (Marschan-Piekkari, Welch & Welch, 1999a; Welch, Welch & Marschan-Piekkari, 2001) and to decrease the need for translation (Piekkari et al., 2013; Welch & Welch, 2008;).

In the late 1990s, Marschan-Piekkari and colleagues (1997) raised an important research topic in the international business and management literature by proposing that a strategic decision to use a shared company language within an MNC may have fundamental effects on the organisation and its employees. The aim of a decision to adopt a common corporate language policy is to foster effective global operations. Yet, the capability of an MNC to act as a global entity might be compromised if its employees are unable to deal with communication challenges that are related to their language proficiency levels and how their language skills are utilised to, for example, understand and share knowledge in a foreign language (Marschan-Piekkari, Welch & Welch, 1997; Piekkari, Welch & Welch, 2014). In global business communication, English is often perceived as an equal alternative in many situations (Kankaanranta & Louhiala-Salminen, 2013). The discourse most commonly takes place in English between colleagues or business partners who are all non-native English-speakers (Kankaanranta & Planken, 2010). Proficiency in a common company language is a pivotal asset for mobile and virtual workers when collaborating with distant colleagues and other collaboration partners. However, recent qualitative research proposes that common company language policies favour native English-speakers (Hinds, Neeley & Cramton, 2014; Neeley, Hinds & Cramton, 2012; Welch, Welch & Marschan-Piekkari, 2001).

Welch and Welch (2015) suggest that common company language policies create hindrances to knowledge transfer and absorption. Differences in common company language proficiency levels between workers make contacts difficult and restrict information sharing within an MNC (Marschan-Piekkari, Welch & Welch, 1999b). The reasons for this are diverse. Misunderstandings caused by

differences in language fluency in communication with native speakers (Welch, Welch & Marschan-Piekkari, 2001) as well as among non-native speakers (Adler, 1991; Fixman, 1990; Usunier, 1993) cause information distortion and loss in communication between individuals in different MNC units. Several empirical research results even indicate communication avoidance in a common company language, which may result in difficulties in knowledge sharing (Harzing & Feely, 2008; Lourcing & Klitmøller, 2015; 2017; Liu & Jackson, 2008; Marschan, Welch, & Welch, 1999b; Neeley, 2013; Neeley, Hinds, & Cramton, 2012; Sanden & Lønsmann, 2018; Sliva & Johansson, 2014). These in turn create potential hindrances in both inter- and intra-unit communication. Aichhorn and Puck's (2017) findings indicate that these communicative behaviours affect both the content of information and relationship building, which has a considerable impact on the quality and quantity of communication. In addition to be able to successfully communicate in a common language, geographically and temporally distributed partners need to collaborate and coordinate their work across time zone differences for synchronous interaction.

#### *Hindrances related to the demand to collaborate across time zone differences*

Temporal dispersion refers to the difference in working times among distributed team members (Carmel, 1999; Espinosa, DeLone & Lee, 2006; Munkvold & Ziguers, 2007; Powell, Piccoli & Ives, 2004). Even though operating across time zones is a resource for MNCs and their workers, internationally distributed teams and networks have also regarded it as demanding (Carmel, Espinosa & Dubinsky, 2010; O'Leary & Cummings, 2007; Saunders, Van Slyke & Vogel, 2004). Crossing temporal boundaries requires more attention and time for tasks from collaborating partners. Mobile and virtual workers face demands related to the time they have available for synchronous interaction because of the temporal distribution of their co-workers, collaboration partners and clients (Carmel, Espinosa & Dubinsky, 2010; Espinosa & Carmel, 2003; 2004; O'Leary & Cummings, 2007; Saunders, Van Slyke & Vogel, 2004).

Due to a common understanding that distribution or virtuality increases the challenges in virtual collaboration and coordination between partners, most existing studies have focused on examining collaboration that takes place in global software development across large time zone differences and around the clock (e.g., Bell & Kozlovski, 2002; Carmel, 1999; Carmel, Espinosa & Dubinsky, 2010; Cramton & Webber, 2005; Espinosa & Carmel, 2004; Herbsleb & Grinter, 1999). These studies have concluded that the more distributed or virtual collaboration is, the more challenging it is (e.g., Bell & Kozlowski, 2002; Espinosa, Nan & Carmel, 2007).

The geographical dispersion of collaborating partners is associated with time-related collaboration and coordination hindrances. Time zone differences are difficult to overcome and can be the principal obstacle to efficient collaboration due to having to wait for replies, rework and restart work (Carmel & Espinosa, 2011). Limited amounts of synchronous work time increase coordination needs (DeLone, Espinosa, Lee & Carmel, 2005; Espinosa & Carmel, 2003), challenge coordination (Espinosa, DeLone & Lee, 2006; Espinosa & Pickering, 2006;

Nurmi, 2011; see also Nguyen-Duc, Cruzes & Conradi, 2014) and reduce the time for synchronous information sharing (Milewski et al., 2007). In their interpretive study of virtual interactions among international student teams in a Norwegian and an American university, Sarker and Sahay (2004) identified time lapses such as silence, missing deadlines and confusion due to the unsystematic order of chat and other message threads.

Few studies have discussed how the disparities between small and large temporal differences (Espinosa & Carmel, 2003; Herbsleb & Grinter, 1999) divergently affect collaboration (Espinosa, Nan & Carmel, 2007). In their study, Espinosa and Carmel (2003) proposed that teams or partners operating across small time zone differences (e.g., Sweden and Finland) do not face as severe collaboration hindrances as organisations with operations spanning across large temporal boundaries (e.g., between India and the USA). As small time zone differences have not gained much attention in the literature, there is a clear need for more studies focusing on their effects on collaboration.

As the consequences of hindrances and related inadequate coping strategies can be severe for both individual workers and their work teams or units, identifying these hindrances and understanding the coping processes related to them is vital.

## **2.2 Coping with hindrances in mobile and virtual work**

Lazarus and Folkman (1984) see effective coping as an individual resource to change emotional states, which in turn helps in managing the psychological stress that arises from internal or external demands. Lazarus (1999) emphasises the personal meaning of stressful situations and the variations in individual emotions and reactions. Stress results when a worker appraises a work event as threatening or challenging and assesses their resources for managing the situation as inadequate. This part of a coping process is called the first appraisal. After evaluating a situation, an individual assesses their available resources, i.e., sufficient or insufficient coping strategies. This phase is called the second appraisal. Lazarus and Folkman (1984) suggest that workers are active agents who regulate their negative emotions and control situational problems, even proactively. By applying different coping strategies, an individual learns to use them more adequately. Thus, the widely accepted coping theory restrains the transactional process between a person and their environmental demands (Lazarus & Folkman, 1984). Watson-Manheim and her colleagues (2002, 2012) theorise that coping in virtual setting denotes building the continuities that bridge the gaps of time, space and culture (including language) that define mobile and virtual work.

In this dissertation, I use the concept of stress to mean distress (Selye, 1974). Hans Selye (1974) distinguished distress, a destructive type of stress reaction, from eustress, which is a positive, energising reaction to a situation. The transactional stress-model (Cooper, 1986; Cooper, Dewe & O'Driscoll, 2001) is based on Lazarus' construct of appraisal (1966). Lazarus and Folkman (1984) define



stress as a transactional process in which the individual is the actor. They see stress as a response to a negative appraisal of situational demands. An individual evaluates their resources to successfully manage a potentially harmful or threatening situation (stress stimulus) and activates coping mechanisms. Stress reactions occur when a person has evaluated internal or external demands as taxing or exceeding their available resources. By using different available coping mechanisms, an individual learns to cope more successfully in similar situations.

Coping strategies have been classified into three groups: 1) problem-focused, 2) emotion-focused, and 3) appraisal-focused strategies (Folkman & Lazarus, 1988). All these different strategies are required for effective coping. When individuals use problem-focused strategies, they rely on their resources to actively influence and manage a situation. They do this by finding information on the problem and learning new skills to manage it. By using emotion-focused strategies, individuals try to process their own emotions through acting and thinking (Ashford, 1988; Sarafino, 1990). Acting from this perspective may manifest as, for example, withdrawal or refusal. Appraisal-focused strategies are cognitive processes used for appraising situations and choosing coping strategies (Folkman & Lazarus, 1988) as well as reappraising stressful work events (Latack, 1986).

As collaboration is a collective phenomenon the social constructivist approach offers an interesting perspective on stress and coping with it by proposing that individual emotional reactions are moderated by social interaction. Therefore, stress experiences involve collective characteristics in organisational settings (Rousseau, 1998) and having a common history can lead to shared views of the sources of stress (Länsisalmi, Peiró & Kivimäki, 2000). In recent decades, stress research has broadened from an individual-focused discourse to a more holistic and integrated approach (Peiró, 1990; Schein, 1996) and several researchers have been interested in the collective nature of stress (e.g., Cox, 1990; Handy, 1995; Länsisalmi, Peiró & Kivimäki 2000; Semmer, Zapf & Greif, 1996). Individuals and groups need effective coping strategies to manage these stressors.

Even though the extensive literature on social support and social work environment has examined the relationship between social resources and individual stress (e.g., Billings, Folkman, Acree & Moskowitz, 2000; Bliese & Britt, 2001; Haines, Hulbert & Zimmer, 1991; Hakanen, Bakker & Demerouti, 2005; Johnson & Hall, 1988), previous research on coping has rarely scrutinised coping strategies at team or work unit level. Instead, coping has primarily been considered an individual resource, and has received the most attention in research (Lazarus & Folkman, 1984; Lazarus, 1999). Collective stress experiences and coping behaviours have mainly been recognised and reported among culturally diverse populations (e.g., Constantine, Alleyne, Caldwell, McRae, & Suzuki, 2005; Heppner et al., 2006; Joseph & Kuo, 2009; Kuo, 2012; Utsey, Adams, & Bolden, 2000; Yeh, Inose, Kobori, & Chang, 2001), in the military field (e.g., Bliese & Britt, 2001; Bliese & Castro, 2000; Jex & Bliese, 1999) and in catastrophe psychology (e.g., Hallmann & Wanderstam, 1992; Pennebaker & Harber, 1993). However, some evidence exists of collective coping in the organisational

context. According to Dunahoo, Geller and Hobfoll (1996), collective coping behaviours can be formally introduced and develop informally. Formal practices include, for example, shared organisational or team level problem-solving practices and informal, for example, processes that develop collectively from actions by the team members. Against the mainstream of coping research and Lazarus's (1995) view that both stress and coping are individual phenomena, some studies have investigated the effects of stress on work teams and the coping strategies used to protect team performance against the negative effects of stress and to manage team task demands (Driskell, Salas & Johnston, 1999; Kamphuis, Gailard & Vogelaar, 2011; Pearsall, Ellis & Stein, 2009). The assumption in 'collectivism' remains that individuals are interdependent within their in-group and have common goals, which exceed their personal goals (Triandis, 2001).

The present research on coping is lacking the understanding of employees' collective coping strategies in organisational contexts. In their qualitative study of three independent divisions of an MNC, Länsisalmi, Peiró and Kivimäki identified both collective stressors, for example, constantly changing customer needs and social undervaluation, and collective qualities in coping, for example, collective commitment and maintenance of good working climate, to the stressors in organisational context. In their study of 525 teachers in 100 schools, Rodríguez and her co-authors (2019) found that collective problem-focused coping was more effective than individual strategies. Some studies exploit coping theory to consider the collective characteristics and complex situations in organisations applying virtual and mobile work. Wiesenfeld, Raghuram and Garud (1999) and Verburg, Bosch-Sijtsema and Vartiainen (2013) describe coping with the managerial challenges in virtual work. Based on the qualitative interview study of 42 leaders and virtual team members, Dubé and Robey (2008) were able to identify several active coping strategies for managing hindrances that they define as paradoxes of virtual team work. Espinosa and Carmel (2003) in turn detected team-level coping strategies to combat time separation. Pearsall, Ellis and Stein (2009) studied 83 teams and found that those teams experiencing hindrances reported higher levels of disengagement as collective avoidant coping responses emerging from interactions with teammates. All of these studies propose the usage of active problem-focused collective coping strategies. However, in her case study of global teams, Nurmi (2011) discovered that the team-level coping strategies used in globally distributed work increased team members' workload and activated their individual coping strategies.

The definitions of collective coping vary across research; collective coping thus lacks a unified definition. Länsisalmi and her colleagues' (2000) definition covers the key elements of collective coping in organisational settings. According to them *'collective coping consists of the learned, uniform responses that members within the culture manifest when trying either to remove the stressor, change the interpretation of the situation, or to alleviate the shared negative feeling it produces'* (Länsisalmi, Peiró & Kivimäki 2000, p. 528). Coping in the context of using available resources to manage job demands denotes using two types of resources: internal (cognitive and behavioural) and external (organisational and social) (Richter & Hacker, 1998). Even though some research results

on collective coping exist, the literature on mobile and virtual work has mostly ignored this topic.

As collaboration is a demanding collective phenomenon, experiences of it and coping with the arising hindrances may be also collective. A considerable gap remains in the literature on job demands, resources and coping, as it almost completely neglects collective coping strategies as a response to collective stress experiences.

#### *Coping with technology use in mobile and virtual work*

In contrast to the ‘*anytime, anywhere*’ ideology of technology-enabled communication and collaboration, several studies describe strategies used for coping with mICT usage-related hindrances. Studies of technology-enabled collaboration indicate that workers attempt to perform several tasks simultaneously in order to cope with the requirement of being available and communicating and collaborating if possible (e.g., Barley, Meyerson & Grodal, 2011; Dery, Kolb & MacCormick, 2014; Golden 2009; Mazmanian, Orlikowski & Yates, 2013; Perlow, 2012), despite the usage of email filters or the mute button on their mobile phone (Dabbish & Kraut, 2006; Järvenpää & Lang, 2005). Barley, Meyerson and Grodal (2011) found that workers’ attempts to process emails in every available situation and the number of processed emails were related to their sense of coping, but not to their stress alleviation. Sarker and Sahay’s (2004) study showed that virtual teams began to make work processes visible, to favour synchronous and visual technologies, and to adopt norms of communication, messaging and virtual presence as a coping strategy. Mobile and virtual workers use several individual and collective strategies, including collective meeting practices, learning to develop relationships through ICTs, matching media to tasks, maintaining shared calendars, and a collaborative culture (Dubé & Robey, 2008). They try to arrange synchronous face-to-face or technology-mediated communication opportunities (Nurmi, 2011). Verburg, Bosch-Sijtsema and Vartiainen (2013) introduced several problem-focused coping strategies used by project managers, including clear communication rules, the alignment of clear shared goals and trust-building within their teams. The need to cope with technology-induced hindrances increases when workers collaborate from changing physical locations and while on the move because mICT is the only available channel for communication with distant colleagues and partners.

#### *Coping with frequently changing work locations*

On the individual level, mobile workers need to solve many new and often challenging situations on their own during the work day while on the move. They try to learn the local infrastructure, the locations of working resources and the appropriate standards of the different work environments they visit even if they are not in any one place for long enough to be able to find out and learn everything necessary. Therefore, they carry equipment with them such as backup devices and separate SIM cards for specific countries to ensure successful collaboration in different situations and to be prepared for unexpected incidents and be able to complete their tasks (Mark & Su, 2010).

### *Coping with foreign language use*

Growing empirical evidence indicates that non-native speakers accept (Louhiala-Salminen, 2002) and learn or try to learn the corporate language (Benito, Dovgan, Petersen & Welch, 2013; Fredriksson, Barner-Rasmussen & Piekari, 2006). English language proficiency is an example of individual resources that workers build and use to manage the demands of multicultural collaboration in distributed work settings and in work situations which use English. They learn to speak *a lingua franca*, which is a simplified, discipline-specific language used by speakers who do not share a native language to help them to cope with adverse language-related emotions. It is primarily learned in real-life practices by participating in professional conversations (Kankaanranta & Louhiala-Salminen, 2010; Kankaanranta & Planken, 2010). *Lingua franca* users share a professional area of expertise involving special terminology and concepts.

Several studies suggest organisational coping strategies to balance language asymmetries between native and non-native speakers by providing language training programmes, assessing language skills in recruitment programmes (Barner-Rasmussen, Ehrnrooth, Kovesnikov & Mäkelä, 2014; Kankaanranta & Louhiala-Salminen, 2013; Welch & Welch, 2015), and emphasising *lingua franca* fluency in performance evaluations (Neeley, 2013).

Alternatively, workers may actively avoid interactions in the corporate language, using avoidance as a coping strategy because of the negative emotional effects of using non-native language (Harzing & Feely, 2008; Lauring & Klitmøller, 2015; 2017; Liu & Jackson, 2008; Marshan, Welch, & Welch, 1999b; Neeley, 2013; Neeley, Hinds, & Cramton, 2012; Sanden & Lønsmann, 2018; Sliva & Johansson, 2014). They may refuse to invite native speakers to meetings (Neeley, Hinds, & Cramton, 2012), withdraw from global innovation projects (Hinds, Neeley & Cramton, 2014; Lauring & Tange, 2010), or even leave the organisation (Vaara, Tienari, Piekari & Sääntti, 2005). They sometimes use colleagues as translators (Marschan, Welch & Welch, 1997) and expatriates as language nodes (Marschan, Welch & Welch, 1997; Marschan-Piekari, Welch & Welch, 1999b). Welch, Welch and Marschan-Piekari (2001) also observed that as a result of this, employees who spoke better English in their work community had a heavier workload.

### *Coping with collaboration across time zones*

Espinosa and his colleagues (2011) found in their field study of 123 technical teams that the impact of temporal dispersion on team performance can be decreased by managing and reducing coordination problems. Crossing temporal boundaries requires that collaborating partners pay more attention and allocate more time to task and schedule coordination. Espinosa and Carmel (2004) identified the use of coping strategies among distributed teams when they encountered time separation. They built better practices for using asynchronous technologies for non-overlapping working times and planned for the existing enlarged periods of synchronous times. Furthermore, they developed awareness of time differences. Sarker and Sahay (2004) introduced coping strategies such

as minimising dependencies between distributed locations, developing time-based norms of communication, and social solidarity to tolerate silence or delayed responses.

### **2.3 Outcomes of job demands in virtual and mobile work**

As mobility and virtuality have become an increasingly common part of work due to rapid technological developments and growing globalisation, research has begun to investigate the outcomes of mobile and virtual work. These outcomes have been divided into positive (benefits) and negative (costs/drawbacks). The JD-R model relies on the assumption that experienced job demands and resources lead to diverse well-being and organisational outcomes. Job demands result in negative and job resources in positive individual well-being outcomes. According to the JD-R model, negative outcomes are individual symptoms of strain, which include loss of enthusiasm, loss of work motivation, disappointment, boredom, demoralisation, and loss of interest in others (e.g., Hakanen, 2002; Maslach, Schaufeli & Leiter, 2001). However, several job resources are positively related to work motivation (e.g., Hakanen, Bakker & Schaufeli, 2006; Saks, 2006; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007), especially autonomous motivation (Fernet, Austin & Vallerand, 2012) and work engagement (Schaufeli & Bakker, 2004). Prolonged exposure to occupational stress may result in a pathologic syndrome called burnout, which involve exhaustion, cynicism and reduced personal efficacy (Maslach, Jackson & Leiter, 1996; Maslach, Schaufeli & Leiter, 2001) and may eventually lead to health problems (e.g., Chandola et al., 2008; Halbesleben & Buckley, 2004). Employee well-being outcomes are operationalised as experiences of an affective-motivational state of work engagement, i.e., vigor, dedication and absorption (Maslach & Leiter, 1997; Schaufeli, Salanova, Gonzales-Roma & Bakker, 2002). These individual negative or positive pathways, in turn, are seen as predictors of organisational outcomes such as absenteeism and turnover intentions (Bakker, Demerouti & Schaufeli, 2003) or organisational commitment (Hakanen et al., 2006), and in-role and extra-role performance (Bakker, Demerouti & Verbeke, 2004; Bakker et al., 2003; Schaufeli & Bakker, 2004).

The coping theory (Lazarus & Folkman, 1984) emphasises individual experiences and regards well-being outcomes as different individual emotions and physiological changes that arise from either successful or unsuccessful coping. The immediate effects are negative feelings such as stress, or positive feelings and alterations in a quality of encounters. Stress reaction involves individually experienced negative physical and emotional reactions. Physical reactions include elevated blood pressure, increased hormonal activity and heart rate (e.g., Axelrod & Reisine, 1984; Karasek, Russel & Theorell, 1982; Ursin & Eriksen, 2004), as well as a decrease in heart rate variability (see Thayer et al., 2012) and cognitive capabilities (e.g., Gaillard, 2017; McEwen & Sapolsky, 1995). Psychological symptoms of stress reaction can be experiences of anxiety, frustration, tension, and even depression (e.g., Cooper, 1986; Cooper, Dewe & O'Driscoll, 2001). Stress can also appear as behavioural reactions, such as withdrawal and

declined productivity. Long-term effects can be social, health and well-being outcomes.

Benefits and costs have both individual and organisational, and sometimes serious, effects on well-being and success at work. Since the research on the outcomes of job demands and coping in mobile and virtual work remain scarce (Derks & Bakker, 2010; Dubé & Robey, 2008; Fujimoto et al., 2016; Gerards, de Grip & Baudewijns, 2018; Kokko & Vartiainen, 2007; Nurmi, 2010; 2011), it is important to explore what kind of outcomes are described in the mobile and virtual work literature.

### **2.3.1 Benefits and costs of mobile and virtual work**

Already in 1991, Sproull and Kiesler suggested that the usage of technological tools changes collaboration. In their study of electronically well-networked communities, they wanted to understand behavioural changes under these conditions. They found that even though the first-level effects of ubiquitous communication possibilities seemed to increase the efficiency of collaboration, the second-level social effects could change employees' behaviour in a way that had unexpected or unwanted consequences for collaboration. For example, when companies started to extensively use email, it was fairly easy to see that sending messages was going to become much faster than before. However, predicting how this might influence individual workers' behaviour and team collaboration was not so straightforward. Often, the positive expression of potentials underestimates the contextual constraints that mobile and virtual workers may experience when working across different boundaries (Axtell, Hislop & Whittaker, 2008; Perry et al., 2001). Moreover, social effects have consequences for individual employees' work-life balance (Hill et al., 2001; Middleton & Cukier, 2006; Murray & Rostis, 2007), productivity (Barley, Meyerson & Grodal, 2011; Belotti et al., 2005; Manger, Wiklund & Eikeland, 2003; Thomas et al., 2006) and well-being (Richter, Meyer & Sommer, 2006). The existing research on the outcomes related to implementing mobile and virtual work and a common company language is controversial and identifies both individual and organisational benefits and costs. The results reveal duality in the well-being impacts.

#### *Well-being and stress*

Research investigating mobile and virtual work has established experiences of greater flexibility and control over work offered by flexible work practices made possible mainly by email, mobile phones, and other communication technologies (Hill et al., 2001; Valcour & Hunter, 2005) as a benefit. Workers enjoy their freedom of choice and flexibility to choose when to work and when to have personal time (e.g., Antila, 2005; Baruch, 2000; Clark, 2000; Felstead, Jewson & Walters, 2005; Golden & Geisler, 2007; Harrison, Wheeler & Whitehead, 2004; Hill, Hawkins & Miller, 1996; Olson & Primps, 1984). By deciding on their own working hours and locations, some workers find a better balance between their working and non-working hours (Hall & Parker, 1993; Järvenpää & Lang, 2005; Mazmanian, Orlikowski & Yates, 2013) and are able to use their working hours more efficiently (Axtell, Hislop & Whittaker, 2008; Brown & O'Hara, 2003;

Middleton & Cukier, 2006) by, for example, using transit and waiting times for working.

Fujimoto and his colleagues (2016) applied the JD-R model to study Japanese workers' total mICT usage, during both office and non-office hours. They found a positive impact on workers' experiences of autonomy at work. In their (2007) study, Ajuha and her colleagues found that experiences of autonomy negatively affected work exhaustion. It is important to pay attention to these positive outcomes, as the following findings paradoxically emphasise more detrimental consequences.

Working in distributed teams and networks across temporal boundaries enabled by mICTs is found to extend working hours (e.g., Barley, Meyerson & Grodal, 2011; Carmel & Espinosa, 2011). Virtual and mobile workers report mICT usage-related experiences of stress and overload (Chesley, 2005; Chesley, Moen & Shore, 2003), which depend on how technologies are used (Barley, Meyerson & Grodal, 2011; Duxbury, Towers, Higgins & Thomas, 2006). mICT usage, together with working across temporal boundaries is a common cause of longer working hours. In their review on the impact of email via personal computers and smart mobile devices on work, Derks and Bakker (2010) found that a usage of smartphone lead to long working hours. Moreover, work and backlogged messages accumulating overnight from colleagues working in other time zones increase stress experiences (Carmel & Espinosa, 2011). The longer working hours are, the more likely mobile and virtual workers are to experience stress and overload, even burnout (Boswell & Olson-Buchanan, 2007; Duxbury et al., 2006; Major, Klein & Ehrhart, 2002; Towers, Duxbury, Higgins & Thomas, 2006). Long working hours correlate with both stress (e.g., Cooper & Marshall, 1976; Moen & Yu, 2000; Sparks, Cooper, Fried & Shirom, 1997) and health consequences (Kivimäki et al., 2015).

According to recent research, another distinct source of stress is the usage of a common company language. Even though it is crucial to be able to collaborate globally across national and linguistic boundaries (Feely & Harzing, 2003; Welch & Welch, 2015), several studies have identified individual negative outcomes. These include status imbalance (Neeley, 2013; Neeley & Dumas, 2016; Vaara, Tienari, Piekkari, & Sääntti, 2005) and adverse subgroup dynamics between native and non-native *lingua franca* speakers (Hinds, Neeley & Cramton, 2014), anxiety and stress regarding language performance among non-native English-speakers (Neeley, Hinds & Cramton, 2012) and the perceived lack of trust (Goodal & Roberts, 2003). In addition to emotional and health effects, the effects on work-life balance have also been discovered.

### *Work-life balance effects*

Researchers have been focusing since the 1990s on the increasing intensity of work due to new ICTs and opportunities to work in different locations and on the effects of this on individual workers' work-life balance in everyday life (e.g., Felstead & Jewson, 1999; Fonner & Stache, 2012; Hilbrecht, Shawn, Jonson & Andrey, 2013; Hill et al., 2001; Hill, Miller, Weiner & Colihan, 1998; Jackson, 2002; Middleton & Cukier, 2006; Murray & Rostis, 2007; Towers et al., 2006).

Even though workers benefit from flexible work possibilities, advanced mICTs also blur the boundaries between work and non-work contexts (Fujimoto, Ferdous, Sekiguchi & Sugianto, 2016) and make working from home a conceivable option. This allows work to spill over into other domains of life, making it more challenging to disengage from work (Boswell & Olson-Buchanan, 2007; Major, Klein & Ehrhart, 2002). For example, workers may have pressure to handle, prioritise and answer excessive amounts of email. Moreover, smartphones make replying to messages after office hours easy and thus risk disturbing the work-home balance (Derks & Bakker, 2010).

Working across time zone differences also seems to create problems for the work-life balance. As mICTs enable working across temporal boundaries and this often leads to longer or irregular working hours due to a need to extend workdays according to synchronous collaboration needs (Nicholson & Sahay, 2004), negative consequences for the work-life balance (Ruppel, Gong & Tworoger, 2013) have been reported. In addition to long working hours, working in global teams and networks requires infrequent or frequent travelling to enable face-to-face collaboration, and this affects the work-life balance of global workers (Mäkelä, Bergbom, Tanskanen & Kinnunen, 2014), especially parents of dependent children (Mäkelä, Bergbom, Saarenpää & Suutari, 2015).

All these changes in technologies and work practices seem to create difficulties in controlling the work-life balance, as work spills over into personal life (e.g., Ajuha et al., 2007; Antila, 2005; Baruch, 2000; Clark, 2000; Felstead, Jewson & Walters, 2005; Golden & Geisler, 2007; Harrison, Wheeler & Whitehead, 2004; Hill, Hawkins & Miller, 1996; Olson & Primps, 1984).

### *Performance effects*

Performance effects can be considered from the process or outcome perspective. Several studies report effects on virtual and mobile work process performance. The process approach focuses on the activities and behaviours that workers carry out in work situations to accomplish their tasks and to perform (Roe, 1999).

The individual-level negative performance outcomes result from technology usage, language challenges, geographical dispersion and time zone differences. Researchers have found that technology usage in virtual collaboration negatively affects process performance (Barley, Meyerson & Grodal, 2011; Belotti et al., 2005; Cappel & Windsor, 2000; Daly, 1993; Graetz et al., 1998; Hollingshead, 1996; Manger, Wiklund & Eikeland, 2003; Straus, 1996; Thomas et al., 2006; Weisband, 1992), because virtual interaction increases the amount of time required to accomplish tasks. Possible reasons for this are the asynchronicity of coordination and communication, demand to work on and divide attention between several tasks at the same time (Malhotra, Majchrzak, Carman & Lott, 2001), and the slowness of typing and using computer-mediated communication technology compared to face-to-face communication (Lebie, Rhoades & McGrath, 1996; Straus & McGrath, 1994).

While on the move, mobile and virtual workers report interruptions and technological limitations in the different locations they use for working, which leads



to difficulties in concentration and slower task completion (Felstead, Jewson & Walters, 2005; Olson & Primps, 1984).

According to Mark and his colleagues' (2005) study of email-related work distractions, it took an average of 25 minutes for workers to return to their original, interrupted task, which significantly extended task completion time. During this time, workers were involved in an average of 2.3 other activities. Griffith and her colleagues (2003) found that reliance on electronically mediated communication might decrease knowledge sharing in organisations. For example, it has been found that mobile and virtual workers are able to concentrate without interruptions and to obtain the privacy required to complete tasks while working at home, but that they are simultaneously isolated from the flow of information and the important relationships with supervisors and colleagues (Felstead, Jewson & Walters, 2005; Halford, 2005).

An increasing number of studies suggest that unacknowledged language challenges may hinder knowledge absorption and transfer as well as trust and rapport-building between workers from different linguistic and cultural backgrounds. This in turn may slow down processes and result in difficulties in completing tasks on time (e.g., Goodall & Roberts, 2003; Kassis-Henderson & Louhiala-Salminen, 2011; Louhiala-Salminen & Kankaanranta, 2012; Manhke, Pedersen & Venzin, 2005; Marschan, Welch & Welch, 1996; 1997; Planken, 2005; Welch & Welch, 2015; Zelter-Bruhn, 2003).

The team-level performance outcomes include both positive and negative effects of working across time zone differences, and negative effects of geographical distribution and language requirements on knowledge transfer and sharing. According to numerous research results, time zone differences between collaborating partners lower team performance (Carmel, 2006; Espinosa, Cummings & Pickering, 2011; Espinosa, DeLone & Lee, 2006; Nan, Espinosa & Carmel, 2009) by increasing coordination costs (Carmel, 2006; Cummings, Espinosa & Pickering, 2007; 2009; Nguyen-Duc, Cruzes & Conradi, 2015; Sarker & Sahay, 2004) and requiring more effort of team members (Espinosa, DeLone & Lee, 2006). Geographical dispersion has been found to cause a coordination delay (Cummings, Espinosa & Pickering, 2007; Espinosa, Cummings & Pickering, 2011) and a negative impact on communication frequency (Damian, Marczak & Kwan, 2007) and team performance (Cramton & Webber, 2005; Espinosa, Cummings & Pickering, 2011). Time zone differences are difficult to overcome and can therefore be the principal obstacle to efficient team work, leading to delays, rework and restarts of work (Carmel & Espinosa, 2011) and prolonged resolutions of problems (Herbsleb & Grinter, 1999). Results from Pearsall and his colleagues' (2009) study of 83 distributed simulation teams indicated that the introduction of a hindrance stressor has negative effects on team performance and transactive memory and increases psychological withdrawal. The geographical distribution of team members and the need to collaborate in a non-native language has shown to have negative effects on knowledge transfer and sharing (McLeod, 2013; Nurmi, 2011; Welch & Welch, 2015).

However, positive effects on performance, related especially to large time zone differences, have also been discovered. When teams collaborate across multiple

time zones, they start to use assets and resources more effectively (Carmel, 2006; Milewski et al., 2007), and the quality (Colazo & Fang, 2010) and speed of their performance seems to increase (Carmel, Espinosa & Dubinsky, 2010; Colazo & Fang, 2010; DeLone, Espinosa, Lee & Carmel, 2005; Espinosa, DeLone & Lee, 2006; Massey, Montoya-Weiss & Hung, 2003).

## **2.4 Synthesis of theoretical background**

Transformations in mobile and virtual work and the rapid digitalisation of communication have produced emergent stressors and required individual workers, teams and organisations to solve novel problems regarding organising and carrying out collaborative work by using mICTs in challenging, sometimes unexpected and changing circumstances. As the preceding literature review showed, literature on stress, well-being and coping in virtual, and especially mobile work, remains scarce. Prior research has covered very few novel context-specific collaboration hindrances and has mainly concentrated on the usage of individual coping strategies.

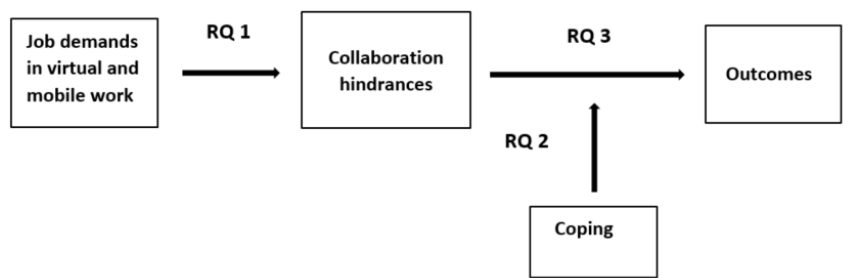
The identified hindrances and coping strategies used may affect workers' well-being and performance. The knowledge regarding the consequences of the coping strategies used in organisational as well as mobile and virtual work contexts also remains limited. Moreover, research results on benefits and costs are somewhat inconsistent.

The existing research on coping and collective coping in organisations has proposed that systematic research on organisational stress processes and on the collective nature of workers' adaptation is needed (e.g., Rodríguez et al., 2019; Torkelson, Muhonen & Peiró, 2007). Therefore, this dissertation aims to create a better understanding of the process of the experienced contextual collaboration hindrances, the individual and collective coping strategies used, and the individual and collective effects on both well-being and performance in mobile and virtual work.

### 3. Research questions

This dissertation builds on the JD-R model (Demerouti et al., 2001) and the transactional coping framework (Lazarus & Folkman, 1984). The coping theory has mainly been applied in studies focusing on individual coping. My focus is broadened by the social constructivist approach and proposes that individual emotional reactions are moderated by social interaction. Therefore, coping is regarded as both an individual and a collective resource. My findings focus on the individual and collective effects of the identified hindrances on performance and well-being in mobile and virtual work.

The dissertation consists of four studies, which complement each other and fill the gaps in the present literature and identify the novel mobile and virtual work-related job demands that are experienced as hindrances, active individual and collective coping strategies, and the resulting benefits and costs. Each article provides a partial solution to the research problem (Figure 3). These articles are in the appendix of the dissertation.



**Figure 3.** Dissertation research questions.

**RQ 1: What kind of collaboration-related job demands, experienced as hindrances, arise from the contextual factors related to work and collaboration in mobile and virtual work? (Studies 1, 2, 3 & 4)**

My first research question addresses the job demands, experienced as hindrances that arise from the contextual factors related to collaboration in mobile and virtual work. As described in the theoretical background, there is a reason to believe that contextual hindrances are related to specific job demands in mobile and virtual work. These hindrances are identified in Studies 1–4. First, Study 1 conducted a systematic literature review. Then, Studies 2–4 investigated

the topic empirically. Study 1 focused on the common and place-specific collaboration hindrances mobile workers experienced while using mICT and working in changing physical locations. This study also formed the basis for the interest in detecting hindrances and their consequences in subsequent empirical studies. Studies 2–4 focused on hindrances when collaborating through mICT (Study 2), when using a common company language (Study 3) and across small time zone differences (Study 4).

### **RQ 2: How do individuals and organisational groups cope with these demands? (Studies 2, 3 & 4)**

My second research question addresses the ways in which individuals and organisational groups cope with these demands and aims to uncover the specific coping strategies used not only by individuals but also collectively by organisational groups. Studies 2, 3, and 4 aimed to connect the identified collaboration hindrances to the coping strategies used. Study 2 focused on multipresence as an individual coping strategy. While multipresent, the participants communicated with or were contacted by one or several contacts through communication media when they were busy doing something else in different and changing locations. Studies 3 and 4 represented cases in which successful collaboration required the usage of collective coping strategies in addition to individual strategies. Study 3 introduced a psychologically safe language climate as a collective coping strategy, which was used to manage collaboration hindrances arising from proficiency-level asymmetries of a common company language in MNCs. Study 4 concentrated on coping with the hindrances resulting from small time zone differences and presented a common global mindset as a collective coping strategy in the MNC environment. Both a psychologically safe language climate and a common global mindset add to the coping theory by demonstrating that people build collective coping strategies in an organisational context. This result establishes the significance of collective coping in the organisational context.

### **RQ 3: What are the outcomes of the identified coping strategies? (Studies 2, 3 & 4)**

As the theoretical background highlighted, the outcomes of coping in mobile and virtual work can be either positive or negative, sometimes even controversial. Therefore, my third research question focuses on the outcomes of the identified coping strategies. The analyses in Studies 2–4 revealed both the benefits and the costs of the coping strategies used. Study 2 focused on the outcomes of the multipresence strategy, Study 3 expanded the investigation of the outcomes of coping with a common company language usage, and Study 4 examined the outcomes of coping with small time zone differences.

## 4. Research design and methods

In this section, I present the research approach and design for answering my research questions in the four studies. Each study gathered and analysed specific data to answer particular research questions.

The overall goal of this dissertation is to investigate the collaboration processes of individual knowledge workers in mobile and virtual work, with a broad objective to link the mobile and virtual work contexts to employee experiences and well-being outcomes.

### 4.1 Research approach

Scientific research may focus on several dimensions of the social world, which affects the philosophical perspective of the approaches used. It is the researcher's responsibility to design data collection and research methods that are applicable to the chosen research topic. This process is directed by the researcher's understanding of the nature of social reality, knowledge and truth (ontology), and how this knowledge can be acquired (epistemology) (Bryman, 2001).

Workers' interaction with each other as well as with technologies in changing circumstances is always emergent and situated, and therefore, dependent on physical, virtual and social settings. The ontological perspective of my dissertation relies mainly on the experiences and behaviours of people in their social and physical contexts of mobile and virtual work. Social phenomena and individual experiences are considered context specific and complex, and sometimes as leading to effects that potentially exist only under certain conditions (Kakkuri-Knuuttila & Vaara, 2007). As a research subject, collaboration in mobile and virtual work is context specific and situational for two reasons. First, collaboration events are unique in nature. Secondly, mobile and multi-locational workers conduct their work in multiple and changing work environments during their work days. This is therefore best understood through lived experiences in real-world settings.

Case study methodology is often based on a constructivist paradigm (Stake, 1995; Yin, 2009), which argues that truth is relative because it relies on the individual's perspective. According to constructivism, the truth is created through human interactions with the natural environment and the acquired knowledge is socially constructed. Case study offers rich contextual explanations (Lincoln & Guba, 1985) and endorses a researcher's engagement (Stake, 1995). It empha-

sises the role of a researcher in knowledge construction, which makes it necessary to evaluate the influence of the researcher's view of world and values on the knowledge construction (Johnson & Duberley, 2000). Thus, my focus is consistent with the sociomaterial approach, as I am looking for bounded generalisations that hold in contextually specific circumstances (Orlikowski, 2000), and I apply qualitative, multiple methods as a methodological approach. I worked in close collaboration with the company participants to execute the studies in real-world settings and to generate rich narrative descriptions. The participants told me their views of reality, which enabled me to explore and understand both their experiences and actions (Strauss & Corbin, 1990).

In the dissertation, I use a systematic review method (Study 1) and multiple methods combining inductive and deductive approaches (Studies 2–4) to identify context-specific novel work demands, especially hindrances, coping strategies for collaborating across boundaries in distributed mobile and virtual work. The combination of qualitative inductive and deductive approaches is appropriate for my intentions to reveal and interpret new work demands and their consequences that have previously been poorly known.

In the review (Study 1), my aim was to systematically review the mobile work literature and to focus on mobile workers' experiences of hindrances when using multiple places for working (Grant & Booth, 2009). Then, I followed qualitative case study methodology in Studies 2–4, because of its suitability for studying context-specific and complex phenomena (Stake, 1995; Yin, 2009). This provided me with tools to include relevant contextual conditions in my research. I explored circumstances and practices in mobile and virtual work that had no clear, distinctive outcomes (Yin, 2009).

## **4.2 Overview of study designs**

The data used in the studies were obtained from published empirical articles and book chapters (Study 1) and individual interviews of knowledge workers employed by MNCs (Studies 2–4). Study 1 was a systematic review and is therefore categorised as a conceptual (theoretical) research paper. Studies 2–4 were qualitative empirical research papers.

In Study 1, my co-authors and I applied a systematic review method to identify tasks to be conducted and contextual hindrances in five types of physical places used for working. We relied on prior research on job demands and resources and physical places in mobile work when creating the research questions and reviewing the articles and book chapters. The scope of the sample was empirical studies published between 1999 and 2011, either in scientific journals or leading textbooks. We used descriptive analysis and organised the evidence using a framework for qualitative synthesis, building up a model of the most common hindrances and providing an overview of all the hindrances identified (Grant & Booth, 2009).

In Studies 2–4, my co-authors and I applied qualitative data collection methods and a combination of inductive and deductive approaches, and intended to investigate and capture previously unidentified collaboration hindrances and

their consequences in mobile and virtual work. The combination of inductive and deductive approaches was applicable for our purposes to reveal something novel and context specific, and to simultaneously apply existing theories and prior research to cover all pivotal themes. I consider explorative, qualitative study design to be the most suitable for addressing the *when* and *how* research questions (Eisenhardt, 1989; Yin, 2009) that we ask in Studies 2–4. When choosing an inductive approach, we made no assumptions about how individuals might experience and respond to particular circumstances and context-specific demands. An inductive approach prioritises the perspective of those being studied. Its potential relies on generalisation into theoretical propositions by suggesting associations between events (Eisenhardt, 1989; Yin, 2009). The inductive approach was applicable because, despite a growing amount of research on virtual and global collaboration, research literature on mobile multi-locational work remains very limited. In virtual collaboration, team or project members often work in multiple locations with specific circumstances.

In Studies 2–4, we relied on in-depth individual interviews as primary data sources for understanding the participants' work and related experiences, by letting them explain from their own perspectives how they work and what they experience as hindrances, and the benefits and costs of coping with these hindrances. We created the interview themes deductively from theory and prior research on mobile work and time zone differences. The interview method was in line with the inductive approach, and revealed the participants' own insights, experiences and perspectives. It also enabled the study of shared understandings and informal procedures (Hannabus, 1996). In the sampling approach we chose, we included participants who had extensive experience in distributed mobile and virtual work, and therefore, rich insights into the hindrances, coping strategies, benefits and costs associated with collaborating across geographical, temporal and language boundaries. Table 1 presents the descriptions of the data and methods and their relationships with the research questions.

**Table 1.** Description of data and methods.

Study	Study 1	Study 2	Study 3	Study 4
<b>Research questions</b>	1. What tasks are performed in different types of physical places? 2. What are the perceived job hindrances that arise from working in these locations?	1. What are the specific causes of multipresence and what are the circumstances that lead to multipresence strategy? 2. How does the use of mICT enable multipresence events across multiple locations? 3. What type of benefits and costs are attached to these events?	1. How do non-native speakers cope with the demands of a lingua-franca mandate? 2. How does collective language coping influence employees' emotional and performance outcomes?	1. How visible are different types of temporal boundaries to global virtual workers, and how is visibility and invisibility related to collaboration? 2. When do different types of temporal boundaries create discontinuities in global work and when do they not? 3. When can temporal boundaries be used for constructing continuities in global work?
<b>Method</b>	Systematic literature review	Qualitative interview study	Qualitative interview study	Qualitative interview study
<b>Data source</b>	Previously published (1999–2011) empirical research discussing the concept of mobile work	Knowledge workers from four MNCs	Knowledge workers from two MNCs	Knowledge workers from four MNCs
<b>Primary data</b>	Empirical articles (N=17) from peer-reviewed journals and relevant studies that were included in two leading textbooks	Individual transcribed interviews (N=25)	Individual transcribed interviews (N=93)	Individual transcribed interviews (N=93)
<b>Additional secondary data</b>	No	Three focus group interviews and individual electronic diary records for five work-days	Qualitative field observations and public documentation	No
<b>Unit of analysis</b>	Research articles and book chapters	Communication events of mobile multi-locational workers	Individual global workers	Individual global workers
<b>Focus of analysis</b>	Collaboration and work hindrances as work demands while working in different physical locations	Individual coping strategies to combat the hindrances of technology-enabled collaboration	Collaboration in multinational innovation teams using English as a company language	Collaboration across temporal boundaries in distributed work settings



### *Research sites and data of empirical studies*

In Studies 2–4, my co-authors and I interviewed knowledge workers in seven Nordic-based MNCs. The companies operate in the telecommunication, oil, banking, transportation, energy, engineering and service, and networks and communication service industries, either globally or across the Northern European region. The participating organisations and individuals presented in Studies 3–4 partly overlap (Table 2).

**Table 2.** Description of participating organisations' industries, operations and number of participating knowledge workers.

Case organisation	A	B	C	D	E	F	G
Industry	Networks and communication service	Engineering and service	Transportation	Telecommunication	Banking	Oil	Energy
Operations	Northern European	Global	Global	Global	Northern European	Global	Northern European
Number of participants N=170	12	34	9	64	9	6	5
Data used in studies	Study 4	Study 3 Study 4	Study 4	Study 2 Study 3 Study 4	Study 2	Study 2	Study 2

#### **4.2.1 Study 1: Reviewing hindrances in mobile multi-locational work**

In the first study, my co-authors and I applied a review method to identify collaboration hindrances as work demands in the different physical locations used for working. This approach offered the advantage of exploring what is known so far about the hindrances in mobile multi-locational work.

#### *Data collection*

We started Study 1 by planning and establishing a review protocol, which specified the relevant search terms, databases, search inclusion and exclusion criteria. First, we identified articles based on empirical studies on mobile and multi-locational work, using three different methods. These included (1) a manual search of the leading textbooks and journals; (2) a systematic search of several electronic multi-disciplinary databases (Scopus, Abi/Inform, Academic Search Elite, Web of Science, Google Scholar) using a broad list of relevant terms; and (3) a manual search of the reference lists from the articles identified through the first two methods. Based on our research questions and our aim to focus on mobile multi-locational work, the search covered the terms representing working in different locations outside of one's main workplace. The list of identified terms included, *mobile work*, *multi-locational work*, *nomadic work*, and *hybrid workspace*.

Despite the growing amount of empirical research on globally distributed work, we found a very limited amount of empirical studies on mobile multi-locational work. As we were interested in how the various places were used for

working, and we were scrutinising the concept of changing work environments, we adopted a multi-disciplinary scope. We included studies from multiple disciplines, such as social science, management, information technology, as well as real estate and facilities management, and eventually identified 20 relevant empirical articles. Only 17 recent empirical articles (1999–2011) from peer-reviewed journals and relevant studies included in two leading textbooks (Andriessen & Vartiainen, 2006; Hislop, 2008) were applicable to our study. They were mostly qualitative case studies, and some also exhibited quantitative data.

#### *Data analysis*

Three researchers conducted the analysis. Each of us read all the articles independently and summarised the contents into the following four categories: (1) the authors' aims, research questions, methods and data; (2) the nature of multi-locality; (3) the hindrances associated with each place, and (4) the outcomes of the study. We shared our summaries with each other to crosscheck the analyses of each article. We then categorised the identified hindrances on the basis of the five types of physical location (main workplaces, home, moving places, secondary and third places) used for working. The hindrances were then classified according to their source in the embedded physical, virtual and social spaces. We itemised the tasks performed in the five types of physical places. After completing the individual analyses, we shared the summaries with each other, resolved any discrepancies through discussion, and recorded the mutually agreed findings on an Excel spreadsheet in our regular bi-weekly meetings.

In our analysis, we focused on how mobile workers used multiple places for working and how they perceived working in these places. From every article, we first documented the authors' aims, research questions, methods and data. Then we analysed the nature of the multi-locality, tasks performed, and the hindrances associated with each place used for working, as well as the outcomes of the study. As our focus was on the hindrances, we categorised these on the basis of the physical locations used for work purposes and according to the source of the identified hindrance, i.e., whether it originated from a physical, virtual or social space.

We summarised our findings by identifying and presenting the place-specific collaboration hindrances that are typical to certain types of places, and the common collaboration hindrances that we could associate with all the locations or spaces.

#### **4.2.2 Study 2: Disclosing multipresence communication in mobile multi-local work**

In this study, we used the event system approach (Morgeson, Mitchell & Liu, 2015) to identify mobile multi-localational knowledge workers' collaboration events. We were able to create a novel concept of technology usage which enabled simultaneous multipresence phenomena in physical, social and virtual spaces as an individual coping strategy to combat the hindrances of technology-enabled collaboration.

### *Data collection*

Twenty-five voluntary knowledge workers (12 women and 13 men, aged 27–63) who worked in partly distributed teams in four MNCs representing the oil, energy, telecommunication and banking industries participated in the study. The selected MNCs had several decades of experience in operating across either the Northern European region or globally. The candidates were all Finnish-speaking, experienced knowledge workers who collaborated with their distributed subgroups and other contacts either within Finland or around the world. Three of them collaborated within Finland only, twelve within the Nordic countries (Denmark, Sweden and Norway), three within Europe (Belgium, Germany, Italy, the Netherlands, Switzerland and the UK) and the rest of them also globally (Canada, China, India, Singapore and the USA). Their work involved, or had recently involved prior to the interview, travelling, working in different locations and using mICT as their daily tool for collaborating across geographical and temporal boundaries.

Prior to entering the field, we contacted the companies' human resources (HR) representatives to obtain further information about the companies' operations and the frequency of their employees' mobility. The HR managers informed the employees of the study and asked interested candidates who met our criteria to contact us.

We explained the data collection protocol and the purpose of the study to the candidates who contacted us. After this, they received written study protocol and instructions on how to use the Outlook calendar to keep their diary records over one workweek in preparation for the interviews. We chose electronic Outlook calendars for this purpose to make the diary filling as easy and quick as possible for the participants. These calendars were easy to access from different locations and already partly filled with the in advance booked meetings and other activities. We guided the participants to fill in the missing activities during their workdays and categorise their experiences by using the colours available in Outlook: experienced high strain in red, moderate strain in yellow and no strain in green. They could also write more detailed descriptions in the appointment field of each calendar entry, which some of the participants did, to explain and clarify their experiences in more detail.

Two researchers collected data from the individual in-depth interviews facilitated by the participants' diary records. The aim of the diary was to make the participants' communication events and places used for working detectable for discussion and to facilitate their memories in the interviews. Our methodological approach was motivated by the stimulated-recall interview technique, developed in educational research (Calderhead, 1981; O'Brien, 1993). We used these personal electronic diaries to visualise the work schedule and the complexity of the participants' daily activities and stimulate their recollection of the original situations during the interviews. The stimulated-recall method has been used successfully to enhance awareness of workers' own work activities (Antonsson, Graneheim, Lundström & Åström, 2008; Carayon et al., 2014; Dershimer & Conover, 1989; Hansebo & Kihlgren, 2001; Mollo & Falzon, 2008). We also used

the diaries as a separate source of data during the analysis, to identify collaboration events and to clarify the daily activities the participants discussed in the interviews.

We created the semi-structured interview themes deductively, using the existing literature on mobile work. The key themes were:

- The use of physical work environments
- The use of different mobile technologies in different locations and while travelling
- How these situations, control over work, and the work-life balance were experienced.

We conducted three pilot interviews to ensure the congruence of our interview protocol and the validity of our themes. The 60–90-minute face-to-face interviews were carried out and recorded in a meeting room in the participants' office building. First, we printed out the electronic diaries so as to use them as memory support during the interviews. We asked all the participants designated questions and allowed them to present other important topics related to our questions. All the participants were Finnish-speakers and were interviewed in their native language.

After the initial analysis of the individual interviews and complementing diary records, we held focus group interviews to discuss and confirm the initial findings. We arranged two focus group interviews, in which we also included new participants from our informants' teams, to obtain feedback and comments on our findings.

### *Data analysis*

Our analysis was indicative and explorative, focusing on the described events and the experiences related to these events. Therefore, our method of analysis was inductive. We listened to the recordings and read the fully transcribed interviews several times. Two researchers coded the interviews independently using Atlas.ti® (Scientific Software Development GmbH, Berlin, Germany) software for qualitative data analysis, and resolved occasional differences through discussion in regular meetings. We started our analysis by inductively developing a list of codes for the text of the interview transcripts. To answer our first and second research question, we first coded the technologies used and the different places in which the events occurred. As we continued, we realised that we needed a framework to include social and mediated social interaction in our analysis.

Consequently, we utilised the event system approach (Morgeson, Mitchell & Liu, 2015) to identify mICT-supported collaboration events in our data. We defined events as being observable parts of the environment or context that are external to the perceiver and bound by space and time (having a temporal beginning and end and developing in a specific setting). According to the event system approach (Morgeson, Mitchell & Liu, 2015), controlled information processing events are separate from the responses to them but form individual observable experiences. This was useful for our analysis. Morgeson and co-authors

(2015) emphasise that individuals notice particularly novel, disruptive, and critical events that influence their behaviour or, more widely, that of an organisation. We were able to identify 344 collaboration events. The described events varied in their length and effects on individuals.

We began our analysis by dividing identified communication events into five different locations, i.e., main workplace, home, moving, secondary and third places. We wanted to understand the usage of mICT for collaboration in these different locations. We began to detect multipresence events. We started to recognise a pattern as the participants frequently described collaboration events as multipresence events, in which they themselves contacted one or many, or were contacted by someone through communication media, while they were preoccupied with something else. In addition, we were able to distinguish the causes and circumstances, i.e., work demands, which led to this behaviour, and the benefits and costs related to them.

#### **4.2.3 Study 3: Investigating coping with a common company language – related hindrances, benefits and costs in global collaboration**

In Study 3, we investigated language as a hindrance to collaboration in multinational innovation teams using English as a company language by linking the language usage to employee experiences, behaviour and work outcomes.

##### *Data collection*

We collected the data from two MNCs, KONE Corporation's Espoo headquarters and its Hyvinkää production plant, and NOKIA Mobile Phones Espoo headquarters. We selected these study sites because both companies had decades of experience in operating globally and using English as a common company language.

Before entering the field, we contacted the companies' HR management. We established a trusting relationship and gained extensive access to the organisations to collect the required data (Eisenhardt & Graebner, 2007). We selected the teams and informed candidates interested in collaboration together with the respective HR management. We held short information sessions for the teams about the purpose of the study and the data collection protocol. Voluntary candidates then received written study protocols and instructions. The selection criteria of the participants were: (1) having a native language other than English and (2) being a member of a globally operating culturally diverse team. We designed a semi-structured interview protocol for data collection and conducted pilot interviews to ensure the congruence of the protocol.

Three researchers interviewed 93 non-native English-speakers (34 at KONE and 59 at NOKIA). The face-to-face interviews were 60–90 minutes long and were recorded and executed in the organisations' premises. Most of the participants (74 of 93) were Finnish-speakers. Their average global work experience was 7.4 years of their total work experience of 8.8 years. Only 21 were women. Both their global contacts and team members, as well as their local team members and colleagues, were from several different cultures and spoke many different languages as their native language. The participants were accustomed to

using English at work, and consequently graded their English language skills on average 8.03 (SD=1.6) on a scale of 0 to 10 (no proficiency – native speaker proficiency). We used qualitative field observations and public documentation to complement the semi-structured in-depth interviews, which provided us with rich data.

#### *Data analysis*

The authors analysed the data. We started with a broad objective to analyse the collaboration process in our participants' teams. We coded the fully transcribed interviews, using Atlas.ti® software (Scientific Software Development GmbH, Berlin, Germany) for qualitative analysis, and then analysed the interviews in the original language, either Finnish or English.

Our method of analysis was inductive, and the analysis was an iterative process. We communicated weekly and added new codes and recoded previous transcripts as we progressed. Our focus on the characteristics of a *lingua franca* emerged from the data on collaboration and employee experiences. We started our analysis by categorising situations in which the participants used or described how they used English and their native languages in work situations, under very broad codes: 'English language' or 'native language'. As we continued to review the transcripts, we realised that we needed to add codes to cover how the participants used English and native languages in team collaboration and how they experienced this. Subsequently, after several rounds of data analysis we grew interested in a psychologically safe language climate as a significant construct. Finally, our analysis directed us to focus on the performance effects of language in teamwork. These findings led us to return to the literature.

Consequently, we detected the characteristics of the psychologically safe language climate that was formed to collectively cope with language-related hindrances. As a result, we were also able to reveal emotional benefits and performance costs.

#### **4.2.4 Study 4: Detecting workers' responses to temporal boundaries in global work**

In Study 4, we built on the organisational discontinuity theory to detect how workers respond to temporal boundaries.

#### *Data collection*

We collected the data from four MNCs, for various research purposes, but with a shared interest in global work. Thus, we planned a common set of interview questions associated with typical working hours, flexible working hours, and experiences and perceptions of collaboration across temporal boundaries during work and non-work time. We conducted 134 interviews. After discussions within our group of three researchers, we discovered that the described experiences of hindrances caused by working across temporal boundaries, and coping with these, formed a common theme in all interviews.

The four case companies represented network and communication services (Alpha), the engineering and service industry (Beta), transportation services

(Gamma), and the telecommunications industry (Delta). These MNCs had several decades of experience in operating either across the Northern European region or globally. Our participants collaborated over small (1–2 hours) (N=64) and large (over two hours) time zone differences (N=71). The direction of time difference varied from forward (N=66) to backward (N=77).

The participants were interviewed in either Finnish or English. We conducted in-depth interviews with each informant mostly in a meeting room in their office building. All the 45–90-minute long interviews were recorded.

### *Data analysis*

We selected only the interviews of participants who worked in global roles and across time zones for the analysis. We analysed 93 of the 134 original interviews, as not all the informants who matched our initial framing and analysis of the data filled these criteria.

In Study 4, we used thematic qualitative analysis methods (Boyatzis, 1998; Braun & Clarke, 2006) to encode qualitative information from our data both inductively and deductively using theory and prior research to generate the themes. Our goal was to detect the experienced discontinuities and analyse behavioural patterns in detail within our data. All the recorded interviews were fully transcribed and read carefully. We coded the interviews using Atlas.ti® software (Scientific Software Development GmbH, Berlin, Germany). We conducted the coding process independently, but regularly discussed issues within the research team during the coding processes to ensure the cohesion of our findings. During our analysis and discussions, patterns started to emerge within our data and we focused on collaboration-related temporal issues. Coding was an iterative process; as we progressed, new codes were added, and the final thematic categories created. First, we were able to separate temporal boundaries from their effects by examining the visibility of the boundaries. Second, we were able to concentrate on the emergence of hindrances and the construction of continuities, i.e., coping, related to working across temporal boundaries.

## 5. Overview of the results

This section depicts the key results of each of the four studies. The results are presented in more detail in each of the articles. The summary then combines the results of each study to form the substance of this dissertation.

### 5.1 Study 1: Hindrances in mobile multi-locational work: Inadequate connections, limited resources and privacy

Study 1 reviewed previously published empirical studies focusing on mobile work. Its aim was to reveal context-specific work demands experienced as hindrances when using mICT in different physical locations for working (Table 3).

**Table 3.** Summary of Study 1.

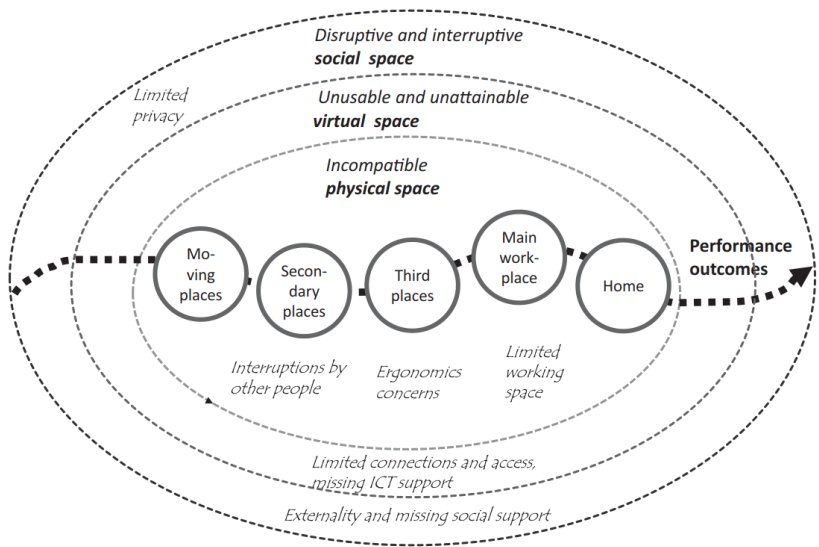
Title	Research questions	Theoretical frame-work	Results
Looking for people, places and connections: hindrances when working in multiple locations: a review	<ol style="list-style-type: none"><li>1. What tasks are performed in five different types of physical places?</li><li>2. What are the perceived hindrances that arise from working in these locations?</li></ol>	JD-R model	Identified common and place-specific hindrances

The analysis of 17 qualitative case studies revealed that the changing contextual factors in mobile multi-locational work created common hindrances which reappeared in all or most of the spaces used for working. Some of the hindrances were distinctive to certain physical locations (e.g., the home environment).

Study 1 revealed job demands that were associated with mobility and multi-locality and the usage of mICT. Continuous changes in physical locations together with collaboration using mICT resulted in several hindrances. As an outcome of our review, Study 1 proposed six mobility and three mICT usage-related common hindrances (Figure 4). The hindrances associated with mobility and experienced in the social and physical spaces that the workers used included 1) limited privacy, 2) a lack of support, 3) experiences of externality, 4) interruption by other people, 5) limited working spaces, and 6) ergonomics concerns. The mICT usage-specific hindrances experienced in virtual space comprised 1) inadequate access to connections, 2) limited access to the internet and other networks and 3) the lack of ICT support appeared to be significant hindrances despite of the continuing technological developments. Problems concerning in-



compatible physical spaces, limited ICT connections and access were hindrances in all the identified physical places that mobile workers used for working.



**Figure 4.** Most common hindrances among mobile multi-locational workers in physical, virtual and social spaces (Koroma, Hyrkkänen & Vartiainen, 2014, 150).

Table 4 presents the place-specific hindrances related to physical and social spaces. These hindrances were found in all physical environments used for working. Interruptions were common and related to all workplaces other than home and a private car. There seemed to be a distinct difference between behaviour in a private space (e.g., a private car) and that in public spaces (e.g., cafes, airports, trains, and airplanes). Behavioural norms limited collaboration and work possibilities in many of the public spaces. Limited privacy was mostly associated with the moving, secondary and third places. Although private cars afforded more privacy for collaboration, attention and concentration were needed for driving.

**Table 4.** Place-specific hindrances in physical and social spaces (Koroma, Hyrkkänen & Vartiainen, 2014, 151).

Place-specific hindrances	Space	Typical place
The length of the journey restricts work activities (short journeys)	P	Moving places
Carrying heavy bags	P	
Limitations due to public space norms	S	
Traffic culture and conditions vary	P	
Misunderstandings in traffic	S	
Attention and concentration needed for driving	P	
Challenges finding a way to conduct work	P	
Continuous changes in timetables and routes	P	
Insecurity	S	
Difficulties locating people	P	Secondary places
Unpredictability of the working conditions	P	
Many demanding social situations and a need to respond within a time limit	S	
Diverse cultures and individuals	S	
Little control over resources in the environment result in non-productive time	P	Third places
Inconvenient spaces	P	
Need to find reliable people and trust them	S	
Limited storage	P	Main workplace
Unpredictable situations	S	
Different mind sets of local and mobile workers	S	
Space does not limit the length of the working day resulting in negative work-home interference	P	Home
Trust/availability concerns	S	
Managers' concerns about their own attentiveness	S	

P, physical; S, social.

Mobile workers frequently encountered demanding collaboration situations because of difficulties finding time and places for collaboration. They often had a tight schedule and pressure to respond within a time limit to the requests accruing in their email and voice mail. Limited resources were available while on the move and when visiting clients or partners in secondary places. These situations were often unpredictable and difficult to prepare for.

Some practical implications for the HR professionals, management and mobile workers themselves were derived from the results. Awareness of mobile multi-locational work-specific hindrances such as challenging circumstances in constantly changing work environments, challenges in synchronising and collaborating with colleagues, and requiring support while mobile is essential in order to develop practical improvements and solutions to work practices that could positively impact employee engagement and vigour.

For the purpose of my dissertation, the literature review in Study 1 supported the requirement to study hindrances and their consequences in mobile multi-locational work. Our results indicate that mobile multi-locational work is a special form of telework and differs distinctly from home-based telework due to its changing contextual factors. Even though the reviewed articles were written from different perspectives, together they offer a comprehensive understanding of context-specific hindrances and emphasise the relevance of this dissertation.

Study 1 contributes to our understanding of mobile and multi-locational work-specific workload factors.

Study 1 showed that very often, the experienced hindrances were related to circumstances in which mobile workers tried to collaborate with their distant partners or were contacted by them in varying locations where they were busy doing other activities, for example, driving a car. Mobile workers for their part actively tried to find places and privacy for collaborative work, even in public places and very demanding situations. Therefore, in Study 2, we focused on examining mobile workers’ experiences of collaborating while working in multiple locations in more detail by deep-diving into their communication events in the various places they used for their work.

### 5.2 Study 2: Benefits and costs of technology-enabled multipresence strategy as a coping method

Study 2 empirically scrutinised the communication hindrances, and individual coping strategies and their consequences when using mICT in mobile and multi-locational work. It supplements the findings of Study 1 by extending our understanding of collaboration hindrances in mobile multi-locational work. The analysis covered how knowledge workers cope with these hindrances and how the hindrances affected the participants’ work and lives. Quite early on in the cycle of our inductive analysis we found interesting and frequent descriptions of the challenging communication events in which mobile workers had to resolve how to be available and to collaborate using technology in changing locations. Therefore, in Study 2 we concentrated on mICT usage as a job demand and on multipresence in particular (Table 5).

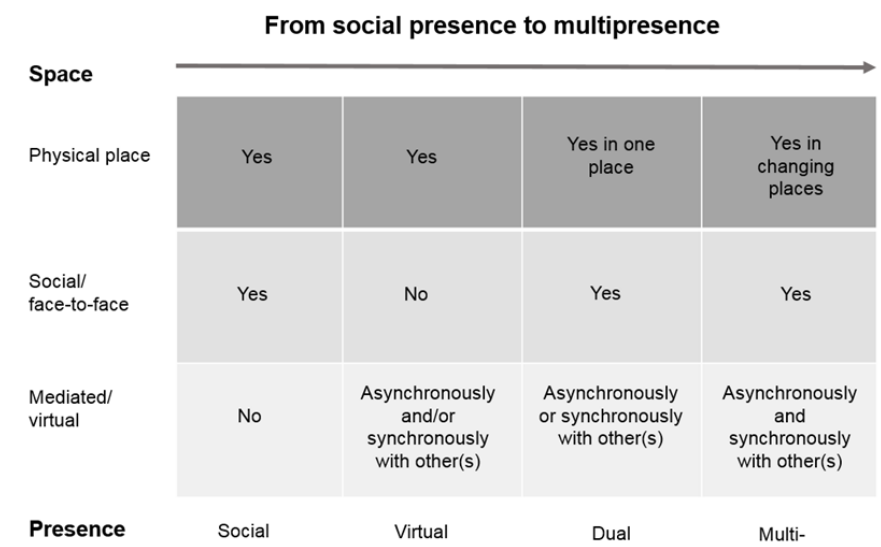
**Table 5.** Summary of Study 2.

Title	Research questions	Theoretical framework	Results
From presence to multipresence: mobile knowledge workers’ densified hours	<ol style="list-style-type: none"> <li>1. What are the specific causes of multipresence and what are the circumstance that lead to multipresence strategy?</li> <li>2. How does the use of mICT enable multipresence events across multiple locations?</li> <li>3. What type of benefits and costs are attached to these events?</li> </ol>	Sociomaterial theory Social presence theory	Concept of technology-enabled multipresence for coping with the hindrances arising from working across boundaries in multiple locations and their consequences

Data analysis revealed 344 work-related communication events with a detectable beginning and end in the interviews of 25 participants. They described mICT-enabled collaboration events in five types of physical places: the main workplace (N=114), home (N=104), moving places (N=51), and secondary (N=22) and third places (N=53). The circumstances in the physical environments had an impact on both social and virtual interactions. From these, we formed four different categories of communication and collaboration events.

They were categories of social presence, virtual presence, dual presence, and multipresence. To contribute to the discussion of technology-enabled collaboration, we concentrated on multipresence as a new phenomenon in our analysis.

Study 2 introduced technology-enabled multipresence as a new concept to define workers’ ability to be simultaneously present in physical, virtual and social spaces while working across boundaries in multiple locations and on the move. We separated multipresence from social and mediated social presences (Figure 5): 1) a social presence event includes only face-to-face collaboration and involves no virtual communication, 2) a mediated social presence event contains only virtual collaboration using one or several technological media when a person is in solitude, 3) in dual-presence events either synchronous or asynchronous virtual communication takes places in a face-to-face social context, and 4) a multipresence event combines face-to-face, virtual synchronous and asynchronous communication as simultaneous layers. We found examples of mobile workers participating in a face-to-face project meeting at a customer’s premises while being simultaneously involved in a teleconference of their own sub-group at their office, asking for advice, chatting and checking also emails for information.



**Figure 5.** Types of communication and collaboration events in different environments (Koroma & Vartiainen, 2018, 193).

The interviewed workers used multipresence as an individual coping strategy to meet the expectations of being available to their contacts and doing intensively their assignments. We identified four mICT usage-related hindrances in addition to the hindrances that Study 1 uncovered. Our analysis revealed that mobile workers chose multipresence as their individual strategy to cope with 1) email overload, 2) constant availability expectations, 3) uncertainty of the contents of incoming messages, and 4) pressure to stay in control of their work and work-life balance.

Study 2 revealed contrasting consequences, both benefits and costs, of choosing multipresence as a coping strategy. The participants clearly felt that they benefitted from using technology while doing something else. They were able to use their time efficiently and to obtain more flexibility and support for their mobile lifestyle. However, they also claimed to have difficulties concentrating on tasks, to be unable to maintain high productivity, and to experience stress and challenges in their work-life balance.

By finding the controversial consequences, this study empirically evidenced the key assumption of the sociomaterial theory (Orlikowski, 2000; 2007; 2009) explaining how ubiquitous communication possibilities have unexpected and sometimes unwanted social effects. The experienced mobile multi-locational workers whom we interviewed found that while they benefitted from the technology-enabled possibilities to be simultaneously present in physical, virtual and social spaces while working across boundaries in multiple locations and on the move, this also had several detrimental effects.

The practical implications derived from the results of Study 2 emphasise the importance of organisational, team and managerial support for individual employees to be able to manage work-related communication and work-life boundaries when using technologies. There is also a need for laws and societal policies, organisational strategies and guidelines to steer and control work practices to ensure sufficient recovery time both off and on the job, work-life balance, productivity and well-being at work.

As a result, Study 2 deepened Study 1's findings regarding hindrances when using mICT, by extending the understanding of the role of using multipresence communication as a coping strategy in collaboration situations occurring in different physical places used for working and using a chosen media when moving between these places. Study 2 identified the restrictions and possibilities of the described physical places. It empirically demonstrated, how the multipresence strategy was used while working in different locations as a response to experienced hindrances; and how the need to use multipresence as an eligible individual coping strategy emerged from overload and uncertainty of the content of asynchronous messages, constant expectations of availability and attempts to control the situation.

Examining mobile workers' multipresence activities revealed the importance of successful collaboration when working from afar and communicating across geographical, temporal and language boundaries due to workers' mobility or membership of virtual teams and networks, which are often globally distributed. Even though, as Study 1 indicated, workers might feel like outsiders, and miss social support when mobile, technological media virtually connects them to their collaboration partners. A common language is central in this collaboration. Because the interviewed mobile workers all spoke Finnish or Swedish as their native language, I became interested in how they coped with having to speak English as the common company language, which was the case in all their organisations, and wanted to investigate it in Study 3. The usage of multipresence as a coping strategy also stemmed from availability expectations and needs to

cross temporal boundaries to collaborate or be in control of contents of incoming messages during the working hours of distant partners. In Study 4, we focused on the effects of time zone differences.

Since mobile employees, who work in global teams and networks, need a common language to collaborate with their distributed team members and other contacts, I next moved on to study hindrances and coping, focusing on the usage of language in cross-boundary collaboration.

### 5.3 Study 3: The emotional benefits and performance costs of having a psychologically safe language climate in MNCs

Study 3 aimed to investigate how the employees of two MNCs experienced the use of English as a common company language while collaborating in global context. The study focused on one critical factor in global virtual collaboration by addressing the experiences of using a common language when collaborating across language boundaries. Study 3 added new observations to the discussion on psychologically safe communication culture in global teams (Gibson & Gibbs, 2006) by revealing the characteristics of an organisation-wide psychologically safe language climate, empathy, acceptance, and inclusiveness as a collective coping strategy leading to both benefits and costs (Table 6).

**Table 6.** Summary of Study 3.

Title	Research questions	Theoretical framework	Results
The emotional benefits and performance costs of having a psychologically safe language climate in MNCs	<ol style="list-style-type: none"> <li>1. How do non-native speakers cope with the demands of a lingua-franca mandate?</li> <li>2. How does collective language coping influence employees' emotional and performance outcomes?</li> </ol>	Coping theory	A model of psychologically safe language climate including emotional benefits and performance costs

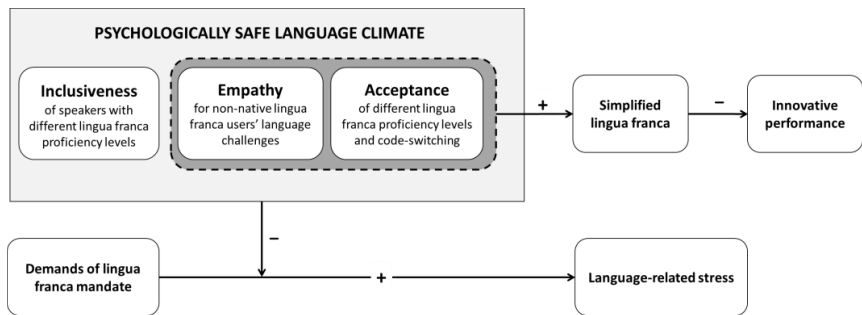
We studied language-related experiences in global work settings by interviewing and observing non-native English-speaking workers (N=93) working in two Finland-based MNCs – KONE and NOKIA Mobile Phones. Both MNCs had designated English as its common company language several decades ago.

To our surprise, the interviewed R&D workers did not experience English usage as stressful. Instead, we found that they had developed a shared social coping mechanism, a psychologically safe language climate, to alleviate potential language-related stress and anxiety resulting from the identified hindrances, which were: 1) asymmetry of common company language skills, 2) difficulties in expressing oneself fully and 3) misunderstandings.

A psychologically safe language climate consists of 1) the empathy for non-native *lingua franca* speakers' feelings, 2) the acceptance of different language-proficiency levels and code-switching practices and 3) the inclusiveness with respect to participants from different linguistic backgrounds and varying fluency levels. Consequently, the use of discipline-specific vocabulary and a simplified

*lingua franca* with regard to speakers’ varying levels of language proficiency hindered knowledge transfer by limiting the richness and depth of discussions.

Therefore, although a psychologically safe language climate seems to help alleviate performance anxiety among non-native *lingua franca* speakers, it may also encourage simplification of the *lingua franca* and thereby impede a global team’s innovative performance. We propose that a psychologically safe language climate buffers the positive effect of demands of *lingua franca* mandate on anxiety and stress related to language performance. However, we also put forward the opposite moderating argument in the case of innovative performance: a psychologically safe language climate facilitates the forging of a positive relationship between language asymmetry and *lingua franca* simplification, which in turn leads to lower levels of innovative performance. The psychologically safe language climate itself does not hinder innovative performance, but the simplified and narrow *lingua franca* that emerges as a consequence of accepting low language-proficiency levels and empathy for non-native *lingua franca* users’ language challenges does. We illustrate these relationships in the initial theoretical model in Figure 6.



**Figure 6.** Model linking a psychologically safe language climate with emotional, language and performance outcomes (Nurmi & Koroma, 2018).

We identified several managerial implications. First, MNCs should provide training to build a psychologically safe language climate and advise on how to code-switch to native tongues to build mutual understanding. Secondly, supervisors should remember that they are powerful examples when creating a psychologically safe communication environment in which everybody feels comfortable. They should encourage the inclusiveness of all workers, regardless of their lingua-franca proficiency, and promote empathy and acceptance.

In conclusion, Study 3 enhanced the understanding of the effects of a common company language policy, which is essential for collaborating across language boundaries, on the experienced hindrances, developed coping strategies and their benefits and costs in the MNC context. It provides empirical evidence to present a theoretical model explaining how a psychologically safe language climate develops from feelings of empathy, acceptance of different language-proficiency levels, and a will to include all participants in discussions; and how it emotionally impacts on the work performance of non-native *lingua franca* speakers. Furthermore, Study 3 contributes to the coping theory (Lazarus &

Folkman, 1984) by indicating that people can build effective contextual resources for collective coping. In addition to the role of language in cross-boundary communication, time zone differences are known to influence working in geographically distributed teams and networks.

#### 5.4 Study 4: Even small time zone differences matter

Study 4 deepens our understanding of the collaboration hindrances when working across time zones and how workers cope with these. In this study, we wanted to concentrate on small time zone differences and the direction of time zone separation as collaboration hindrances in globally distributed virtual work. Earlier studies had demonstrated that large time zone differences typically hinder team collaboration and complicate employees' possibilities to control their work-life balance (e.g., Bell & Kozlowski, 2002; Espinosa, Nan & Carmel, 2007). Study 4 showed that even small time zone differences have similar effects.

The organisational discontinuity theory suggests that the visibility of boundaries influences the perception and effects of a specific boundary and makes discontinuities context specific (Watson-Manheim, Chudoba & Crowston, 2012). According to Watson-Manheim and her co-authors (2012), discontinuities emerge when communication and collaboration across a boundary require a conscious effort. Common to all boundaries is their physical, administrative and categorical nature. Physical temporal boundaries are quite permanent borders of time, such as time zones. Administrative temporal boundaries are legitimised by authorities: they can be organisational practices or national rules of law. Categorical temporal boundaries are less visible and include individual distinctions to classify other people according to, for example, their work time preferences or work schedules (Orlikowski, & Yates, 2002; Saunders, Van Slyke & Vogel, 2004). In this study, we scrutinised hindrances as discontinuities related to physical, administrative and categorical temporal boundaries and their visibility in distributed virtual work. We focused on situations in which small time zone differences created hindrances and how workers built continuities, i.e., developed and used contextual coping strategies (Table 7).

**Table 7.** Summary of Study 4.

Title	Research questions	Theoretical framework	Results
When a one-hour time difference is too much: temporal boundaries in global virtual work	<ol style="list-style-type: none"> <li>1. How visible are different types of temporal boundaries to global virtual workers, and how are visibility and invisibility related to collaboration?</li> <li>2. When do different types of temporal boundaries create discontinuities in global work and when do they not?</li> <li>3. When can temporal boundaries be used for constructing continuities in global work?</li> </ol>	Organisational discontinuity theory	Small temporal boundaries and the direction of time difference can play an important role in coordination and collaboration in global work



Based on the interview data of 93 participants from four different organisations, Study 4 revealed that a small time zone difference is not as visible to global collaborators as large temporal differences and is therefore not adequately addressed. Even a physical temporal boundary of small time zone differences (from one to two hours) created hindrances when 1) the societal rhythm, that is an administrative temporal boundary, was not in line with the work requirements and a worker had to, for example, leave work to pick up children from day-care at a certain time, and 2) when intrinsic working rhythms, that is an individual temporal boundary, did not match the collaboration rhythm (early morning versus evening collaboration requirements). Hindrances also appeared in coordinating meeting schedules over temporal boundaries because of 3) the discrepancy of daily working and lunch hours, which is a categorical temporal boundary. These boundaries seemed to be more visible eastbound than westbound. Those who worked in a time zone ahead of their collaborators (eastbound) noticed a discontinuity, which their westbound collaboration partners did not seem to be aware of.

The interviewed workers had developed individual coping strategies to overcome these hindrances. They 1) adjusted their individual working hours and 2) scheduled their workdays according to their collaboration partners, 3) adapted their preferred communication media, and 4) developed varying strategies to restrain their virtual availability after office hours. Our analysis revealed also that a global mindset as a collective coping strategy supported working across temporal boundaries. Distributed group members proactively aligned their schedules with more flexible working hours when they were aware of potential challenges of global work. A shared global mindset helped individuals and organisational groups to overcome discontinuities related to crossing the temporal boundaries. These strategies led to a benefit of flexibility in their work but also to a cost in the form of extended workdays and challenges in work-life balance.

Study 4 also revealed some important managerial implications to help workers cope with identified discontinuities, i.e., hindrances. We found that organisational support was crucial for encouraging the usage of flexible work practices among employees who worked across physical temporal boundaries and needed to adjust their schedules according to global collaboration. Embracing the global mindset within the organisation helped virtual workers in global roles to cope with the hindrances created by temporal boundaries. Supervisors should encourage their team members to discuss potential hindrances created even by small time zone differences and develop practical improvements to work practices and policies within their teams.

To conclude, Study 4 emphasised the visibility of temporal boundaries and showed that the physical, administrative, categorical, and individual characteristics related to temporality play important roles in how hindrances related to temporal boundaries emerge in global virtual work.

## 5.5 Summary of results

In this chapter, I summarise the main findings of this dissertation by responding to each of my three research questions.

### 5.5.1 Hindrances in mobile and virtual work

My first research question asked *what kind of collaboration-related job demands, experienced as hindrances, arise from the contextual factors related to work and collaboration in distributed mobile and virtual work*. Study 1 revealed that mobility, multi-locality and technology usage-related contextual demands were experienced as collaboration hindrances in former empirical studies. These experienced hindrances were associated with limited resources, support and privacy in changing locations and while on the move. In Study 2, I concentrated on technology usage-induced collaboration hindrances only. The outcome revealed that collaborators had collectively started interpreting each other's physical and social situations as being constantly available. The study showed that especially the volume of asynchronised messages and uncertainty of their contents created hindrances. A common company language is an essential part of collaboration in the global environment of MNCs, and Study 3 introduced collaboration hindrances related to language differences. Study 4 showed that while mobility and globality are causing needs to work across temporal boundaries, even small time zone differences may create collaboration hindrances, depending on the visibility of the temporal boundary, societal and daily working rhythms, and intrinsic and collaboration rhythms. Most of the hindrances were experienced individually but I identified also several collectively experienced hindrances. Table 8 summarises the main findings regarding demand-related collaboration hindrances.

**Table 8.** Identified context-specific hindrances.

Contextual demands	Individually experienced collaboration hindrances	Collectively experienced collaboration hindrances
<b>Mobility Multi-locality (Study 1)</b>	<ul style="list-style-type: none"> <li>• interruptions by other people</li> <li>• lack of social support</li> <li>• limited privacy</li> <li>• difficulties finding time and place to collaborate with colleagues</li> <li>• limited available resources</li> <li>• unpredictable work situations</li> </ul>	
<b>Mobile information and communication technology (mICT) usage (Study 1-2)</b>	<ul style="list-style-type: none"> <li>• email overload</li> <li>• uncertainty of contents of incoming messages</li> <li>• pressure to remain in control of work and work-life balance</li> <li>• inadequate connections and internet access</li> <li>• technological problems</li> <li>• lack of ICT support</li> </ul>	<ul style="list-style-type: none"> <li>• expectations of constant availability</li> </ul>
<b>A common company language usage (Study 3)</b>	<ul style="list-style-type: none"> <li>• difficulties in fully expressing oneself</li> </ul>	<ul style="list-style-type: none"> <li>• asymmetry of language skills</li> <li>• misunderstandings</li> </ul>
<b>Small time zone differences (Study 4)</b>	<ul style="list-style-type: none"> <li>• difference between intrinsic working and collaboration rhythms</li> </ul>	<ul style="list-style-type: none"> <li>• invisibility of temporal boundary</li> <li>• societal rhythm not in line with work requirements</li> <li>• discrepancy of daily working rhythms between distributed partners</li> </ul>

### 5.5.2 Individual and collective coping mechanisms, and their benefits and costs

My second and third research questions asked *how individuals and organisational units cope with these demands and what are the outcomes of the identified coping strategies*. In addressing these questions, I detected different coping strategies that the participants described using either individually (Table 9) or collectively (Table 10), as well as their consequences, presented in Studies 2–4.

**Table 9.** Contextual job demands, identified individual coping strategies, and their benefits and costs.

Job demands when collaborating	Individual coping strategies	Benefits	Costs
By using mICTs in mobile work (Study 2)	Flexible work practices	Increased flexibility	Work-life conflict
	Multipresence strategy	Increased flexibility Increased efficiency Increased mobility Experience of control	Work-life conflict Stress Concentration difficulties Low performance
Across small time zone differences (Study 4)	Adjustment of working hours Scheduling of workdays according to collaboration partners' schedule Adaptation of preferred communication media Development of strategies to restrain virtual availability after office hours	Increased flexibility	Work-life conflict

In the context of collaboration in mobile multi-locational work, the individual coping strategies used were more situational and often exercised in circumstances in which the temporal and geographical boundaries made the work solitary or workers experienced that the hindrance had to be solved individually. Both Studies 2 and 4 showed that individual workers used flexible work practices to promote collaboration. Working across time zone differences required adjustment, rescheduling and adaptation of work practices according to collaboration needs. Increased flexibility was experienced as a benefit, but it led to coinciding experiences of work-life conflict. Study 2 revealed that multipresence communications formed a successful strategy for coping with email overload, constant expectations of availability, uncertainty of the contents of incoming messages, pressure to stay in control of work and the work-life balance, and limited connections and access. The identified benefits were experiences of control, flexibility and the efficiency of using ineffective time while travelling and at work. Consequently, the multipresence strategy also caused several performance and well-being costs, i.e., lower productivity and poorer concentration on tasks, experienced stress and work-life conflict.

The individual coping strategies, flexible work practices and multipresence communication can be characterised as problem-focused. Even though problem-focused coping strategies are defined as beneficial for handling emotionally demanding situations because of the belief in being able to change the situation

and to act accordingly (Folkman & Lazarus, 1988), I found these coping strategies to result in both benefits and costs.

The major contribution of this dissertation resides on the unanticipated empirical research results of usage of collaboration-related collective coping (Table 10). The qualitative inductive method used in this dissertation enabled to reveal collective coping strategies, which help in coping with collective hindrances created by language asymmetries and difficulties to fully express oneself in a common company language, as well as the invisibility of small time zone differences and the discrepancy between the daily rhythms of collaborating partners.

**Table 10.** Contextual job demands, identified collective coping strategies, and their benefits and costs.

Job demands when collaborating	Collective coping strategies	Benefits	Costs
By using a common company language with varying proficiencies (Study 3)	Psychologically safe language climate	Low language-related stress	Hindered knowledge transfer Low innovative performance
Across small time zone differences (Study 4)	Common global mindset	Support for crossing temporal boundaries	Work-life conflict

Building a psychologically safe language climate was an emotion-focused collective coping strategy. Non-native English speakers collectively and proactively reduced their own and their collaborating partners' negative experiences, i.e., anxiety and stress, resulting from different language fluency levels. The common global mindset was an appraisal-focused collective strategy. It helped workers to prepare for and act according the needs of a globally distributed organisation. Both of these used strategies were related to the collaboration hindrances created by demands that arose from global operations. Analogous to individual strategies, these collective coping strategies had both beneficial and detrimental consequences, which appeared separately and simultaneously. In Study 3, a psychologically safe language climate lowered the experienced language stress, but it also hindered knowledge transfer and reduced innovativeness. Study 4 revealed the consequences of the common global mindset in MNCs. Adopting a global mindset helps workers cross temporal boundaries, overcome hindrances, and cope with these, but this simultaneously causes work-life conflicts. If distributed group members share a global mindset, they are more aware of potential challenges of global work which support them to cross the temporal boundaries. This study shows that it is important to recognise collective hindrances and coping strategies regarding collective phenomena, such as collaboration.

## 6. Discussion

The following section shows the theoretical contributions and practical implications of the dissertation and adds unique knowledge to the mobile and virtual work discussion based on Studies 1–4. It also evaluates the design and methods of the study and proposes recommendations for further research.

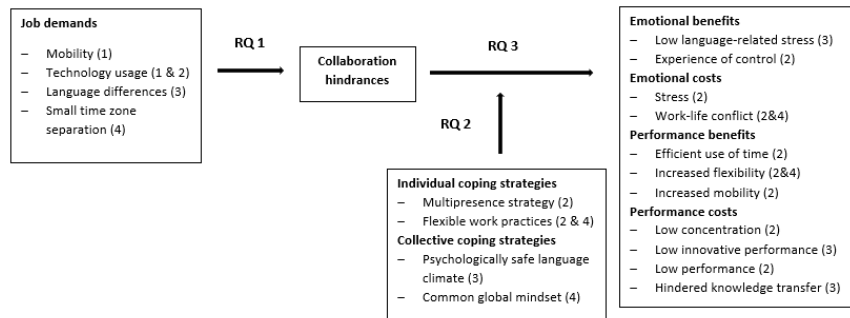
This dissertation contributes both theoretically and practically to the occupational well-being, organisational behaviour, mobile and virtual work literature. It reveals novel, context-specific collaboration hindrances that are experienced and managed both individually and collectively. It also shows duality in the consequences, by identifying both the benefits and costs stemming from the coping strategies used to overcome specific hindrances.

### 6.1 Theoretical contributions

My theoretical starting points relied on the JD-R model (Bakker & Demerouti, 2007; Demerouti et al., 2001) and the coping theory (Lazarus & Folkman, 1984). However, my dissertation proposes new aspects to both of these. It extends the JD-R model in three ways: by identifying context-specific job demands and suggesting that the usage of technology constitutes an independent job demand, by detecting novel collaboration hindrances in the dynamically changing contexts of mobile and virtual work, and by proposing that these hindrances can be experienced both individually and collectively. The coping theory is extended by introducing both individual and collective mobile and virtual work-related coping strategy usage for supporting shared collaboration tasks. Finally, a significant contribution lies in the duality in the outcomes of the coping strategies used, resulting in both emotion- and performance-related costs and benefits. My findings deepen the understanding of employee experiences and behaviour in the mobile and virtual work context and draw attention to the effects of the selected coping strategies on performance and well-being.

The model in Figure 7 suggests that context-dependent collaboration hindrances are related to employees' emotions and performance. This study shows that mobility and virtuality cause hindrances for both individuals and groups. Further, I propose that individual and collective coping strategies buffer the negative effects of the collaboration hindrances related to mobile and virtual work-specific job demands. However, I also suggest that the usage of these coping strategies does not directly result in positive outcomes. Despite the coping strategy used, the emotional and performance outcomes can be both beneficial

and detrimental to individual workers and work groups. My findings offer salient new aspects as organisations are increasingly using distributed teams and networks to leverage remote expertise.



**Figure 7.** Model linking new job demands to individual and collective coping strategies and their outcomes (study numbers in brackets).

First, this dissertation contributes to the JD-R model by introducing context-specific job demands related to collaboration in mobile and virtual work. Job demands and resources refer to the physical, psychological (cognitive and emotional), social and organisational characteristics of work (Bakker et al., 2003; Demerouti et al., 2001). Crossing geographical, temporal and language boundaries is commonly agreed to be fundamental for collaborating in mobile and virtual work in global settings. Collaboration across these boundaries in changing work locations is made possible by the usage of different, constantly developing communication technologies and a common language, constituting fundamental job resources. Paradoxically, these same work characteristics may create hindrances and therefore be experienced as job demands, as Watson-Mannheim, Chudoba and Crowston (2012) demonstrate in their theoretical paper. Working in changing locations (mobility) may form a physical job demand, language differences a social demand, and working across even small time zone differences an organisational demand.

However, the usage of technological mediums for collaboration is difficult to place individually into the physical, psychological, social and organisational work characteristics. The usage of technology can be a resource in many ways; for example, by enhancing collaboration or providing tools and applications for collaboration and making the usage of working hours more effective. However, it may conversely form a demand; for example, by failing to provide adequate connections and generating additional technological problems because of the technological solutions used, by resulting in an overload of asynchronous messages, or by lacking adequate technological support because of behavioural or managerial choices. Therefore, my results suggest that we should not regard only the technologies themselves, but rather their usage as an independent work characteristic that consists of both job resources and demands. The usage of mICTs for collaboration is a pivotal part of this and should hence be included as one of the aspects of work that is a fundamental resource in modern work life, but which can also form a demand and turn into a job stressor.

Second, this study suggests that dynamically changing work conditions in mobile and virtual work should be considered when discussing the aspects of collaboration-related physical and social job demands. The dynamic character of mobility and virtuality at work stems from the physical and social conditions of frequently changing work locations and varying social and technological conditions in virtual collaboration. Prior research on job demands and resources has concentrated mainly on locally executed human service jobs (e.g., Bakker et al., 2003; 2007; Hakanen, Bakker & Demerouti, 2005; Hakanen, Bakker & Schaufeli, 2006; Schaufeli & Bakker, 2004) and increased our understanding of employee well-being, stress and performance in local work. Only a few prior studies have scrutinised how mobility affects collaboration (e.g., Axtell, Hislop & Whittaker, 2008; Bosch-Sijtsema, Ruohomäki & Vartiainen, 2010; Felstead, Jewson & Walters, 2005; Vartiainen & Hyrkkänen, 2010). My results are in line with Demerouti and her colleagues' (2001) findings regarding the context-specificity of job demands and add to previous research by identifying the hindrances unique to the constantly changing contexts of dynamic mobile and virtual work (see Table 8 in page 51). Mobility and virtuality may increase the experiences of collaboration hindrances because of the incremental dependence of mICTs and changing circumstances while working in different locations and on the move.

Third, as collaboration is a collective phenomenon and successful collaboration in mobile and virtual work is demanding, new knowledge of possible hindrances is important in order to improve the understanding of the role that stress and coping processes play in completing interdependent tasks that require cross-boundary coordination, cooperation and collaboration. Prior empirical studies have focused on either job stressors experienced in virtual work in general (e.g., Kokko & Vartiainen, 2007; Nurmi, 2010;) or hindrances created by one collaboration-related job demand such as working across large time zone differences (e.g., Carmel et al., 2010; O'Leary & Cummings, 2007; Saunders, Van Slyke & Vogel, 2004), usage of mICTs (e.g., Barley, Meyerson & Grodal, 2011; Järvenpää & Lang, 2005; Levina & Vaast, 2008; Middleton & Cukier, 2006) or a common company language (e.g., Hinds et al., 2014; Marschan-Piekkari, Welch & Welch., 1999b; Welch, Welch & Marschan-Piekkari, 2001). Even though these empirical studies have offered applicable evidence of several contextual hindrances, they fail to fill the gap in the knowledge regarding the hindrances that are pivotal to successful collaboration. This study contributes to the JD-R model, mobile and virtual work and well-being literature by suggesting that in addition to individually experienced hindrances, organisational groups experience some hindrances collectively when collaborating to complete shared tasks. Thus, this dissertation combines empirical evidence of different job demands related to collaboration from afar and changing locations, and provides unique knowledge regarding individually and collectively experienced, contextual, collaboration-related hindrances (see Table 8 in page 51).

Fourth, this dissertation contributes to Lazarus and Folkman's (1984) coping theory in three ways: by identifying specific mobile and virtual work-related coping strategies such as the usage of multipresence strategy, by introducing the

usage of collective coping strategies such as building a psychologically safe language climate, and by revealing the duality of consequences that introduces both benefits and costs as outcomes, despite the strategies used (see Tables 9 and 10 in the pages 52-53). Mobile and virtual workers use a broad array of strategies to cope with collaboration hindrances. Until now, little focus has been placed on identifying these strategies or scrutinising the experiences of shared job demands and coping in organisational settings, and almost none has been allocated to distributed organisational settings (exceptions to this are Cummings, Espinosa and Pickering's (2007), Dubé and Robey's (2008) and Nurmi's (2011) works). This dissertation demonstrates that mobile and virtual workers may also instinctively develop collective coping strategies, without intentional managerial involvement. Thus, contradicting the individualistic stress and coping paradigm and earlier literature on transactional stress processes (Cooper, Dewe & O'Driscoll, 2001; Lazarus & Folkman, 1984), this study offers a unique contribution by indicating that organisational sources of stress can be experienced collectively and may lead to the usage of collective coping strategies.

Fifth, the results of this study indicate duality in the outcomes. They suggest that despite the coping strategy used, the outcomes can be both positive and negative. Interestingly, the chosen problem-, emotion- or appraisal-focused coping strategies resulted in both benefits and costs. Problem-focused coping strategies in particular have long been defined as active strategies for solving problems and as the most successful for stress management (Folkman & Lazarus, 1988; Lazarus & Folkman, 1984). This study shows that even problem-focused strategies may result in negative emotional or performance outcomes. By aiming to cope with specific hindrances, workers may create other sources of stress such as work-life balance challenges, or their performance may deteriorate because they, for example, find it difficult to concentrate on the tasks at hand. Hence, in line with Nurmi (2011) I argue that successfully coping with one hindrance may create another problem that requires the usage of different coping methods. It is also essential that we pay attention to the duality in the outcomes. For example, using multipresence, flexible work practices or a common global mindset as a coping strategy resulted in experiences of flexibility as a positive outcome but also led to work-life conflict as a negative outcome. It seems that in these cases, mobile and virtual workers need to choose between tolerating hindrances at work and accepting compromises in their private lives.

We must also discuss what is missing in the theoretical contribution and the model in Figure 7. Professional, organisational and national cultural differences form a boundary (Watson-Manheim, Chudoba & Crowston, 2012) that may constitute a social job demand. This in turn may create different hindrances, including miscommunication and misunderstandings as well as different communication styles, attitudes, expectations, interpretations, and ways of thinking, adding complexity in collaboration (Kayworth & Leidner, 2000; Maznevski & Chudoba, 2000; Nurmi, 2011). I have not included cultural differences in my dissertation, but I am aware that they can affect both communication and trust (Järvenpää & Leidner, 1999). Crossing cultural boundaries also requires the us-



age of specific coping strategies (Janssens & Brett, 2006). Several research results indicate that cultural differences include multiple aspects, from the culture under scrutinisation (e.g., a professional, a team, a company, or a national culture) to, for example, parallel operations within different cultures (e.g., Carmel, 1999; Kayworth & Leidner, 2000; Maznevski & Chudoba, 2000). It also seems that global teams may adapt their behaviour according to intercultural norms (Cramton & Hinds, 2014).

In sum, this dissertation expands on previous research applying the JD-R model and the coping theory by identifying the unique mobile and virtual work-specific job demands that are experienced as hindrances to task completion and performance, the related coping strategies used, and their outcomes. The research results of this dissertation highlight the importance of exploiting empirical evidence in real-life MNCs when theorising on the individual and collective consequences of well-being in the mobile and virtual work context.

## **6.2 Practical implications**

This dissertation is grounded in real-life MNC environments and some important practical implications can be derived for improving collaboration in mobile and virtual work. My findings can help supervisors and workers improve their understanding of globally distributed mobile and virtual work-related job demands and the related hindrances experienced, the individual and collective coping strategies applied, and how they can prevent and manage stress and performance losses, both individually and in organisations. They accentuate the responsibilities of an organisation and supervisors to support individuals and intra-organisational groups in managing hindrances caused by technology-enabled collaboration in changing physical work locations and distributed settings.

For many workers, the nature of collaboration has changed fundamentally after the introduction of mICTs and (often globally) distributed work in MNCs. They regularly have to rely on their self-management skills to handle recurrent and sometimes highly challenging communication and collaboration situations, especially when working across temporal and language boundaries from changing locations and while on the move. In addition, technological media are developing rapidly and offering new possibilities for communication, meaning that current collaboration practices are in transition. These substantial changes in work have managerial and work design implications that should be considered carefully. Organisational strategies and guidelines should be developed to direct and control commonly executed work practices to support well-being at work, ensure sufficient recovery time both off and on the job and to manage the work-life boundary.

The first step is to pay attention to the local, dynamically changing work conditions of distributed team members, to identify the context-specific hindrances and the coping strategies used within organisations, and to recognise the importance of managerial support. Enhancing successful collaboration in mobile and virtual work requires HR professionals, supervisors and workers to main-

tain continuous, open dialogues with and within teams as well as the whole organisation on collaboration practices and coping with potential collaboration-related hindrances. Special attention should be paid to working in multiple physical places and while on the move, across even small time zone differences, and when using different communication technologies and a common company language.

In order to promote the efficiency of collaboration and the well-being of workers, individuals who work together, and their supervisors, must develop a shared understanding of and policies on how to choose and use appropriate technologies, how to schedule and coordinate collaboration, how to request and provide sufficient support for workers collaborating from changing locations and while on the move, and how to handle common availability pressures and differences in individual language proficiencies. Practical improvements to work practices should be designed and used for varied communication, coordination and collaboration needs across geographical, language and temporal boundaries to enhance performance, positively impact on engagement and vigour at work, ensure sufficient recovery, and manage workers' work-life balance. Supervisors should organise interventions targeted at both work groups and individuals for developing better work practices and providing necessary training; for example, on a common company language for low proficiency-level speakers and relying on collective language-coping options. They should pay special attention to the outcomes of the implemented coping strategies and evaluate both their short- and long-term consequences on both the workers and the organisation.

One of the important implications of my dissertation is that organisational and managerial support are both crucial for promoting changes in work practices, and decisions cannot be relegated to individual workers only. Supervisors are also powerful models of behavioural styles and play an important role in introducing new, more beneficial work practices. In some cases, there may even be a need for new laws and societal policies to guide and control common work practices.

### **6.3 Evaluation of study**

This dissertation is based on a combination of inductive and deductive qualitative research approaches. The data of the empirical part of my dissertation were mainly collected by interviewing 170 mobile and virtual workers from seven MNCs working in real-life distributed teams. As the credibility of qualitative research tends to be subjective, contextual and interpretive (Strauss & Corbin, 1990) and to rely on the efforts and skills of the researcher (Golafshani, 2003), it is important to assess the research process in terms of its validity and reliability, i.e., 'trustworthiness' (Guba & Lincoln, 1982). In this chapter, I evaluate the quality of the research process using common quality assessment criteria, including reliability, internal, external, and construct validity (Yin, 2009).

### 6.3.1 Validity of study

#### *Construct validity*

Construct validity means that correct operational measures have been used for the concepts studied. Readers of this dissertation may have noticed that the collected data consist primarily of the experiences of the informants, and secondarily of the subjective diary entries, the field observations of work activities on randomly selected work days and the researcher's interpretations of the collected data. Consequently, the reader cannot be certain that the suggested collaboration hindrances, coping strategies used and their outcomes represent the objective reality of mobile and virtual workers. In qualitative research, the results of data analysis always reflect the combination of both the researcher's and informants' views of reality.

Employing the qualitative interview study as a primary method was a useful approach for studying socially constructed collaboration processes and for capturing the real experiences of the informants. It allowed me to use both deductive and inductive explorations of collaboration hindrances and the consequential coping strategies and their outcomes. The major advantage of this approach was that it revealed unanticipated findings.

I followed several recommended tactics for qualitative research in the data collection and analysis to ensure the dissertation's construct validity. I designed my interview question to focus my research questions but also to be open enough to allow informants to express their own opinions and describe their experiences freely without being led by or trying to please the researcher. The combination of deductive and inductive approaches allowed me to also use prior validated conceptualisations related to some studied phenomena in my interview questions. Careful professional verbatim transcriptions of the interview recordings ensured that the data being analysed represented exactly what the informants had expressed.

I established a chain of evidence to ensure the transparency of my reasoning. Careful data management allowed me and my co-authors to move back to the interview questions and to the actual recordings through the analysis process. Several researchers conducted the analysis. Before drawing conclusions, I also used the focus group interviews, the participants' diary notes (Study 2) and the field observation notes (Study 3) to increase construct validity. To contribute to the transparency of my reasoning, I created analysis tables (displayed in the appendices) to facilitate following and understanding my interpretation process.

The limitation of both construct and internal validity may be that in some of the interviews my co-authors and I, as non-native English speakers, interviewed other non-native speakers. This may have hindered the development of shared understanding, mitigating the expressions in informant responses and therefore leading to potential biases (Welch & Piekkari, 2006). However, my informants demonstrated high levels of English proficiency due to the fact that they lived in Finland and worked in MNCs as foreigners and regularly used English to communicate both at work and during their leisure time. My co-authors and

I increased the quality of the non-native interviews by asking clarifying questions during the interviews, slowing down the pace if needed, and avoiding difficult expressions (Welch & Piekkari, 2006).

### *Internal validity*

Internal validity refers to how the conclusions mirror the real world, whether event X leads to event Y, or whether alternative explanations occur: for example, how a used coping strategy such as multipresence leads to increased flexibility as a benefit, and challenges the control of work-life balance as a cost.

The gradual building of the answers to my research questions required several series of iterations and seeking for competing explanations by formulating parallel explanations of why or why not specific coping strategies were used. The validity was checked by my co-authors during the data analysis, by external reviewers of the articles during review processes, and by connecting my conclusions to external literature. My co-authors and external reviewers offered competing theoretical and practical explanations and pushed me to present additional evidence and conclude further analyses to ensure internal validity.

My co-authors and I used multiple methods to ensure internal validity. We conducted focus group interviews (Study 2), individual diary records (Study 2), and field observations (Study 3) to complement the individual interview findings. Since we mainly relied on retrospective data, it remains unclear how the actual collaboration occurred. It may have been difficult for the participants to recall all the situational factors that affected collaboration. Therefore, I suspect that the actual collaboration is more complex than my findings suggest.

### *External validity*

External validity questions how the findings of the study can be generalised beyond the conducted immediate study. Case studies do not aim for statistical generalisation to a larger population; they rely rather on analytic generalisation striving for theory building (Yin, 2009).

Interestingly, the sample of mobile workers in Study 2 and the virtual team members in Studies 3 and 4 did not differ greatly. The mobile workers in Study 2 were all members of virtual teams distributed throughout Finland, Europe or globally. Similarly, the samples of virtual team members in Studies 3 and 4 included mostly mobile workers who worked from various different locations such as home, client's premises or even cafés, and travelled because of their work. Consequently, the different samples do not negatively affect the generalisability of findings and conclusions.

The mixture of different industries and functions together with a carefully selected sample of experienced mobile and virtual workers increased the external validity of my dissertation. However, some limitations of the findings should be made explicit and discussed. My findings depict the subjective experiences of the informants. The empirical data in Studies 2–4 were obtained from a relatively small sample of white-collar (knowledge) workers living and working in Finland. Differences in national laws, cultural and organisational norms and practices, preferences for using specific types of technologies, and commonly

used collaboration practices combined with a nationally relatively high level of English proficiency among educated knowledge workers all likely affect worker behaviour, even in global companies, and therefore also influence the generalisability of the findings.

### **6.3.2 Reliability of study**

A qualitative study, like all research, should be repeatable by other researchers and produce reliable and consistent results that are not dependent on coincidental circumstances during the research (Kirk & Miller, 1986). Subsequent researchers should arrive at the same conclusions for the same cases by following the same procedures as I have described in the Research design and methods section. To enable repeatability, I meticulously documented the procedures that I followed in the case studies. This also enabled me to replicate them, which forms an integral part of confirming reliability (Yin, 2009).

I documented each phase of the design, data collection and analysis of my study to increase the transparency of the process. I stored the database both in its original and transcribed form. I also combined a variety of data sources and used individual and focus group interview data and observation and diary data to provide a more detailed understanding of collaboration in mobile and virtual work, which strengthens the reliability of my dissertation.

A limitation of this study is that the data were obtained from a rather small number of participants. Even though the data were saturated in terms of most of the interview themes, a larger sample might have revealed more hindrances, coping strategies and different benefits and costs.

## **6.4 Conclusions and future research**

This dissertation expands on the JD-R model and the coping theory and makes an important contribution to both the well-being and mobile and virtual work literature. It suggests that collaboration in mobile and virtual work includes context-specific job demands that workers may experience as hindrances that may be either individual or collective sources of stress. Coping with these hindrances activates specific coping strategies, which can also be applied individually or collectively.

Mobile and virtual work has and will become increasingly common because of mobile lifestyles, developing technologies and growing distributed and multi-locational work settings. This underlines the role of the various contexts in which employees operate, as each specific workplace is layered to physical, virtual and social spaces. Despite its limitations, this dissertation creates a unique understanding of the work characteristics that create job demands and are potentially experienced as hindrances. This is essential from the viewpoint of work and organisational design and individual and team job crafting, and deeper understanding of these contexts is needed. It also provides new knowledge for managing these circumstances and controlling experiences of stress and the resulting consequences. The need for this knowledge applies to HR professionals, supervisors and the mobile and virtual workers themselves.

I anticipate that the emerging theoretical model presented in my dissertation will provide a useful framework for further investigating both individual and collective coping with hindrances in mobile and virtual work. I emphasise the need to test this quantitatively by collecting data from a wide-ranging sample of employees working in MNCs and conducting statistical testing to confirm and advance the initial model. This dissertation also shows that both individual and collective experiences and behaviours should be considered in studies of organisational contexts.

My findings show that understanding the dynamic nature of context-specific job demands is important for future research. I emphasise the need for the incremental investigation of the dynamicity of these demands and their effects on mobile and virtual work in general and on collaboration. This dissertation merely initialises the understanding of dynamically changing job demands and therefore this aspect requires more attention in the future.

Experienced hindrances related to shared demands and collective coping in organisational settings have to my astonishment received almost no attention in the JD-R, coping or occupational well-being literature. My results reveal that distinct aspects of interdependent tasks, as well as shared activities and operations such as collaboration, deserve more scrutiny in future research.

In my dissertation, I focused on geographical, temporal and language boundaries. However, mobile and virtual workers commonly also cross-cultural boundaries when collaborating in distributed settings (e.g., Watson-Manheim, Chudoba & Crowston, 2012; Watson-Manheim, Crowston & Chudoba, 2002;). Future research has the opportunity to explore how workers experience hindrances related to collaboration across cultural boundaries and how they cope with these. It is also important to remember that definitions of well-being differ between cultures and emphasise different sources of well-being. Future studies should also expand the focus from employees working in one country to global collaboration partners. This, however, requires new types of research designs and methodologies.

Finally, I conclude this dissertation by hoping that my results inspire future researchers and practitioners to promote well-being and performance in mobile and virtual work by building and leveraging new related knowledge.

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