Revealing the Obligations that lead to ICT-related Technostress in the Digital Workplace

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Prologue

Firstly, this dissertation is dedicated to any knowledge worker who has experienced technostress and to organisations. May my research reach you.

Then, I must state my gratefulness to the many people that have helped me along the way. A PhD research is not created in a vacuum, in which only the student and the research exist, but rather in a collaboration of many helping hands.

I must first thank my supervisor, Assoc. Prof. Hanne Westh Nicolajsen, who was very kind and trusting to embark on this journey with me since November 2017. We have shared many moments that I will forever cherish, and our collaboration has evolved towards a beautiful friendship. Hanne has taught me how to give myself the time off and encouraged me to find the workstyle and rhythm that works for me.

Assoc. Prof. Michelle Carter and I first talked together towards the end of August 2020, after she has read my HICSS paper. "I want you to aim high" – she told me, "why not a top journal?". I still remember the tears and excitement I felt hearing this. I never considered top journals before that moment, and that conversation marked the end of my self-imposed limitations in terms of publishing. Since then, a world of opportunities has opened in front of me. Thank you, Michelle, for opening up this world for me, for teaching me, and for your kindness and patience.

In the springtime of 2018, I enrolled in the course Sociology of Emotions. I wouldn't have known about this course, if it were not for Prof. Brit Ross Winthereik. Prof. Winthereik was one of the firsts to guide me towards a PhD journey, thus a big part of why I signed up for the course was my admiration. A few days after my enrollment, Prof. Åsa Wettergren, one of the course teachers, sent an email to all course participantins encouraging us to send an abstract to the Sociology of Emotions conference. To my surprise, my abstract was accepted. Thank you, Brit, and thank you Åsa – without you, I would have never discovered "obligation" as a sociological theory.

November 2019 marked the day of my mid-way evaluation. Hanne and I were daring enough to bring together both qualitative and quantitative scholars: Assoc. Prof. Mari-Klara Stein, Prof. Jason Thatcher, and Assoc. Prof. Ella Hafermalz. This meeting marked the end of my confusion period, which I understand many PhD scholars go through. Finally, there was light, as my supervisor and committee helped me see the red thread in all my work thus far, and encouraged me to pursue technostress and obligation.

Ass. Prof. Christian Østergård Madsen has read my drafts many times. And every time, he asked: "Where are your tables?". I dedicate all the tables in my dissertation to you, Christian, and I am very thankful that you have shown me the power of providing visuals in my writing.

Assoc. Prof. Oliver Krancher has also read my drafts. Similarly, to Christian, Oliver wanted me to create figures. I was delighted with the end result: figures helped me understand my own research even better, and communicate it more clearly. Thank you, Oliver.

I attended the writing retreat "Writing Boot Camp" conducted by Mirjam Godskesen and Jens Larsen three times. Here, I have learned the discipline of academic writing, how to conquer space and time, and I was pushed to write as much as a half an article in three days. When I was done, I let Mirjam know. Her answer: "You still have a few writing sessions left, you can write more". This has shown me what is possible, when one is provided with the right tools.Thank you Mirjam, and thank you Jens.

The IRIS community has been a place where I could take my early work and have as many as seven other academics reading it and spend an hour together with me discussing how to improve my work. I am also thankful for the feedback received while attending IFIP 8.2, and HICSS conferences. This feedback made me aware of some of my research's weaknesses.

The courses "Affectivity and affective theories", "Advanced Leadership topics", "Qualitative research methods", "PhD Symposiums", "The politics and practicalities of publishing in Organisation and Management studies" have provided me with a solid network, knowledge, and new research perspectives.

My students have been a big inspiration. It has been extremely important for my research to be able to teach it to others.

To one of my first master's students that I have supervised: Eliza Vejlegaard. Eliza chose Technostress as a topic for her master thesis, and that inspired me to move my research in that direction as well.

To Carolina Velasco from Open Entrepreneurship for all the time she has allocated in trying to understand how my research can translate into practice. Her most common question would be: "How much does technostress costs organisations?". Carolina, your questions are the reason why my dissertation and one of my papers include such numbers.

To Prof. Sarah Louise Muhr. When I first started my PhD, leadership was one of the topics I felt I had to research. As I advanced in my research, I had too many working concepts. Prof. Muhr told me in her feedback on my research:" Why don't you just drop leadership and focus on technostress?". And so, my PhD topic was changed. Thank you, Prof. Muhr, for giving me the courage.

To PhD Fellow Esben Langager Olsen who has invited me to give a talk at The National Research Center for Work Environment. This has made me reflect on my research implication in a Danish context and provided me with the opportunity to check whether my assumptions and findings related to the public official documents were on the right track, or if I was missing something.

To the PhD School at ITU for being accommodating and supportive.

To ITU for being an inspiring place to work for, and for providing the structure within which my research could take place.

To the Danish Industry Foundation for funding my first year of my PhD.

To my Twitter academic community for being supportive and answering questions related to the PhD journey in general.

To my husband, Rasmus, who almost never grew tired of hearing me speak about my research ideas, read my articles before submission, and for talking about my research with such pride. He has also been an abundant provider of healthy snacks and meals in the busier periods.

To my stepdaughters, Ella and Asta, for being understanding for the weekends or evenings in which we could not play together as much as they would want.

To my dog, Joy, for being an endless source of energy and laughter. To my cat, Laban, for purring relaxingly next to me while working.

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Abstract (English)

Technostress is a growing area of research and a concern for practitioners. So far, IS research on technostress has assumed that the environment in which technostress arises is the technology environment. However, I argue that a sociological approach can further our understanding of how technostress is co-constructed in the workplace around the usage of Information and Communication Technologies (ICTs). I ask: "What can the sociological lens of obligation reveal about ICT-related technostress in organizations?". To investigate this question, I use the sociological concept of obligation. Obligation is the feeling that we owe something to ourselves, others, organizations, or the society as a whole. I conduct interpretative research based on qualitative data: interviews, case study research, and journal entries. I analyze these different types of data by using thematic analysis, content analysis, or life narratives. I contribute to IS technostress research by employing the analytical lens of obligation, which allows me to find that employees see technostress as their individual obligation and devise strategies to avoid it. These strategies add to their technostress and augment group obligations that leads to technostress for the collective. Furthermore, I find that tensions between overlapping obligations that cannot be carried out simultaneously also augment technostress. I contribute to practice by making visible the obligations that can lead to technostress for employees, which can be used to consciously re-negotiate patterns of interaction and communication that would lead to more desired outcomes for organizations.

Abstract (Danish)

Technostress er et voksende forskningsområde og en bekymring for fagspecialister. Indtil videre har IS-forskning inden for technostress antaget, at det miljø, hvor technostress opstår, er teknologimiljøet. Jeg hævder imidlertid, at en sociologisk tilgang kan fremme vores forståelse af, hvordan technostress opstår på arbejdspladsen omkring brugen af informations- og kommunikationsteknologi (IKT). Jeg spørger: "Hvad kan det sociologiske begreb "obligation" afdække om IKT-relateret technostress i organisationer?". For at undersøge dette spørgsmål bruger jeg det sociologiske begreb om "obligation". "Obligation" er følelsen af, at vi skylder noget til os selv, andre, organisationer eller samfundet som helhed. Jeg anvender fortolkende forskning baseret på kvalitative data: interviews, casestudieforskning og journal indlæg. Jeg analyserer disse forskellige typer data ved hjælp af tematisk analyse, indholdsanalyse eller livsfortællinger. Jeg bidrager til IS technostresseforskning ved at anvende det analytiske begreb for "Obligation", som giver mig mulighed for at kunne konstatere , at medarbejdere ser technostress som deres individuelle forpligtelse og udarbejder strategier for at undgå det. Disse strategier forværrer deres technostress og forøger gruppeforpligtelserne, der fører til technostress for kollektivet. Desuden finder jeg, at spændinger mellem overlappende forpligtelser, der ikke kan udføres samtidigt, også øger teknostressen. Jeg bidrager til praksis ved at synliggøre de forpligtelser, der kan føre til technostress for medarbejderne, og som kan bruges til bevidst at forventningsafstemme mønstre for interaktion og kommunikation, der ville føre til bedre resultater for organisationer.

1. Introduction

This PhD research explores ICT-related (Information and Communication Technologies) technostress in organisations from a sociological perspective and aims at contributing primarily to the field of Information Systems (IS). The ontology of this research project is systemism (Reihlen, Klaas-Wissing, & Ringberg, 2007), an ontology from the discipline of management studies. In this ontology, organisations are neither aggregations of individuals (micro level) nor holistic entities (macro level), but rather, they are comprised of both the micro and macro levels, and processes, structures, environmental constraints, norms, and obligations. In other words, I draw upon the micro (individuals) and the macro (organisations) perspectives, but I focus on the obligations. These obligations can be brought in the organisation by employees 'previous assemblages of norms and conditioning, be co-created amongst employees (micro-level), present at the organisational (macro-level), created in the meeting between the macro and micro, or inherited from the societal level.

In my research, I use the following technostress definition:

> ''Technostress is *a stress phenomenon experienced by employees in organisations as a result of their interaction with ICTs. This is caused by an individual's attempt to deal with constantly evolving ICTS and the changing physical, social, and cognitive responses demanded by their use."*
>
> *(Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008, p. 418).*

Although there is no firm way of defining obligation, in this PhD thesis, I draw upon the work of Clark (1990) and define obligation as follows:

> ''*Obligations represent an emotional blend that makes us feel that we ''ought to'' do, be, or give something (time, resources, certain emotions) to ourselves, others, or the organisation we work for.''*

My empirical context is Denmark, a highly digitalised country with high ambitions regarding the digitalisation of both the private and public sectors (Digitalt Vækstpanel, 2017). I zoom in on technostress in the private sector, and particularly on knowledge work. When I first started researching technostress, fully remote work in private Danish organisations was a rare case. Now, at the moment of writing this dissertation, due to the pandemic and the lockdown, fully remote work seems to be the new normal for many organisations. Fully remote work and the pandemic might have intensified technostress, making the findings and contributions of this PhD research even more relevant.

In Denmark, the aftermath of the pandemic in terms of stress is unknown. The stress numbers that we can still rely on are from 2017, or 2018 at best, in which we are made aware by the official authorities, that one out of four employees, or one out of five employees, depending on which statistics one looks at, suffers from high levels of stress (Det Nationale Forskningscenter for Arbejdsmiljø, 2018; Jensen, Davidsen, Ekholm, & Christensen, 2017). It would take a political effort to understand precisely how many employees in Denmark currently struggle with high levels of stress daily when there is even a higher overlap between

work and home, and when one's home has become one's workplace, their partner's workplace, and their children's school – depending on the living situation of each individual. Similarly, IS technostress research to date, including my research, has investigated contexts in which employees are primarily working from the physical space of their workplace.

Technostress, as well as stress, are research areas that still evolve. More recently, we see a turn towards a sociological perspective in stress research (Peterson, 2018). Peterson (2018) claims that while psychophysiological and psychological perspectives helped us uncover many fruitful insights and better understand stress, adding a sociological perspective can help us understand the context of stress. For example, treating stress as an outcome of social forces can provide more insights into the causes of stress and better understand stress as a process. Stress as a process, or the transactional perspective to stress, is well-explored in technostress research (e.g., Tarafdar, Cooper, & Stich, 2019) and will be further explained in the theoretical chapter.

Methodologically, both technostress and stress research invites a turn towards qualitative research. In particular, (Lazarus, 2006) invites qualitative research, especially longitudinal case studies and life narratives, claiming that this is the only way to get intimate with employees' stress experiences. Furthermore, Lazarus (2006) points towards exploring emotions in stress research. I am perhaps not as convinced as Lazarus (2006) that qualitative research is the only way to get intimate with employees' experiences of stress. Nevertheless, I view all current and past stress and technostress research as having their merits in moving the field to where it is today and enabling my and other similar research. In a similar line of thinking, Tams (2020) calls for looking beyond self-reported psychological ways of measuring technostress, claiming that we are missing out on a broader understanding of technostress by not doing so. Although Tams (2020) makes this claim to argue for neurophysiological measurements of technostress, I see that looking into the obligations that lead to technostress can very well fit his argument. Thus, as I argue above, exploring technostress with a focus on obligations as an emotional blend provides an opportunity to contribute to IS technostress research.

This dissertation is structured in the following way: the next subchapter, Outputs, provides the reader with an overview of the publications I have selected to be part of my dissertation. Next, I will present my research project's theoretical background (technostress and obligation) at length. The methodology chapter presents the reader with personal reflections of my world view as a researcher, the ontology and epistemology of my research, and the data collection and analysis of each of the papers. The results chapter will present the findings of each article in relation to the overarching research question of this PhD research. The contribution and discussion chapter present my research results in the light of IS technostress research, emphasising the contributions. Lastly, I present conclusions, limitations, and future paths of research.

1.1.   Research outputs

This dissertation brings together six academic peer-reviewed outputs: two conference abstracts, one extended conference abstract, two conference papers, and a book chapter. To

help the reader, I present below each of the outputs, which I refer to as articles in this PhD dissertation (e.g., Article 1).

    📖 **Article 1:** Sociology of emotions in digital leadership and communication **(conference abstract)** (Stana, 2018)

Avenue: The 8th Midterm Conference of the ESA Sociology of Emotions Research Network (RN11), 2018.

Status: Abstract accepted and presented. Peer-reviewed.

Impact: Presented at the European Sociological Association, one of the largest conferences within sociology.

Authors: Stana, Raluca.

Research Question: What can micropolitics of emotions inform us about leadership and communication practices in the digital age?

Methodology: Qualitative interpretative research. Interviews with leaders interpreted through the theoretical lenses of the micropolitics of emotions.

Main Findings:

(1) Micropolitics of emotions as an interpretation tool for interviews can help uncover emotions otherwise inexplicit in interviews,

(2) Remote work makes it more difficult for leaders to elicit obligation from their followers,

(3) Obligation as an emotional blend is a driver for constant connectivity, a common techno-stressor.

    📖 **Article 2:** People on the other side are waiting: how felt obligations contribute to ICT-related technostress **(conference article)** (Stana & Nicolajsen, 2020)

Avenue: Tenth Scandinavian Conference on Information Systems. Selected papers of the IRIS, Issue Nr 11, 2020.

Status: Paper selected and published. Peer-reviewed.

Impact: Level 1, 1 BFI point.

Authors: Stana, Raluca and Nicolajsen, Hanne Westh.

Research Question: How do felt obligations contribute to ICT related technostress in organisations?

Methodology: Exploratory single case study.

Main Findings:

(1) Employees take on themselves the ideals and norms of technology being functional and seamless.

(2) When ICTs do not live up to the ideal, employees experience shame and guilt.

(3) Employees feel it is their obligation that ICTs should perform seamlessly.

(3) Obligations around the usage of ICTs are co-constructed between employees.

(4) Multiple running communication channels can lead to the co-construction of new obligations, such as: feeling obligated to follow all the communication channels and creating strategies to do so.

(5) Unlimited work: employees feel obligated to be available, to manage by themselves what others can expect of them in their free time.

(6) Technology resilience: employees are expected to increasingly become more resilient in their interaction with technology.

(7) Employees feel obligated to perform work that is not legitimised as work, e.g., ICT troubleshooting.

📖 **Article 3:** A cautionary tale: How co-constructed work obligations lead to ICT-related technostress **(conference article)** (Stana & Nicolajsen, 2021a)

Avenue: Proceedings of 54th Hawaii International Conference on System Sciences (HICSS), 2021.

Status: Paper published and nominated for Best Paper Award. Peer-reviewed.

Impact: Level 1, 1 BFI points. Discussed in Finans.dk and Jyllands-Posten.

Authors: Stana, Raluca and Nicolajsen, Hanne Westh.

RQ: What can the sociological analytical concept of obligation reveal about ICT-related technostress in organisations?

Methodology: Interpretative research based on qualitative interviews, a hermeneutical approach.

Main Findings:

Employees feel an obligation to:

(1) relate to constant input,

(2) keep an overview over their inbox even when off work,

(3) manage ICT-related distractions,

(4) constantly connect to work,

(5) reduce stress for themselves and others,

(6) monitor ICT channels,

(7) administer ICTs, for example, notifications, passwords, or upgrades, and,

(8) constantly learn.

📖 **Article 4:** Sociological mechanisms behind ICT related technostress in the workplace (**book chapter)** (Stana & Nicolajsen, 2021b)

Avenue: Emerald Group Publishing, Book: Information Technology in Organisations and Societies: Multidisciplinary Perspectives from AI to Technostress, 2021

Status: Published. Peer-reviewed.

Impact: Level 2, 2 BFI points. Discussed in Finans.dk and Jyllands-Posten.

Authors: Stana, Raluca and Nicolajsen, Hanne Westh.

RQ: What is the knowledge that the sociological lens of obligation can bring to the understanding and handling of technostress?

Methodology: An embedded case study with two sub-units of analysis.

Main Findings:

Employees feel an obligation to:

(1) be available,

(2) have an overview of their tasks at all times,

(3) be productive,

(4) ensure good communication with their work peers,

(5) manage individual well-being at work,

(6) manage a work-home balance,

(7) manage ICTs.

(8) Additionally, there is an obligation in the workplace for ICTs to work as expected.

(9) Stress is viewed at a society level from a response perspective, thus putting the responsibility on the employees to become more resilient.

📖 **Article 5:** "I was struggling with my guilt for not being able to log in." Technostressful constructions of obligation in the digitalised workplace. **(conference abstract)** (Stana, 2020b)

Avenue: The 9th Midterm Conference of the ESA Sociology of Emotions Research Network (RN11), 2020.

Status: Abstract accepted and presented. Nominated for Best Paper Award. Peer-reviewed.

Impact: Presented at the European Sociological Association, one of the largest conferences within sociology.

Authors: Stana, Raluca**.**

RQ: What is the role of obligation in how technostress is constructed or dealt with in organisations?

Methodology: Longitudinal case study comprised of an IT leaders' reflections for six months, coupled with interviews.

Main Findings:

(1) When technology does not work as expected, it leads to feelings of shame, guilt, and self-doubt.

(2) The employee identifies with the failure or success of the technology.

(3) The individual deals with technostress through humour and sarcasm, as she feels that she is not allowed to feel anger or frustration.

📖 **Article 6:** Between an online Friday bar and efficient work – A life narrative of obligation and technostress in organisations **(extended abstract for the conference)** (Stana, 2020a)

Avenue: IFIP – Paper Development Workshop Proceedings: The Future of Digital Work: The Challenge of Inequality: IFIP Joint working conference, 2020.

Status: Abstract accepted and presented. Peer-reviewed.

Authors: Stana, Raluca**.**

RQ: How are the obligations that lead to technostress constructed in the workplace?

Methodology: Longitudinal case study comprised of an IT leaders' reflections for six months, coupled with interviews.

Main Findings:

(1) When technology does not work as expected, it leads to feelings of shame, guilt, and self-doubt,

(2) The closeness between the employee and the technological artefact leads to an over-identification with the success or failure of the technological artefact,

(3) The individual deals with technostress through humour and sarcasm, as she feels that she is not allowed to feel anger or frustration,

(4) The employee deals with technostress by herself,

(5) There is a tension between not wasting time and socialising in work purposes, as the latter is not emphasised as a valuable part of one's work.

2. Research Design and Research Questions

I started my PhD research in November 2017 as part of the research project Innovation for Leadership (Richter, Nicolajsen, Nielsen, Müller, & Krancher, 2019). The I4L (Innovation for Leadership) project aimed to create research-based normative tools and workshops for practitioners. During this initial stage, I gathered data from focus groups and conducted open

interviews in an exploratory approach (Bryman & Bell, 2011), this representing my Research Study 1.

In my first doctoral course, Sociology of Emotions, I was asked to write a paper (Article 1) using one of the theoretical lenses presented during the course to analyze some of my data. The research question is:

How are **micropolitics strategies of emotions** *affected* by ICTs in the **leadership-follower interactions***?*

Article 1 provided the following insights:
(1) Micropolitics of emotions (e.g., obligation), as an interpretation tool for interviews, can help uncover emotions otherwise inexplicit in interviews,
(2) Remote work makes it more difficult for leaders to elicit obligation from their followers,
(3) Obligation as an emotional blend is a driver for constant connectivity.

These insights seemed novel in IS technostress literature, which I present in-depth in the theoretical chapter. However, it was not until my PhD mid-way evaluation in November 2019 that I could define what the focus of my PhD research should be. As a result of the input received during the evaluation from the committee and my supervisor, I defined a red thread and an overarching tentative research question. The overarching research question is a "what" question (Blaikie, 2009), and this question is the driver for my following research studies:

What can the **sociological lens of obligation** *reveal* about **ICT-related technostress in organizations***?*

I choose a "*what*" question due to the novelty of studying technostress from a sociological standpoint, particularly the relation between obligation and technostress. Blaikie (2009) emphasizes that a "what" question is necessary for areas where little research has been conducted. As I problematize and describe in the theoretical chapter about technostress and obligation, IS research has focused primarily on psychological and neurophysiological perspective in researching technostress (Tarafdar et al., 2019), thus leaving space for researchers to make significant contributions by employing a sociological view. In the theoretical chapter, I explain in-depth the constructs "*sociological lens of obligation*" and "*ICT-related technostress in organizations*", which I use in my overarching research question. Furthermore, I use the verb "*reveal*" to illustrate the relation between my primary two constructs, as this verb hints at the exploratory nature of my studies.

The mid-way evaluation led to launching two research studies: Research Study 2 and Research Study 3, as I visualize in Figure 1. In Figure 1, I visualize the three research studies, the articles that resulted from these studies, and their research questions.
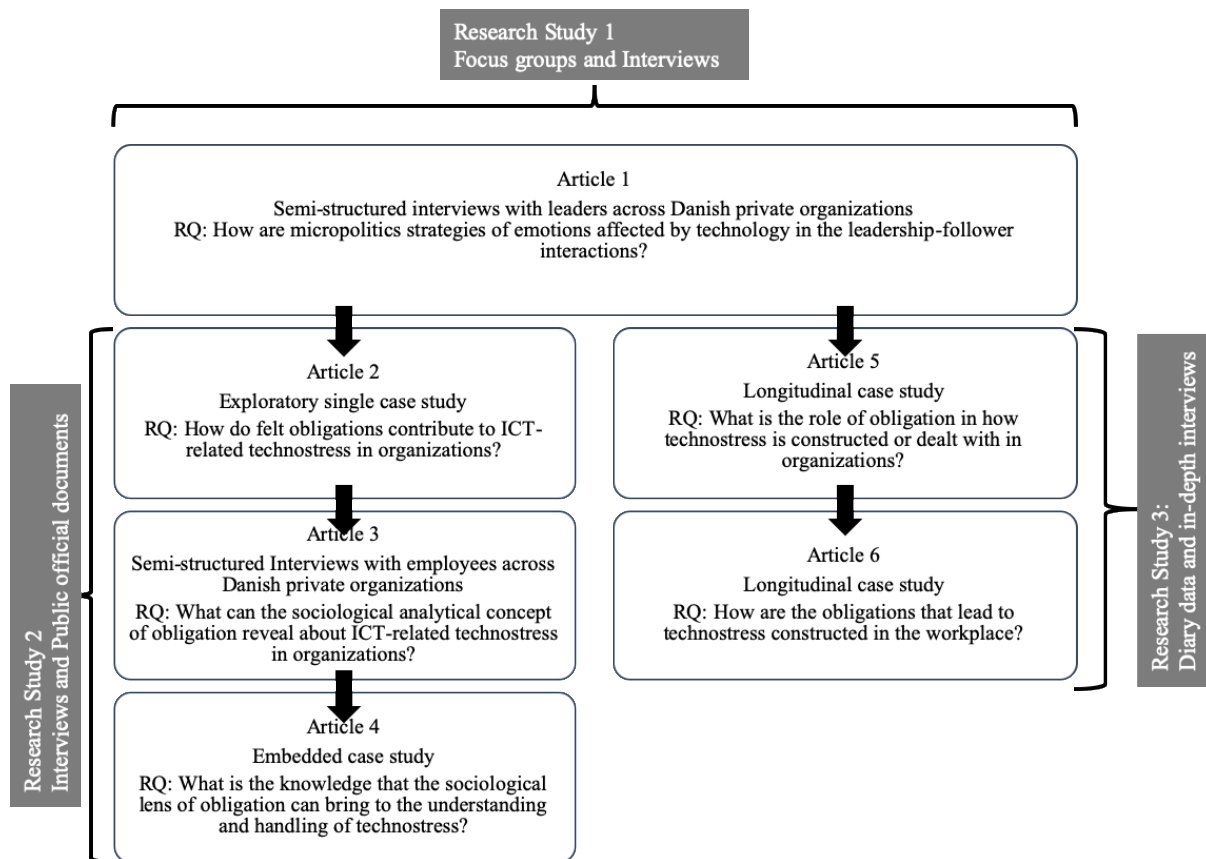
Figure 1- Research Studies, Research Questions, and Articles

Research study 1 is exploratory, as mentioned in the introduction of this chapter. During this phase, I collected open and semi-structured interviews and focus group data with leaders from private organizations in Denmark. The output of this phase is Article 1.

In Research study 2, I collected public documents released by official authorities in Denmark that discuss stress, and semi-structured interview data from private organizations in Denmark. The outputs of this Research Study are Articles 2, Article 3, and Article 4.

In Research study 3, I collected diary data from an IT leader who wrote a weekly diary about technostress and obligation as she is experiencing it in the context of her work for six months and in-depth interviews. The outputs of this Research Study are Article 5 and Article 6.

The arrows in Figure 1 represents the flow of insights. The insights resulting from Article 1 led to the following articles. Therefore I depict the downward arrows from Article 1 towards Article 2, on the left, and Article 5 on the right. On the left column, Article 2 led to Article 3, and Article 3 led to Article 4. Similarly, in the column on the right, Article 5 led to Article 6. The separation of the two columns is due to the two different research studies: Research Study 2 and Research Study 3. In the methodology chapter, I discuss the research studies, data collection, and analysis in-depth. In the findings and contribution chapters, I discuss how the articles are different and how they relate. Also, the intention is not to unite the two different flows of insights, as they complement each other, as I convey in the methodology and the analysis chapters.

In the next chapter, the theoretical background, I address the primary constructs of my research question: "*ICT-related technostress*" and the "*Sociological lens of obligation*".

3. Theoretical background

In this chapter, I discuss the theoretical background of my dissertation: "*ICT-related technostress*" and the "*Sociological lens of obligation*". Then, I discuss which theoretical elements were used in the different articles included in my dissertation for each of the two constructs.

3.1. Stress in organisations and the changing nature of work

The word stress is part of our almost daily use in the workplace: from the coffee machine talk, where we merely want to signal that we are busy, to the empty seat at the lunch table that once belonged to a colleague now on a stress sick leave, and other stress-related experiences in the middle. This chapter discusses the impact of stress, the changing nature of work, its implications on stress, and stressors, strains, and stress research epistemologies.

In developed countries like Denmark, which focuses intensely on digitalization (e.g., Digitalt Vækstpanel, 2017), the statistics show that one out of four employees suffers from high-stress levels (Jensen et al., 2017). The Stress Union in Denmark reports that 430.000 employees in Denmark experience acute stress symptoms daily, which costs the Danish government 1.5 million workdays yearly, amounting to over three billion US dollars (Stress Forening, 2020). However, these costs do not include the costs for managing employees life-long health consequences due to stress, which have been documented to be conditions such as depression, sleeping problems, heart disease, diabetes, or cancer, amongst many other ailments (Jensen et al., 2017; Nielsen & Kristensen, 2007). The consequences of these ailments, argues Cooper, Dewe, & O'Driscoll (2001), is a ravaging of health and happiness for the individuals and a direct or indirect effect on their families. Another cost that is not included in the financial estimation, besides the costs of leave of absence due to stress, is the work that companies lose due to employees being stressed while at work. Research reports that employees that experience stress are less creative, less innovative, less productive, less committed, demotivated, have concentration and social relations issues, and experience increased job dissatisfaction (Ragu-Nathan et al., 2008; Salo, Pirkkalainen, & Koskelainen, 2019; Tarafdar et al., 2019; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007).

3.1.1. The changing nature of work and stress

Cooper et al. (2001) discuss that the changing nature of work, the postindustrial workplace, introduction of computer technology in organisations, and the new organisational reality are highly relevant for stress research and a source of work-related stressors and strains. Stressors are characteristic of the environment that can stress employees, while strains are the cognitive, behavioural, emotional, or physiological responses of the employee to these stressors (Cooper et al., 2001). Nevertheless, how is work changing, and how are these changes impacting employees? Below, I present a few aspects of these changes.

Due to the introduction of information technology in the workplace, employees who perform routine tasks are increasingly freed to focus on more creative and complex tasks (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). However, although employees can enjoy stimulating and exciting tasks, an overload or underload in such tasks can be stressful (Cooper et al., 2001). Additionally, employees might feel threatened by the introduction of these technologies, job insecurity also being a common stressor (Dewe & Cooper, 2020).

Furthermore, work can be performed anytime, anywhere (Shurygailo & Cascio, 2003). As a result, employees might opt to perform some work at home. Additionally, the increasing focus on sustainability, carbon initiatives, and environmentally friendly strategies might also pressure organisations to enable employees to work from home to reduce the carbon footprint (Dewe & Cooper, 2012). However, working from home might leave employees with the burden of navigating blurred boundaries between work and private life by themselves (Mazmanian, Orlikowski, & Yates, 2013). Multiple stressors can occur due to these blurred boundaries and the frequent switch between work and home due to being able to check-in and out of work several times during the day. For example, some of these stressors are inter-role conflict (particularly between work and family obligations); incompatibility between values, emotions, and attitudes required by each of these roles (e.g., one might feel expected to be ambitious, competitive, and task-oriented at work, but loving, relationship-oriented, and accommodating at home) (Cooper et al., 2001); and the possibility to constantly connect to one's workplace via ICTs.

Thus, work is increasingly more self-organised, and productivity, formerly a responsibility of the manager, is now in the hands of the autonomous knowledge professional (Drucker, 1999). However, the workload can also be a stressor, as each individual has an optimal band of workload they can fulfil (Cooper et al., 2001).

Besides the changing fabric of the organisation and work, employees are also changing their mindsets. Bass (1999) argue that the confirming worker of the 1950s has been replaced with the sceptical worker of the 1990s, who is more concerned with their self-interest rather than that of the organisation, as the worker of the 1950s used to be. Here, the leadership style plays an important role and can be a stressor for employees who need more autonomy. Autocratic and authoritarian leadership styles could increase stress amongst employees, as well as leaders that are task-oriented rather than considering their employees' needs and motivation (Cooper et al., 2001). Furthermore, lack of effective contribution to decision-making, and overly bureaucratic structures that inhibit flexibility and innovation, are also reported as everyday stressors amongst employees (Dewe & Cooper, 2020)

Moreover, Avolio, Sosik, Kahai, & Baker (2014) highlight that the "Millennial" generation believe that leaders should serve rather than direct. Thus, the traditional role of the manager as a direct supervisor, controller, and coordinator is changing. Instead, new ways of leading and managing are required (Dewe & Cooper, 2012). Additionally, leaders also need to consider issues such as the emotional quality of the workplace, well-being, inclusion and diversity (Dewe & Cooper, 2012, 2020). These changes can lead to role stress for leaders (Cooper et al., 2001), whose role is less well-defined.

Moreover, inappropriate and ineffective communication has also been identified as stressors. ICT mediated communication might intensify this stressor, as it can affect how one's emotions are perceived by the receiver of the message (Avolio et al., 2014). For example, in online communication, receivers may perceive a message as less positive than the sender intended it to be (Byron, 2008).

It is also important to note that stress research distinguishes between episodic and chronic stressors and strains. Episodic stressors and strains are short-term or one-off events (e.g., a computer error) while chronic stressors and strains are ongoing situations that affect the individual consistently (e.g., lack of boundaries between work and private life) (Cooper et al., 2001). However, Weil & Rosen (1997) warns that the cumulative effect of episodic stressors and strains lead to chronic stressors and strains.

3.1.2. Stress epistemologies

In any research study, the way stress is defined and the epistemology that this definition is based on plays a crucial role, as it impacts how stress is viewed and what can be said about stress as a result of that particular research study. Therefore, it is essential to understand the common approaches of viewing and defining stress in stress research. Cooper et al. (2001) summarise four common approaches in defining stress: response, stimulus, interaction, and transactional approach, which are described below:

⇒ Response approach: In this early approach to defining stress, the focus is on the outcome or consequences of stress, and stress is viewed as a dependent variable (Cooper et al., 2001). This approach has a physiological focus, and it suggests that stress is a response of the body to a demand made upon it (Selye, 1956), which can be a psychological, physiological, or behavioural response (*strain*). Although this approach has its merits, it has also attracted criticism. In particular, critics point out that this view is missing psychosocial elements related to stress and that it cannot answer wherein the body stress manifests. However, the most extensive critique, argues Cooper et al. (2001), stems from excluding the environmental factors in the stress process.

⇒ Stimulus approach: This approach focuses on identifying potential sources of stress (*stressors*) and has its roots in physics and engineering. In this view, stress is a force exerted on an individual and depending on the individuals' resilience, it can lead to temporary or permanent damage (Cooper et al., 2001). The critique of this approach is similar to the response approach: it excludes the environmental factors in the stress process, and does not account for individual differences (Cooper et al., 2001).

⇒ Interaction approach: This approach looks into the relationship between a stimulus and a response, thus having a cause-effect focus. Definitions following this approach focus only on the interaction between two variables. The main critique for this approach is that it fails to consider the complexity of the stimulus-response relationship, the context in which this takes place, or individual differences (Cooper et al., 2001).

⇒ Transactional approach: In this approach, the responses and stimuli are defined relationally and are considered inseparable from the context in which the stressful event occurs. Stress, in this approach, is neither residing in the individual nor in the

environment but instead in the relationship between the individual and the environment. Stress is thus embedded in the ongoing process in which individuals transact with their environment, and the constructs used (e.g. *stressors* or *strains*) become inseparable from the context in which the stressful encounter occurs (Cooper et al., 2001).

3.2. Technostress

3.2.1. Technostress conceptualisations

Technostress is a phenomenon that Brod first observed and coined in 1982, after a computer programmer was referred to him for psychotherapy. During the psychotherapy sessions, the computer programmer disclosed feeling depleted, apathic, and having marital problems, while jokingly comparing his wife to a "horrible peripheral – jargon for a computer accessory" (Brod, 1984, p. xi). Brod (1982) recognized that these symptoms suggest depression, but this conversation made him curious to further investigate technostress as a phenomenon. Brod defines technostress as "*a modern disease of adaptation caused by an inability to cope with new computer technology in a healthy manner*" (ibid). He finds that technology is connected to stress and that workers began internalizing computer standards, such as perfectionism or accelerated time. Furthermore, he discloses, computers are changing our relationships to our job and families.

Since being coined in 1982, technostress has preoccupied multiple research fields and practitioners. In 2018, I performed a search in the Harzing tool "Publish or Perish" (Harzing, n.d.), which has returned close to a thousand articles containing technostress in their title from disciplines such as library studies, psychology, or IS. In IS, the first study was published in 2007, and it establishes that technostress in the technological context of ICTs leads to role stress and decreased productivity (Tarafdar et al., 2007). This early study marks the beginning of a steady interest from the IS community in researching and understanding the technostress phenomenon.

From then on, we can see a technological focus around the use of ICTs and an epistemological focus on the transactional approach to stress in IS technostress research. Furthermore, the transactional approach to stress which I have outlined in the previous chapter seems to be the most used epistemology in studying technostress in IS (e.g., Ayyagari, Grover, & Purvis, 2011; Galluch, Grover, & Thatcher, 2015; Pirkkalainen, Salo, Tarafdar, & Makkonen, 2019; Tams, Hill, Guinea, Thatcher, & Grover, 2014; Tarafdar, Tu, & Ragu-Nathan, 2010).

As stated in the introductory chapters, in this thesis, I define technostress as:

> ,, *Technostress is a stress phenomena experienced by employees in organisations as a result of their interaction with ICTs. This is caused by an individual's attempts to deal with constantly evolving ICTs and the changing physical, social, and cognitive responses demanded by their use'* (Ragu-Nathan et al., 2008, p. 418).

This definition builds on the transactional approach to stress, as it emphasizes the constant changes in both the ICTs and the way individuals can respond to these changes. The transactional approach also emphasizes that the interaction between ICTs and individuals is dynamic (Cooper et al., 2001), as the above definition also suggest.

In recent technostress research, we see a turn towards positive aspects of stress, techno-eustress. Techno-eustress is defined by Tarafdar et al. (2019) as a phenomenon that embodies the positive stress faced by individuals in their interactions with IS. In techno-eustress, the focus is on seeing techno-stressors as opportunities for individuals to upskill themselves, which will lead to positive outcomes for the individual and the organisation (Tarafdar et al., 2019).

In this PhD research, I focus on the unfavourable and undesired aspects of technostress. My focus is driven on the one hand by my interviewees' accounts, and on the other hand, by the concerning stress statistics as presented in the introduction of the theoretical chapter.

Methodologically, IS technostress research has focused primarily on quantitative measurements (e.g., Ayyagari et al., 2011; Tams et al., 2014). However, recently, we see studies adopting a mixed-method approach (e.g., Califf, Sarker, & Sarker, 2020). Furthermore, we see two main disciplinary approaches in IS technostress research:
  (1) Psychological technostress: the interaction between environmental demands and an employee's self-assessment of those demands, i.e., a conscious self-assessment of whether an employee feels overloaded by the number of emails received (e.g., Ayyagari et al., 2011; Pirkkalainen et al., 2019; Tarafdar et al., 2010).
  (2) Neurophysiological technostress: the direct response to an environmental demand that can be measured, i.e., an increase in salivary cortisol or heart rate variability as a result of receiving a large number of emails (e.g., Galluch et al., 2015; Tams et al., 2014).

Next, I discuss technostress conceptualisations under the transactional approach. Focusing on a response approach would mean focusing on *strains*, while the stimuli approach would only allow for a discussion about *stressors*. According to Cooper et al. (2001), stress is a process that includes the presence of an environmental condition (*stressor*) that the individual finds stressful (*strain*). This perception sets in motion a *coping* mechanism that leads to psychological, behavioural, emotional, or physiological *outcomes*. Thus, the conceptualisations that follow this approach are *stressors*, *strain*, *coping*, and *outcomes*.

These conceptualisations have been closely investigated in IS technostress. They have allowed us to explore many valuable aspects of technostress and establish that technology does stress employees and uncover techno-stressors, techno-strains, outcomes, coping mechanisms, and technostress inhibitors. I provide a brief overview of these conceptualisations in Table 1.

Definitions	Examples	References
Techno-stressors: Stressful events or properties of events that individuals encounter. (Cooper et al., 2001)	Techno-overload Techno-complexity Techno-uncertainty Techno-insecurity Techno-invasion Work overload Role ambiguity Job insecurity Work-home conflict Invasion of privacy Interruptions Over or under acquisition of information	Ayyagari et al. (2011), Galluch et al. (2015), Ragu-Nathan et al. (2008), Stich, Tarafdar, Stacey, & Cooper (2019).
Techno-strains: Individual's psychological, physical, and behavioural response to stressors. (Cooper et al., 2001)	Demotivation Lack of creativity Disruptive behaviour Concentration issues Social relations issues Anxiety Fatigue Workaholism Addiction	Salanova, Llorens, & Cifre (2013), Salo, Makkonen, & Hekkala (2020), Tarafdar et al. (2007).
Outcomes: The consequences of strain at the individual and the organisational level. (Cooper et al., 2001)	Job dissatisfaction Low organisational commitment Decreased productivity Impaired innovation and productivity	Ragu-Nathan et al. (2008), Tarafdar et al. (2007), Tarafdar et al. (2010).
Coping: "Individual's cognitive and behavioral efforts exerted to manage specific external and internal demands that are appraised as taxing or exceeding the resources of the person." (Pirkkalainen et al., 2019)	Reactive coping: Distress venting and Distancing from IT Proactive coping: Positive reinterpretation and IT control	Pirkkalainen, Salo, Makkonen, & Tarafdar (2017)
Inhibitors: "Organisational mechanisms that have the potential to reduce the effects of technostress." (Ragu-Nathan et al., 2008)	Organisational and Technical support ICT training Involvement facilitation Innovation support	Ragu-Nathan et al. (2008), Tarafdar et al. (2010)

Table 1- Technostress Conceptualisations

3.2.2. Social environment in technostress research

As seen in the transactional stress approach description above, the stress process described by Cooper et al. (2001) includes the environmental conditions that are deemed stressful by the individuals, thus triggering a behavioural, physiological, or psychological response. However, IS technostress research has insofar defined the environment in which technostress

arises as the technology environment conditions, meaning the characteristics of ICTs and ICT-related events that can create a demand in the individual, appraised by the individual as stressful (Tarafdar et al., 2019). Furthermore, this approach 1) assumes that the employees can consciously assess whether or not the particular event was stressful, and 2) leaves out the emotional responses triggered by these stressors.

What remains to be studied and the focus of this PhD research is the social environment, in which obligations related to ICTs that create technostress are consciously or unconsciously negotiated and adopted. Thus, it is necessary to consider the environment in which technostress arises as the social environment around the usage of ICTs, and the extant or co-created obligations present in this environment. The shift and the importance of the social environment, the move beyond self-assessment measurements, and the inclusion of emotions as forms of strain are also emphasized by stress research, technostress research, or organisations studies (OS), as I present below.

In IS technostress research, Ayyagari et al. (2011) invite researchers to shift the question beyond investigating the technological stressors to investigating these technological stressors' determinants. Additionally, Tams et al. (2014) point out that by focusing on psychological and self-reported measurements, which assumes that respondents can consciously assess what is stressful, we are missing out on unobserved variables, such as the expectations present in the sociological environment: for example, responsiveness after work-hours (Tams, 2020). This view is also supported by the stress researcher Lazarus (1999), who invites researchers who want to profoundly understand stress to turn towards narrative and emotions rather than measurements based on self-assessment. Moreover, (Lazarus, 2006) invites researchers to get closer to employees' experiences of stress by adopting qualitative methods, such as personal narratives, biographies, or longitudinal research. As I argue further in the methodology chapter, qualitative methods offer more nuances and explanations for employees' experiences of technostress, which adds to what we already know about technostress.

The standpoint that obligations around the usage of ICTs can be stressful for employees is also supported by Organization Studies research, but mostly with a focus on norms and email usage. The difference between norms and obligations is that norms are written or unwritten rules that employees adhere to (e.g., answering emails during weekends), while obligations allows a closer look at the root cause for how these rules are created and adhered to (e.g., answering emails due to feeling that we owe something to our peers or the organization we work for).

In OS, Barley, Meyerson, & Grodal (2011) find that the technological artefact (in their case, email) served as a distraction from identifying the actual source of stress for employees. They find that the source of stress is the norm of responsiveness co-created around using ICTs, and not the technological artefact itself (Barley et al., 2011). These findings are confirmed by IS research. For example, Galluch et al. (2015), who look at ICT interruptions in the workplace, find that the expectation that employees should always be online, which is present in the culture, creates distress. For example, they find that the sheer quantity of interruptions stresses the individual, regardless of the content of the message, and that even if the employees decide to take a break, the thought that the tasks are still pending – and thus someone is waiting for their completion, can cause more strain on the employee than

completing the incoming continuous tasks received via ICTs (Galluch et al., 2015). These findings show that the amount of ICT input that stress employees and the co-created obligations around how to relate to this ICT input stress the employees, and not the technological artefact or the technology environment.

At this point, one could probe whether the employees can simply use their autonomy over their time to control how they relate to constant input. A critical study from Organization Studies reveals that employees paradoxically use their autonomy to restrict aspects of their autonomy (Mazmanian et al., 2013). For example, answering emails outside working hours cost employees reduced control over their work, and working more hours decrease work-life balance, increase strain and work-family conflict. This study also finds that, despite the consequences, employees are reducing their autonomy to fulfil their (conscious or unconscious) obligations towards their colleagues, clients, and the organisation. These obligations are also created due to the norm of professionalism and engagement in the workplace, in which responsive employees are perceived as more caring and professional (Mazmanian et al., 2013).

A turn towards sociology is not only novel in technostress research but also stress research. Recent research on stress draws attention to "*treating stress as an outcome of broader social, cultural, and political forces is the most fruitful way of understanding its causes and understanding stress as a process*" (Peterson, 2018, p. 18).

Furthermore, Lazarus (2006) argues that there is a pressing need for stress research to work with emotions. He argues that emotions can reveal many aspects of the relationship between the individual and their environment. Likewise, Lazarus (2006) claims that stress and emotions are interdependent as where there is stress, there is also emotion (Lazarus, 2006). Although emotions are not the primary object of investigation in this research, they are considered and included both theoretically and methodologically, as I will explain in the next chapters.

Considering the arguments above, this PhD research focuses on exploring technostress from a sociological perspective. I do so by considering the environment in which technostress arises as the social environment around the usage of ICTs, and the extant or co-created obligations present in this environment. Obligations are viewed as an emotional blend, thus allowing for uncovering the emotions related to technostress. Therefore, the relationship between obligations and technostress is essential to understand how the social environment contributes to employees' technostress. I explore this relation using the sociological lens of obligations, which I describe in the next chapter.

3.3. Obligation

3.3.1. Historical lines for Sociology of Emotions and IS

1975 was a significant year for the field of sociology and emotions. After a long cultural period during the Boolean Age, as Kemper (1990) calls the postindustrial era, in which the cognitive perspective dominated the social sciences, emotions were promulgated as a part of

sociology and emotion emerged as a legitimate topic of inquiry (Kemper, 1990). This is a major milestone for the study of emotions, which was only peripherally addressed in scientific work, and often treated under categories such as attitudes or social class identity (Kemper, 1990). A new discipline, Sociology of Emotions, was born.

Information Systems is also a relatively new discipline, some considering the start of the discipline to be parallel with the widespread of using computers to process data in the 1950s (Avison & Elliot, 2006). However, Hirschheim & Klein (2012) argue that the first widely used historical treatment of the field was first published in 1981 (Dickson, 1981). As a discipline, IS isn't only looking at the technological artefact, but it also considers its impact on people and organizations, and often draws from disciplines such as sociology, psychology, or anthropology (Avison & Elliot, 2006).

I draw this parallel between the history of Sociology of Emotions and that of Information Systems to emphasize that the meeting of IS technostress research and Sociology of Emotions is inevitable. As described in the previous chapters, technostress has insofar focused on cognitive or physiological perspectives, leaving out emotions and sociological perspectives. This could be due to the early cognitive focus both in sociology and IS research, which have dominated both fields. However, including a Sociology of Emotions perspective can enrich our perspectives as I demonstrate in this PhD thesis.

3.3.2. Obligation

Since we could philosophise and write about it, obligation has been discussed in various forms. For example, one of the earliest examples of obligation is "The apology of Crito", written by Plato (Allen, 1980), which presents a form of legal obligation: should one respond to injustice with injustice? I mention this example to point out that obligation, in one form or another, unlike technostress, has been occupying our minds for quite some time, and this can be seen in the myriad of works that bear the word obligation in their title, from moral, justice, or religious standpoints. However, although much has been written about obligation, obligation is still used in many different ways, and obligation as a concept is scattered across many disciplines.

In my PhD research, I take a sociological standpoint on obligation. I draw upon the work of Clark (1990) who sees obligation as a mix of different emotions, rather than one emotion that can stand by itself. In my research, I define obligation as the feeling that we "ought to" do something or that we owe something to ourselves, others, or society as a whole. Clark (1990) emphasises that obligation is not only something imposed from the outside but that we would not answer these outside calls unless we consciously or unconsciously develop a sense of duty or responsibility in ourselves. Obligations are essential in ensuring group coherence and integrating the employee in the organisation, as it motivates employees to give and conform to group norms (Bergson, 1977; Poder, 2008). In the following chapters I discuss different types of obligations, covert and overt obligations, obligation as habits, obligations and emotions, as well as the mechanisms that make us fulfil our obligations.

Types of obligation in organisations

Although I define obligation in relatively simple terms, as a feeling that we "ought to", or a feeling that we owe something to ourselves, others, the organisation we are part of, or the society as a whole, obligation is very complex. There are many types of obligations that I consider relevant in an organisational context. Table 2 maps relevant types of obligations in the workplace based on works that lean towards sociology.

Types of obligation	Description
Continuance obligation	"Continuance obligation represents the extent to which employees wish to remain a member of a group or organisation due to the individual benefits that derive from the membership or the opportunity costs of leaving the organisation. This form of obligation implies a market-oriented or a transactional relationship between the organisation and the individual" (Lawler, Thye, & Yoon, 2009, p. 23).
Normative obligation	"Normative obligations are based on relational ties and can be defined as a sense of moral obligation towards an organisation. It involves a belief that it is right and proper to conform to the rules and serve the collective interests. Employees with a normative commitment are motivated by their sense of duty to the collective goals and are based in taken-for-granted elements of the social situation" (Lawler et al., 2009, p. 24).
Affective obligation	"An affective obligation is based on an emotional tie towards the organisation, and it indicates that the very appartenance to the group is perceived as an end in itself. This intrinsic value of the membership status is based on positive feelings (enjoyment, enthusiasm, elation) generated by participation in group activities and the degree to which the membership is self-enhancing" (Lawler et al., 2009, p. 24).
Social obligation	Obligations co-constructed in society. For example, the obligation to be a good citizen (Ross, 1970).
Status related obligation	Obligations dictated by the status in a group. For example, a leader has similar obligations to the rest of the group, plus additional obligations dictated by the group's leadership status (Ross, 1970).
Personal obligation	Freely and voluntarily making a promise, and thus regarding the self as obligated to do something (Ross, 1970).

Table 2 – Types of obligations

Covert and overt obligations

Obligations can be either covert or overt, as described in Table 3.

Type of obligation	Description
Covert obligations	A covert obligation is an obligation that is felt but not necessarily easily explained or made visible. For example, there might be specific ways in which people are expected to behave in an organisation, although no one has said precisely what these ways are (Ross, 1970).
Overt obligations	An overt obligation is an obligation that can be easily identified, explained, or made visible. For example, an employee might feel an obligation to answer emails during the weekend, as they have observed their colleagues doing so as well (Ross, 1970).

Table 3 - Covert and overt obligations

Obligation as habits

What form do obligations take? Obligations are embodied in our daily lives through habits (Bergson, 1977). According to Bergson (1977), our social lives consist of interlocking obligations towards society, our family, the organisation we work for, and other groups. Being embodied in habits, obligations are interwoven in the very texture of our daily lives. Daily, we carry out routines rooted in obligations - without these, it would be impossible to live a family life or follow a profession (Bergson, 1977). In this sense, obligations are carried out almost automatically, and we might not even be aware of them (Clark, 1990; Ross, 1970).

In my research, I discuss both conscious and unconscious obligation-based habits, which I define in Table 4.

Type of obligation-based habit	Description
Unconscious obligation-based habits	A conscious embodiment of our obligation (e.g. deciding to check our email before work to feel prepared for work).
Conscious obligation-based habits	An unconscious embodiment of our obligation (e.g. reaching to our phone to check email).

Table 4 – Obligation-based habits

It would be challenging to draw a definitive line between unconscious and conscious obligation-based habits. For example, one cannot pinpoint the precise moment in which a habit which is carried out consciously (e.g., deciding to check one's email before work to be prepared) becomes automated, and one reaches for their phone without much cognitive effort.

Bergson (1977) claims that it is a matter of habit for employees to obey their obligations. However, at times, the individual would find themselves in situations where several obligations would demand their attention simultaneously: for example, a father might find himself being solicited to care for his child while in a work meeting. In such a conflicting situation, Ross (1970) claims that we would pursue the obligation belonging to the group that enlists our loyalty the most. I would add that besides loyalty, there are other mechanisms in place, such as empathy, emotional avoidance, or pursue mechanisms, that make us carry out our covert or overt obligations, which I discuss in the next sub-chapter.

Emotions and obligations

In this PhD thesis, I work with emotions based on Wetherell's (2012) approach, a Professor in sociopsychology. In her approach, Wetherell sees affect and emotions as impossible to separate and that emotions are interwoven and conditioned by discourse (Ahmed, 2004; Wetherell, 2012). These considerations are disagreed upon by other sociologists. For example, Massumi (2002) assumes that affect is precognitive and that affect transforms and impacts discourse. However, Wetherell considers that seeing affect as precognitive is an oversimplification, and attempting to separate affect from emotions leaves researchers with no meaningful ways to work and engage with the empirical (Wetherell, 2012). Additionally, Wetherell considers:

"(...) specifying the exact relationship between affect and discourse is less interesting than investigating the range and entire patterning of affective assemblages operating in important scenes in everyday life along with their social consequences and entailments. Affect and discourse intertwine in these patterns to varying extents in varying ways."(Wetherell, 2012, p. 52)"

Wetherell defines affect/emotions as "embodied meaning-making"(Wetherell, 2012, p. 4) and argues that working with emotions in sociology enables researchers to brings the dynamic and the dramatic of everyday life back into the social analysis. This is a valuable way of thinking of emotions in relation to obligations. While obligation-based habits are ways for researchers to understand how obligations are embodied in everyday situations, emotions can provide a way to understand how we relate with and embody the fulfilment (e.g., with pride) or unfulfillment (e.g., with shame) of these obligations, as I explain in the next chapter "What makes us fulfill our obligations". Furthermore, Wetherell (2012) argues that an emotion is not an object inside the self, as basic emotions research assumes, but it is a relation to others, a response to a situation or the world. This last argument, emotions as a response to a situation, fits very well with Lazarus (2006) arguments that stress and emotions are inseparable. This is an aspect that I use extensively in my analysis of technostress experiences, as I present in the analysis chapter.

What makes us fulfil our obligations?

As discussed in the previous chapters, although we might not be aware of our obligations, we find ourselves habitually engaging in obligations, which are a fundamental part of our daily lives. However, what makes us fulfil our obligations? In this chapter, I discuss seven mechanisms that lead to individuals fulfilling their obligations: emotional avoidance and pursuit mechanism, freedom, empathy, loyalty, alter-casting, duty, and responsibility.

Emotional avoidance and pursuit mechanism

Sociologists claim that what keeps the employee obligated is a mechanism that can be described as avoiding negative emotions or pursuing pleasant emotions (Clark, 1990). According to Poder (2008), individuals act on their feeling of obligation to avoid unpleasant emotions, such as guilt, shame, fear, or embarrassment. Bergson (1977) adds that not following one's obligation, would generate moral distress for the individual, as they would experience an incongruence between their social and individual self.

These mechanisms are essential when discussing technostress. As mentioned in the "Technostress" chapter, a vital technostress coping mechanism is being able to vent or air out frustrations. This might be hindered by emotions such as shame or guilt, where employees are attributing failure onto themselves rather than onto the technological artefact (Ahmed, 2004).

The pursue mechanism refers to an individual seeking to fulfil their obligation due to anticipating desired emotions or outcomes, such as pride, relief, or satisfaction (Clark, 1990). The mechanisms of pursuit and avoidance can be either conscious or unconscious.

Freedom

Ross (1970) discusses that obligation and freedom cannot be treated without one another. He claims that although freedom and obligation can seem like contrasting concepts, obligation cannot exist without freedom. He explains that acting under obligation, contrary to acting under a law, represents acting freely. Acting under the law would imply that there is an outside force that makes one act in a certain way, and its violations would bring legal punishment. On the other hand, acting under an obligation is an act of freedom, in the sense that not fulfilling one's obligation may bring no punishment at all, and it can be a measure of the individual's self-discipline or self-restraint. However, as argued in the previous chapter, the punishment for not fulfilling one's obligations might come from the individual themselves or the collective in the form of shame/shaming or guilt/blaming.

However, the freedom to act, or autonomy, can also be deceiving, as I presented in the chapter 3.2.2. "Social environment in technostress research" . In one study made by Mazmanian et al. (2013), it is found that, paradoxically, in ICT rich environments, employees used their autonomy to engage and co-construct obligations outside working hours, that limited their time off work. Seen in this light, Mazmanian et al. (2013) study would teach us that employees would rather endure the consequences of being constantly available than the feelings that might occur from not fulfilling their obligations towards their colleagues, clients, and organisations.

Empathy

Another mechanism that motivates employees to fulfil their obligations is empathy. Ross (1970) argues that although we have obligations to behave in specific ways towards others (e.g., our colleagues or leaders), regardless of how we feel about them, how we feel about them or their situation might influence the extent or timing for fulfilling our obligations towards them. For example, an employee might choose to interrupt their work and help a colleague in need instead of feeling empathetic towards their colleague's situation.

Loyalty

Loyalty can be described as an emotional or intellectual commitment to someone or something, for example, towards the organisation we work for. Ross (1970) claims that loyalty is fundamental to performing one's obligations towards a group - and that although membership brings about obligations, these are fulfilled by employee's loyalty towards the group.

Alter-casting

Alter-casting is a mechanism through which individuals are reminded of their obligation, usually with reference to their position in society, organisation, or group (Clark, 1990). An obligation imposed from the outside (others) comes with a "title". So, for example, if in the organisation, employees who work outside working hours are referred to as motivated, then

employees might feel obligated to work outside working hours to show that they are motivated (Clark, 1990). An alter-casting of an obligation can be thus performed by attaching a title or an attribute to an employee, who will then feel compelled to take on the obligations that come with the title.

Duty

Duty can be explained as a cognitive push, a sense of urgency, the feeling to act, or an impulsion to act from within moral ground towards others or society (Clark, 1990). Duty is often used in military contexts, to describe a soldier's duty for their country. In this environment, one would go as far as losing their lives in order to fulfil their duty.

Responsibility

Responsibility is about response - response representing an answer. In that sense, a responsible person is a person who is answerable or accountable for their action (Ross, 1970).

Applications of obligation

We see applications or connections to obligations in, for example, Hochschild (1983). In her research book, Hochschild studies the emotions shown by flight attendants at work. She finds that flight attendants perform certain emotions during their work by, for instance, smiling in situations where this is contrary to what they actually feel (Hochschild, 1983). Hochschild named the phenomenon of performing certain emotions as emotional labour. Furthermore, she discusses feeling rules, which refers to the emotional repertoir that is acceptable in a given context, group, or situation. Emotional labor and feeling rules are considered critical theories within Sociology of Emotions (Kemper, 1990). I see emotional labour and feeling rules as closely connected to obligations, as employees consciously or unconsciously feel obligated to perform certain emotions. This theory has implications for technostress research as well. For example, airing out frustrations is shown to be an essential technostress coping mechanism (Ayyagari et al., 2011; Pirkkalainen et al., 2019). Considering that employees feel obligated to perform certain emotions during work might mean that they do not have access to all types of emotional coping mechanisms.

Another application could be in understanding constant connectivity. Wajcman & Rose (2011) find that employees spend an average of 5.5h daily on communication-related activities. They posit that the more rushed we feel, the more we turn to our digital devices to relieve the time pressure. In this example, we see how obligation-based habits are created to avoid certain perceptions (techno-overload) and pursue time pressure relief.

From the unconscious realm to the political arena

The individual needs to constantly negotiate both between their own needs and the constraints that obligations place on these needs and between overlapping obligations - even more so in the digital age, in which we can fulfil multiple roles simultaneously. Wolfe (1991) asserts that what makes it even more difficult for employees is when these obligations are

hazy or hidden - as it forces the individual to organise themselves and operate within certain obligations defined by an invisible authority. Ross (1970) mentions that we might even be ashamed or surprised when we discover the kind of obligations we have unconsciously and habitually fulfilled in some cases.

However, claims Ross (1970), when obligations are discovered and articulated, they can leave the unconscious realm and enter the political arena of the organisation, in which obligations can be negotiated and thus released if they do not serve the group.

3.4. Theoretical underpinnings used in my research

As previously discussed, the articles included in this PhD dissertation range from a book chapter (Article 4), conference articles (Article 2 and 3), abstracts (Article 1 and 5), and an extended abstract (Article 6). Some of these articles (e.g. Article 4) allowed for an expanded discussion and inclusion of more technostress and obligation theoretical aspects, while others discuss technostress and obligation in more general terms (e.g. Article 5 and 6). In Table 5, I present a brief overview of the theoretical aspects used in each article.

	Obligation	Technostress
Article 1	Obligation as a micropolitics of emotions strategy, as theorised by Clark 1990.	Technostress is inexplicit, emerges as an issue from this first exploratory experiment.
Article 2	Forms of obligations: duty, responsibility. Obligation mechanisms: Emotional avoidance and pursuit mechanism, and alter-casting	(Tarafdar et al., 2007) five technostress creators: techno-overload, techno-insecurity, techno-uncertainty, techno-complexity, techno-invasion.
Article 3	Forms of obligation: individual obligations, group obligations, overt and covert obligations. Obligation-based habits. Obligation mechanisms: Alter-casting.	(Tarafdar et al., 2007) five technostress creators: techno-overload, techno-insecurity, techno-uncertainty, techno-complexity, techno-invasion.
Article 4	Obligation mechanisms: alter-casting, avoidance and pursue mechanisms. Obligation-based habits.	A broader understanding of techno-stressors, e.g., the five technostress creators (Tarafdar et al., 2007), interruptions (Galluch et al., 2015), ICT usability (Ayyagari et al., 2011), or role ambiguity (Ayyagari et al., 2011), and techno-strain, e.g., fatigue (Galluch et al., 2015), workaholism, anxiety, feeling inefficient, or addiction (Salanova et al., 2013).
Article 5	Obligation as defined by Clark (1990). Applications of obligation: emotion rules.	All aspects of technostress are considered during the analysis (e.g., techno-stressors, techno-strains, coping, outcomes, inhibitors).
Article 6	Obligation as defined by Clark (1990). Applications of obligation: emotion rules.	All aspects of technostress are considered during the analysis (e.g., techno-stressors, techno-strains, coping, outcomes, inhibitors).

Table 5 - Overview of theoretical aspects used in articles

Considering the writing of the articles on a timeline, one could say that my understanding of technostress and obligation has also deepened from the writing of an article to another. Repeatedly writing and reading about technostress and obligation has enabled me to notice hidden details at first. Additionally, how I use the different theories is also influenced by my reviewers. For example, in Article 3, I propose the distinction between individual and group-based obligations to accommodate a reviewer request. This has proved to help the analysis, and I have since worked with that differentiation.

In this chapter, I have presented technostress and obligation theory at large while arguing for the need for a turn towards sociology in technostress research. Moreover, I have also presented the theoretical foundations used in the articles included in this dissertation. Finally, in the next chapter, I discuss methodology.

4. Methodology

In this chapter, I discuss the ontology and the epistemology of this PhD research. I discuss conducting qualitative and interdisciplinary research. Furthermore, I present how the data was collected and analysed. The chapter starts and ends with reflections on my worldview, data analysis, and being a researcher in the world.

4.1. Reflections on researcher's worldview

Reflecting on my academic journey and the way I see the world as a researcher, the following quote from Alice in Wonderland feels familiar to my process:

> " *Alice had not a moment to think about stopping herself before she found herself falling down what seemed to be a very deep well. Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next." (Carroll, 2011, p. 8)*

Pondering upon the moment before Alice falling down the rabbit hole reminds me of my point of no return, although, unlike Alice, I did not see the well I was about to fall through in front of me. The sentence representing the beginning of my academic journey is: "*With whose blood were my eyes crafted*" (Haraway, 1988, p. 585), which I have first read five years before writing this dissertation. Haraway poses this rhetorical question while walking her dogs, realising how differently she sees the world compared to her canine companion. I cannot even remember how I saw the world before reading Haraway's paper, as just like Alice, I could not go back to yesterday.

Haraway argues against "God's eye view" and instead argues for acknowledging both our complexity and positioning and that of what we gaze upon while creating science:

> "*I am arguing for politics and epistemologies of location, positioning, and situating, where partiality and not universality is the condition of being heard to make rational knowledge claims. These are claims on people's*

lives. I am arguing for the view from a body, always a complex,
contradictory, structuring, and structured body, versus the view from
above, from nowhere, from simplicity. Only the god trick is forbidden".
(Haraway, 1988, p. 589)

This is the position I also try to make evident in my research: that my view is a partial perspective, and not a universal one, shaped by the blood with which my eyes were, are, and continue to be crafted, as I see pursuing a PhD as a never-ending transformative and re-transformative journey. As my position today is different than when I have started my PhD, my perspective on the process is also different: I cannot say whether I know more or less. However, like Alice, I did have plenty of time to wonder while falling through the academic well (which I compare a PhD to be like) without knowing my destination. As such, now that I have reached the destination, the well I fell through appears different than while I was falling through it. Therefore, my PhD thesis is also a matter of choices, writing, and narrative composition, focusing on a coherent story and sense-making by looking backwards, rather than a chronological listing.

Furthermore, my motivation to research technostress is my own experience with stress, as I have been on stress sick leave twice, and technology has played a role both times. My own experience has given me much empathy for the employees and leaders I interviewed and made me attuned to their experiences. Additionally, researching stress and technostress has also been enriching and transformative for me. Working with obligations has led to me experiencing less stress in my life generally.

Another aspect that shapes my perspective is my academic background. While IS was a field I was already familiar with before starting my PhD, Sociology of Emotions was not. Thus, the journey of gathering and sense-making of obligation as a theory and how obligations function in an organisational and technostress context has been steep.
In order to make sure that I do not go on a digression, I have stayed close to the Sociology of Emotions community by taking doctoral courses and by sending pieces of my work to be discussed at their conferences, in which I could have access to ask questions and receive input on my work. I have gained much from these encounters, more than everything, confidence, and confirmation that obligation as a theory is not well-established in Sociology of Emotions.

4.2. Ontology: Systemism

The ontology that this PhD research is based on is systemism. This chapter presents what systemism is, how systemism emerged, and its relevance for this research.

Systemism is an ontology with its roots in Management Studies and was proposed as both an alternative and a way to mitigate the shortcomings of individualism and holism ontologies. Individualism sees organisations as aggregates of people and the core of organisations as determined by the employees' characteristics, meaning that it assumes that organisations have no other characteristics than those present in their members (Reihlen et al., 2007). On the other hand, holism sees the behaviour of the organisations and their members as inseparable and assumes that organisational structures cannot be explained through looking at the

individuals but rather through understanding the collective dynamics (Reihlen et al., 2007). The main criticism of both holism and individualism is that they acknowledge neither that individuals are interrelated nor the relation between the macro-level (holism) and the micro-level (individualism) (Bunge, 2000).

Reihlan et al. (2007) describe systemism ontology as an ontology that views organisations as comprised of individuals, processes, structures, and environmental constraints. In order to understand the organisation and the employees, aspects of both holism and individualism must be integrated, as systemism embraces both individual (micro-level) and organisational (macro-level) explanations (Reihlen et al., 2007). Furthermore, systemism adopts a whole systemic worldview, in which everything is a system or a potential component of a system (Bunge, 2000).

The current PhD, in this ontology, systemically approaches technostress by looking both at the individuals (micro-level) and the structural features of the environment that these individuals operate in (macro-level). The transactional approach to stress fits with this ontology. In the transactional approach, stress is viewed as embedded in the process involving individuals (micro) transacting with their environment (macro) and not a factor that resides in neither the individual (the micro) nor the organisation (macro).

4.3. Epistemology: Interpretivism from a hermeneutical perspective

The epistemology of this PhD research is interpretivism under the hermeneutics school (Alvesson & Sköldberg, 2017).

Hermeneutics as a word has its etymology in Greek, from the word "*understand*" or "*interpret*", which suggests taking something from the outside and attempt to understand it (Crotty, 1998). Under the hermeneutical perspective of interpretivism, the reader and the text are interconnected through the act of interpretation and sense-making. Thus, understanding a social fact is to interpret it, which is then shared with the world (Crotty, 1998). Under this perspective, there is no objective reality or truth that can be discovered, but rather what is meaningful in the situation studied. Thus, this PhD research is not concerned with objectively understanding the obligations connected with technostress, but rather the relevant obligations in the given situation.

Hermeneutics is concerned with the "*parts*" (e.g., a text to be interpreted, such as interview transcriptions) and the "*whole*" (e.g., the context of the text, including the author and its reader), and the connection between the "*parts*" and the "*whole*". In the case of this PhD study, the "*parts*" are data used in this research: the transcriptions of the interviews, the written diary, and official public documents. The "*whole*" represents the context of this data, the employee interviewed, the organisation and the society the employee is part of, as well as technostress and obligation theory.

Another relevant aspect of interpreting is empathy: being able to transfer oneself into the situations one reads about (e.g., interview transcriptions). Alvesson and Sköldberg (2017) argue that when interpreting, one has to move away from analysing from the outside and use one's intuition, as "*only intuition can fully assimilate the mental universe of another human*

being" (Alvesson & Sköldberg, 2017, p. 118),. Thus, some essential elements in this PhD research while interpreting the data have been attunement and connecting to my intuition. As I explain in the chapter "Data analysis", this PhD research comprises rich data, and the analysis has spanned over several months, split into different periods. Therefore, being consistently attuned and intuitive in relation to the data on the duration of the data analysis phase has required effort.

Furthermore, Alvesson and Sköldberg (2017) argue that the result of using one's intuition when connecting with the text that one interprets, complimented with the readers' broader understanding, could result in one of the main themes of hermeneutics: interpreters might understand the agents better than they understand themselves. Similarly, in this PhD research, the reader can see traces of this theme. For example, one of the main findings of this PhD research is that employees did not know of technostress before being invited to participate in an interview, nor could they put words on their experiences. As the interpreter of this data, and being attuned to the employees' experiences (both as a researcher and someone who has also experienced stress) has allowed me at times to deeply understand employees' experiences, perhaps more profound than they seem to understand them.

4.4. Interdisciplinary research

" *Disciplinary boundaries (…), do not have sharp edges."* write Tarafdar & Davison (2018, p. 525), although, at the beginning of this PhD research, I would naively ask: "*What is IS?",* "*Where does it start, where does it end?".* The deep embeddedness of IS in many societal and human aspects poses a challenge in answering these questions. Nevertheless, simultaneously, IS plays an essential role in the solutions to complex societal problems, such as technostress, which brings in the challenge of an ever-advancing disciplinary boundary (Tarafdar & Davison, 2018).

Interdisciplinary research develops new concepts at the intersection of different disciplines and draws from IS and other disciplines (Tarafdar & Davison, 2018). Interdisciplinary research arises from the interplay between different disciplines and proposes new ways of understanding a complex problem (ibid). The current PhD research finds its home in IS while drawing upon Sociology of Emotions. Additionally, I also draw upon stress research to better understand technostress epistemologies and conceptualisations, and Organisation Studies to understand better the social structures that impact how employees relate to ICTs and each other. As this PhD research draws upon multiple disciplines and aims at developing technostress as a concept that exists at the intersection between these disciplines, it can be said that this PhD research is interdisciplinary. Furthermore, this current PhD research develops new ways of understanding technostress as a complex phenomenon in organisations and society.

Moreover, Tarafdar et al. (2019) argues that the IS technostress research has a significant potential for contributing both to technostress research and stress research, considering the discipline's long history with socio-technical systems and understanding how humans and technology interact in the context of work.

4.5. Qualitative research

The empirical part of this PhD research is based on qualitative data. In this chapter I argue for the importance of conducting qualitative research in exploring technostress.

An argument for using qualitative research is that the current PhD research aims at understanding the social environment in which technostress exist, as well as understanding technostress from the perspective of the participants and their particular social and organisational context, which would be largely lost if the data would be quantified (Kaplan & Maxwell, 1994). Additionally, as Lazarus (2006) emphasises, to understand stress profoundly, it is necessary to get as close as possible to the employees' experiences through interviews, life narratives, or diaries.

Furthermore, on the one hand, I argue that qualitatively collecting data helps me build themes not existing in prior research, and which I believe to be necessary when researching a novel topic such as technostress. On the other hand, empirical studies on technostress are predominantly based on quantitative data (Tarafdar et al., 2019), and only recently we see a move towards mix-methods and qualitative research (e.g., Salo et al., 2020).

It is important to note that this PhD research is focused on technostress amongst knowledge workers in Denmark. An argument for focusing on a specific cultural context is that it has been shown that culture plays a significant role in what constitutes technostress. For example, two similar empirical studies on technostress impact on employee productivity have shown different results on the population in China compared to North America (Tu, Wang, & Shu, 2005; Tarafdar et al., 2010). Another argument is my proximity as a researcher to the Danish cultural context.

4.6. Data collection

In this chapter, I present the data collection process and types of data included in each of the research studies and articles.

Data collection for this PhD research took place between 2017 and 2020. The types of data collected are interviews, focus group, official public documents, and diary data. In Figure 2, I present the succession of this PhD research data collection. The two downwards arrows from Research Study 1 symbolises that the insights derived during Research Study 1 lead to Research Study 2 and Research Study 3, while Research Study 2 and Research Study 3 do not directly inform each other.
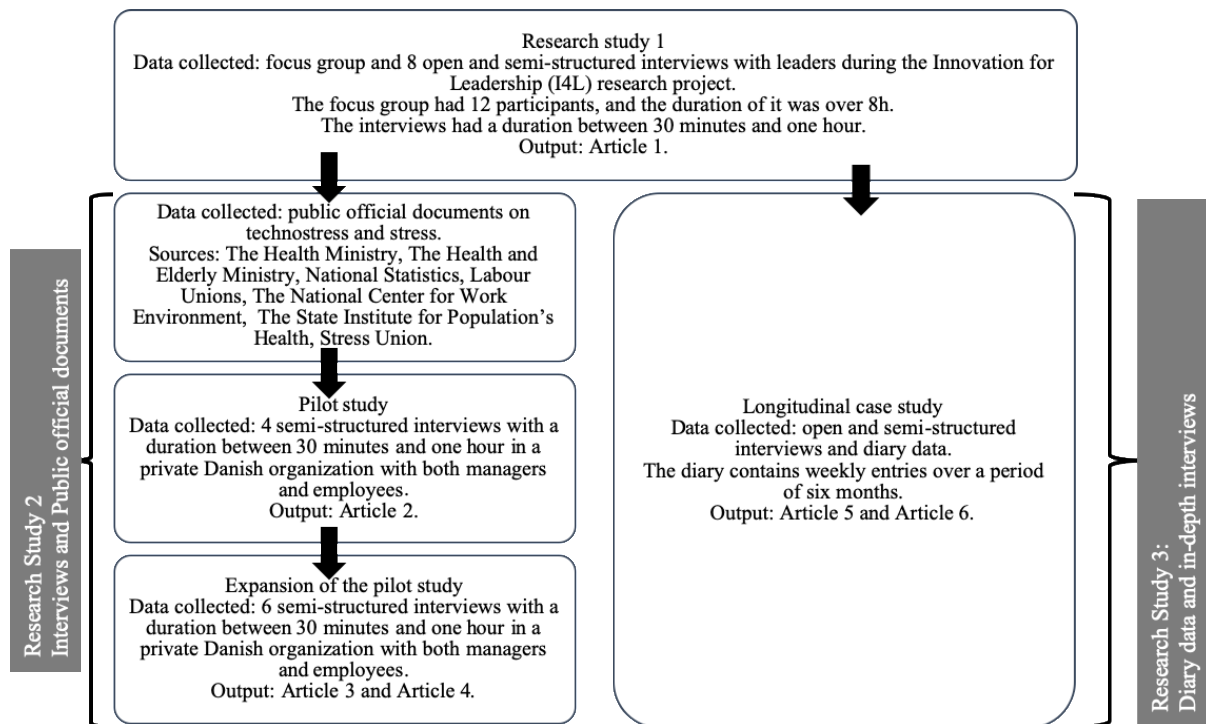
Figure 2 - Data Collection

The data collected for Research Study 1 comprises a focus group and semi-structured interviews. The data was collected during the project Innovation for Leadership using a snowball sampling (Bryman & Bell, 2011). The I4L project engaged with leaders from Danish companies who wanted to learn more about how to lead in a digital age. The participants were found through the university's network of practitioners and the researchers' professional network. The data and insights gathered during this phase served to inform Research Study 2 and Research Study 3. In particular, this phase drew my attention towards technostress and obligation as leaders discussed their constant availability, which they justified when working with employees from multiple time zones. The data collected during this phase led to Article 1.

Based on the observations and Article 1 written during the first research study, I started collecting official documents to see how the Danish official authorities discuss technostress. Next, I designed a pilot study to gather semi-structured interviews from an organisation in Denmark using a snowball sampling (Bryman & Bell, 2011). The university has sent an open call to practitioners to participate in my research study. The contact person from the organisation has then recommended whom to interview, and these interviewees recommended the next participants. The purpose was to explore how to conduct interviews on technostress and obligation with employees and what themes would emerge from the data. As the data collected during this pilot study was rich and provided many promising themes, I decided to expand the pilot study with more interviews. This research study also led to Article 2, Article 3, and Article 4. Article 2 is based on the pilot study data. Writing and receiving feedback on this article from the reviewers and my academic peers motivated the expansion of my data collection and the writing of Article 3 and Article 4. What was surprising during this Research Study 2 was that none of the interviewees heard the term

technostress before. As they were allowed to discuss their experiences of and with technostress freely, the interviewees seemed almost relieved to be able to discuss their daily nuisances, to be able to name them, and to be given a space in which they could talk about it.

Research Study 3 was inspired by the Mid-Way evaluation committee ideas and a paper from the curricula of a doctoral course I took: Muhr, De Cock, Twardowska, & Volkmann (2019), in which an entrepreneur was asked to write their diary for a more extended period. The participant was recruited from my network, similar to how Muhr et al. (2019) recruited their participant. While Research Study 2 informed me about the themes present in the organisations that participated, and their recurrence amongst interviewees, Research Study 3 allowed me to follow how obligations are shaped over a longer time. Open and semi-structured interviews fit well with research where it is crucial to be close to participants perceptions and accounts (Bryman & Bell, 2011). The participant wrote her diary from the moment she starts working in a news organisation. This provides insights into how the employee takes upon the obligations already present in the social environment she joins and how these evolve.

4.7. Data analysis

In this chapter, I review the different methodologies and types of analysis employed in each article, which I summarize in Table 6.

	Methodology and analysis
Article 1	Semi-structured interviews. Thematic analysis on verbatim transcriptions of semi-structured interviews.
Article 2	Exploratory single case study. Content analysis on verbatim transcriptions of semi-structured interviews.
Article 3	Semi-structured interviews. Content analysis and two rounds of coding.
Article 4	Embedded case study, with two units of analysis. Content analysis and three rounds of coding.
Article 5	Longitudinal case study based on diary data and interviews. Life narratives approach.
Article 6	Longitudinal case study based on diary data and interviews. Life narratives approach, with two rounds of coding.

Table 6 - Methods and Analysis for each article

Article 1, Article 2, Article 3, and Article 4 are concerned with looking into the breadth of technostress as a phenomenon and the obligations connected with technostress. Article 5 and Article 6 work on a longer time horizon and consider technostress and obligations over a more extended period. In the next subchapters, I present my analysis process for each of the articles included in this dissertation. In Table 7, I describe the types of analysis and coding.

	Description
Types of analysis	

Thematic analysis	A type of analysis of qualitative data with a focus on the frequency of the occurrence of specific incidents, words, or phrases (Bryman & Bell, 2011).
Content analysis	A type of analysis of qualitative data which seeks to quantify content and works with predetermined categories in a systematic manner (Bryman & Bell, 2011)
Life narrative	According to a life narrative approach, emotions and self-perceptions are not necessarily addressed directly and explicitly, but the focus is instead on plots (Riessman, 2008).
Types of coding	
Structural coding	"Structural coding applies a content-based or conceptual phrase representing a topic of inquiry to a segment of data to both code and categorize the data corpus." (Saldaña, 2009, p. 66)
Pattern coding	A type of coding in which the focus is on finding patterns becomes a code (Saldaña, 2009).

Table 7- Descriptions of types of analysis and coding

4.7.1. Analysis in Article 1

Article 1, titled "*Sociology of emotions in digital leadership and communication*", is based on a thematic analysis of semi-structured interviews. The text (semi-structured interviews) was read to find themes connected to the micro-politics of emotions (e.g., obligation).

> '*I try be there around 9 am, (...) we have a general management meeting with US from 4.30 – 6.00 pm – so we are going to hang around at least until 6 pm (...) Then **in the evening I would grab my phone** and see if there are any emails or whatever and then **get online and answer their questions** either on Slack or an email **to make sure we don't waste another 24h with the feedback***.' (Middle-manager)

Figure 3 - Sample quote from Article 1

The quote presented in Figure 3 is the quote that first drew my attention to notice the connection between technostress and obligation. Although I was not familiar with or researching technostress at the time of the analysis, this particular quote made me wonder why the leader works almost the whole day. The description of a working day for the leader hints towards constant connectivity: "*in the evening I would grab my phone*" and "*get online and answer their questions*". However, what seems interesting here is the reason for this behaviour: "*To make sure we don't waste another 24h with the feedback*", which was added under the theme of obligation.

4.7.2. Analysis in Article 2

Article 2, "*People on The Other Side Are Waiting: Work Obligations and Shame in ICT-Related Technostress*", is based on content analysis of verbatim transcriptions of interviews collected in the pilot study of the Research Study 2. Data analysis was approached with a preliminary reading of the text (the transcriptions of the interviews), and one of the texts was read and coded by both authors to discuss and decide how the coding should be approached. At this stage, the authors discussed approaching the text and what is to be understood as a technostress perception from the text. The decisions of considering specific quotes as technostress experiences or not were based on whether both authors agreed or if one of the

authors would have a strong enough argument to persuade the other author of the specific quote being a technostress experience. This phase has been paramount for writing Article 2, but also Article 3 and Article 4.

Next, the interviews included were coded, and the codes were clustered in themes. For each theme, the authors picked a quote that was representative in order to interpret it. Below, I present a sample quote from Article 2 to demonstrate how the interpretation was conducted. I choose the quote that inspired the title of Article 2 in Figure 4.

> 'You can classify it as technostress [...] It's not only that you're getting angry and might act irrationally because of it, but well, if you're in time pressure, say you're preparing for some meeting, it's in ten minutes, and you wanted to open some presentation and also some application, and also connect to some server, prepare everything on your screen to be ready, and something doesn't work, then, of course, it's irritating, and then you're really stressed, and pressed on time, and **of course the source it's the technology that doesn't work as it is expected**, [...] **people on the other side are waiting**, and they are writing on some other channels, "**Are you there**? We are waiting for you."' (Employee)

Figure 4 - Sample quote from Article 2

This quote was chosen due to the strong emotions that the employee explicitly describes as experiencing in his meeting with an ICT error, e.g., "*you're getting angry and might act irrationally",* and added to the theme "*Technology resilience*".

In this quote, we have highlighted, "*of course the source is the technology that doesn't work as it is expected*," as this phrase is explicit about the source of the employee's anger. Furthermore, we highlight "*people on the other side are waiting*", as it seems like the expectations of others intensifies the employee's experience of technostress. This example showcases the connection between the individual and the group, while the employee experiences technostress and obligations.

4.7.3. Analysis in Article 3

Article 3, "*A Cautionary Tale: How Co-Constructed Work Obligations Lead to ICT-Related Technostress*", is based on content analysis of semi-structured interviews. The coding was performed by using the qualitative software Atlas.ti. We started the analysis from the five technostress creating dimensions by Tarafdar et al (2007). Departing from the five technostress-creating dimensions, we coded 116 quotes in which interviewees suggest experiencing technostress by either using the word "*stress*" or evoking intense emotions (e.g., anger, fury, frustration) in a first-round of structural coding. The second round of coding is pattern coding, in which we look at the obligations that could be teased out from the quotes under each of the technostress creating dimension. Obligations were teased out by looking for verbs that indicate that the employee feels they ought to do something or by looking for emotions in discourse (e.g., employees disclosing or indicating feeling anger).

> *"We really **have to be much more conscious about spending your time right**, because **the level of distraction is pretty high**, right. [...] So, I **think it requires quite a bit of discipline** to not go into distraction mode and to avoid **stress** related to that" (Top manager).*

Figure 5 - Sample quote from Article 3

For example, in the first round of structural coding, the quote above is coded under techno-overload due to the top manager reporting that "*the level of distractions is pretty high*" and "*stress*". In the second round of pattern coding, the obligations teased out from the text are: "***have to** be much more conscious about spending your time right*", and "*it **requires** quite a bit of discipline*", due to the verbs "*have to*" and "*requires*", which are used in relation to "*distraction mode*". This quote exemplifies the connection between techno-overload and what the employee feels is his obligation: to be disciplined and conscious about spending their time.

4.7.4. Analysis in Article 4

Article 4, "*Sociological Mechanisms Behind ICT-Related Technostress in the Workplace*", is based on an embedded case study with two units of analysis. The first unit of analysis comprises archives and reports about stress published by the Danish government between 2007 and 2009. The second unit of analysis is based on semi-structured interviews.

The coding of the semi-structured interviews was performed by using the qualitative software Atlas.ti. The first round of coding is structural coding, in which we code the text based on employees' suggestions of technostress. Technostress in Article 4 is viewed in a broader perspective than in Article 3. For instance, in Article 3, we only consider the five technostress creating dimensions (Tarafdar et al., 2007), while in Article 4, we consider additional techno-stressors, such as ICT usability (Ayyagari et al., 2011), and techno-strains, for example, fatigue (Salanova et al., 2013; Salo et al., 2020; Tarafdar et al., 2007). The first round of coding result in 130 quotes. Due to including more technostress aspects, the quotes coded could have multiple technostress related codes associated with them.

In the second round of coding, we look at each quote coded in the first round, and we code these quotes with obligation related codes, resulting in 34 obligations. Finally, in the third round of coding, pattern coding, we develop themes and sub-themes based on the obligation codes found through identified patterns of relatedness and commonalities. This last round of coding included effort on both authors to discuss, agree, and disagree on themes and sub-themes and required multiple rounds of assessment.

While Article 3 departs from techno-stressors and aims at finding obligations connected to these techno-stressors, Article 4 adds an extra step in the analysis. This extra step is finding the obligations associated with technostress in a broader perspective and then focusing on creating themes and sub-themes centered around these obligations. Below I showcase an example from the analysis. In Figure 6, I present a sample quote used in the analysis, and in Figure 7, I present the process of coding this sample quote.

> *Another thing you have to administer is like, that the notifications and how they disturb you. But, you know, on the other hand (...) people should be able to reach you if they need (you)' (Employee)*

Figure 6 – Sample quote from Article 4
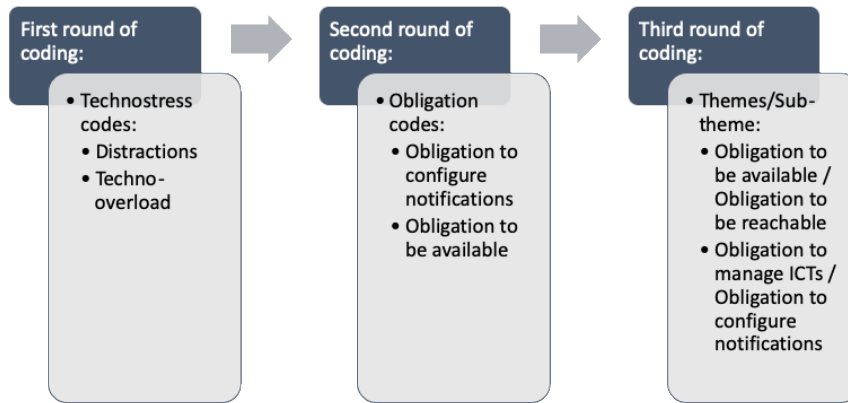
Figure 7 - Coding process for Article 4

As depicted in Figure 7, in the first round of coding, the quote was coded with the technostress codes: distractions and techno-overload, as the employee signals disturbances in the workplace (distractions) connected with ICTs and incoming information flow which disturbs (techno-overload). Next, we code the quote with the obligations: "*obligation to configure notifications*": "*you have to administer notifications*", and "*obligation to be available*": "*people should be able to reach you if they need you*". Finally, in the third round of coding, this quote was clustered in two themes: the theme "*obligation to be available*", sub-theme "*obligation to be reachable*", and the theme "*obligation to manage ICTs*", sub-theme "*obligation to configure notifications*". As it can be noticed, this quote fits under two obligation themes and two sub-themes, and this aspect is treated in the discussion of Article 4 as overlapping obligations.

4.7.5. Analysis in Article 5 and Article 6

Article 5, "*I was struggling with my own guilt for not being able to log in. Techno stressful constructions of obligation in the digitalized workplace*", is based on a longitudinal case study and has a life narrative approach to the analysis. In this article, technostress is viewed in a broader perspective, similarly to Article 4. Article 5 is an abstract, which later was developed into an extended abstract, thus resulting in Article 6, "*Between an online Friday bar and efficient work – A life narrative of obligation and technostress in organizations*". As these two articles are closely related and use the same data, I treat them together in this sub-chapter.

In the analysis for Article 5, I have performed a preliminary round of coding considering both technostress and obligations codes simultaneously. These codes were arranged in themes of experiences, faithful to the life narrative approach.

> *"On my first day – **the login details they gave me for my new work PC did not work**. There I was, **thinking that I was making repeated typing errors in front of my new colleagues**. I had to breathe deeply and convince myself that my fingers were not failing me on the keyboard. I must have encountered my first issue already. Great! Nothing is ever easy, right. A colleague confirmed that I was typing in the correct details and that it was not my fault. **She apologized on behalf of the system and looked a little embarrassed as well**. Maybe she taught that I was judging the company while actually **I was struggling with my own guilt for not being able to do something as simple as log in**."* (Middle manager)

Figure 8 – Sample quote from Article 5

As an example, the sample quote from figure 7 is coded with the technostress code ICT error: ("*the login details they gave me for my new PC did not work*"), and obligations code related to emotional pursue and avoidance mechanisms: shame ("*she apologized on behalf of the system and looked a little embarrassed as well*"), guilt ("*I was struggling with my own guilt for not being able to do something as simple as login*"), and self-doubt ("*thinking that I was making repeated typing errors*"). This code is then clustered under the theme: "*when technology doesn't work, it leads to feelings of shame, guilt, and self-doubt*".

Article 6 is a continuation of Article 5. Furthermore, Article 6 is an extended abstract, and it promises a more sophisticated analysis at a later stage, in a forthcoming publication, by using several rounds of coding and the qualitative software Atlas.ti. However, to write the extended abstract, I have performed one round of coding based on life narratives.

> *"The office secretary now pulls in my other mentor for help. I walk in on both of them **discussing the application in frustration** and look up at me like "speaking of the devil". Jokingly my second mentor says "how dare you ask for access to application XXX!" I laugh nervously and give them my warmest and most charming apology. I decided not to tell them about my own struggles (...) as they are preoccupied with the options within the application on the screen. Theatrically, I step away slowly as if they could snap out and bite me at any second. I realize that this is how we all deal with our frustrations over technology - by using humor"* (Middle manager)

Figure 9 – Sample quote from Article 6

The quote in Figure 9, is an example of an ICT error and the experience of the middle manager in dealing with this ICT error while asking for help from the office secretary and her two mentors. Although sounding frustrated as the middle manager perceives it "*discussing the application in frustration*, " one of the mentors attempts to make a joke. The middle manager apologizes for having encountered the ICT error, thus placing the blame on herself. Furthermore, she uses humour and self-blame when communicating about the ICT error. The emerging theme here is related to emotion rules and obligations in dealing with technostress.

4.7.6. Researcher's reflections on the data analysis

Collecting interviews and analyzing them proved to be a very contrasting experience to collecting and analyzing diary data. As described in chapter 4.3. "Epistemology: Interpretivism from a hermeneutical perspective", in the hermeneutical approach, it is important to consider both the author and the reader while interpreting the text (Alvesson & Sköldberg, 2017). Collecting diary data has been a more distant process than collecting

interviews. In order to collect interview data, my presence was required, while the diary data has been a solitary process for the middle manager who wrote her diary weekly.

Thus, the text of the interviews that I analyzed in my role as a reader includes traces of my presence as well, as I ask questions and thus steer the conversation in what seems attractive to pursue in the moment.

Talking about obligations in the workplace with a stranger (the Researcher) can be difficult. During my interviews, I experienced performing emotional work, as I use myself as a tool to inspire interviewees to open up about otherwise taboo topics. However, my interviews proved to be sources of very rich and interesting data. Perhaps, one reason for this is that using empathy, being vulnerable, attuned, open to what employees want to disclose at the moment (as semi-structured interviews allow for), has motivated my interviewees to provide rich accounts, sensitive stories, and even disclose things they are ashamed of (for example, disclosing feeling shame about giving a bad example to their children by being on their phone during dinner or family time).

Another aspect of collecting data is the therapeutic effect it has on participants. It seemed like the interviewees appreciated reflecting on their experiences and how it affects them, as the quote in Figure 10 suggests. Here, the middle manager who write her weekly diary, described writing about technostress incidents as a healing process, which "*feel(s) better afterwards"*.

> "*So, I think the process actually it was (...) a systematic way to reflect about incidences that I've had and feelings I've had where I would usually-- I think I'd let them pass, um, or even perhaps try to suppress them. But in a weekly, on a weekly basis, like, actually getting to write about it, reflect about it (...) it's kind of healing (...) it made me work through some things and figure out some connections that I don't think would have otherwise realized, (...) it feels better afterwards having reflected on them and then letting them go, as opposed to just letting them pass through, or through me in this way, right."* (Middle manager)

Figure 10 – Quote on the process of writing a weekly diary

The analysis of the interviews proved to be less complicated than that of the diary data, as I could remember facial expressions, intonations, and the conversation was more structured. On the other hand, interviewees expressed fewer emotions than can be seen in the diary data. Perhaps not reminding the participant of my presence allowed her to access her emotions and vulnerabilities deeper than if we were face to face. This resulted in Article 5 and Article 6 being more focused on emotions related to obligation and technostress than the other articles. Going back to Lazarus' (2006) claim that emotions and stress cannot be separated, this becomes obvious in the diary data, in which the participant is very generous in describing her emotions in relation to technostress.

Another aspect is related to interpreting and coding the data consistently. The word coding is often used in computer science to signal writing programming languages, which is a relatively rigid and programmatic process. Using the word "coding" can be misleading in the context of analyzing qualitative data, which requires a high degree of interpretation, as opposed to writing programming language. As Alvesson and Sköldberg (2007) point out, it is

important to be empathic in interpretive research and use one's intuition. As the analysis for Article 3 and Article 4 spans extended periods, I have often wondered how to stay consistent in my interpretation every day as I approached the text. Could it be that what I would code today as techno-complexity will prove to look more like techno-overload tomorrow? Working with constructs like technostress and obligation in coding the data means that I do not work with definite categories but rather with categories that have blurred lines, and often, a quote could be included in multiple categories.

Technostress and stress are issues that affect employees negatively, and I could feel at times the responsibility of being consistent in my analysis and being cautious in my interpretation weighing on my shoulders. Both Cooper et al. (2001) and Haraway (1988) warn that when we make claims and produce knowledge, we make claims about people's lives.

Thankfully, Haraway (1988) also offers a way, which is to be aware and honest of our positioning, which is "*the view from a body, always a complex, contradictory, structuring, and structured body*" (ibid, p. 589). In my attempts to stay consistent and attuned to my intuition and empathy, I sometimes used meditation to empty my mind and become more present with the text. When too much time passed after my morning meditation, I could sense categories becoming more blurred and my intuition fading, and I would need to step away from my analysis process to either meditate again or revisit the following day. Thus, I see the analysis process as a consistent effort to stay present with the text rather than a consistent or unitary practice in itself.

4.7.7. Being a researcher in the world

Although in this dissertation I present the collected data in boxes with sharp edges, being a researcher in the world means that I am constantly exposed to data relevant to my research, for example, while teaching, reading news, or having conversations with peers. Technostress proved to be a very relatable topic, and very often, when I would talk about my PhD topic, I would be met with personal stories about technostress.

Furthermore, at the beginning of my PhD, I focused on leadership, which produced three articles, two of which were never published. Therefore, writing this thesis and being a PhD researcher involves decisions of what to include or exclude. I would describe the edges between what is included and what is excluded as porous, meaning that what was excluded has impacted my understanding and provided me with a broader context for technostress.

For example, the articles that are not included in this dissertation discuss leadership. Moreover, in the first year of my PhD, I have been part of the project I4L, in which we have interacted and conducted workshops for leaders, and I have also been teaching lectures with a focus on leadership and taken a doctoral course in "Advanced Leadership Topics".
My research, interactions, and teaching leadership have enabled me to see technostress in a broader context, but it has also set me on the path of researching technostress.

In addition, technostress is a somewhat relatable topic, prompting my conversation partners to disclose their personal experiences and attracting interests from my professional network, think tanks, startup companies, or journalists. During these conversations, I have conducted

many thought experiments. As an example, one such thought experiment included giving a talk at The National Center for Work Environment in Denmark. During this talk, I could check with the researchers working there my understanding of how stress is tackled in Denmark.

5. Results

In this PhD research, I set to answer the following main research question:

What can the sociological lens of obligation reveal about ICT-related technostress in organizations?

The articles included in this dissertation have answered different research questions that contribute to the main question, as I will explain below. First, Table 8 summarizes my main findings from each article and the research question that led to these findings. Then, in the following subchapters, I discuss the findings listed in Table 8 about each article's research question and the main research question of this PhD thesis.

Main RQ	Articles' RQ	Main results from each article
What can the sociological lens of obligation reveal about ICT-related technostress in organizations? (main RQ)	How are micropolitics strategies of emotions affected by technology in the leadership-follower interactions? (Article 1)	(1) Micropolitics of emotions (obligation is one of the strategies), as an interpretation tool for interviews can help uncover emotions otherwise inexplicit in interviews; (2) Remote work makes it more difficult for leaders to elicit obligation from followers; (3) Obligation as an emotional blend is a driver for constant connectivity.
	How do felt obligations contribute to ICT related technostress in organizations? (Article 2)	(1) Employees take on themselves the ideals and norms of technology being functional and seamless. (2) When ICTs do not live up to the ideal, employees experience shame and guilt. (3) Employees feel it is their obligation that ICTs should perform seamlessly. (3) Obligations around the usage of ICTs are co-constructed between employees. (4) Multiple running communication channels can lead to the co-construction of new obligations, such as feeling obligated to follow all the communication channels and creating strategies to do so. (5) Unlimited work: employees feel obligated to be available, to manage themselves what others can expect of them in their free time. (6) Technology resilience: there seems to be an obligation to be more resilient alter casted on the employees. (7) Employees feel an obligation to perform invisible work in the form of troubleshooting ICTs malfunctioning.
	What can the sociological analytical concept of obligation reveal about ICT-related technostress in organizations? (Article 3)	Employees feel an obligation to: (1) relate to constant input, (2) keep an overview over their inbox even when off work, (3) manage ICT-related distractions, (4) constantly connect, (5) reduce stress for themselves and others, (6) monitor ICT channels, (7) administer ICTs, for example, notifications, passwords, or upgrades, (8) constantly learn.
	What is the knowledge that the sociological lens of	Employees feel an obligation to: (1) be available, (2) have an overview,

		(3) be productive,
	obligation can bring to the understanding and handling technostress? (Article 4)	(4) ensure good communication, (5) manage individual well-being at work, (6) manage a work-home balance, (7) manage ICTs, (8) There is an obligation in the workplace for ICTs to work as expected. (9) Stress is viewed at a society level from a response perspective, thus putting the responsibility on the employees to become more resilient.
	What is the role of obligation in how technostress is constructed or dealt with in organizations? (Article 5)	(1) When technology does not work as expected, it leads to feelings of shame, guilt, and self-doubt (2) The employee identifies with the failure or success of technology (3) The individual deals with technostress through humour and sarcasm, as she feels that she is not allowed to feel anger or frustration
	How are the obligations that lead to technostress constructed in the workplace? (Article 6)	(1) When technology does not work as expected, it leads to feelings of shame, guilt, and self-doubt (2) The lack of distance between the technological artefact and the employee leads to an over-identification with the success or failure of the technological artefact (3) The individual deals with technostress through humour and sarcasm, as she feels that she is not allowed to feel anger or frustration (4) The employee deals with technostress by herself (5) There is a tension between not waiting time and socializing in work purposes, as the latter is not emphasized as a valuable part of one's work

Table 8- Main findings

5.1. Article 1

As presented in chapter 2. "Research Design and Research Question", Article 1 provides the research direction of this PhD research. The research question posed in Article 1: "How are micro politics strategies of emotions affected by technology in the leadership-follower interactions?" yields intriguing findings, for example, that obligations are connected to the techno-stressor constant connectivity, as I also clarify in chapter 4.7.1.

Another critical finding at this stage is that using micropolitics of emotions, particularly obligation, can help the researcher uncover inexplicit aspects in interviews. For instance, using obligation as an analytical lens provides the researcher with a tool for uncovering social elements related to technostress. In the analysis chapter, I provide an example in which I display how the techno-stressor constant connectivity is connected to the leader's obligation of not delaying the overseas team. The obligation of not delaying the team working on a different time zone prompts the leader to engage in obligation-based habits, thus resulting in the leader almost working a double shift. Some of these obligation-based habits are hurrying home after work hours to attend a work call with the team in the USA, check emails after dinner, and connect on her work computer to resolve additional tasks.

Furthermore, remote worker hinders leaders in eliciting obligations from their followers. For example, one of the leaders explains how it is no longer possible to tap someone on their shoulders (i.e., elicit obligation) to receive a faster response to an email.

5.2. Article 2

In Article 2, I answer a "how" research question: "How do felt obligations contribute to ICT related technostress in organizations?". I choose a "how" question to focus on explaining and exploring the relationship between obligations and ICT-related technostress, and I choose the verb "contribute" to accentuate the focus on investigating this relation.

My findings suggest that obligations intensify the way employees' experience techno-stressors. For example, I find that ICT errors trigger emotions of shame and guilt in employees, particularly when the employee experiences that his colleagues are waiting for him. This can be due to employees feeling obligated to take upon themselves the idea that technology is seamless. As such, it seems that this obligation intensifies employees' experience of technostress when they encounter the techno-stressor ICT errors. Furthermore, apart from employees' identification with technology functioning, I also find an obligation for employees to be resilient when encountering technological malfunctions. Although it would be difficult to identify which particular obligation plays which role in the specific moment when the employee encounters an ICT error, it can be said that these two obligations intensify how the employee experiences an ICT error. Thus, in the employee and the ICT error meeting, it is not only the technological environment that is technostressful for the employee but also the social environment that is charged with obligations of seamlessness and resilience.

Other insights derived from Article 2 are that: employees feel it is their obligation that ICTs should perform seamlessly; obligations around the usage of ICTs are co-constructed between employees; multiple running communication channels can lead to the co-construction of new obligations, such: feeling obligated to follow all the communication channels and creating strategies to be able to do so; unlimited work: employees feel obligated to be available, to manage themselves what others can expect of them in their free time; and that employees feel an obligation to perform invisible work in the form of troubleshooting ICTs malfunctioning.

Thus, I am answering the Article 2 research question by showing how techno-stressors are not standing by themselves but are surrounded by different obligations, which amplify employees' technostress perceptions, thus providing technostress research with more nuances and possible explanations for how technostress is co-constructed in the social environment of the workplace.

This article connects to the main RQ ("*What can the sociological lens of obligation reveal about ICT-related technostress in organizations?*") by showing that the sociological lens of obligation can show how obligations contribute to ICT-related technostress in the workplace, as I explained above: the obligations co-constructed in the social environment of the workplace exaggerates how employees perceive techno-stressors.

5.3. Article 3

In Article 3, I answer the research question: "*What can the sociological analytical concept of obligation reveal about ICT-related technostress in organizations?*". In this article, I emphasize obligations as an analytical concept, and the focus on obligation as an analytical

lens distinguishes the research question of this article from the main research question of this PhD research. Thus, I am using obligation as an analytical tool in analyzing my data, as I exemplify in chapter 4.7.3, whereas the focus of the main research question is to look at technostress through the theoretical lens of obligation.

The findings of Article 3 suggest that obligations are co-constructed in the workplace: for example, constantly connecting as an obligation is driven by obligation-based habits of checking one's ICTs outside working hours, at the weekends, or during vacations. During the analysis, it is revealed that leaders feel an individual (micro-level) obligation to be reachable off work. This leads to normalizing off work availability for the collective (macro-level). Thus, this obligation operates both at an individual (micro) and organizational (macro) levels, as the two levels influence one another. In this example, it can be seen how individual obligations are inherited from the group and contribute to the creation of group-based obligations.

Furthermore, a surprising finding is that employees feel an obligation to manage their technostress to reduce stress for themselves and others, which exacerbates the technostress they experience. Other interesting insights derived from Article 3 are that employees feel an obligation to: relate to constant input; keep an overview over their inbox even when off work; manage ICT-related distractions; constantly connect; monitor ICT channels; administer ICTs, for example, notifications, passwords, or upgrades; and constantly learn.

As in Article 2, in Article 3, I demonstrate that certain obligations are connected to techno-stressors and that when employees meet a certain techno-stressor, the meeting is charged with certain obligations, specific both to the individual and the workplace.

This article connects to the main RQ ("*What can the sociological lens of obligation reveal about ICT-related technostress in organizations?*") by exposing obligations in the workplace that exaggerate technostress for employees, as well as how these obligations are co-constructed in the workplace as explained above.

5.4. Article 4

In Article 4, I answer the research question: "*What is the knowledge that the sociological lens of obligation can bring to the understanding and handling of technostress*". This article looks at obligation as a sociological lens. Some of the data included in this article (the official authorities documents) are looked at through this lens, which reveals that stress, at a societal level, is viewed from a response approach, thus placing the responsibility on the individual. The way technostress is viewed at a societal level has consequences on how technostress is tackled in organizations, as employees feel obligated to manage their technostress by themselves. The employees' obligation to manage technostress by themselves is also in line with the findings in Article 3, but in Article 4, I also show how this obligation is inherited from the societal level, as previously explained. Furthermore, an interesting finding is that employees have not heard of technostress before the interviews and that technostress is not mentioned in the official documents of the authorities either. Furthermore, some findings are confirmed by the findings in Article 2 and Article 3, for example, the obligation to constantly

connect and be available, while others are new, for example, the obligation to ensure good communication.

Other insights yielded by this article are that employees feel an obligation to: have an overview over their tasks and incoming information flow; be productive; ensure good written communication; manage individual well-being at work; manage a work-home balance; manage ICTs. Furthermore, there is also an obligation in the workplace for ICTs to work as expected.

Article 4 contributes to the main research question, notably by exposing the societal level and how certain obligations are inherited from this level to the organizational level and the individual level while also bringing in a new direction that moves towards handling technostress, as is discussed in Article 4.

5.5. Article 5

In Article 5, I endeavour to answer the research question: "*What is the role of obligation in how technostress is constructed or dealt with in organizations?"*. Article 5, similarly to Article 6, have a life narrative approach to analyzing diary data and in-depth interviews of a single individual over a more extended period, thus, as explained in chapter 4.7.5, providing a longer horizon perspective to technostress.

Some of the findings are similar to Article 2 that had a thematic analysis methodology. For example, employees experience shame, guilt, and self-doubt when technology does not work as expected. Additionally, I find that the employee does not feel that she can express anger or frustration when dealing with technostress, but that she feels she can only show humour and sarcasm. Thus, one answer to this article's research question is that obligations of professionalism set emotion rules for employees, meaning that the obligation of showing professionalism dictates which emotions are "right" to experience when being technostress. This finding has implications on technostress coping mechanisms, as I will explain in chapter 6. Another finding is that the employee identifies with the failure or success of ICTs.

Article 5 connects to the main research question by exposing the role that obligations play in how technostress is constructed (e.g., through the employees identifying with technology failure) and dealt with (e.g., through humour and sarcasm) in organizations.

5.6. Article 6

In Article 6, I attempt to answer the research question: "*How are the obligations that led to technostress constructed in the workplace?"*. This article builds and expands Article 5, sharing the same methodology and data, as explained in chapter 4.7.5. However, Article 6 focuses even more on the relation between technostress and obligation. An unexpected finding is that the employee experiences a tension between her conflicting work obligations of socializing and engaging in productive work, as socializing is not emphasized as part of one's work, thus not seen as productive work. Furthermore, the employee finds strategies to deal with her addiction (techno-strain), but even these strategies (e.g., leaving her phone outside of the meeting room) leave the employee in a conflicting situation in which she is not

reachable. Not being reachable creates guilt. I am consequently answering the research question by showing how some of the obligations that lead to technostress arise in conflicting situations in which the employee has to make choices by herself.

Article 6 contributes to the main research question by revealing some of these conflicting obligations that lead to technostress: the tension between being social at work and productive work and the tension between managing one's technostress and not being reachable.

This chapter shows how each of the articles included in this dissertation and their research questions contributes to the main research question.

6. Discussion and Contributions

This chapter discusses this PhD's research findings in relation to the current IS technostress literature and highlights the research contributions.

In order to structure my contributions to IS technostress research, I use Leidner's (2020) approach. Leidner (2020) proposes looking at contributions as a five-point star or pentagram, as depicted in Figure 11. The interior of the pentagram represents common and current undertakings of IS research, even superficial, colloquial, or less rigorous research, while the outwards represents original, novel, or distinctive research (Leidner, 2020). The stars in the background depict that some research can contribute more in some of the areas and less in others, as the star arms are longer or shorter in those respective areas.
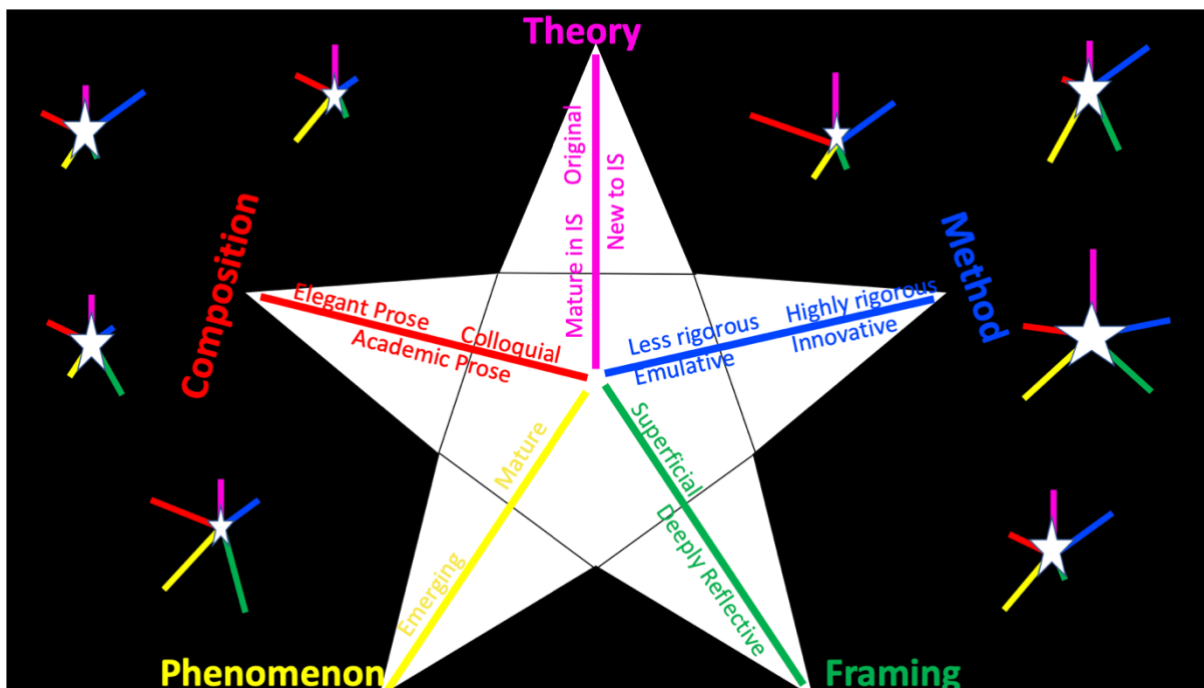

Figure 11 - Leidner's view on contribution 1

Based on this approach, I explain my main contributions to technostress IS research from the perspectives of theory, method, framing of literature, and phenomenon in relation to practice. The last arm of the start, composition, refers to the academic and writing style and presentation of research, which it would be difficult to discuss as a contribution from the author's perspective.

My research also brings a secondary contribution to Sociology of Emotions, as I mention in the "Theoretical contributions" chapter.

6.1. Theoretical contributions

According to Leidner (2020), a novel theoretical contribution refers to either using a theory that is not new in itself but is new to IS or developing a new theory. In this PhD research, I position my theoretical research contribution between using a new-to-IS theory and developing a new theory. As I describe in chapter 3.3. "Obligation", although obligation as a theory is new to IS, is not necessarily readily imported from a different discipline. Theoretical underpinnings of obligation are scattered around different disciplines, and this PhD research has made a significant effort to bring scattered pieces together in a coherent framing of obligation as a theory. A coherent framing of obligation can also be seen as a secondary contribution to the field of Sociology of Emotions.

In the subchapters below, I present my main contributions to exemplify how using obligation as a theory to explore technostress offers exciting insights in relation to what we currently know about technostress in IS.

6.1.1. The importance of the social environment in technostress research

This PhD research appears to be the first IS research to pursue technostress from a sociological perspective. An implication of this is establishing a sociological stream in IS technostress research additional to the psychological (e.g., Ayyagari et al., 2011) and the neurophysiological streams (e.g., Tams et al., 2014). As previously described in the introduction and the theoretical chapter on technostress, IS technostress research assumes the environment in which technostress arises as the technology environment, described as the characteristics of ICTs and ICT-related events that have the potential to be stressful (Tarafdar et al., 2019). In my research, I consider the environment in which technostress arises as the social environment around the usage of ICTs, and the extant or co-created obligations present in this environment. This enables my research to contribute to IS technostress research with novel findings, as further presented in this chapter.

As understood in this current thesis, the social environment refers to the obligations created or present at the societal and the organisational level, as depicted in Figure 12. Thus, this PhD research demonstrates how the obligations shaped at the societal and organisational levels, either inherited, enacted, or co-created by the employees, have implications on technostress. Furthermore, as highlighted in Article 3, individual obligations lead to creating obligations for the collective.
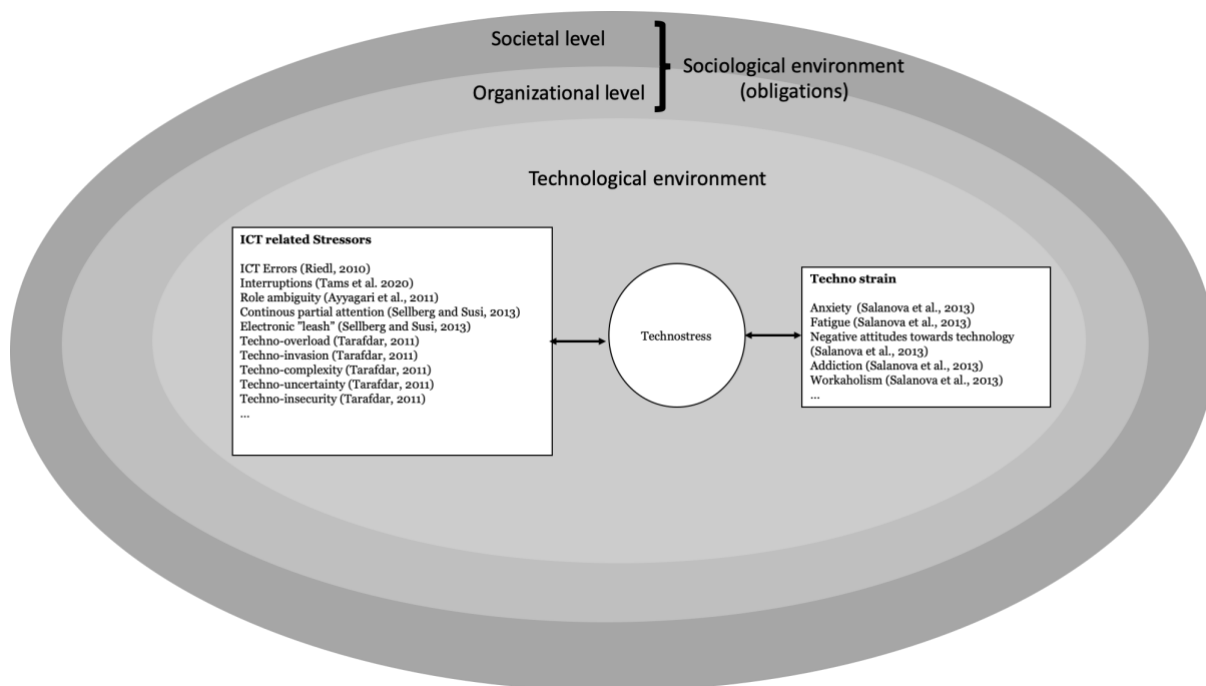
Figure 12- Social Environment in Technostress research (Originally presented in Article 4)

One interesting finding is that obligations present at the societal level influence how employees tackle technostress and which techno-stressors they experience in their work. For example, an unexpected finding presented in Article 4 is that the inbuilt societal assumptions around stress might influence how employees internalise technostress as an individual responsibility. Article 4 highlights that official documents released by relevant authorities in Denmark in which stress is discussed are focusing on a response approach to technostress (Cooper et al., 2001), which might explain why employees see technostress as an individual responsibility as I discuss further in the chapter 6.1.2.

Another example of how the societal level influences technostress is presented in Article 3, which surprisingly highlights that employees did not experience techno-insecurity, a common techno-stressor (Tarafdar et al., 2007) as a fear of losing one's job due to the introduction of new ICTs. This could be explained by the societal context, Denmark, which has a high level of job security. Per these results, previous studies have demonstrated that society has implications on technostress. In particular, Tu et al. (2005) have conducted a study based on the five technostress creating dimensions by Tarafdar et al. (2007) in China. They found significant differences in how Chinese employees experience these techno-stressors compared to an American context, where the study was initially conducted.

Additionally, the organisational level is also a vital component of the social environment in studying technostress. For instance, in my data, I notice differences in how employees from two different companies experience ICT errors, a techno-stressor previously signaled by technostress research (e.g., Ayyagari et al., 2011). Article 3 pinpoints that in the organisation where employees benefit of technical support, there seems to be less frustration around ICT errors. When asked how they cope with ICT errors, employees jokingly respond that they do not. They call on the person who is in charge of IT support.

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On the other hand, in the organisation that does not have IT support as readily available, employees report more frustration and anger in relation to ICT errors as they feel it is their obligation to deal with these technical issues, suggesting increased technostress around this techno-stressor. These findings reflect those of Ragu-Nathan et al. (2008), who find that technical support is a strong technostress inhibitor. Therefore, technical support could also be seen as a way for an organisation to take on responsibility in regard to the technostress created by ICT errors.

In conclusion, the articles included in this PhD thesis present how the obligations co-created amongst employees (herein also managers) impact the organisational level and vice versa. In particular, Article 3 focuses on employees' obligation-based habits that lead to creating obligations for the group. These findings have implications on technostress research, as it shows how the social environment, which can be either at a societal or organisational level, impacts which techno-stressors employees encounter.

6.1.2. Technostress as an individual responsibility

A surprising and novel finding in my articles is that employees have never heard or discussed technostress or stress related to technology at work and see technostress as an individual responsibility. For example, in Article 2, 3, 4, and 6, I demonstrate how employees devise strategies to avoid technostress. Paradoxically, these strategies lead to even more technostress.

For instance, in Article 6, I discuss how the employee has decided not to take her mobile device with her in a meeting room to deal with her perceived mobile device addiction. However, the employee discloses her feelings of anxiety to the thought that she is no longer reachable to her other employees while in the meeting room. Thus, not bringing her mobile device into the meeting room (avoiding technostress) creates technostress (as she is no longer reachable).

In Article 3 and 4, I discuss mechanisms that employees use in order to avoid technostress. For example, employees report checking emails in the morning, in the evening, during the weekends, and on vacation to avoid techno-overload at work. Paradoxically, these mechanisms are not relieving employees of technostress but adding to their technostress experience. Therefore, these individual efforts do little to alleviate technostress in employees, and on the contrary, add more workload. However, employees do not seem to know of any other solutions, as technostress is not discussed and tackled at the organisational level. This PhD research contributes by showing how individuals see it as their responsibility to cope with technostress, which leads to them adapting certain obligation-based habits that increase their technostress. This contribution implies that a way for organisations to tackle technostress is to view technostress as a collective responsibility.

Another implication is that technostress prevention mechanisms devised by the individuals lead to more work outside working hours for the individual and the collective, and thus to more technostress. Working outside working hours inhibits an individual's recuperation, as in stress, the resting period is significant to restitute one's ability to tackle the next working day's challenges (Cooper et al., 2001).

The insights that individual view and act as if technostress is solely their responsibility contribute to what we know about technostress in IS research, which insofar has focused more on quantifiable and visible outcomes, for example, organisational outcomes, such as productivity or individual performance (Tarafdar et al., 2007, 2010). This implies a need to turn our attention to less quantifiable measurements that contribute to the bottom line, such as an individual's well-being. This, in turn, will also contribute to the organisation's bottom line in the long term, as stress-related costs decrease.

6.1.3. Towards sociological techno-stressors

One of the main contributions of my PhD research is establishing obligations as techno-stressors. Article 3 and Article 4 analyse in-depth and propose a list of obligations directly connected to techno-stressors, such as the obligations to be available, to have an overview, engage with work professionally, or engage in productive work. This PhD research brings new to the understanding of techno-stressors the sociological mechanisms that lead to technostress.

For example, techno-complexity is a well-established and discussed techno-stressor (e.g., Tarafdar et al., 2007), described as the employees' frustrations due to dealing with complex ICTs. However, my research suggests that it is not only the complexity of the ICT artefact itself that stresses employees but the information complexity and navigating and administering these ICTs (Article 2, 3, and 4). In my data, some employees experience frustration and anger around not knowing which is the right communication channel for the type of information they want to share (Article 2) as they feel an obligation to communicate using the right channel. Others experience doubt and confusion in the tension between the obligation of being available and the obligation to engage in productive work, as already presented (Article 3, 4, and 6)

Furthermore, faithful to the transactional approach to technostress, not all individuals would respond to or be affected by these obligations in the same way. Some individuals might feel it is easier to mitigate some of these obligations or are less bothered by some obligations than other individuals. In the following subchapter, I describe in detail some of these obligations and their implications for IS technostress research.

Availability during and off work

One of the most significant obligation categories measured by the times suggested by the interviewed employees is the obligation to be available. This obligation is encountered both at work and off work.

This obligation is encountered during work while employees feel split between engaging in productive work and experiencing an incoming stream of information. Previous IS technostress research point to the employees experiencing interruptions as stressful regardless of the content of the message (e.g., Galluch et al., 2015). Research suggests that although one of the best ways to mitigate the strain of interruptions at work is to step away from the ICT environment, employees still experience technostress while being away from their ICTs

knowing that they have work to do, which leads to more strain (Galluch et al., 2015). In my research, I show how this tension arises as, although employees can step away from the technology environment, they cannot as quickly step away from the social environment predominated of obligations of availability, responsiveness, and professionalism. This implies that in order for coping mechanisms for interruptions to work to be effective, the social environment needs to be addressed. This could be done by renegotiating availability, setting common boundaries, or agreeing on a standard waiting time that allows the individuals to relate to the incoming information flux in a less stressful way.

Off work availability as an obligation leads to employees checking their work during vacation, evenings, mornings, and weekends. However, I also see a status-based difference (Article 2). The managers interviewed discuss that availability is part of their role. Role stress has been explored previously in technostress research, for example, Tams (2020) and Tarafdar et al. (2007). In my articles, I show how although managers do explain their availability as part of the nature of their role, this availability can be taken to the extreme of being available on all the communication channels that employees prefer, and even during vacations. Paradoxically, the interviewed managers talk about work-life balance and how this availability is not expected on employees, not being aware that their availability can lead to employees feeling obligated to be available constantly, hinting at status based obligations (Ross, 1970).

Unproductive work as techno-stressor

Another important aspect is related to unproductive work and the obligations around unproductive work related to the usage of ICTs lead to technostress, which is new in IS technostress research. Unproductive work is work that employees describe as a time waste or work described by employees as preparation for what they perceive to be actual work. Some of this unproductive work identified in my data is tasks around email, ICT troubleshooting, and being social at work while working from home.

Employees report many tasks associated with the usage of email. For example, Tarafdar et al. (2010) discusses the techno-stressor techno-overload as employees over-communicating and receiving more information than they can process. In my research, I find more nuances to techno-overload and why employees spend time outside working hours. For example, in Article 3, Article 4, and Article 6, I present more tasks related to receiving emails, such as scanning, prioritising, assessing the relevance, planning tasks received via emails, understanding emails, being careful while crafting emails in order not to miscommunicate or not to have to send a follow-up email with additional information later.

However, what is interesting here is not only the sheer amount of emails and processing tasks related to email but the strategies that employees come up with in order to perform these tasks: they perform this work before work, during weekends, during vacation, as to not take too much of their work time at work in performing these tasks. One employee referred to some of this work as "preparation for work", suggesting that this work is not seen as part of work. This is a surprising finding. Research thus far has established that email is stressful and ubiquitous (e.g., Barley et al., 2011; Mazmanian et al., 2013; Stich et al., 2019). However, my

research suggests that what is also stressful about emails is that employees do not see this work as a legitimate part of their work; therefore, employees view it as unproductive work.

Another type of unproductive work made visible in my data is ITC troubleshooting. Dealing with ICT errors creates more work and leads to intense emotions such as anger, shame or guilt. One of the employees interviewed recognised that dealing with ICT errors feels like "road rage" (Article 3), while others discussed their anger, frustrations, or shame. This can be due to not articulating these tasks as a legitimate part of one's work, such as by the leader or by providing training in the workplace to handle these issues. Thus, this work is seen as time waste in a social environment in which employees feel the obligation to engage in productive work.

Another unacknowledged type of work is the social interactions online. In Article 5 and 6, the employee feels split between being social during an online Friday bar and performing "actual" work. This is also a new finding in IS technostress research.

In conclusion, unproductive work in email-related tasks, ICT troubleshooting, and online social interactions are perceived as stressful by the employees. A potential explanation for this is the obligation of engaging in productive work predominant in the social environment. These tasks are not articulated as legitimate and valuable parts of one's work, and employees describe these tasks as time waste, which leads to technostress when they engage in these tasks.

Professionalism in the digital world and technostress

In my research, I find that some of the technostress that the employees' experience can be traced back to obligations of professionalism in the workplace, which one of my respondents describe as a culture of engagement. These obligations can be described as being responsive, caring for others, being available, or being a team player. In the digital world, these obligations translate to obligation-based habits such as constantly checking one's email, working extra hours, or checking email outside working hours not to delay others. This culture of engagement has been hinted at in OS studies such as Barley et al. (2011) or Mazmanian et al. (2013). However, this PhD research is one of the first research in IS technostress research to the best of my knowledge that establishes and turns towards the culture of professionalism in the workplace and the habits created around it that can create ICT-related technostress in employees.

Professionalism or wanting to appear professional could also be an explanation for Galluch et al. (2015) insights that although employees have access to a simple coping mechanism of stepping away from the ICT environment in order to mitigate the stress experienced due to interruptions, employees continue to experience strain due to unfulfilled obligations.

These findings imply that professionalism in the digital age needs to be renegotiated and discussed in order for employees not to feel that they would appear unprofessional if they are not responsive or available constantly and thus experience the technostress associated with the unfulfillment of these obligations.

The illusion of the seamless ICT artefact

In his psychotherapeutic practice and research Brod (1984) finds that employees are being socialised by the computer and internalise computer standards, such as efficiency, a desire for perfection, or accelerated time (Brod, 1984). Brod (1984) discusses how the introduction of technology made us take upon us technological ideals – and he discusses this is in the context of systems. Now, in the information and communication age, it appears to me from my data that employees take upon themselves ideals of seamlessness and availability. My findings suggest that employees prefer productive work, not wasting other's time, and experience shame and guilt when their ICTs do not perform perfectly.

With a few exceptions (e.g., Ayyagari et al., 2011), ICTs are treated as seamless in IS technostress research, meaning that there is little discussion about ICT errors, usability, or the administration of passwords and notifications. However, in my research articles included in this PhD dissertation, I show how employees spend time troubleshooting and administrating privacy concerns or notifications. In my data, ICT errors trigger anger, fury, and frustrations amongst employees, while the administration of passwords and notifications often leads to confusion.

Discussing the ICT artefact as imperfect and making visible ICT errors, usability issues, and administration tasks has implications on both research and practice. In IS technostress research would make visible even more techno-stressors in the workplace that affect employees. For practice, it could lead to a legitimisation of the tasks and emotions around using ICTs that are not seamless.

From computer anxiety to affective nuances

Moving towards a sociological approach to technostress affords us other ways of discussing emotions. As Wetherell (2012) argues, conventional psychological assumptions about emotions are rooted in the paradigms of measurements of primary and secondary emotions, which can be narrow and restrictive. Sociological perspectives allow my research to contribute to IS technostress research by integrating affective practices, scenes, events, or collective emotions and understanding how emotions intensify technostress experiences.

In particular, IS technostress research discusses the idea of computer anxiety extensively (e.g., Ayyagari et al., 2011; Pirkkalainen et al., 2019; Ragu-Nathan et al., 2008; Tarafdar et al., 2010). However, my interviewees report a wide range of emotions from fury to love to describe their relation to ICTs. For example, when encountering ICT errors, employees describe feeling fury, anger, frustration, shame, or guilt (Article 2, 3, 4, 5, and 6). On the other end of the emotions' spectrum, voluntarily checking their emails outside working hours is described with emotions such as love, curiosity, or care towards other team members (ibid). This suggests that it is not only anxiety or phobia that is associated with technostress, but that whether it is out of love or out of anger, ICTs triggers all sorts of emotions in us which intensify our technostress. Even curiosity, love, or care, although so-called positive emotions in certain traditions, can still have negative consequences, be signs of computer

addiction, workaholism, or signs of performing one's duty and obligations to the detriment of one's health.

This adds more nuances to our discussions of technostress in IS. We ought to look both towards negative emotions as signs of negative experiences, and towards positive emotions, the latter being equally harmful when they motivate employees to engage in work outside of what would be healthy for them.

Emotional labour and feeling rules in technostress coping research

Recent IS technostress research turned to discuss issues of coping. For example, Pirkkalainen et al. (2019) focus on distress venting as an important technostress coping mechanism. In my research, I uncover that organisations have specific feeling rules related to which emotions are acceptable or not (Hochschild, 1983) and that employees experience a wide range of emotions when encountering technostress, some of which they feel they are not allowed to display (Article 5 and 6).

Furthermore, Hochschild reminds us that there is a difference between who is allowed to feel and what they are allowed to feel – meaning that feeling rules are not only connected to the organisational culture, but also to issues of status and gender (Hochschild, 1983). Without further exploring the issues of gender, which I use in a binary sense here (male/female), Hochschild points out that women do not as easily express anger as men. This is also suggested by the female IT leader, which I have followed for half a year in Article 5 and 6, in which she describes how she is coping with technostress through humour and sarcasm, as she feels her anger and frustration would not be well received. However, more data would be necessary for more conclusive results on gender, emotions, and coping with technostress.

Furthermore, status can also have implications on which coping mechanisms employees can access. As Ross (1970) points out, each status in the group comes with specific obligations. Thus, considering Hochschild (1983) theory on feeling rules, it can be said that status plays an essential role in coping.

These mechanisms are essential when discussing technostress. A more comprehensive study on distress venting as technostress coping could look into feeling rules in the context of an organisation, status, and gender.

Redefining technostress

Wetherell (2012) argues that definitions are utterly crucial in stress research, as we have a moral obligation towards those whose lives we wish to explore to be as close as possible to their reality and experiences.

To answer this request, I deem it important that IS technostress research expands the definition to go beyond the technological environment and encompass the social environment. As my research is built upon IS technostress research so far, to find a new definition of technostress, I depart from Ragu-Nathan et al. (2008) definition: '*technostress is*

a stress phenomena experienced by employees in organisations as a result of their interaction with ICTs. This is caused by an individual's attempts to deal with constantly evolving ICTs and the changing physical, social, and cognitive responses demanded by their use' (Ragu-Nathan et al., 2008, p. 418). In this PhD thesis, I have explained why we need to change the focus from the individual's responsibilities, or ICT's shortcomings, towards the social environment to comprehend the dynamics that can lead to technostress fully. Thus, the definition I propose is:

> *"Technostress is stress experienced by employees in organisations as a result of their interaction with ICTs, in an environment that is not adequate for technostress-free work, due to unspoken obligations, unclear responsibilities, and continuously changing physical, social, and cognitive demands on the individual" (Article 4).*

This definition focuses on ICTs, employees, and organisations and brings attention to the environment. Although the definition contains the assumption that technostress-free work exists, I emphasise the environment dimension that could be designed to enable technostress-free work by discussing the obligations created in that environment, defining responsibilities, and addressing the changing demands on the individual as they appear.

Next, I will discuss my methodological contributions and afterwards practical contributions.

6.2. Methodological contributions

In this chapter, I am discussing my methodological contributions. In Leidner's (2020) view, a methodological contribution refers to either using novel types of data (e.g., data that spans points in time) or new approaches to data analysis. What I see as interesting in this PhD research is using different types of data (e.g., interviews and diary data) and engaging in different methodologies and types of analysis.

Journaling and technostress

To the best of my knowledge, what distinguishes my Research Study 3 and its academic outputs (Article 5 and 6) from previous technostress research, is the use of diary data. Although this data has not been fully exploited, and the intention is to develop Article 6 further, diary data allows for a unique approach and perspective into technostress.

First, it allows for looking at technostress spanning different points in time. For example, I am enabled to see snapshots of technostress incidents from when the employee first joins the company and snapshots of technostress incidents further down the line. Interestingly, the employee starts her diary with a technostress incident and describes her feelings about that experience and her concern about how her colleagues might perceive her based on her technostress encounter on her first day at work. This raises interesting questions for future research in relation to obligations of professionalism and status in the group: does being a new employee in an organisation bring about obligations of professionalism with a different intensity than being in an organisation for a while?

Secondly, it seems that diary data allows for in-depth descriptions and rich accounts of the emotions and obligations encountered while dealing with technostress. Thus, IS technostress research might consider exploiting diary data as a valuable data source when investigating technostress.

Thirdly, using diary data appeared to be a therapeutic and healing process for the participant. This might have implications for both practice and researcher. IS technostress researchers might consider further exploring journaling as a coping mechanism for employees. Practitioners might consider adopting journaling or offering employees the option to use some time to journal about their experiences in order to cope with technostress.

Different types of methodologies

In this PhD research, I apply different types of methodology in answering somewhat similar research questions. For example, Article 2 is based on a single case study, Article 4 is based on an embedded case study, and Article 5 and 6 are based on longitudinal case studies. In addition, Articles 1 and 2 are based on interviews.

I see using different methodologies in answering similar research questions as a strength of this PhD research because it allows for approaching technostress from different angles. For example, working on a longer time horizon, as in the longitudinal case study in Article 5 and Article 6, enables me to witness how obligations are formed over time and how the new employee is socialised in the workplace. The employee learns the workplace's feeling rules and obligations in dealing with technostress (e.g., to choose solving tasks rather than being fully attuned online to a social event, as she could hear others doing the same).

On the other hand, Article 2 and Article 4, based on case study research, allow for a snapshot in time. Article 2, a single case study based on interviews in a Danish private organisation, reveals how employees and leaders relate to technostress differently. For example, the top manager feels obligated to signal availability during vacation, while the employees check emails during a vacation not due to an obligation of availability but due to being curious. Article 4 allows for a snapshot of technostress and obligations at multiple levels: societal, organisational, and individual. This enables an understanding of how the way stress is viewed and dealt with at a societal level is inherited in how it is dealt with at an organisational and individual level, as explained in the "Theoretical contributions" chapter.

Thus, approaching technostress from a specific methodology can be said to represent a choice with specific consequences. Therefore, a potential contribution of this PhD research is an account of how different methodologies can help uncover certain aspects of technostress and might be limited in uncovering other aspects.

Emotions in analysis

In this PhD research, I apply a sociological approach to emotions. This means engaging with coding and identifying emotions in discourse based on Wetherell's (2012) approach to discourse and emotions. Wetherell (2012) sees emotions and discourse as interwoven and

encourages researchers to move away from rigid measurements and definitions and towards the dramatic of everyday life and working with their empirical material (ibid).

Working with emotions in relation to both stress and technostress represent a new direction for both stress and technostress research, a direction that is not only necessary but can also provide a deeper understanding of employees' affective experiences when stressed. Lazarus (2006), a predominant stress researcher, argues that emotions are fundamental if we want to profoundly understand stress, as stress and emotions are inseparable.

As such, a contribution is how I methodologically approach emotions in IS technostress research: from a sociological perspective. Although emotions are neither the primary object of inquiry nor the theoretical lens of this PhD research, obligations and emotions and emotions and technostress are not easy to separate. As explained in the theoretical chapter, while obligation-based habits are ways for researchers to understand how obligations are embodied in everyday situations, emotions can provide a way to understand how we relate to and embody the fulfilment (e.g., with pride) or unfulfillment (e.g., with shame) of these obligations. Therefore, emotions represent a critical unit of analysis for my empirical material, rich with expressions of emotions. In my material, it became evident what Lazarus (2006) posits: emotions and stress are closely connected. Indeed, my participant's discourse around technostress accounts is rich with descriptions of their emotional experiences.

Thus, working with emotions and discourse as interwoven can represent a new methodology of understanding technostress and other socio-technical phenomena in IS: a sociological methodology that focuses on working with emotions from a sociological perspective rather than a psychological perspective. A sociological approach to data analysis means capturing employee's experiences and how they relate to others, the environment, and the ICTs, rather than focusing on rigid measurements, which are more common in a psychological approach (Wetherell, 2012).

6.3. Framing of literature

Leidner (2020) argues that a deeply reflective framing of the literature synthesises insights from past findings to build a captivating novel frame for the research or to craft multiple streams of research together to produce something novel.

The articles included in this dissertation focus on weaving together technostress and obligation, two distinct streams of research from two different disciplines. This affords my PhD research to produce novel insights, as presented thus far. However, a considerable effort has been made in defining, describing, and glueing scattered pieces and work that look into obligation. Hence, part of my work was to build the theoretical foundation of obligation.

This work, the weaving of technostress and obligation, could be further carried or inspire more technostress researchers to either employ an obligation lens or to use other lenses from the disciplines of sociology or Sociology of Emotions. In doing so, IS research can advance what is currently known and discussed about technostress while also enriching the IS theoretical portfolio.

6.4. Phenomenon and practical contributions

In order to move towards the outwards of the star arm on the "Phenomenon" arm, researchers need to base a phenomenon on a real-world problem that organisations or society is faced with and provide evidence of the importance of the research to individuals, organisations, and society (Leidner, 2020).

This research is based on a real-world problem that individuals, organisations, and societies are affected by in great numbers, as detailed in the theoretical chapter and emphasised in Article 4. As Tarafdar et al. (2019) emphasise, technostress research can make a real contribution to stress research due to the field's long tradition in researching and understanding socio-technical systems.

The current research contributes to practice by shedding light on specific obligations that organisations can include in conversations with employees or add to working guidelines. In particular, Article 3 and Article 4 present some of these obligations in a table format, and they can be used separately or combined as an organisational survey tool.

Furthermore, I hope that this current research can also contribute to policymakers and policymaking by showing how lack of organisational and societal awareness and commitment to create guidelines and regulations when working in an ICT environment intensifies technostress. In particular, future studies might explore technostress and obligations in the public sector, and empower policymakers with insights related to how to interact with the citizens in a technostress-free manner.

Individual employees can also use the insights presented in this research to become aware of which obligation-based habits they might engage in and reassess whether it is in their best interest to continue doing so.

7. Limitations

As with any research study, highlighting the limitations is essential. The current PhD research has many limitations, as I present below.

First, technostress research has limitations that are inevitably inherited by my research. The most predominant ones, as I gathered from the feedback received thus far from reviewers, and the mid-way evaluation committee, is: "*Is the stress experienced by the employees negative or positive?*" and "*Are you working with chronical or episodic stress?".* To these questions, I must answer: "*I do not know."* As previously discussed, my data did not lead me in the direction of positive technostress. Furthermore, it does not allow me to definitively judge whether the stress experienced by the employees is chronic or episodic. Future research might look into episodic versus chronic technostress and might attempt this separation with great benefits. For example, it could be interesting for research to understand whether obligations play an equal role in chronic and episodic technostress.

Secondly, in my research, I build on the transactional approach. A potential critique for using the transactional approach in my research could be integrating a sociological perspective and the transactional approach, which emerges from a psychological perspective on stress. Future research might attempt to establish a new epistemology in stress research that is fully rooted in a sociological perspective.

Thirdly, much of the data included in this research is based on interviews. This type of data might be limitated in that interviewees might choose to disclose what they perceive their interviewer might want to hear. Furthermore, interviews warrant interviewees to reconstruct events and emotions from the past, thus raising the question of objectivity. However, objectivity is not the aim of this research; instead, the focus is on exploring employees' subjective experiences. Future research that would want to focus more on objectivity might choose to add several types of data. For example, interviews could be coupled with participant observations and diary data.

Fourth, life narratives represent an exciting method of analyzing the diary data. However, both Article 5 and 6 do not fully exploit the potential of this method, as I am using it very close to thematic analysis and focusing on finding technostress incidents instead of focusing on plots. For example, the participant writes in her diary about generational differences between herself and her father-in-law regarding time spent at work. Her father-in-law is critical of her disclosing buying flight tickets while at work and expresses judgement towards her. This could have been an interesting plot to follow. Future research using life narratives could focus even more on emotional tensions, moods, motivations, or plots.

8. Future Research

I consider the articles included in this PhD thesis as merely scratching the surface of what is possible to uncover technostress when utilizing the sociological lens of obligation. Below, I present a few paths for future research, additional to the paths I have already hinted towards in the previous chapters.

Towards establishing obligations methodologically and theoretically

Future research might consider focusing on a methodological article to define and construct obligations as an analytical lens for technostress research. The aim of this research could be to establish a method to analyze qualitative data in order to extract obligations. This article would empower future research on socio-technical phenomena with a novel way of analyzing the social environment surrounding the IS artefacts and to profoundly understand how users relate to these artefacts, each other, and the context in which these artefacts are used.

Additionally, further work might focus on defining and establishing obligations theoretically and how these affect individuals, organizations, and societies in the context of digital transformation.

Affective practices in technostress research

Another path of research could be focusing on affective practices in technostress. This would add more nuances to our discussions of technostress in IS. For example, emotions could be established as (techno) strains. Psychology research establishes anxiety and fatigues as forms of techno-strain (Salanova et al., 2013). My research reveals the myriad of emotions that employees experience when encountering technostress, from love to anger. Thus, future research might be concerned with exploring these emotions and their connection to techno-strains.

Another research path concerning emotions and technostress is whether employees perform these emotions as part of an organizational emotional repertoire. For example, do organizations have feeling rules or do employees co-construct feeling rules about technostress? Although, in my research, I touch upon feeling rules, what remains to be studied is whether employees reconstruct their experiences during interviews and report having felt anger due to feeling rules, and not to them actually having felt anger in the particular situation.

Mixed methods and action research

Future research might focus on further developing Article 3 or Article 4. For example, a mixed-methods approach could supplement qualitative data with a broader survey spanning more organizations. This would allow to check the universality of obligations and further develop the obligations categories already found due to these articles. These findings could be further distilled to create measurements that organizations can use in order to assess the obligations present in their organizations. Furthermore, future research might consider an action research study. What would happen if organizations become aware of these obligation-based habits that lead to technostress and start renegotiating them?

Comparative studies

What would be interesting is to replicate the research conducted in either Article 3 or Article 4 on a different cultural environment. In addition, Article 6 raises the question of developing countries and how status-based obligations might be even more intense might be more intense in developing countries. Thus, a comparative study might shed light on which role the socioeconomic aspects play in technostress and obligation.

Coping in technostress research

A fruitful path of research in coping in technostress research is investigating the role of journaling. As discussed in the methodology chapter, the employee reports that journaling about her technostress experiences has helped her understand her own experiences and even gave her a sense of "healing". Thus, future research might explore additional coping strategies, such as journaling.

Additionally, future research on coping might consider feeling rules in the context of organizations, status, or gender. Do all employees have access to, for example, distress venting, or are there differences based on the status in the group or gender? For example, in the sociology of emotions, Ahmed (2004) and Hochschild (1983) makes us aware that there are status-based and gender differences in which emotions we experience or feel we ought to experience.

9. Conclusions

The digitalization of societies and changing nature of work has unintended consequences, such as technostress. Therefore, technostress is an increasing area of research and concern for practitioners, as extensively discussed in this dissertation thus far. However, IS technostress has solely considered the technology environment, thus leaving out the social environment in which norms and obligations related to the use of ICTs are created and negotiated, which I aimed at emphasising in this dissertation.

In this PhD research, I set to answer the research question:" What can the sociological lens of obligation reveal about ICT-related technostress in organizations?". I explore this research question through the six articles included in this PhD thesis.

In order to answer the main research question and the research question of each of the articles, I use the sociological lens of obligation. I define and describe obligation as a theory, departing from a Sociology of Emotions perspective, as the feeling that we "ought to" or owe something, others or the organization.

The six articles employ different methodologies, thus approaching technostress and obligation from different angles. For example, article 1 and 3 are based on interview data. Article 2 is based on a single case study. Article 4 is based on an embedded case study, while Article 5 and 6 employ a longitudinal case study. In addition, these articles are based on different types of data analysis, for example, thematic analysis, content analysis, and life narratives.

My findings suggest that employees are not directly familiar with technostress as a term but report rich technostress accounts. Furthermore, employees seem to take responsibility for handling their technostress, which paradoxically increases their experiences and augments group-based obligations. Additionally, obligations co-created amongst employees influence the obligations at the organisational level and vice versa.

My research contributes to theory by establishing obligations as techno-stressors and highlighting the importance of the social environment. Methodologically, my research shows how combining different data types, and spanning different points in time can yield significant findings.

I contribute to practice by making visible the obligations that can lead to technostress for employees, which can be used to consciously renegotiate patterns of interaction and communication that would lead to more desired outcomes for organizations.

However, this PhD research is not without limitations, amongst which limitations specific to technostress research, limitations related to the data, and the match between the transactional approach to stress and a sociological perspective.

Future research might consider further establishing obligations methodologically and theoretically, conducting mixed methods and comparative studies, exploring affective practices in technostress research, and explore the role of journaling and feeling rules in technostress coping research.

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📖 Article 1: Sociology of Emotions in digital leadership and communication **(conference abstract)** (Stana, 2018)

Avenue: The 8th Midterm Conference of the ESA Sociology of Emotions Research Network (RN11), 2018.

Status: Abstract accepted and presented. Peer-reviewed.

Impact: Presented at the European Sociological Association, one of the largest conferences within sociology.

Authors: Stana, Raluca.

Research Question: What can micropolitics of emotions inform us about leadership and communication practices in the digital age?

Methodology: Qualitative interpretative research. Interviews with leaders interpreted through the theoretical lenses of the micropolitics of emotions.

Main Findings:

(1) Micropolitics of emotions as an interpretation tool for interviews can help uncover emotions otherwise inexplicit in interviews,

(2) Remote work makes it more difficult for leaders to elicit obligation from their followers,

(3) Obligation as an emotional blend is a driver for constant connectivity, a common techno-stressor.

Sociology of emotions in digital leadership and communication

Over the past decades, digital tools have been increasingly employed in organizations as a means of communication. Leaders and followers alike have the option to interact with each other using emails, instant messaging, social networks, or mobile phones, and often, as in the case of remote workers, they don't have the option to interact face-to-face. With the pervasiveness of digital tools, researchers point out that there is a need for a better understanding of the mechanisms behind digital interactions, such as transmission or perception of emotions. Emotions in leadership are important, although the understanding of these in the context of digital leadership and communication is limited. With this study, we aim to contribute to a better understanding of interactions in the context of digital leadership, from a sociology of emotions perspective. Two interviews are analyzed through the theoretical lenses of micropolitics of emotions. Amongst our findings, we find that remote work makes it more difficult to elicit obligation from subordinates, while access to communication tools might make leaders feel obligated to stay in touch constantly. Exploring digital leadership and communication through the lenses of micropolitics of emotions allows us to emphasize aspects of digital leadership that haven't been previously explored.

📖 Article 2: People on the other side are waiting: how felt obligations contribute to ICT-related technostress (conference article) (Stana & Nicolajsen, 2020)

Avenue: Tenth Scandinavian Conference on Information Systems. Selected papers of the IRIS, Issue Nr 11, 2020.

Status: Paper selected and published. Peer-reviewed.

Impact: Level 1, 1 BFI point.

Authors: Stana, Raluca and Nicolajsen, Hanne Westh.

Research Question: How do felt obligations contribute to ICT related technostress in organisations?

Methodology: Exploratory single case study.

Main Findings:

(1) Employees take on themselves the ideals and norms of technology being functional and seamless.

(2) When ICTs do not live up to the ideal, employees experience shame and guilt.

(3) Employees feel it is their obligation that ICTs should perform seamlessly.

(3) Obligations around the usage of ICTs are co-constructed between employees.

(4) Multiple running communication channels can lead to the co-construction of new obligations, such as: feeling obligated to follow all the communication channels and creating strategies to do so.

(5) Unlimited work: employees feel obligated to be available, to manage by themselves what others can expect of them in their free time.

(6) Technology resilience: employees are expected to increasingly become more resilient in their interaction with technology.

(7) Employees feel obligated to perform work that is not legitimised as work, e.g., ICT troubleshooting.

PEOPLE ON THE OTHER SIDE ARE WAITING: WORK OBLIGATIONS AND SHAME IN ICT-RELATED TECHNOSTRESS

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Abstract

With the pervasiveness of information and communication technologies (ICTs) in organisations, employees continuously interact both online and offline. This continuous interaction leads to the construction of norms and obligations around the usage of technology, which can also result in negative impacts on employees' health, for example, technostress. Previous Information Systems (IS) research on technostress has focused on psychological or neurophysiological quantitative research on the use of ICT and its effects. To our knowledge, there are no technostress studies that make use of the role of obligation, which in our view is a crucial lens, as it shifts the technostress debate to showing how the felt obligations constructed around the use of ICTs can lead to technostress. To further explore how technostress arises, we use the analytical concept of obligation from the discipline Sociology of Emotions. Our data comes from an exploratory case study in a Danish private company. We find that employees take on themselves the ideals of ICTs being seamless, and when ICTs do not live up to their expectations, they experience shame and guilt. To avoid such feelings, they construct obligations that lead to technostress. We contribute to IS research on technostress by showing how obligation contributes to technostress.

Keywords: obligation, technostress, ICTs, information systems, qualitative research

Introduction

Technostress – defined as any negative impact on attitudes, affects, thoughts, behaviours, or body physiology caused directly or indirectly by technology (Weil & Rosen, 1997) – represents an increasingly important area of research within IS (e.g. Tams, Ahuja, Thatcher & Grover, 2020; Tarafdar, Cooper & Stich, 2019; Tarafdar, Maier, Laumer, & Weitzel, 2020). Research shows that ICTs (information and communication technologies) in organisations create technostress (Ayyagari, Grover, & Purvis, 2011; Tams et al., 2020; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). A study following knowledge workers found that they spend an average of 5.5h daily on communication-related work instances (Wajcman & Rose, 2011). The amount of time employees spend using their ICTs makes the issue of looking closer at ICT-related technostress even more pressing. Taking email as an example of ICT, too little or too much email usage compared to what the employee desires increases technostress amongst employees (Stich, Tarafdar, Stacey, & Cooper, 2019).

However, intriguing research on email claims that it has become a symbol of stress that distracts us from what creates stress, which research shows is the norm of responsiveness around email use, and not the medium itself (Barley, Meyerson, & Grodal, 2011). On the same line of thought, Mazmanian, Orlikowski, and Yates (2013) argue that email use leads to the creation of obligations around using

email, as the knowledge workers experience a continuous tension between their autonomy and work obligations in the 'working all the time, everywhere' paradigm.

Past research on technostress assumes that technostress arises in the individual as a response to an interaction with technology (e.g. Riedl, Kindermann, Auinger, & Javor, 2012); or that we need to focus on the ICTs in order to identify the technostress stimuli (e.g. Ayyagari et al., 2011; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011); or that technostress arises in the static or dynamic interaction between the individual and the ICT (e.g. Sellberg & Susi, 2014).

These assumptions leave out the social arena, where work obligations (covert or overt) are negotiated (Clark, 1990; Ross, 1970); and norms around the use of ICTs are co-created (Mazmanian et al., 2013). We are opening up these past assumptions in technostress research and attempting to contribute to existing technostress research by looking closer at how obligations, duties, and responsibilities are shaping employees' habits that lead to technostress. Furthermore, in this paper, we look at technology as an indirect cause of technostress, as we see ICTs as a means of bringing up other issues in the organisation that can lead to technostress.

We take the stance that employees construct some of the ICT habits that lead to technostress as a result of their felt obligations, and that the ICTs amplify social aspects. For example, enabled by ICTs, employees might apply the norm of responsiveness they act on during working hours to their free time as well, if they feel a covert or overt obligation to do so (Mazmanian et al., 2013). We argue that it is essential to make covert obligations overt in organisations to avoid negative consequences, such as techno-invasion, -complexity, -uncertainty, -overload, and -insecurity, which are all examples of technostress creators (Tarafdar et al., 2011).

We emphasise technology as an indirect cause of technostress. Much of the past technostress research argued technology as being the source of technostress (e.g., Riedl et al., 2012; Sellberg & Susi, 2014; Tarafdar et al., 2019). On the contrary, we argue that it is also the employees' felt obligations that can lead to technostress, and thus technology plays a role in the background in our paper, while we bring the social environment in which obligations are co-constructed to the forefront.

This paper seeks to accentuate and contribute to the debate concerning technostress in Information Systems (IS) by using the sociological lens of obligation. We are seeking to answer the research question: 'How do obligations contribute to ICT-related technostress in organisations?' To conceptualise and analyse these issues, we look into how obligation (Clark, 1990), an emotional blend borrowed from the discipline Sociology of Emotions (Turner & Stets, 2006), plays a significant role in how we shape ICTs usage habits and perceptions contribute to technostress.

The empirical context of this paper is an exploratory single case study based on an international private company. We analyse verbatim transcriptions of our interviewees to find technostress perceptions and tease out the felt obligations that led to these perceptions.

We contribute to IS technostress literature by using the sociological theory of obligation on researching technostress. One of our findings suggests that employees take on themselves the ideals and norms of ICTs being functional and seamless, and they feel it is in their obligation that ICTs should perform. When ICTs do not live up to the ideal, employees experience feelings of shame, which leads to the construction of duty (a form of obligation). To avoid shame, one must have ICTs that are functioning. When they do not, this leads to technostress.

Technostress

Being alive implies a constant response to stress, and stress reactions are not necessarily wrong. A certain level of stress is needed for motivation, growth, or development, also known as eustress (Selye, 1976), or as techno eustress (Tarafdar et al., 2019). However, unmanageable (techno)stress is damaging to both our mental and physical health (Cooper, Dewe, & O'Driscoll, 2001). Below, we present four

approaches to investigating technostress, inherited from organisational stress – response, stimulus, interaction, and transactional:

- The response approach views technostress as a dependent variable, for example, a response to a threatening stimulus, such as a computer breakdown or an IT error. This approach is based on neurophysiological measurements (Riedl, 2012; Tams, Hill, Guinea, Thatcher, & Grover, 2014), for example by measuring cortisol, also known as the stress hormone (Riedl et al., 2012), or heart rate variability (Schellhammer, Haines, & Klein, 2013).

- The stimulus approach focuses on identifying the potential sources of technostress, such as information overload, or blurred work-life boundaries (Ayyagari et al., 2011; Galluch, Grover, & Thatcher, 2015; Sarabadani, Carter, & Compeau, 2018; Tarafdar et al., 2011). For example, Ayyagari et al. (2011) found that some technostressors are work overload, role ambiguity, invasion of privacy, job insecurity, and work-life conflict.

- The interaction approach focuses on the technostress arising in the interaction between the individual and technology. Some studies find that for some people, technostress can add to their existing psychological stress (Hudiburg, 1989). One example is the interplay between employees and the different types of technologies that they need to relate to within a day (Sellberg & Susi, 2014).

- The transactional approach looks at stress not as a factor that resides in the individual or the environment, but one that is instead embedded in the ongoing process that individuals engage in, to continuously appraise stressful situations, make sense of them, and find the necessary coping resources. In technostress research, we see an example in Ragu-Nathan, Tarafdar, Ragu-Nathan, and Tu (2008).

In our paper, we take our departure from the transactional approach to define and explore technostress. At the same time, we expand this approach by arguing that stressful incidents arise not only in the dynamic interaction between humans and technology, but also as a result of employees' felt obligations.

Furthermore, researchers point out two ways of measuring and exploring technostress – psychological and neurophysiological:

- Neurophysiological stress is a direct response to environmental stimuli that can be measured, i.e., an increase in cortisol as a result of an IT system error (Riedl et al., 2012).

- Psychological technostress is the result of an interaction between environmental demands and an employee's conscious assessment of those demands, i.e., conscious self-assessment of whether the IT system error has caused felt stress (Ayyagari et al., 2011).

Research classifies technostress creators in five creating dimensions (or technostress creators), which we present in Table 1.

Form of technostress	Definition
Techno-overload	Employees face information overload and ICT-enabled multitasking.
Techno-uncertainty	Employees feel unsettled by the continual upgrades and ICT changes.
Techno-insecurity	Employees feel insecure about their jobs in the face of new ICT and others who might know more about these technologies.
Techno-complexity	Employees feel intimidated by using ICTs.
Techno-invasion	Employees never feel free of ICTs.

Table 1 - Technostress Creators Based on Tarafdar et al. (2011)

Furthermore, there are also studies discussing technostrain. Salanova, Llorens, and Cifre (2013) define technostrain as 'a combination of high levels of anxiety, fatigue, skepticism, and inefficacy related to the use of ICTs' (Salanova et al., 2013, p. 2).

As we have seen in this chapter, there are two ways of measuring technostress: neurophysiological and psychological. In our research, we propose a third approach to exploring technostress: a sociological approach. We expand on this in the chapter related to our analytical lens, and we argue that it is not only the interactions between humans and technology that can cause technostress, but also the direct or indirect interactions around technology.

Although the concept of obligation in Sociology of Emotions is designed for face-to-face interactions (Clark, 1990), we are using it in a highly digitised context. We allow space for our interviewees to wander from the online to the offline and back again, to account for their realities of hybrid interactions, in semi-structured interviews. We have no particular questions in mind, as the intention is to work closely with them, the employees of the digital age, in a grounded attempt to find the answer to our research question: 'How do felt obligations contribute to ICT-related technostress in organisations?' We argue that Sociology of Emotions, and particularly the lens of obligation, can contribute to technostress research by showing how what we believe is our duty, responsibility, or what we owe to others, is what leads to situations of technostress.

Obligation as an analytical lens

In our paper, we are utilising the concept of obligation as defined in the field of Sociology of Emotions. This discipline arose from the need to integrate emotions into the field of sociology (Kemper, 1990). In 1990, Candance Clark wrote a chapter in Kemper's book (1990), where she proposes a novel way of looking at obligation.

Clark (1990) proposes that emotions can be used to negotiate a social place. A social place is a micro-level position, where those occupying higher places have more prestige, power, and interactional rights. Those in a higher position have the right to evaluate others, to be late, to have something more important to do, to ignore others, and so on. For example, monopolising others' time by making them wait reflects and reinforces power differences. Micropolitics involves lines of actions to gain or maintain a social place. Clark defines several strategies through which people can negotiate social place. One of them is through eliciting obligation.

Obligation is defined by Clark as an emotional blend, meaning that one cannot pinpoint only one affect associated with obligation, but multiple. She argues that obligation is what makes people want to behave in a certain way towards others or society as a whole, emphasising that obligation is the feeling that we owe something to others (e.g., time, services), or that we ought to do something. At the same time, obligation can be imposed from the outside or the inside. We can feel inner obligations due to our desire to do things because it is moral to act that way or because we would feel better about ourselves.

From a micropolitics perspective, invoking a feeling of obligation in others is a way to inform and negotiate our social place with others. For example, duty is a form of obligation that makes people want to behave in a certain way towards others. If we do not carry out our duties, we might experience feelings of dishonour, guilt, or shame, or feelings of pride, satisfaction, or relief when we complete our duty. Responsibility, which Clark describes as 'an account to self that includes affect surrounding the cognition' (Clark, 1990: 324), is also a form of obligation where we feel we have to perform specific actions for others.

Shame can be a strong driver for constructing one's duty. Shame is defined by Ahmed (2004) as being 'witnessed in one's failure' (Ahmed, 2004: 103), and she further explains that shame can be intensified if the individual is looked at while experiencing shame. At the same time, when experiencing shame, the feeling is taken upon the self, rather than having it attributed to an object. Furthermore, the fear of

shame can prevent employees from betraying norms, while the lived experience of shame can remind the employee of the reason for those norms.

Another form of invoking feelings of obligations in others is alter-casting. An example is referring to the status of the other to make a role expectation more salient, e.g., 'Graduate employees are so motivated that they work even at the weekends'. If a new employee accepts the status of being a motivated employee, they might also have to accept the obligation the role entails.

In our analysis, we are focused on finding tensions in data of where obligations lead to technostress perceptions, by zooming in on duties and responsibilities that are taken for granted. We look at the technostress perceptions that our interviewees discuss when asked about technostress, and we tease out the obligations that led to that incident.

Methodology

We are conducting qualitative research in the form of an exploratory single case study. Case study research provides an opportunity to investigate a phenomenon in a given context, which is useful in situations where the phenomenon is deeply entangled in the context (Yin, 2009). In our case, we are conducting an exploratory and interpretive case study looking into elements of technostress by exploring how obligations are constructed and experienced in the real-life setting of a company. In this exploratory case study, we conducted four semi-structured interviews, with each interview lasting 30 to 60 minutes.

We interviewed the director, a middle manager, and two employees from a company, as it was important to us to see how organisational members at different levels engaged in the construction and experience of obligations around the use of ICTs. As there is not much qualitative research on technostress to be inspired by, our approach was exploratory with an emphasis on how the interviewees frame and understand technostress, while allowing them to discuss what they found important (Bryman & Bell, 2011, p. 468).

We point out that perhaps a perceived limitation of single case study research is inherent in its singular nature. As Eisenhardt and Graebner (2007, p. 27) point out, a pivotal response to this perceived challenge is to clarify up front that we are interested in developing a new sociological approach in exploring technostress, and not to test it. They further argue that in a single case study, as opposed to multiple case research, the advantage is that rich data can be presented at length (Eisenhardt & Graebner, 2007, p. 29).

We perform text analysis on the verbatim transcriptions of the interview data. Although this could be perceived as a limitation for our case study, as we do not use more data sources than the interviews, we argue that on the one hand researching technostress from a qualitative perspective in IS is relatively new, and our focus is to look at how different concepts are made sense of by our interviewees. On the other hand, our focus is on the inter-relations; hence, we found the interview data to be most interesting. One way to strengthen this in the future is by coupling it with observations.

We conduct our analysis on verbatim transcriptions of the interviews by interpreting what the interviewees themselves describe as technostress. In that sense, we can claim that we are conducting content analysis (e.g., evoked emotions) (Wetherell, 2012). As Thoits (1989) describes, it would be difficult to conduct a thorough analysis of the interviewees' emotions, as even just five minutes of recorded footage would require a serious amount of coding of emotions, micro-emotions, tonality, facial expressions and other cues (Thoits, 1989). Wetherell (2012) believes that it is less interesting to define the relationship between affect and discourse, and more interesting to look into the affective assemblages and their social consequences, as affect and discourse are intertwined (Wetherell, 2012, p. 52).

Analysis

In this chapter, we give space to the employees' stories of technostress. We selected the most representative quotes related to repeated technostress perceptions and interpreted them by using the concept of obligation inspired by Clark's definition (Clark, 1990). These perceptions are what the interviewees understand as technostress. We started from technostress perceptions, from which we deductively derived obligations as opposed to inductively looking at obligations, as we wanted to focus on the relation between technostress and obligation.

In the following, we look into three themes that we interpreted as emerging from our data: multiple running communication channels, unlimited work, and resilience to technology, to investigate how felt obligations about technology create stress in the workplace.

Multiple running communication channels

While analysing our data, we noticed a recurrence in employees discussing the impact of multiple communication channels on their technostress; therefore, our first theme is 'multiple running communication channels'. In this chapter, we explore how the employees experience the existence of communication channels with respect to technostress. We look into how that constructs what they believe are their obligations.

- Formulating a given strategy

Below, the director discusses why he is using many different communication channels and how that affects him. The quote also refers to a company communication strategy, created to ease the problem, but which is not adhered to:

'*[...] during your daily work, you need to relate to a lot of input [...] So we have different kinds of communication channels. So even though that...that **we have tried to formulate a given strategy**, then so...**not all adhere to it**, for the...basically for the reasons that...that someone has decided that one-size-fits-all, but it does not. So **we still have the openness of several possibilities**, and that is definitely a stress factor.*' *(Director)*

The director describes the many communication channels he needs to use to do his work. He thus feels obliged to use the different communication channels, either due to each communication channel having a different purpose or due to his followers having different preferences.

Even though the company has a communication strategy, it does not appear to have been successfully implemented. A strategy to include norms can be seen as an obligation work on an organisational level by setting expectations of when to use which communication channels. However, this attempt is without success as '*not all adhere to it*', and it seems like the leader does not want to enforce it either, as the premise of one size fits all is not accepted.

At the same time, he indicates his understanding of the employees not feeling obligated to follow the company's communication strategy, arguing that the reason '*someone has decided that one size fits all*' is not strong enough for the employees to comply with the strategy. Concurrently, this lack of obligation in employees, as well their leaders, leads to '*the openness of several possibilities*', which the director classifies as '*definitely a stress factor*'.

- Knowing where to address a given concern or question

Further, the director talks about the consequences of having several communication channels open:

'*That is definitely a stress factor – both keeping pace with it, but also um, you can say follow up or (how can I put it?) **knowing where to...to...to address a given concern or question or whatever**, which channel or which system that you should be using. That...**that gives some kind of, I would call it, anger, actually**.*' *(Director)*

The director seems to feel that it is his duty towards his followers to know '*where to address a given concern, or question, or whatever*', which leads to '*anger, actually*'. In this example, it is becoming evident that while the director gives a strong indication of the technostress generated by multiple communication channel options ('*that is definitely a stress factor*'), his perceived duty of '*knowing where to address a concern*' leads to anger, thus contributing to why it is stressful for him to have multiple communication channel options. At the same time, we could say that the reason for why the director feels angered when he does not know '*where to address a given concern, or question, or whatever*' is that he internalises it as his duty to know this.

- The nature of my role

A middle manager presents another perspective of having multiple communication channel options, arguing that relating to all these communication channels as a manager is part of the '*nature of his work*':

'*I asked my people what their favourite communication ways are. And I talk to them, I want to help them in any sense, so I don't have an operational role. **I want to minimise the friction for them**, so **I don't force them to contact me on a specific channel. Instead, I adapt myself to whatever they prefer**. [...]On my computer, **I am running every possible communication tool**, but yeah, it's fine. I don't have any issues with it [...]having Slack, Teams, Skype, Cisco, Viber, emails, open [...]**that's the nature of my role**... But it's better they are not distracted. [...]when I go home, actually, it's very sad to say, but **I don't have the same energy**.' (Middle manager)*

The above quote is a representation of obligation in the form of duty. He explains his duty rhetorically, contrasting I/them, illustrating his duty as a leader towards his followers, whom he calls '*my people*': '*I asked my people*'; '*I talk to **them**'; '*I want to help **them**'; '*I want to minimise the friction for **them**'; '*I don't force **them**'; '*I adapt myself to **them**.*'

His perceived duty towards his people drives this middle manager to '*run (...) every possible communication tool*', due to his interpretation of his duty: '*I need to talk to people*', thus '*having Slack, Teams, Skype, Cisco, Viber, emails, open*'. This is coupled with a sense of sacrifice: '*it's better they are not distracted*', where the middle manager is using a comparative '*better*', without emphasising both comparison terms, and this time focusing on '*they*' but forgetting the '*I*'.

However, when later asked about any changes in his perceived well-being, his answer is: '*It's very sad to say, but I don't have the same energy.*'

- Moving reminders forward

An employee presents his experience about having to relate to so much input in the form of incoming emails and his solution for dealing with what he perceives as new tasks:

'*(the) **most stressful thing** is some things that you have to take some actions, but maybe not even now, you have to remember that next week you have to do so and so, and then you really have to be creative: okay, would I like to put something in my calendar? No, maybe not, because I still don't know which days it will be? Should I then open my outlook and make some reminder? And then it ends up in having every day, many times during the day, just a list of reminders. And then you have to consciously go one by one, and I delay this by one, this one by one week, this one by one hour. And then the next day again, you have to take those decisions, and then you realise you continuously spend time on moving those reminders forward. [...] And then, of course, **it pops up in some unexpected moments when you're really in the middle of something creative**.' (Employee 1)*

In this quote, the employee feels a responsibility to act on specific requests and uses the technology to keep postponing the obligation of doing something. The way the employee explains what is going on and that it is (the) '*most stressful thing*' indicates that this way of dealing with demands is problematic. One of the reasons is that much time is spent leading to nothing: '*you constantly spend time on moving*

those reminders forward', and that it prevents creative work as '*it pops up in unexpected moments when you are in the middle of something creative*'. Disturbances are known to slow down productivity as it gives a cognitive setback. At the same time, whenever a reminder pops up, the employee engages in extra cognitive processes of questioning what to do and planning tasks, which likewise takes up energy.

- Feeling expected to follow all of it.

Further, Employee 1 describes how he feels expected to follow through with the requests, or at least decide whether the information received is something vital to him or not:

'.. *using these technology channels it's so easy, that **maybe some people overuse it**, maybe they don't think twice before actually collecting some bigger chunks of information as one item of information, [...] and it just creates more traffic, and then **you feel expected to follow all of it**. Or if even if you don't, you're curious - okay, **maybe something is important for me**, I better read this and check, and do something about it.*' (Employee 1)

This employee refers to the overload of information that happens as a consequence of the ease of communicating too much and instantly: '*maybe some people overuse it*'. The employee describes feeling like he would be missing out, due both to being curious and fearing that he might miss something important. We only see the latter one as an instance of obligation related to the duty of staying updated (*'what is important to me'*). However, both create different kinds of insecurity. As a consequence, this employee reads all to avoid the feeling of insecurity, thereby constructing his duty around continually staying up to date with what others are sending, even though he is conscious that '*maybe some people overuse it*'.

Unlimited work

Unlimited work is a theme that has been debated for many years. In the following quotes, we see an example of alter-casting that leads to firm work-life boundaries, as well as an example of obligation to be continuously available.

- Not feeling obliged to contribute more

The employee describes a manager that in the past has helped him relate to working in his free time in a way that he perceives as positive, and what that subsequently meant for him:

'*I had some specific manager, [...] the manager used to say: "okay, the day has only 8 hours, and the working week has only five days, you should not really feel obliged to contribute more, you still have family, private lives" – [...] "this is not the way to really keep you as a **valuable resource, that needs some rest and peace and quiet.**" [...] And that was good, I had the feeling that I am being taken care of, that I am not being **vacuumed** into something that will **swallow** me at some point, and is escalating more and more, nothing like that so that I think that it was quite a luxurious situation. I hope for it to continue[...], so I think I'm stronger in the sense that when, just in case, when it comes to this situation that some new manager **expects more**, [...] I would use it as a negotiation point.*' (Employee 1).

The employee describes how he feels '*taken care of*' when his superiors do not impose any obligation to work beyond working hours and how, on the other hand, if he has a manager who expects more and thereby imposes obligations in terms of expectations and duty, he could quickly feel '*vacuumed*' or '*swallowed*'. The employee refers back to a manager who explicitly stated that working within hours was the expectation, and thus placed obligations through alter-casting that employees are '*valuable resources that need some rest and peace and quiet*'. The employee keeps this argumentation as a reason for how he should behave, what is expected, what his obligation is, and argues that if he ever experiences another manager who '*expects more*', then he will refer to this earlier manager. This manager thus becomes a role model, and the manager's speaking of employees as valuable resources becomes a mantra story.

- Feeling free to call

The director discusses work-life balance, his availability outside working hours and on holiday, as well as what he communicated to his employees about it:

'*I have made it very explicit, telling people that I do not expect them **to check mail when they are off,** either on holiday or in the evenings or in...in the weekends. **I try to refrain myself also sending out emails outside office hours**. I would not say that I **succeed every time**, but I am trying to...to...I'm super much aware, so I'll not do something like that. So to me, it's about being available, basically. So though when I go on holiday, I have this "**out of office**" reply that I do not check my mail. I actually turn the notifications off on my phone, so I don't **get new mail notifications** when I'm on holiday. But I have an option that **they're always free to call** me. And, I may have experienced that once or twice, but people, in general, don't. So they respect. But I think that it's okay for them to know that it's the position that I have, that it's okay that they can reach out.*' (Director)

The director describes that he has made it explicit that he does not expect people to '*check mail when they are off*'. Whether this is a common approach in the company, it is unclear. According to the employee's quote above, it depends on the individual manager. The director's statements show that he knows he is a role model, and he has to show what is wanted through his behaviour. In this way, he shows his understanding of his perceived duties, placing certain obligations onto himself. As a role model, he tries to '*refrain myself also sending out emails outside office hours*', but the use of '*try*' and the fact that he does not '*succeed every time*' indicates that the obligation to set expectations is known but challenged by other needs.

Furthermore, the director is not saying anything about checking emails at night. Still, he says he uses '*out of office reply*' when on holiday, so that he doesn't '*get new mail notifications*', which indicates that he feels an obligation to check his mail. Making himself available ('*they are free to call*') indicates he feels the need to be available if his employees need it. Checking emails and being available is possibly a feeling of duty due to his position as director.

Technology resilience

When operating online meeting technologies, an employee raises the issue of additional work in setting up, running, and not least troubleshooting when the online meeting technologies do not work as expected. These might be minor issues, however, and as the employee expresses below, they add up.

- People on the other side waiting

The employee provides an account of a stressful situation, that of having to prepare for an online meeting when the equipment does not perform as expected:

'*You can classify it as technostress [...]It's not only that you're getting angry and might act irrationally because of it, but well, if you're in time pressure, say you're preparing for some meeting, it's in ten minutes, and you wanted to open some presentation and also some application, and also connect to some server, prepare everything on your screen to be ready, and something doesn't work, then, of course, it's irritating, and then you're really stressed, and pressed on time, and **of course the source it's the technology that doesn't work** as it is expected, [...]**people on the other side are waiting**, and they are writing on some other channels, "**Are you there**? We are waiting for you."*' (Employee 1)

The employee describes a generally stressful situation for him, which he would classify as technostress. It is a situation in which he has to prepare for a meeting. Even though he arrives ten minutes in advance to ensure that the equipment is ready for the meeting, if something suddenly does not work, he feels stressed, and he is confident that '*of course the source is the technology that doesn't work as it is expected*'. Later, he describes how other people are waiting on the other side.

From the others' questions, it seems like they do not mention anything about the possibility of technology not functioning. On the contrary, they ask, '*Are you there?*' By posing these questions, the colleagues are alter-casting the expectations of their colleagues to be on time and prepared. In situations where the technology is not working, this interaction is the source of technostress, as the employee feels it is his duty to have everything prepared. He incorporates the performance of technology as part of his performance, and when technology does not work, he gets stressed. Not living up to expectations is shameful, and the feelings of shame might be intensified under the perceived gaze of the others (the colleagues waiting on the other side).

- It really takes much capacity

The employee further explains how the accumulation of minor technical issues can lead to employees having to use a lot of their capacity on troubleshooting them:

'*Even if it's a minor issue because we know by experience that even the minor issue, multiplied by the number of meetings during the day, multiplied by the number of days in a period, **it really takes a lot of capacity**, people spend their time on this kind of things instead of coming to the meeting and starting discussing productively... then of course if you don't do anything **it might only get worse**.' (Employee 1)*

As can be seen from the quote, technology handling takes up time, delays meetings and reduces what employees perceive as productivity. The way the employee talks about these issues reveals that '*it takes up a lot of capacity*'. The employee feels an obligation to take on this additional work and sees it as his and his colleagues' duties, which is a duty to make meetings work because if they do not, then '*it might only get worse*'.

- Individuals need to have more resilient behaviour

The middle manager talks about how technology is not perfect and how employees need to be more resilient:

'*.. the video conferencing technology, even state-of-the-art, **is not perfect**. This happens, so it's good to have some resilience to any failures. I don't think you can find anybody who says, like, "It never had a problem, it worked **like a charm**! [...]" So now it will be a kind of management talk, but as management, we try to solve these problems. So we invest in technology, better technology, **to make it seamless**. Of course, that's our duty. But still, also the people, the individuals, need to have a **more resilient behaviour** [...] to change and to be able to embrace change just as a fact of life, you can say.' (Middle Manager)*

The manager acknowledges that technology '*is not perfect*' and argues that it is a condition that the technology does not always work '*like a charm*'. He argues that people – his employees – need to be '*more resilient*', meaning he is alter-casting the responsibility of his employees to stay open and handle the troubleshooting related to working with, e.g., conferencing technologies. The manager argues that resilience to deal with changes is part of life, thus alter-casting that changes and challenges are to be expected. Therefore, there is an expectation for the employees to deal with change, whatever it is. However, he also addresses the managerial responsibility ('*our duty*') to invest in technology '*to make it seamless*'. The obligation seen about conferencing technologies is thus balanced between management providing the best in the market and employees being resilient.

- Is it now that you need to address this, or should you wait?

The director talks about technological glitches and whether or not employees can be vocal about it:

'*I know myself, can also be **super, super frustrated** if...if it's something, "Okay, we have tried to change that, **it's not possible to change that**. Let's try to get the best possible out of this situation." Even so, people are continually complaining about. [...] I also can be a little bit frustrated and stressed. [...] I*

*do understand that, but we also need to move on, right and get it. So you get some slack, get on board, or I don't know **maybe you need to find another job** if you continue complaining about it.' (Director)*

In the quotes above, the director talks in general terms about changes and agile transformation as a current challenge. He argues as earlier that this is part of the current situation ('*it's not possible to change that*'). He argues that he, at times, feels stressed and frustrated and that he expects people to take responsibility for coping with change as part of the job. He puts it bluntly that people get some '*slack*' in the beginning; however, if they '*keep complaining*' then '*maybe you need to find another job*'. He communicates substantial obligations for his employees and himself (alter-casting) that, as an organisational member, you need to cope with change and the stress and frustration that follow.

Discussion

In the following chapter, we couple some insights we found in the analysis chapter with theory. We preserve the same subchapters as under the analysis chapter.

Multiple running communication channels

In our analysis chapter, we discussed how having multiple communication channels options creates technostress among employees. Although the source is shared, the director, the middle manager, and the employee have different experiences of how these multiple channels are causing technostress.

The director reports feeling angry about not knowing where to address a given concern. In technostress literature, feeling unable to keep up with changes in how to use ICTs is known as techno-uncertainty, and feeling overwhelmed by the complexity of ICT is known as techno-complexity (Tarafdar et al., 2011), both of which are technostress-creating dimensions. The director was not asked if he experienced these forms of technostress, nor did he hear about them before the interview. Still, he is reporting that having multiple communication channels options as a stress factor while reporting that not knowing where to address a given concern can even cause anger. One might take it further and ask why the director feels that he needs to know where to address a given concern. It seems like he is constructing a sense of duty of having to know, and it is the unfulfillment of this duty that is causing him to feel angry and to perceive multiple communication channels options as a stress factor. The director tries to avoid being seen as having what he perceives as his shortcoming of not knowing where to address a specific concern, and is not able to attribute the 'badness' to the technology, but taking the shame of failing onto himself (Ahmed, 2004).

The middle manager discusses his need to be flexible and use multiple communication channels simultaneously to minimise friction for his employees. He discusses techno-overload and ICT-enabled multitasking (Tarafdar et al., 2011). At the same time, he discloses that he feels fatigued after working hours, which is a common symptom of technostress (Salanova et al., 2013). In his case, we can also see that his perceived duty of operating multiple communication channels at the same time is what drives his behaviour.

Employee 1 reports techno-overload (Tarafdar et al., 2011) in the form of reminders that keep popping up, and techno addiction (Salanova et al., 2013), in which he is constantly checking emails out of curiosity or of fear of missing out. Employee 1 also reports feeling like he is expected to both read and act upon all of them, which shows what he perceives as his obligation.

It can be said that obligation in the digital age is constructed in a way that puts great pressure on employees: if technology can keep up with everything, then so should the employees. If technology can be accessible everywhere, then so should the employees in a way that transcends the human body's capacity. However, neurophysiology reminds our organisational members that they are not cyborgs, by triggering forms of technostress, stress, anger, fatigue, and confusion.

Unlimited work

Previous literature has reported blurred work-life boundaries as an increasing problem (e.g., Ayyagari et al., 2011); however, in our analysis, we see that the employee reports that he does not feel obligated to work during his free time. This is because a previous manager, who currently serves as a role model for him in this area, has inspired a change by letting him know he is a valuable resource and needs to rest when he is not at work. His current director is also very adamant about not being available on email during his free time.

However, we see a contrast in how obligation is constructed around the concept of availability outside working hours, where the employee only checks emails out of curiosity. At the same time, the director resorts to tricks to make space for himself. We call it a trick because he requires those who need him to call him, instead of being available on email. Calling requires more effort on the part of the caller and perhaps makes the caller feel hesitant to interrupt the director's holiday.

Technology resilience

Regarding technology resilience, the employee, the middle manager, and the director discuss the issue of technology not working as expected. We see in the chapter on technostress that even one IT error can create a spike in cortisol level (stress hormone) to such a degree that researchers can classify that as acute stress (Riedl et al., 2012).

The employee describes a typical situation of encountering ICT errors while preparing for an online meeting, despite his efforts. It seems like the employee is attributing the technology failure to himself, while the people waiting for him on the other side seem to also ask him about whether he is there or not, and not mentioning the possibility of technology malfunctioning. We could say here that the employee turns towards himself and is not able to attribute the 'badness' to the technology, and takes the shame onto himself (Ahmed, 2004). Shame might be the driving force for him in constructing his duty to perform in front of others and to live up to the norm of having functional technology. He does not seem to be able to shift the shame on to the 'other', in this case, the technology.

At the same time, from what the middle manager and the director have to say, it seems like the ideal is to be 'resilient', but one could ask – how resilient can we be in the face of technology? As Sellberg and Susi (2014) discuss, we are flexible, creative beings that have built rigid technological structures – and of course, the interaction between us and technology can lead to technostress (Sellberg & Susi, 2014). The middle manager and the director, at the same time, seem to be repeating the discourse that stress is the responsibility of the individual, which is also one of the earliest approaches to technostress: the individual is at fault for not being able to cope with technology (Brod, 1984).

One can also note that the type of technology malfunction reported by the employee is not the same type that the middle manager and the director seem to discuss. The underlying message from the middle manager is that one needs to be resilient, whereas the director takes it even further and mentions that one should move on and find another job. These subliminal messages can add to the construction of the ideals and norms in a company (Orlikowski, 1994). It can add to the shame experienced by those around whom technology cannot live up to the ideal, by taking upon themselves this 'lack'. This shame can heighten the sense of obligation, to avoid shame, that one constructs as one's duty to have the technology function, and when it doesn't, this creates shame, which is described by the employee as a perception of technostress.

We can see that the director is not spared this. It seems like his status does not affect his feeling frustrated and stressed. It can also be a matter of who is allowed to feel and who is not. It seems like the director creates the very same feeling rules that impact him, with the difference being that the others would need to find another job if they cannot live up to the ideals, which is a sign of a heightened social place (Clark, 1990).

Conclusion

In our paper, we investigated the research question 'How do felt obligations contribute to ICT-related technostress in organisations?' through an exploratory single case study. We have employed the lenses of obligation, as understood by Clark (1990), thus emphasising that technology is an indirect cause of technostress while bringing the social environment to the forefront of our study. Technostress has so far been researched quantitatively, from either a psychological or a neurophysiological perspective.

We thus expand technostress literature by proposing a sociological perspective: obligation is at the core of what leads to technostress. We intend to shift the debate on technostress to showing how the felt obligations constructed around the technology can lead to technostress.

Among our findings, we note that employees take on themselves the ideals and norms of technology being functional and seamless. When technology does not live up to the ideal, they experience feelings of shame, which leads to the construction of duty (obligation) – to avoid shame; employees feel they have a duty to ensure the technology is performing. When it does not, this leads to technostress.

The use of obligation as a lens shows us that the feelings of obligation may lead to stress, but may also prevent stress. There is thus a need to be more aware of the obligations experienced and how these are often constructed unconsciously. Obligations are co-constructed between individuals, providing expectations and norms about how to behave. This understanding points to the handling of technostress as an organisational, managerial, and individual effort, rather than solely individual. Implementing technologies may change what is possible, meaning it potentially blurs our current practices and the limitations given by less flexible technologies. It also means expectations and norms need to be re-negotiated to create obligations that are sustainable from a technostress perspective.

We contribute to IS technostress literature by using the sociological theory of obligation in researching technostress. One of our findings suggests that employees take on themselves the ideals and norms of ICTs being functional and seamless, and they feel it is their obligation that ICTs should perform. When ICTs do not live up to the ideal, employees experience feelings of shame, which leads to the construction of duty (a form of obligation). To avoid shame, one must have functioning ICTs. When it does not, this leads to technostress. Furthermore, we find that the feelings of obligation may lead to, as well as prevent, technostress. We further expand on our findings in the discussion and conclusion chapters.

Limitations and further work

Our current study can be seen as a pilot and has the limitation of having a small sample when exploring ways of discussing and investigating felt obligations in the workplace. Its purpose is to test obligation as a lens to unfold and better understand technostress in the workplace. We would like to follow up by talking to more organisational members, coupled with observations, and returning to our informants and asking them more questions. This work may help us understand technostress from a sociological perspective, as well as ways in which organisations can avoid or handle technostress.

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📖 Article 3: A cautionary tale: How co-constructed work obligations lead to ICT-related technostress (conference article)

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RQ: What can the sociological analytical concept of obligation reveal about ICT-related technostress in organisations?

Methodology: Interpretative research based on qualitative interviews, a hermeneutical approach.

Main Findings:

Employees feel an obligation to:

(1) relate to constant input,

(2) keep an overview over their inbox even when off work,

(3) manage ICT-related distractions,

(4) constantly connect to work,

(5) reduce stress for themselves and others,

(6) monitor ICT channels,

(7) administer ICTs, for example, notifications, passwords, or upgrades, and,

(8) constantly learn.

A Cautionary Tale: How Co-Constructed Work Obligations Lead to ICT-Related Technostress

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Abstract

Technostress is a growing area of research and a concern for practitioners. So far, IS research on technostress has focused on either neurophysiological or psychological measurements. We argue for a sociological approach that allows us to reveal the socially co-created obligations around using ICTs (information and communication technologies). We ask, "What can the sociological analytical concept of obligation reveal about ICT related technostress in organizations?" To investigate this question, we use the sociological concept of obligation. We conduct interpretative research based on qualitative interviews. We contribute to IS technostress research by employing the analytical lens of obligation, which allows us to find that employees see technostress as their individual obligation and devise strategies to avoid it. These strategies add to their technostress and augment group obligations that can lead to technostress for the collective. Furthermore, we find that tensions between overlapping obligations that cannot be carried out simultaneously augment technostress.

1. Introduction

Technostress represents any negative impact on attitudes, affects, thoughts, behaviors, or bodily physiology caused by technology directly or indirectly [1]. Technostress is an increasingly important research area within IS (Information Systems) [e.g., 2–4].

Research shows that ICT usage in organizations leads to technostress [e.g., 2,5,6]. Considering that a knowledge worker might spend up to 5.5h a day on communication-related work instances [7] makes the need to look closer at ICT-related technostress even more pressing.

Taking email as an example of ICT, too little or too much email usage compared to employee desires increases technostress among employees [8]. At the same time, research on email claims that email has become a symbol of stress that distracts us from what creates stress, which can be the norm of responsiveness arising from the social context of email use, and not the medium itself [9]. Along the same line of thought, Mazmanian, Orlikowski, and Yates (2013) demonstrate that, among knowledge workers, email usage leads to a continuous tension between perceived autonomy and work norms. In other words, knowledge workers feel that they have autonomy over their email use, and they choose to exercise that autonomy by being available outside working hours, without being aware of how the norm of responsiveness impacts their decision and others'.

Past research on technostress follows different streams. One stream focuses on technostress as an individual's response to interaction with technology [e.g., 10]. Another stream focuses on ICTs in order to identify the technostress stimuli [e.g., 5,6]. A third stream is based on assumptions that technostress arises in the interaction between the individual and the ICTs [e.g., 4].

These streams of research leave out the social arena, where obligations (conscious or unconscious) are negotiated [11,12] and where norms and obligations related to the use of ICTs and their material properties are co-created [13]. We focus on how obligations shape employees' habits and how this affects their experience of technostress.

We argue that a sociological approach is crucial in technostress research, as it contributes to a more profound understanding of how technostress affects knowledge workers and the organizational milieu. We cast light on the relationship between technostress and employees' obligations. Organizational recognition and articulation may move employees' obligations from the realm of unconscious habits, as Ross (1970) calls them, to the group's political arena, where these habits can be discussed and changed. We argue that changing obligation-based habits related to ICT use is a meaningful way for organizations to work with technostress.

We ask, "What can the sociological analytical concept of obligation reveal about ICT-related technostress in organizations?"

To investigate this question, we use the concept of obligation as an unlocking device to unfold employees' experiences of technostress. We define obligation as the conscious or unconscious feeling that we owe something to others, ourselves, or the organization [11].

We conduct interpretative research based on qualitative interviews and employ a hermeneutical approach in our analysis. Our data consists of interviews with 10 employees from two private organizations in Denmark.

Our findings suggest that employees see technostress as their individual obligation, and they devise obligation-based habits to evade technostress. For instance, they engage in constantly checking their ICTs, even when on vacation or free time, as they want to avoid feeling overwhelmed upon returning to work. Employees' overwhelm is caused by the number of emails, their lack of overview of their task, or the burden they feel for colleagues who might be awaiting their answers. Additionally, our data suggest tensions in the obligations felt by employees. For example, employees might experience a clash between their individual obligation to be reachable and the need to engage in focused work, as they cannot carry out these two obligations simultaneously. These individual obligations and obligation-based habits lead to group obligations, as we demonstrate and discuss in our analysis and discussion chapters.

These findings are theoretically advancing our comprehension of technostress because they reveal how our individual obligations shape our habits and affect group obligations, and how group obligations in return affect individual obligation.

The paper is structured as follows: we first discuss technostress and obligation, which constitute this paper's theoretical background. Next, we present our methodology for conducting this study. We then present our analysis results, which we follow with a discussion of our theoretical background. Finally, we conclude and present the limitations of this study.

2. Theoretical background

2.1. Technostress

Stress is part of our daily lives. A certain level of stress is needed for motivation, growth, or development, also known as eustress [14] or techno eustress [3]. However, unmanageable (techno)stress

damages both our mental and physical health [15]. In our research, we focus on unmanageable technostress.

We begin by drawing from the technostress-creating conditions described in Tarafdar et al. (2011), which are predominant in technostress research; see Table 1.

Table 1. Technostress-creating conditions

Technostress-creating condition	Definition
Techno-overload	Employees face information overload and ICT-enabled multitasking, resulting in information overload, interruptions, and multitasking.
Techno-invasion	Employees never feel free of ICTs, as they can potentially be reached anywhere or anytime, and feel the need to be connected continuously.
Techno-complexity	Employees feel intimidated by the complexity of ICTs and feel forced to spend time learning and understanding how to best use ICTs.
Techno-uncertainty	Employees feel unsettled by continual learning, upgrades, and ICT changes.
Techno-insecurity	Employees feel insecure about their jobs in the face of new ICTs and others who might know more about these technologies.

The approach in Tarafdar et al. (2011) can be considered a psychological approach to technostress. The psychological approach stems from quantitative measurements of the individuals' conscious appraisal of what they find stressful in their interactions with technology [e.g., 3,5,6].

A more recent research approach, which can be used either complementarily or alternatively to the psychological approach, is the neurophysiological approach [16], which focuses on neurophysiological measurements such as heart rate variability (HRV) [e.g., 17] or changes in salivary stress hormone [e.g., 10].

In our paper, we propose a sociological approach. We argue that some covert or overt obligations are technostress creators. IS technostress research has focused on technostress creators, which so far have been identified as either technological (e.g., usability [5]) or individual (e.g., personality [18]). We hypothesize obligation as a sociological technostress creator, which, to our best knowledge, has not been pointed out in previous research. We highlight that individual and group obligations can

lead to obligation-based habits. These may contribute to technostress. For example, an individual obligation to not delay others or a norm of responsiveness (group obligation) can lead to an obligation-based habit of constantly checking emails from home (constant connectivity). Constant connectivity is related to techno-invasion, a recognized technostress creator [6].

We highlight that a sociological approach exists in, for example, Organization Science research by Mazmanian et al. (2013) or Barley et al. (2011), with an emphasis on email and norms. They argue that it is not the IT artifact that causes technostress, but the socio-material entanglement between the individual, the technology, and the social norms surrounding this interaction. Additionally, they point out that employees might treat the resulting norms as objective constraints, thus indicating that the individual or the organization doesn't feel they have agency over these constraints.

We argue that these studies focus on the techno-overload-creating dimension of technostress specific to email. Our research differs in that we expand our focus to all five technostress-creating dimensions recognized by Tarafdar et al. (2011), and to all ICTs. Furthermore, we use the sociological concept of obligations as opposed to norms.

Norms are rules that employees adhere to; for example, if others are answering emails during weekends, employees feel they should also do so. The concept of obligation differs in that it allows us to look more profoundly at the root cause of such decisions: employees might answer emails because they feel they owe something to themselves (they feel it is their individual obligation), their peers, or the organization (group obligation). The repeated action of answering emails from home as a result of an individual or group obligation might lead to an obligation-based habit.

2.2. Obligation

Inspired by Clark (1990), we define obligation as the conscious or unconscious feeling that we owe (or ought to do) something for others, ourselves, or the organization we work for. In addition, an obligation is a law of reciprocity or a give-and-take in everyday interactions. We summarize the concepts used in this study in Table 2, "Obligation categories."

Table 2. Obligation categories

Concepts	Description
Individual obligations	A sense of duty and/or responsibility that we build in ourselves, consciously or unconsciously, of owing something to ourselves or our social group(s) [12,19] (e.g., the duty to not delay our colleagues).
Group obligations	A set of obligations (covert or overt) that ensures a social group's cohesion and health [19] (e.g., being reachable).
Obligation-based habits	Unconscious or conscious embodiments of our individual or group obligations [12] (e.g., checking emails constantly).

Bergson (1977) states that the nature of obligation is to integrate the individual into the social group and thereby ensure the group's health and cohesion. Looking at the individual, Bergson (1977) argues that obligation has its source in the sense of duty we build in ourselves, and that feeling obligated outward or toward others would not be enough unless we cultivated that sense of obligation in ourselves as well. Ross (1970) calls this individual obligation, which is regarding one's self as obligated to do something instead of merely inheriting group obligations.

According to Bergson (1977), our social lives consist of interlocking obligations toward society, profession, or family, and these obligations become quotidian by being embodied in our daily habits, for example, answering emails from home. Ross (1970) adds that most obligations are intuited and felt and are accepted only in the sense that we feel impelled to carry them out, but not that we are necessarily conscious of them. Bergson (1977) points out that we have an inner resistance to not carrying out our obligations. If we do decide not to perform them, this might even lead to shame, guilt, or blame [11].

Additionally, Clark (1990) presents another mechanism of integrating the individual into the group that might add to our inner resistance to not carrying out our obligations: alter-casting. Alter-casting is an obligation reminder carried out by referring to the other's status, such as "Motivated employees ought to work during their vacations as well." If one wants to accept the title of "motivated employee," he or she must also inherit the group obligations that come with it: "working during vacation."

In our paper, we start with the premise that certain covert or overt obligations are technostress creators. Technology can lead to overlapping obligations for employees. Whether they are individual or group obligations, we argue that these obligations can lead to technostress.

Ross (1970) argues that when we become aware of our unconscious habits that arise from covert obligations, we can choose to release the need to carry them. However, that is not always easy. The first step toward making covert obligations overt is

identifying them. When they are discovered and articulated, they can leave the social arena (unarticulated norms that are inherited from our group membership status) and enter the group's political arena, where we can discuss, criticize, and make changes to our obligations.

This last argument drives our motivation for choosing obligation as an unlocking analytical device for technostress. We hypothesize that when employees become aware of their obligation-based habits, they can then either release the habits that lead to technostress (if they have control over them) or they can articulate them. By doing so, employees move these obligations from the realm of unconscious habits, as Ross (1970) calls them, to the political arena of the group, where they can be discussed and changed.

3. Methodology

We conducted interpretative research [19], with a hermeneutical approach to the analysis. We looked into the dialectic between the understanding of the text as a whole and the interpretation of its parts [19], as we describe below.

Our data consists of 10 semi-structured interviews [20] in two Danish organizations—each interview lasting between 30 and 60 minutes. Our informants are both managers (top-managers and middle-managers), and employees without leadership responsibilities. The questions that these informants had in common were related to whether they have heard about technostress prior to the interview, and what are their experiences in relation to technostress.

We used the technostress-creating dimensions presented in Table 1 to identify the type of technostress the interviewees described. Loyal to the hermeneutical approach, we entered the analysis with technostress-creating conditions and obligation categories in mind to see how these conditions and obligations were interwoven in the interviewees' accounts.

To afford a certain level of analysis, we focused on the concepts of individual obligations, group obligations, and obligation-based habits. We were also sensitive to our interviewees' evoked emotions, which can also indicate obligations.

We conducted our analysis based on verbatim transcriptions of the interviews by interpreting what the interviewees themselves described as technostress (e.g., evoking negative emotions or explicitly naming what they find stressful about technology). In that sense, we claim that we conducted content analysis (e.g., evoked emotions) [21].

We coded our interview material in several rounds. We first engaged in a preliminary reading of the interview material. Both authors checked and compared their understanding of how to code the different technostress incidents, hence engaging in coding with a priori goals [22].

We then engaged in the first round of coding by using the qualitative analysis software Atlas.ti. We coded the technostress incidents based on the parameters defined in Table 1, hence applying a structural coding strategy [22]. Whenever we found clear indications of technostress, we coded the incident accordingly. We considered the interviewees' use of the word *stress* and their evocations of feelings such as annoyance, frustration, or anger. For instance, the quote, "During your daily work, you need to relate to a lot of input […], and that is definitely a stress factor" (Top manager, Company 2) was coded as "Techno-overload."

Next, we looked at the 116 resulting quotations in which interviewees suggested technostress and evaluated each one in relation to obligation. Scholars researching obligations often refer to it by using the verb *ought to*. Similarly, we looked for verbs that indicated the interviewees felt they owed something to themselves, each other, or the organization.

After the first round of coding, we conducted a second round using pattern coding. We looked at the obligations under each of the technostress-creating conditions and developed significant themes from the obligations we found [22] (e.g., "Relating to constant input"). These themes are reflected in Table 3.

From the quote above, we teased out the obligation "I ought to relate to a lot of input during my daily work" to highlight the relationship between technostress-creating conditions (techno-overload) and the obligation to relate to a lot of input during daily work. The resulting obligations are presented in Table 3, "Technostress and obligations."

4. Analysis

In the following, we present an overview of the obligations and obligation categories we identified during our analysis (see Table 3.). We explain each of the obligation categories presented in the table, together with a representative quote. It is also noteworthy that the technostress-creating conditions based on Tarafdar et al. (2011) are overlapping. In our paper, we do not attempt a definitive distinction neither between technostress-creating conditions, nor between the obligation sub-categories we find as a result of our analysis.

Further in the analysis, we observe individual and group obligations and obligation-based habits.

4.1. Techno-overload

Techno-overload is the most discussed technostress-creating condition among the interviewees. We categorize the obligations found under techno-overload under three themes: "Relating to constant input," "Keeping an overview," and "Managing ICT-related distractions."

4.1.1. Relating to constant input. A common individual obligation theme among our interviewees is having to relate to constant input both during and outside working hours. Employees experience that it is their individual obligation to follow up with the constant stream of information they receive from different ICTs (e.g., email, chat, intranet, instant messaging on their company phone), and to prioritize the information and tasks received. Some employees report obligation-based habits, such as checking their emails off-work multiple times during the weekday,

Table 3. Technostress and Obligations

	Obligation category	Obligations
Techno-overload	Relating to constant input	I ought to relate to the input coming via ICTs I ought to follow up with the input I receive via ICTs I ought to be able to prioritize the input I receive via ICTs I ought to remember the actions I need to take from the input I receive via ICTs I ought to have control over the input I receive via ICTs
	Keeping an overview	I ought to organize the information I receive via ICTs I ought to keep an eye on my inbox (ICTs) during vacation I ought to always have an overview of my inbox (ICTs) I ought to know which information to address, or is addressed to me (from ICTs)
	Managing ICT distractions	We ought to be more conscious of ICT distractions We ought to have discipline to avoid ICT stress Others ought to contact me again via ICTs if their request is important enough
Techno-invasion	Constantly connecting	I ought to lose my work-home boundary to show that I love my work I feel I ought to check my work phone throughout the whole day I ought to be fine with checking emails (ICTs) on the weekend
	Reducing stress	I ought to check my work emails (ICTs) every day during vacation, due to a new activity at work that requires attention to what is going on I ought to check my emails (ICTs) in the morning to see what came through the night so I can have a more relaxed attitude coming into the office I ought to be prepared when going to work, therefore I check ICTs on my phone when I come home, before and after dinner, and before I go to work I ought to check ICTs while at home to reduce overall stress for the team
Techno-complexity	Monitoring ICTs	I ought to keep pace with the input received via ICTs I ought to monitor all the different ICTs I ought to figure out how to best use new ICTs It should not be mandatory to have a common communication strategy for the different ICTs Others ought to like the ICTs we use in the department We ought to have the option to use the ICTs we like
	Administering ICTs	The average employee ought to relate to 20 IT systems, each with its own upgrades, notifications, and passwords Others ought to be able to reach me if it's urgent; thus, it is difficult to switch off ICT notifications completely I ought to remember to deactivate and disable ICT notifications to avoid being interrupted
Techno-uncertainty	Constantly learning	I ought to be able to motivate people to learn new technology/ICTs I ought to make my employees realize they really need to change and be able to learn new technology/ICTs throughout their entire career experience We all ought to change in order to adapt to new technology/ICTs We ought to continuously develop our technological/ICT skills

weekends, or vacations, in order to assess relevance to them. Some engage in the act of remembering what they are supposed to answer to or take action on upon returning to the office. Furthermore, they devise various strategies to remember, including setting reminders on their calendar (obligation-based habits).

"During your daily work, **you** need to relate to a lot of input […], and that is **definitely a stress factor**—**both keeping pace with it**, but also **follow up**" (Top manager, Company 2).

The top manager describes in a generalized way how "you" need to relate to much input (individual obligation) coming from the different ICTs used at Company 2 . He sees that as "definitely a stress factor," as he indicates feeling obligated to "both [keep] pace with it," and also "follow up."

4.1.2. Keeping an overview. Employees feel it is their individual obligation to keep an overview by keeping an eye on their inbox during off-work times, by knowing which information is directed to them and which information is not, and by organizing the information received via ICTs (obligation-based habit).

"When I have a very full Outlook email inbox, that can actually stress me until I have identified **which emails I should address and not**" (Employee 4, Company 1).

Employee 4 from Company 1 reports that what stresses her is having a full inbox and not knowing which emails are addressed to her, and "which emails I should address and not." This indicates her individual obligation to have an overview of which emails are addressed to her.

4.1.3. Managing ICT-related distractions. Employees report feeling obligated to be more conscious and disciplined about how they spend their time, given the level of distractions in their environment. We find that one way for employees to manage distractions is by ignoring them and expecting their colleagues to reach out to them multiple times if a request is urgent enough (group obligation), thereby contributing to an increase in the number of distractions.

"We really have **to be much more conscious** about spending your time right, because the level of distraction is pretty high, right. […] So, I think it requires **quite a bit of discipline** to not go into distraction mode and to **avoid stress** related to that" (Top manager, Company 1).

The top manager from Company 1 reports having to "be much more conscious about spending your time right." She reports that it takes "quite a bit of discipline" to "avoid stress" due to ICT-related

distractions, indicating an individual obligation to be disciplined and avoid technostress.

4.2. Techno-invasion

Employees describe techno-invasion as either being constantly connected and available for work, or as a strategy to reduce stress by being prepared when coming to work.

4.2.1. Constantly connecting. A common theme for all employees is continuously connecting to work and feeling pressured to lose their work-home boundaries in order to show that they care about their work. Most employees report working during evenings, weekends, and vacations. The top manager and the middle manager from Company 2 justified their constant connectivity by stating that they want to signal their availability (individual obligation), hence reinforcing a group obligation of availability outside working hours.

"**Coming home**, check my phone. **Before dinner** I check my phone, **after dinner**, **in the morning** before I go to work, I would always check my phone as well. […] It is nice because then I'm **prepared**" (Employee 3, Company 1).

Employee 3 reports checking her company phone several times throughout a regular weekday: "coming home," "before dinner," "after dinner," and "in the morning."

Additionally, several employees report comments made by their spouses or children related to their use of mobile devices to work from home. These comments signal a tension between their work and family obligations.

4.2.2. Reducing stress. Being perpetually connected sometimes comes with a reward: that of reducing stress, as we see in the example below.

"If there's something that I know that I might have to deal with, I'll deal with it, because then **that reduces stress overall for the team**. I also have a tendency to, before I even leave home in the morning, check what's coming through the night, um, but, but it allows **a more relaxed attitude coming into the office**." (Employee 1, Company 1).

Employee 1 from Company 1 reports that checking her phone at home and engaging in work tasks will reduce "stress overall for the team," suggesting her individual obligation to reduce stress for the group. Further, in order to have "a more relaxed attitude coming into the office," she feels the need to check the emails received during the night, suggesting that she feels obligated to have a relaxed attitude at work. This individual obligation

contributes to group obligations of having a relaxed attitude at work.

4.3. Techno-complexity

Employees discuss techno-complexity either from the perspective of the many ICTs they need to monitor or from the perspective of managing distractions and notifications.

4.3.1. Monitoring ICTs. A predominant group obligation theme is monitoring the different ICTs employees need to perform their work tasks. Employees report feeling obligated to keep pace with all the ICTs, monitoring them, and figuring out how to best use them. Surprisingly, our data indicates a predicament: although having many communication channels without clear norms around them causes technostress, employees indicate that it should not be mandatory to adhere to a strict communication strategy.

"We **have a lot of new channels** now, new applications that we are learning […] I think I have felt that I was **getting stressed** because of this, because of having too many things coming from different places and try to **figure out how to use them best**" (Employee 1, Company 1).

Employee 1 from Company 1 reports that there are "a lot of new channels" at the company she works for. Moreover, she reports "getting stressed" as she feels it is her personal obligation to "figure out how to use them [new applications] best."

4.3.2. Administering ICTs. Multiple ICTs come with multiple notifications, upgrades, and passwords. The Top manager from Company 1 points out that an average employee at the company has to relate to around 20 IT systems and each system comes with its upgrades, notifications, and passwords. Employees report that it is their individual obligation to know how to deal with these.

"Another thing you have to administer is, like, that the notifications and **how they disturb you**. […] But, you know, on the other hand you have to, um, like, people **should be able to reach you if they need you urgently** […] notifications are—they are useful but they can also distract you and distress you" (Employee 1, Company 1).

On the one hand, Employee 1 from Company 1 suggests feeling obligated to oversee the notifications and "how they disturb you." On the other hand, she also suggests feeling obligated to be available for her colleagues, who "should be able to reach you if they need you urgently." Her answer indicates a tension between her individual

obligations to perform concentrated (undisturbed) work and the individual obligation to be reachable.

4.4. Techno-uncertainty

4.4.1. Constantly learning. Constant learning is an aspect explicitly discussed by the two top managers, but only implicitly addressed by other employees (e.g., see quote under the chapter "Administering notifications"). Employees report a group obligation to change, grow, learn, and continuously develop skills and capabilities. Learning is presented as a condition for survival as an employee in the company due to the constant introduction of new technologies.

"The parameter that could induce some stress also is if you're facing **new technology**. I have a **few employees** that say, 'I would not like to learn anything more,' for instance. And that is super, super hard to **move those people**" (Top manager, Company 2).

The top manager from Company 2 acknowledges the introduction of "new technology" as a stress factor for a "few employees," together with his individual obligation, as a top manager, to "move those people."

4.5. Techno-insecurity

The employees we interviewed neither discussed nor mentioned feeling that the introduction of ICTs threatened their jobs.

5. Discussion

In our study, we set out to answer the research question, "What can the sociological analytical concept of obligation reveal about ICT-related technostress in organizations?" The analysis chapter reveals some of the individual and group obligations that our knowledge workers consciously or unconsciously experience, as well as some of their obligation-based habits.

Our main finding is that certain obligations are technostress creators. We find that individual obligations are not only inherited from group obligations, but also contribute to the creation and enforcement of group obligations. Carrying out group and individual obligations leads to the creation of obligation-based habits. Our study is the only one, to our knowledge, that explores how individual obligations shape employees' habits (obligation-based habits) and lead to the creation of group obligations, and the only qualitative study on technostress within IS research.

5.1. Technostress-creating conditions and obligations

We start our analysis with the technostress-creating conditions described by Tarafdar et al. (2011), with a focus on identifying obligations (group, individual, or habits). However, we add depth to the conditions proposed by Tarafdar et al. (2011) by showing how many different subcategories and obligations can be listed under each technostress-creating condition, thus adding more nuance to each of these conditions.

For example, Tarafdar et al. (2011) point out that the techno-overload dimension refers, among others, to employees feeling forced by ICTs to work much faster or to have a higher workload. We add to this previous knowledge by showing how, for the knowledge worker, techno-overload means engaging in additional work related to constant input: scanning, organizing, prioritizing, following up, and remembering. Additionally, we find that these obligation-based habits are rooted in an individual obligation of having an overview and having control over one's inbox. Missing the overview and control can lead to stress and anxiety, as our respondents inform us.

Another example is techno-complexity. Here we find that, in addition to the argument by Tarafdar et al. (2011) that employees feel pressured to learn and understand how to use new ICTs, ICTs are particularly stressful for the employees we interviewed due to the unspoken norms and tension between overlapping individual obligations. In particular, employees report feeling insecure and frustrated about lack of knowledge related to which channels to use for which type of communication; the overlap between ICTs used similarly; the lack of a common and mandatory communication strategy; notifications set on default to disturb; and ICTs used for both casual and urgent communication. ICTs used for both casual and urgent communication create a tension between the individual obligations of being available and conducting focused work, which cannot be carried out simultaneously.

5.2. How obligations are shaped

As Bergson (1977) points out, in order to carry out our individual obligations, we create habits. At the same time, Bergson (1977) and Rose (1970) highlight group-level obligations as easily transferred to the individual who belongs to a particular group; otherwise, the individual would have difficulty belonging.

Taking "constantly connecting" as an obligation subcategory found during our analysis, we find that leaders feel an individual obligation to be reachable by their employees, and therefore they signal their off-work availability. This leads to a normalization of availability outside working hours, thus enforcing a group obligation for employees as well.

However, the obligation-based habits of constantly connecting create a strain on family life. Multiple employees reveal that their spouses or children comment on our respondents' use of ICTs when at home, which is also in line with findings by Tams et al. (2020) and Barley et al. (2011).

At the same time, some admit to feeling curious or committed, or calling their inbox their "beloved," suggesting that for some, it is their individual obligation to be committed to their job that drives their obligation-based habits of constantly connecting. Regardless of the reason, these individual obligation-based habits contribute to group obligations of availability and lead to obligation-based habits of constantly connecting.

5.3. Strategies for avoiding technostress

It is not new that employees are receiving input constantly. We find that employees receive input and scan for what is important to them, as Mazmanian et al. (2013) and Barley et al. (2011) have found; however, our data also shows that employees engage in remembering tasks they need to take action on. A novel finding in technostress research is that employees build habits of adding reminders in their calendars for the tasks they cannot take action on in the present. This indicates that the individual obligations of relating to constant input and keeping an overview also lead to additional habits that occupy their time.

Another important finding is that employees report feeling obligated to be disciplined and more conscious about how to spend their time, and feel it is their personal obligation to avoid (techno)stress. It becomes evident that besides information overload, interruptions, and multitasking, which previous research on technostress points out [6], employees engage in additional obligation-based habits to remember, prioritize, keeping an overview, being disciplined, and trying to avoid (techno)stress. Thus, employees see technostress as their individual responsibility rather than a shared responsibility or an organizational one.

On the other hand, employees construct obligation-based habits [18] to check their ICTs in the morning or evening, on weekends, or during vacations. They engage in these habits due to their individual obligations to have a relaxed attitude and

feel prepared when coming to work, to avoid feeling overwhelmed at work, or to avoid being a burden for other team members. These individual obligations indicate that employees feel it is their responsibility to manage their technostress.

5.4. Practical implications

To handle technostress in the workplace, organizations need to accept responsibility for both discussing and handling the obligations that lead to technostress. This requires, first, openness about these issues, which can be difficult as these matters may be surrounded by shame and guilt. Having a forum to discuss felt obligation and (techno)stress can make a difference.

A specific issue that needs to be handled is technostress as an organizational responsibility requiring organizational solutions. A starting point could be taking the obligations found in this study, summarized in Table 3, and exploring via a qualitative survey to what extent employees relate to these obligations. For example, if organizations find that "I ought to relate to the input coming via ICTs" (Table 3) is a common individual obligation, this could be re-negotiated. A way to negotiate this obligation could be to agree upon which ICTs to prioritize (e.g., email), to agree that other ICTs are to be down-prioritized, and to agree that individuals are not expected to relate to the input coming via the down-prioritized ICTs.

Organizations have to remember that the consequences of not handling technostress are grave for both the individual (e.g., health problems, addiction, fatigue, exhaustion, negative affectivity) and the organization (e.g., reduced commitment from individuals, reduced capacity for creativity and innovation, job dissatisfaction, negative attitudes towards technology in general) [2–6,8,16]. Tackling technostress from a sociological perspective rather than a technological or an individual perspective can empower organizations.

6. Conclusion

With our study, we answer the research question "What can the sociological analytical concept of obligation reveal about ICT-related technostress in organizations?" by showing how certain obligations are technostress creators. We find that beyond the material properties of the ICTs [5,6], and beyond norms surrounding the usage of ICTs that lead to technostress [9,13], individual and group obligations and obligation-based habits also contribute to technostress.

Our main contributions are theoretical and methodological. Theoretically, we contribute to IS research on technostress by employing the sociological lens of obligation [11], a theory that is novel to IS. Methodologically, we contribute to IS research on technostress by investigating technostress from a qualitative perspective, which is a new way of looking at it.

An important discovery is a tension that we find in overlapping individual obligations, for example, feeling obligated to be available, but also to conduct focused work, obligations that cannot be carried out simultaneously.

Furthermore, we note that employees feel it is their individual obligation to avoid technostress, and they devise strategies to cope with technostress-creating conditions. Their efforts add to their technostress and reinforce group obligations that can lead to technostress for the collective.

We contribute to practice by revealing employees' felt obligations that contribute to ICT-related technostress. Organizations can move these articulated obligation-habits that lead to technostress from the realm of unconscious habits, as Ross (1970) calls them, to the political arena of the group where they can be discussed and altered. That is, by discussing obligations explicitly, organizations can use obligations to alleviate technostress for employees. For example, organizations could discuss options for splitting the day into time slots when employees can engage in focused work and time slots allocated for information exchange.

7. Limitations

In this chapter, we present some of our paper's limitations. First, we acknowledge that we are working with limited data and therefore cannot make claims related to the universality of the obligations we have found. For example, this study was conducted in Denmark. The results of a similar study might differ in another cultural context. More specifically, techno-insecurity might be more prominent in a country with less job security than Denmark.

Our study is based only on interview data, which we also see as a limitation. Future studies might choose to add more data sources, such as survey data.

Another limitation is that employees and leaders might experience different types of individual obligation. For example, we find that leaders feel it is their individual obligation to motivate employees to adapt to new ICTs, which is not common in employees without managerial responsibilities.

However, these differences are outside the scope of our study.

We also have to add two methodological limitations that are common to technostress research. One is related to whether we are dealing with episodic or chronic (techno)stress. Due to our approach's sociological nature, we cannot answer whether the technostress incidents are episodic or chronic. Another methodological limitation is that we cannot say whether the technostress reported by employees is positive or negative (or both).

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📖 Article 4: Sociological mechanisms behind ICT related technostress in the workplace (**book chapter**) (Stana & Nicolajsen, 2021b)

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Impact: Level 2, 2 BFI points. Discussed in Finans.dk and Jyllands-Posten.
Authors: Stana, Raluca and Nicolajsen, Hanne Westh.
RQ: What is the knowledge that the sociological lens of obligation can bring to the understanding and handling of technostress?
Methodology: An embedded case study with two sub-units of analysis.
Main Findings:
Employees feel an obligation to:
(1) be available,
(2) have an overview of their tasks at all times,
(3) be productive,
(4) ensure good communication with their work peers,
(5) manage individual well-being at work,
(6) manage a work-home balance,
(7) manage ICTs.
(8) Additionally, there is an obligation in the workplace for ICTs to work as expected.
(9) Stress is viewed at a society level from a response perspective, thus putting the responsibility on the employees to become more resilient.

SOCIOLOGICAL MECHANISMS BEHIND ICT-RELATED TECHNOSTRESS IN THE WORKPLACE

RALUCA STANA & HANNE WESTH NICOLAJSEN

ABSTRACT. In highly digitalised countries such as Denmark, statistics show that one out of four employees has experienced high levels of stress. However, despite ample research evidence on the presence of technostress, the knowledge on this phenomenon is not yet part of the material and guidelines from official authorities. Previous research on technostress provides quantitative psychological and neurophysiological perspectives on technostress, focusing on the individual, the technology, or the technological environment. We see this as a limited approach, as it leaves out the social environment in which technostress arises. We aim to expose the sociological mechanisms that contribute to technostress by using the sociological lens of obligation. We ask: 'What is the knowledge that the sociological lens of obligation can bring to the theoretical understanding of technostress?' To answer our research question, we employ an embedded case study in Denmark by looking into the existing political material and interviews with 14 employees across six organisations. We find that stress in practice is mostly addressed from a response perspective, which points to the individual. This view is inherent in how the individuals take responsibility for the technostress they experience. Another critical finding from our data is that technostress is socially constructed. We contribute to theory by using a new-to-IS theory and a qualitative approach to technostress research, which allows us to uncover how the social construction of obligation impacts the individual employee. Our theoretical contributions point to a need for practice to move in the direction of seeing technostress as a societal, rather than solely individual, responsibility.

Keywords: technostress, obligation, information and communication technology, information systems research, sociology, qualitative study

Introduction

By the end of today, 430,000 employees will have experienced acute stress symptoms. By the end of the year, this will cost the Danish government 1.5 million workdays, the equivalent of 27 billion Danish crowns, or over three billion US dollars (Stress Forening, 2020). These estimates do not consider the related costs for managing life-long health issues that individuals might develop due to stress. These issues are: an increased risk of heart disease, depression, decreased life quality (Jensen et al., 2017), diabetes, cancer, and sleeping problems (Nielsen & Kristensen, 2007). Despite ample evidence that technology contributes to workers' stress (e.g., Tams, Thatcher, & Grover, 2018; Tarafdar, Cooper, & Stich, 2019), technostress is not yet being considered by official authorities.

In this chapter, we focus on technostress experiences concerning ICTs (Information and Communication Technologies) in the workplace. The seductive discourse about the benefits of ICTs convinces many societies and organisations to intensify their use of these technologies. However, less positive aspects of using ICTs have also surfaced, such as technostress. Technostress research makes us aware of the negative consequences for organisations and individuals, such as negative attitudes towards ICTs, lack of focus, and decreased productivity (Ayyagari, Grover, & Purvis, 2011; Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011).

We depart from the following technostress definition: 'stress phenomena experienced by employees in organisations as a result of their interaction with ICTs. This is caused by an individual's attempts to deal with constantly evolving ICTs and the changing physical, social, and cognitive responses demanded by their use' (Ragu-Nathan et al., 2008, p. 418). This definition builds on the transactional

approach to stress (Cooper, Dewe, & O'Driscoll, 2001) and sees technostress as an ongoing process of individuals transacting with their environment.

Information Systems (IS) technostress research has focused on the technological environment and less on the social environment. This is problematic as it leaves out the socio-material entanglement between the individual, the technology, and the environment (Mazmanian, Orlikowski, & Yates, 2013). Technostress research so far has relied predominantly on quantitative measures and surveys and has focused on the individual, the technological artefacts, or the static or dynamic interaction between the individual and the technology.

In our research, we bring the social environment in which technostress arises to the forefront of our study and move beyond the 'faulty worker' approach, the vilification of technology, and the stressful worker-technology interaction. We do this by taking a sociological perspective, and we employ obligation (Clark, 1990) as a lens to show how technostress is a complex social phenomenon that goes beyond the individual. This new lens helps us nuance the current theoretical approaches and the understandings and practices related to technostress, which may help us evaluate organisations' and society's political agenda.

Our research question is: What is the knowledge that the sociological lens of obligation can bring to the theoretical understanding of technostress?

To investigate our research question, we use an embedded case study based on Denmark, with two units of analysis. The first unit of analysis comprises public documents and statistics released by relevant official authorities such as the Health Ministry and National Statistics. The second unit of analysis consists of 14 semi-structured interviews with knowledge workers from six private organisations from industries such as IT, Pharmaceuticals, Entertainment, and Healthcare. These knowledge workers are employees, middle managers, or top managers. We use the sociological lens of obligation to explore our interview data, and we compare the findings with the political agenda in Denmark concerning stress and digitalisation.

We find that stress in practice is mostly addressed from a response perspective, which points to the individual. This view is inherent in how individuals take responsibility for their stress due to their interactions with technology. Another critical finding from our data is that technostress is socially constructed; for example, we find that obligations of availability and engaging in productive work, which is a function of the social environment, are connected to specific technostressors and technostrain.

We contribute to theory by using a new-to-IS theory on technostress research, which allows us to shed light on the social constructions of obligation and how it impacts the individual employee. This contribution is based on qualitative research that allows us to deepen the theoretical understanding of technostress and bring to the surface how the social environment affects the individual and their perception of technostress.

Our theoretical contributions point to a need for practice to move in the direction of seeing technostress as a societal, rather than solely individual responsibility, that needs clear guidelines and regulations in order to protect the individual, the organisations, and the society from the increasing stress epidemic.

Technostress

Technostress is a well-researched phenomenon within IS. It was coined for the first time in 1982 (Brod, 1984). Technostress has inherited the epistemological approaches found in the research on stress and could be seen as a subcategory of stress. Cooper et al. (2001) point at four epistemological approaches to stress: 1) the response approach, 2) the stimuli approach, 3) the interaction approach, and 4) the transactional approach. We describe each approach below and relate them to technostress.

1. The response approach focuses on the outcomes (behavioural, physiological, or psychological) of technostress as dependent variables (Cooper et al., 2001). We also find this approach in quantitative studies on technostress, focusing on end-user satisfaction and performance (Tarafdar, Tu, & Ragu-Nathan, 2010).
2. The stimuli approach focuses on the potential sources of stress as objective measures of environmental conditions, intending to create better working conditions (Cooper et al., 2001). Quantitative research in this approach identifies stimuli such as information overload and blurred work-life boundaries (Ayyagari et al., 2011).
3. The interaction approach is a structural and quantitative approach that focuses on the relation between stimulus and response (Cooper et al., 2001). We see this approach in much quantitative technostress research, where the focus is on the cause-effect relation (Tarafdar et al., 2011).
4. The transactional approach highlights that stress resides neither in the individual nor in the environment, but rather in the ongoing process that individuals engage in, to continually make sense of their stressful experiences occurring in their environment, and to find resources with which to cope in the given situation (Cooper et al., 2001). This is represented in technostress research by studies such as Ragu-Nathan et al. (2008).

Studies such as Ragu-Nathan et al. (2008) and Galluch, Grover, & Thatcher (2015) depart from the transaction approach to technostress and conduct quantitative research, while the environment they account for is technological. However, we argue that for technostress research to benefit from the transactional approach, it is necessary to conduct qualitative research and to include the social environment.

Based on the transactional approach, we adopt the following conceptualisation of (techno) stress processes and the terminology:

- (Techno)stressors represent events or properties of events encountered by individuals (Cooper et al., 2001).
- (Techno)strains are the individual's psychological, physical, and behavioural responses to stress (Cooper et al., 2001).

In other words, (techno)stressors are antecedent conditions to technostress, while (techno)strain is the individual's response to this condition (Cooper et al., 2001).

We showcase a proposed framework listing ICT-related stressor and technostrains in Figure 1. 'Proposed technostress framework listing ICT-related technostressors and technostrains' based on technostress literature. We explain the different technostressors and technostrains below. We also emphasise that there is no one-to-one connection between stressor and strain.
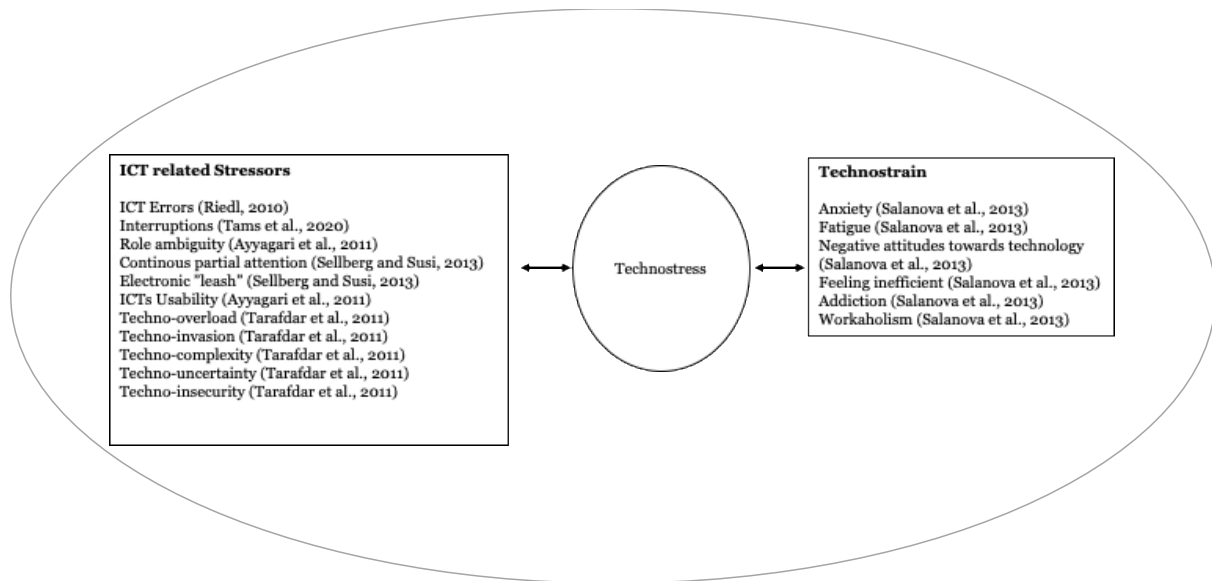
Figure 1. Proposed technostress framework listing ICT related technostressors and technostrain.

ICT-related Stressors

Stressors represent events, demands, stimuli, or conditions encountered by the individuals in the organisational environment as factors that create stress (Cooper et al., 2001).

ICT Errors

ICT errors represent any ICT crash or login difficulties. Within technostress research, we see a tendency to investigate ICT errors from a neurophysiological perspective. For example, research reports that an IT error or a system breakdown can lead to a spike in the salivary cortisol consistent with acute stress (Riedl et al., 2012).

Interruptions

ICTs can expose the individual to an endless stream of email notifications, reminders, and instant messages (Tams et al., 2018). When workers feel they have control over interruptions, they perceive them as less disturbing (Tams et al., 2018). Other studies find that the quantity of ICT interruptions stresses the individual, regardless of the messages received (Galluch et al., 2015).

Work-home conflict

Constant connectivity comes at the cost of blurred work-home boundaries. Research shows that employees who feel that they can be reached through ICTs at any time, experience a perceived work-home conflict (Ayyagari et al., 2011).

Role ambiguity

Receiving demands for attention by always having one's email open or getting other notifications takes time from other work tasks. The interruptions and the need to multitask add a layer of decision making and can lead to individuals experiencing role ambiguity (Ayyagari et al., 2011).

Continuous partial attention

As an addition to role ambiguity and multitasking, continuous partial attention refers to the motivation that leads people to certain behaviours—for example, a desire to be more productive and efficient, being afraid of missing something important, leads to them continuously check their emails even during meetings (Sellberg & Susi, 2014).

Electronic leash and expectations of availability

Continuing on this line, ICTs have become like an electronic leash that pulls employees to work, even outside working hours. Subsequently, the time needed for rest is used for work (Sellberg & Susi, 2014). Continuous partial attention and the electronic leash also lead to availability (Sellberg & Susi, 2014).

ICT usability

Ayyagari et al. (2011) state that employees do not usually have a choice of whether or not to adopt a particular ICT. They claim that this leads to low perceptions of usability features and may result in employees' perception of work overload (Ayyagari et al., 2011). At the same time, ICTs are becoming increasingly complex, which also contributes to individuals' perception of work overload (Ayyagari et al., 2011). The perception that ICT is unreliable may result in increased workload due to either unreliable interfaces or anxiety about ICT breakdown (Ayyagari et al., 2011).

Techno-overload

Techno-overload arises when it is 'too much,' as when employees face an overload of information and tasks. Employees feel forced to work faster, do more work than they can handle, work with tight schedules, change their work habits, and deal with a higher workload because of increased technological complexity (Tarafdar et al., 2011).

Techno-invasion

Techno-invasion is the feeling of being 'always connected' and never free of ICTs. Employees report that they spend less time with their family due to ICTs, that their life is invaded due to ICT usage (Tarafdar et al., 2011). At the same time, employees are also aware of how ICTs invade their privacy, which is exacerbated by unspoken norms of appreciating individuals who are available (Ayyagari et al., 2011).

Techno-complexity

Techno-complexity can be described by the word 'difficult,' as employees find ICTs intimidating. Employees report feeling that they do not know enough about ICTs to complete their tasks, need a long time to understand and use new technologies, do not have enough time to upgrade their skills, and find ICTs too complex to understand (Tarafdar et al., 2011).

Techno-insecurity

The techno-insecurity dimension addresses feeling 'uncomfortable.' Employees report feeling anxious about losing their jobs, a constant need to update their skills, and that they should share less knowledge with others in order to have an advantage over them (Tarafdar et al., 2011).

Techno-uncertainty

Techno-uncertainty means 'too often and unfamiliar'. Employees feel unsettled by the number of ICT updates, upgrades, and the changes in the ICTs used in the organisation (Tarafdar et al., 2011).

Technostrain

A strain is defined as an individual's psychological and physiological response to environmental demands (Selye, 1956). Employees experiencing technostrain can feel anxiety, fatigue, scepticism, and inefficiency related to ICTs (Salanova et al., 2007).

Anxiety

Computer anxiety is a widely studied technostrain experience. Employees experience fear or agitation when interacting with technology, such as fear of losing information, making a mistake, or finding the interaction with the computer intimidating (Salanova et al., 2013).

Fatigue

Fatigue represents a negative psychological experience produced by the use of ICT and is characterised by low psychological activation. Research makes us aware of a specific type of fatigue resulting from interacting with ICTs, called information fatigue syndrome (IFS) (Salanova et al., 2013). IFS could appear due to information overload and can lead to issues such as memory problems or poor decision making (Galluch et al., 2015; Jensen et al., 2017).

Negative attitudes towards technology

Fatigue and exhaustion can also lead to a distant, indifferent, sceptical, and cynical attitude towards ICTs (Salanova et al., 2013). Scepticism comes from the job burnout literature and represents the display of distant attitudes, indifference, and detachment towards ICTs (Salanova et al., 2013).

Feeling inefficient

Feeling inefficient refers to the feeling of being unproductive when using ICTs. The sense of efficiency decreases when ICT users need to cope with increasing demands that contribute to their anxiety, fatigue, and negative attitudes about technologies (Salanova et al., 2013).

Technoaddiction

Technoaddiction is defined as a compulsion to use ICTs everywhere and anytime, excessively, and for long periods. Employees use ICTs because they feel they have to use it (which is a compulsion) and feel anxious when they do not use it. Simultaneously, empirical studies show that the greater the technoaddiction, the more anxiety, fatigue, and generally less psychological well-being employees experience (Salanova et al., 2013).

Workaholism

Salanova et al. (2013) explain that technoaddiction is based on the traditional workaholism literature, which describes that employees tend to work excessively hard and think about work even in their free time.

Although much is already known about technostress in IS, scholars often point to variables that cannot be measured quantitatively. For example, both Tams et al. (2020) and Ayyagari et al. (2011) point out that a limitation of their study is not investigating social norms around ICT usage. To the best of our knowledge, prior technostress research has shaped our understanding of technostressors and technostrains existing in the technological environment, with a focus on the individual. In our study, we are expanding the focus from the technological environment to the sociological environment.

Analytical lens

Obligation is a concept that helps us understand the reciprocity and exchange in our interactions. Feelings of obligation arise when we feel we owe emotions, time, or energy to the society as a whole, others (and ourselves) (Clark, 1990). Obligations may come as feelings of duty or responsibilities. Clark (1990) explains that duty is a form of obligation that makes people want to behave in a certain way, where responsibility is 'an account to self that includes affect surrounding the cognition' when the individual feels that they are obliged to perform specific actions for others (Clark, 1990).

A sense of obligation is crucial for social exchange, and obligation is central to creating groups and having members conform to group norms (Poder, 2008; Bergson, 1977). Feelings of obligation are often inherited from the values we have and the cultural norms of the groups we are part of. A way to learn about norms or trying to build norms is through alter-casting. Alter-casting occurs when we invoke feelings of obligation in others to act in certain ways by telling them what we expect of them and what they owe us. A well-known example refers to status, which makes role expectation more salient: e.g., if a new employee accepts the status of being 'a motivated employee', they have to accept the obligations that come with this status, e.g., working longer hours (Mazmanian, Orlikowski, & Yates, 2013).

Obligation is often perceived as something objective and tangible imposed from the outside. Here we discuss the feeling of obligation, meaning that it is less tangible. However, there can be strong cultural drivers for the feeling of obligation. In our everyday interactions, we invoke feelings of obligation in others, which is a way to inform and negotiate with others about their and our social place. Our place is both other-constructed and self-constructed. Hence, there might be a conflict if these are not aligned, which would imbalance the relationship between the social and the individual (Bergson, 1977). Negotiations occur as we take positions through our behaviours as we may resist or accept others' place (Clark, 1990).

Obligations are strong behavioural markers because of the associated emotions. When we perform our duties and responsibilities, we feel satisfaction, pride, or gained status (Clark, 1990). However, if we do not fulfil our duties, this leads to shame, guilt, self-blame, or blame (Clark, 1990). Avoiding these negative feelings is known to be even stronger, and avoidance is, therefore, a primary motivator to perform duties (Lawler, Thye, & Yoon, 2009; Ross, 1970).

Our obligations to the society, our family, and our profession work as concentric circles, with the individual in the middle (Bergson, 1977), the society as the outer circle, and the other obligations as in-between circles. Bergson (1977) and Wolfe (1991) discuss how individuals find themselves confronted with choosing between obligations or needs from different circles happening simultaneously. However, these choices are often unconscious, as many obligations are habitual and taken for granted (Ross, 1970). Thus, obligations are embodied in our daily habits, such as answering emails from home, nursing our children, and paying our taxes. Ross (1970) claims that when we are conflicted by our obligations, we tend to choose the obligations of the group that enlists our loyalty the most.

When we become aware of our unconscious habits that arise from covert obligations, we can act and make changes (Ross, 1970). We might feel ashamed for having carried out our past habits, but we can choose not to act on these habits in the future. However, it is not easy. The first step towards

making covert obligations overt is identifying them. When felt obligations are discovered and articulated, they leave the unarticulated norms that are inherited from our group membership status and enter the group's political arena, where the group can discuss, criticise, and make changes to them.

Regarding technology, Ross (1970) argues that a wealth of possibilities increases the number of choices. We argue further that ICTs add choices, which create conflicting situations when the individuals need to choose (consciously or unconsciously) which obligations they will conform to. In particular, the digital and flexible workplace provides a more significant overlap of obligations to different groups.

Methodology

The epistemology of this research is interpretivism under the hermeneutical school (Alvesson & Sköldberg, 2017). There is no objective reality or truth to be discovered from this perspective, but the focus is on exploring what is meaningful in the situation studied. In this view, understanding a social fact is to interpret it (Crotty, 1998). Interpretivism, under the hermeneutical school, begins from an initial understanding of the whole and how it relates to the parts, and from the parts to the whole again (Alvesson & Sköldberg, 2017). Similarly, in our study, we depart from an initial understanding of technostressors, technostress-creating dimensions, and technostrains based on current research. We compare these elements with our interviewees' accounts about technostress, and we observe how these relate to technostress research. We present our observations in the discussion chapter.

We conduct qualitative research in the form of an embedded case study (Yin, 2018). Case study research provides an opportunity to investigate technostress as a phenomenon in a given context, which is useful in situations like researching technostress, where the phenomena are deeply entangled in the environment (Yin, 2018). At the same time, case study methodology is appropriate for our sociological approach to technostress, as it allows us to say something about the sociomateriality of the environment in which technostress arises. Case study methodology, in the hermeneutics school, allows us to unfold how the social environment affects the individual, the organisations, and society, and how the whole (society) affects the parts (the individuals and the organisations).

Our embedded case study consists of two units of analysis. The first unit comprises archives and reports about stress published and released by the Danish government between 2007 and 2019. Our second unit comprises 14 semi-structured interviews (Bryman & Bell, 2011) with knowledge workers from six Danish private organisations. Each interview lasted 30 to 60 minutes. We conduct our analysis on verbatim transcriptions of the interview data, and we use technostressors, technostress creating dimensions, and technostrains (see Figure 1).

We coded our material in several rounds of coding, as described by Saldaña (2009). We first engaged in a preliminary reading of the interview material, where both authors checked and compared their understanding of how to code the material against Figure 1, hence conducting coding with a priori goals (Saldaña, 2009). We then engaged in the first round of coding by using the qualitative analysis software ATLAS.ti. Our coding strategy for this first round of coding was structural (Saldaña, 2009),

meaning that we would code the quote accordingly every time we found a clear indication of technostress. For example, the following quote:

*'of course, as soon as it [ICTs] works, **but to get it to work sometimes it can be time-consuming and stressful**, and we get all feeling that okay, we had this meeting room, even ahead of time, and we spend so much time, and we're still not ready, why **shouldn't we spend our time on something more profitable**, something that makes the result.'* (Employee 1, Fintech)

We coded the quote with the codes 'ICT errors' and 'Feeling inefficient'. The result of this first round of coding was the identification of 130 quotes. After the first round, we conducted the second round of coding, in which we coded each quote with an obligation-related code (Saldaña, 2009). For example, we added the code 'Obligation to spend our time on something more profitable*'* for the quote above. We then engaged in the third round of coding, using pattern coding (developing significant themes from the obligation codes we found, according to Saldaña (2009)). Each of the authors looked at the codes independently to assess the more prominent cluster theme the unique codes fit. The result was 18 obligation themes. These were then further regrouped into obligation categories and subcategories through identified patterns of relatedness and commonalities, resulting in eight categories with 2–4 subcategories. We present them in Table 1 in the analysis chapter.

Case study

Denmark is a highly digitalised country. In 2007, the Danish government launched the project 'Strategy for digitalizing the public sector 2007- 2010' (Danmark et al., 2007). The purpose was to place Denmark at the forefront of digitalisation globally by taking advantage of the digital opportunities and offer more effective public digital services to citizens and organisations (Danmark et al., 2007).

In the same period, numbers in the stress statistics in Denmark increased. In 2000, 2% said they felt overloaded at work (Juel, Sørensen, & Brønnum-Hansen, 2006), while in 2010, this increased to 12.6% (Christensen et al., 2010). In 2012–2018, the number of employees experiencing stress varied from 21% to 23%, which means constantly more than one in five workers (Det Nationale Forskningscenter for Arbejdsmiljø, 2018a). The Health Ministry reports are even worse, documenting that one in four employees (25.1%) reports high stress (Jensen et al., 2017). The consequences are severe. Long-term stress increases the likelihood of heart conditions, infections, depression, fatigue, and cancer (Nielsen & Kristensen, 2007), and a reduction in life expectancy (Juel et al., 2006). For organisations, stress causes lost work. British research documents 24 days of lost work on average for each employee experiencing high stress (Health and Safety Executive, Great Britain, 2019). Despite the individual and organisational consequences of stress, only 28% of the small organisations and 64% of the middle and large organisations in Denmark have stress policies and guidelines (Det Nationale Forskningscenter for Arbejdsmiljø, 2018b).

 Looking into the material on stress on a political level, we find that technology is rarely mentioned. Examples of causes of stress recognised by the Health Ministry and The National Work Environment Research Center are the inability to influence one's tasks, difficult or inconsistent communication, and incoherence between workload and time (Det Nationale Forskningscenter for Arbejdsmiljø, 2018b). In 2007, the Health Ministry published a stress handbook, where technological development is briefly mentioned as influencing work-life balance (Nielsen & Kristensen, 2007). However, technology is not addressed in either the following stress guidelines (e.g., Jensen et al., 2017) or in

national surveys such as the workplace assessment or the national statistics on stress (Workplace Assessment 2018; Denmark National Statistics). We also checked the website for the Centre for Digital Health, which did not present any material regarding technostress at the time of our investigation.

In June 2018, six Danish ministries commissioned a stress panel (Sundheds- og Ældreministeriet, 2019). The stress panel's purpose was to identify what produces stress and create recommendations on how to tackle it, and increase awareness and conversation about it in Denmark (Sundheds- og Ældreministeriet, 2019). The recommendations should be non-regulatory (e.g., working hours, days off, leave) and incur no implementation costs. A call made to the general public resulted in 202 recommendations from researchers, private persons, and organisations. Further, the panel invited students to fill in a questionnaire on how to decrease the stress curve in society. As a result, the panel came up with 12 recommendations, such as addressing parents' use of school intranets, digital sexuality, or early and coordinated treatment of stress (Sundheds- og Ældreministeriet, 2019).

Of the 12 recommendations, three of them relate to stress in organisations either directly or indirectly (see Box 1), while recommendations 'Action 2' and 'Action 4' discuss stress in organisations more specifically.

Action 2: Create workplaces and management cultures where unavailability outside working agreements is expected, where there is a balance between resources and requirements, and conduct leadership training to include mental health and stress.
Action 4: Strengthen digital public health.
Action 12: Invite the tech industry to respect human biological, social and psychological needs.

Box 1. Recommendations from the Stress Panel regarding stress in the workplace, based on the Ministry of Health and Elderly

Recommendation 'Action 2' two consists of three suggestions:
· Expected inaccessibility when the employee has time off, which needs to be made explicit by the leaders. The stress panel recommends that workplaces develop policies related to healthy digital habits that are communicated explicitly and supported by leaders, but that also respect the various ways that employees prefer to work (e.g., parents might want to work until 14.00, spend time with the family, and work again in the evenings).
· Provide an overview of resources and requirements.
· Leadership training in mental health, stress prevention, and stress management.
Recommendation 'Action 4' consists of two suggestions:
· Customise institutions' and authorities' digital boundaries concerning citizens' need for sleep and leisure. For example, avoid sending emails from the tax authorities on a Friday evening, as it can increase stress during the weekend for the citizen, who cannot contact the tax authorities until Monday.
· Challenge institutions to work experimentally and purposefully towards distraction-free spaces to promote presence, focus, concentration, achievement, and respect. For example, avoid the presence of a phone on a meeting table as it decreases employees' cognitive resources (Sundheds- og Ældreministeriet, 2019).

Besides the recommendations specifically tailored to the organisational environment, recommendation 12 challenges the tech industry to review their applications and services by considering humans' biological, social, and psychological needs. As examples, the stress panel points towards calendar and email apps that ask the user if they need preparation time before a meeting or email providers that allow you to ask if an answer should be delivered right away or later. Furthermore, the stress panel challenges the tech industry:

- Avoid a design that triggers specific addictive behavioural patterns (e.g., certain games) or contain addictive use patterns (e.g., autoplay functions);
- Prompt the user with recommendations for how long one should use that particular application or software to avoid addiction;
- Research technoference (a term used to define how technology interferes in relationships) and include it as a conversation point, e.g., in general practitioners' or midwives' conversations with new parents;
- Require better and simpler notification management in iOS and Android, with an opt-in design where notifications can be turned on by the user instead of the current opt-out design;
- Be dedicated to following the newest and independent research in the field, e.g., from the newly established Centre for Digital Health, and more generally understand and take responsibility for the tech industry's role in today's society. (Sundheds- og Ældreministeriet, 2019)

Analysis

In the following chapter, we present and discuss the general obligation categories identified in our interview material and their subcategories. A common finding is that none of the employees has heard about technostress; hence, this is not an established phenomenon. However, some of the technostress themes are well known – for example, work-home balance. What also becomes evident in the analysis is that a given situation may contain several obligations, so there might be overlaps between categories.

Table 1

Obligations Surrounding the Application of ICT in the Workplace

Obligation	Obligation subcategory
Obligation to be available	Obligation to be reachable
	Obligation to show engagement
	Obligation to be attentive
Obligation to have an overview	Obligation to stay updated
	Obligation to be able to prioritise tasks
	Obligation to be prepared
Obligation to be productive	Obligation to be time-efficient (distractions, using time right, and focus)
	Obligation to be on time

	Obligation to not delay others
Obligation to ensure good communication	Obligation to avoid misunderstandings
	Obligation to know where to address a given concern
	Obligation to follow up on the received communication
Obligation to manage individual well-being at work	Obligation to managing time and space for deep work
	Obligation to self-control
	Obligation to be resilient
Obligation to manage a work-home balance	Obligation to separate work from home
	Obligation to constantly check emails
Obligation to manage ICTs	Obligation to troubleshoot
	Obligation to configure notifications
Obligation for ICTs to work as expected	ICTs ought to talk together
	ICTs ought to be more straightforward
	All ICT functionalities ought to work at all times
	ICTs ought to behave as expected

Obligations to be available

The obligation of availability is widespread across our interviewees and represents one of our richest obligation categories in terms of quotes. The critical aspects of availability can be treated under three headings: being reachable, being attentive, and showing engagement.

Employees' obligation to be reachable is expressed as both their obligation towards others and others' expectations of them. For example, they feel that others should feel free to call them even while they are on holiday, that they should adapt to and be reachable on the ICT channels that others prefer, and that others should know that they can get hold of them if they need to, even when they are not at work. Thus, their reachability is constructed around others' preferences of time and medium, as a duty of a self that wants to be available and flexible.

On the other hand, our informants also point out that others expect them to be reachable. These expectations are expressed in the form of interruptions (to the extent that deep work is not possible) or as remarks about perceived delayed responses. For example, one employee reports his manager saying: '*Well, it would've been nice to have this response much earlier*' (Employee 1, Company 1), showing how reachability is expected and constructed in the work environment.

Our respondents discuss the obligation to be attentive, to check their inbox outside working hours for various reasons. Several employees reported that working with different time zones places an

obligation on them to check their emails when others are working in case there are follow-up questions. One interviewee argued that '*in those situations, it is a deliberate choice to step into a 24/7 delivery cycle*' (Middle manager, Company 2), as he would want to ensure that the tasks are appropriately handed over to the overseas team by being available for follow-up questions to his emails. This view was echoed by another middle manager, who argued that she would take the time to respond until late at night rather than delay the overseas team for 24 hours. In another example of attentiveness, an employee reported that she checked her email every day while on holiday: '*We were starting on a new activity that kind of requested, that required that we were very attentive*' (Employee 1, Company 2). This suggests that the obligation to be attentive was placed on her and that she felt it required and requested her to check her email daily, even during her holiday. She proceeds by saying: '*I know it's not the best thing, but that's how it is today*' (Employee 1, Company 2), suggesting the commonly accepted normalcy of this practice.

Furthermore, there is a sense of a hidden culture of engagement amongst employees, which contributes to availability. One interviewee accentuates this: '*They have so many very driven persons that the people working here actually work far more hours out of choice, out of passion, out of engagement (…) it's the hidden culture. And then if one says, well, I only work from nine to five and switch off my phone, I think one would feel a little bit bad because the rest is doing more hours*' (Employee 3, Company 2). In this quote, we notice a tension between working more hours as a deliberate choice, and the employee noting that she would feel bad if she chose to switch off her phone after five when her official workday ends. Other interviewees allude to this type of engagement by explaining how the nature of their role is to be available, and they must make themselves available to the others outside working hours.

Obligation to have an overview

Another reported obligation is the obligation to have an overview, particularly over the incoming information flow. In this category, we see three themes emerging: staying updated, prioritising tasks, and being prepared.

Being updated is a common issue for having an overview. Two discrete reasons emerge. One relates to feeling in control of the incoming information flow, e.g., '*you have to be constantly cleaning and moving things from one place to another and keeping a lot of control*' (Employee 2, Company 2). The second one relates to checking either casually, e.g., '*I might take a look very quickly if there is anything really that needs my attention*' (Employee 1, Company 2) or looking for critical updates, e.g., '*In some cases, if you have a strict deadline (…) we actually need to reply to "Is this what you mean and not that?" in order for them to tell the delivery people how to actually fix the problem in China*' (Middle manager, Company 2).

The incoming information flow leads to prioritisation practices of sorting through, moving things around, and knowing which types of work (ad hoc tasks or deep work) to focus on. This becomes increasingly difficult as our interviewees report being interrupted by others through different communication channels, and they continuously receive new tasks. As one employee puts it: '*It's hard to prioritise, and then you realise that you spent so much time and energy on just managing, not even really doing it constructively, but just managing this information flow and deciding: what should we postpone, what should be cancelled, what should be done right now*' (Employee 1, Company 1).

Another interesting emerging theme is that of being prepared. Our interviewees report their obligation to be prepared, exhibited in habits such as checking their email at home in order to know in which rooms their meetings will take place in the next day and to feel more relaxed at work, e.g. '*Before I even leave home in the morning, I check what's coming through the night, um, but, but it allows a more relaxed attitude coming into the office*' (Employee 2, Company 2). Another form of preparation discussed by some of our interviewees is coming into meeting rooms earlier to make sure that the room configuration allows for an online meeting without technological challenges.

Obligation to be productive

Several employees expressed an obligation to be productive. This category can be split into three broader themes: obligation to be time-efficient, obligation to be on time, and obligation not to delay others.

The obligation to be time-efficient can be observed in how interviewees discuss tasks that they perceive as a time waste, such as troubleshooting hardware for online meetings, administering different communication channels, or spending time understanding new ICTs. One interviewee states, referring to malfunctioning equipment: 'It's *a minor issue (…) people spend time on these things, instead of coming to the meeting and starting to discuss productively*' (Employee 1, Company 1), suggesting a perception that fixing hardware issues is not productive, but discussing in a meeting is. On the same line of thought, employees do not see keeping track of different communication channels as a productive task.

We also observe a theme related to employees' obligation to be on time. When they are prevented from being on time to, for example, online meetings, employees experience technostress due to technology. We can see the obligation to be on time articulated in the quote: '*Say you're preparing for some meeting, it's in ten minutes, and you wanted to open some presentation and also some application, and also connect to some server (…), and something doesn't work, then, of course, it's irritating, and then you're stressed and pressed on time*' (Employee 1, Company 1), where our respondent experienced stress, although he has done everything in his power to be prepared.

The third theme in this category is the obligation not to delay others. We see this in our data, on the one hand, exemplified in quotes related to online meeting delays due to malfunctioning ICTs as in the example above, and on the other hand, in accounts of employees responding to emails outside working hours in order to not delay their overseas colleagues, which we have also discussed extensively in some of the previous categories.

Obligation to ensure good communication

Another reported issue was the obligation to ensure good communication. The employees express various perspectives concerning avoiding misunderstandings, knowing where to address a given concern, and following up on received communication.

A few interviewees discuss their concerns to formulate their written communication in order to avoid misunderstanding, e.g., '*You would have to formulate it in such a way that you're absolutely sure this person will understand*' (Employee 1, Company 1)*.* Moreover, employees are also careful to ensure complete communication whenever they write an email describing a task they would want

their peers to complete, e.g., '*It's bad ethics (…) I'm inflicting stress on them if I don't respond in a timely and in an informed manner*' (Middle manager, Company 5).

Other interviewees discuss how they feel obligated to know which communication channels are used for addressing specific concerns and adhering to that. Furthermore, respondents explain they feel they must always follow up on the received communication and are dealing with the feeling that they do not have the time to always follow up, and are continuously being behind, as this employee explains: '*You do not really have time to, to answer or do something about it, and then to say, okay, I'll do it afterwards, right. And then afterwards, you don't because then there are other things coming and all the time*' (Employee 1, Company 2).

Obligation to manage individual well-being at work

A common theme amongst our interviewees is their obligation to manage technostress, from which we notice three emerging themes: obligation to manage time and space for deep work, obligation to self-control, and obligation to be resilient.

A variety of examples were expressed on the obligation to manage time and space for deep work. It was suggested that employees feel it is their responsibility to devise strategies to achieve deep work. One interviewee expressed: '*I try to work from home one day a week simply because when I am here, there are so many people grabbing my attention and asking for help*' (Middle manager, Company 3), suggesting that he uses his home as a space for deep work, as his workplace does not allow for an environment free of interruptions.

Another emerging theme is the obligation to self-control. Several employees describe their efforts to control their impulses to check their emails from home, manage interruptions, or be disciplined about how they spend their time at work. For example, the following comment: '*It is an effort to shut it down again, that instinct to just check my email from my phone*' (Middle manager, Company 5), expresses a common struggle for employees, who take on the obligation to manage their urges. On the same line of thought, the following quote expresses the effort one has to put into not allowing oneself to be distracted: '*We really have to be more conscious about spending our time right because the level of distraction is pretty high*' (Top manager, Company 2).

In our data, an exciting theme of obligations to be resilient emerged. One interviewee explicitly states: '*The video conferencing technology, even state-of-the-art, is not perfect. So, it's good to have some resilience to any failures*' (Middle manager, Company 1). The quote suggests how resilience to failures happening in the work environment is seen as an individual obligation. In other accounts, resilience is discussed as strategies to survive or to avoid distractions, interruptions, or to tackle multitasking: '*That's the way I survive, that I'm not trying to get all this information at the same time*' (Employee 4, Company 2).

Obligation to manage a work-home balance

The obligation to manage work-home balance is another well-represented category. It could be included in the previous category related to managing well-being at work. However, due to the richness of the data, we decided to treat it separately. In this category, we notice two themes: an obligation to separate work from home and constantly checking emails.

The obligation to separate work from home emerges as a theme that presents a struggle for the interviewees, as they take it upon themselves to build barriers between their private life and work. For example, an employee mentions: '*I keep telling people to not write me on Facebook but send me a text instead*' (Middle manager, Company 5), which reveals the extra practices employees engage in in order to ensure separateness. This struggle is echoed by several other employees, who devise practices to protect their privacy and private life by having two mobiles: *'In my case, I have two phones (...) this is a work phone, I'm not supposed to use it privately, but it's also difficult to control (...) I prefer to keep my private things separated'* (Employee 1, Company 2).

On the other end of the spectrum, our informants suggest their obligation to constantly check emails in order not to feel overwhelmed when coming to work, as this interviewee suggests: '*I also have a tendency to check what's coming in through the night, but it allows a more relaxed attitude coming into the office. I know there's nothing burning in my inbox*' (Employee 2, Company 2). This is echoed by several other informants, suggesting that employees use their time at home to ensure balance in their work time.

Obligation to manage ICTs

Our informants express concerns about the obligation to manage ICTs, in the form of both troubleshooting and configuring notifications.

The obligation to troubleshoot ICTs is clearly articulated by one middle manager, who explains that since meeting rooms are shared rooms, it is a shared responsibility to act when malfunctions are experienced. Otherwise, everyone stresses about them: '*If you have a problem, you need to act on it*' (Middle manager, Company 2). This also suggests that the obligation to troubleshoot is alter-casted on employees. However, he continues: '*I am not sure that everybody knows how to do it*' (Middle manager, Company 2), suggesting that employees lack the training to tackle this task. This also indicates that the manager expects the employees to take on troubleshooting ICT as part of their work. Simultaneously, other employees echo that they feel it is their obligation to troubleshoot and report frustration concerning this task, as they would instead perform other tasks that they perceive as more productive.

Another theme discussed by our interviewees was their perceived obligation to configure notifications. This issue brings predicaments of availability to others and their personal need to focus, as one interviewee notes: *'Another thing you have to administer is, like, that the notifications and how they disturb you. But, you know, on the other hand (...) people should be able to reach you if they need (you)'* (Employee 1, Company 2).

Obligation for ICTs to work as expected

A distinct emerging category is that of employees alter-casting obligations onto technology to work as expected, followed by intense explicitly expressed emotions of anger, frustration, or fury. In this category, we see four emerging themes: ICTs ought to talk together, ICTs ought to be more straightforward, all ICT functionalities ought to work at all times, and ICTs ought to behave as expected.

The suggestions that ICTs ought to talk together are particularly voiced about configuring meeting rooms, where one employee remarks that he needs to take precautionary measures if he uses a new

meeting room, as his ICTs might not be configured for that particular room, although he believes they should. Other concerns relate to the alter-casted obligation that ICTs ought to be more straightforward, as one interviewee exclaims: *'It should be straightforward, uh, so that I don't use, uh, unnecessary time on, on things'* (Employee 4, Company 2).

Other obligations that some of our interviewees alter-cast on technology are that all ICT functionalities ought to work at all times and behave as expected. One of our respondents remarks that '*sometimes when something doesn't work for me (…) just the basic, (…) I am getting almost furious*' (Employee 1, Company 1), and adds that he would be more understanding if he knew that the ICT was in a prototype phase. Another respondent adds: '*It's the burden of the different technologies when they don't work as I or the consumer expect*' (Employee 2, Company 2).

The results in the analysis indicate obligations that shape employees' habits, which can lead to technostress. Therefore, the next chapter moves on to discuss the relationship between our findings and the extant technostress literature.

Discussion

In this chapter, we discuss how our findings relate to and expand the extant literature on technostress and how our insights challenge the current political discourse on how to handle technostress in organisations. We depart from our empirical study on the perceived obligations employees report, shaped by ICTs in the workplace, as a sociological approach to technostress. Our findings show gaps in the existing political discourse and approach to technostress and indicate a need for a new and extended discourse and new political measures.

Experiences of technostress in the workplace

A surprising finding is that none of our interviewees knows of or uses the term technostress. However, they all provide rich accounts of technostress, which they consider a regular part of their work. Employees feel obligated and take on the responsibility to manage technostress by devising strategies to manage their time and space for deep work, self-control, and resilience, which adds to their workload.

This finding is interesting as our data shows that technostress, seen through the lens of obligation, is a function of the social environment. However, in practice, it is experienced by individuals as their responsibility. This is an unexpected outcome that is not found in previous research on technostress. An explanation for this is that since the (techno)stress discourse is focused on the individual, this also leads to individuals taking responsibility for their experienced technostress.

Employees manage technostress in the workplace in numerous ways. They feel an obligation to manage space for deep work. This is a struggle as they experience the technostressors interruptions, distractions (Tarafdar et al., 2011), techno-overload, and techno-complexity (Ragu-Nathan et al., 2008). This stressful situation arises because of two conflicting obligations: being productive through deep work and the obligation to be available, and thus not delay others. All employees discussed their obligation to read emails while on holiday, on the weekends, and before or after work. We find several reasons for these behaviours: the obligation to keep an overview, feeling obligated not to delay colleagues overseas working in different time zones, or obligation to be available to others.

However, the strategies applied lead to techno-invasion, techno-overload (Tarafdar et al., 2011), addiction, and workaholism (Salanova et al., 2013). As a consequence, employees struggle to manage the urge to check work from home and to be disciplined about their focus, even though they know it is unhealthy and can lead to addiction and workaholism, two common ICT-related technostrains (Salanova et al., 2013). The addiction and workaholism are thus formed by their strategies to avoid technostress, as addiction is formed by repetitively performing a habit that brings initial release and satisfaction, and workaholism refers to being unable to stop thinking about work, even in free time (Salanova et al., 2013).

Acknowledging what is seen as (productive) work is another crucial challenge. Some of the tasks around ICTs are considered unproductive and inefficient. This creates tension for the employees as they feel an obligation to be productive, and the situation leads to feeling inefficient, which is a technostrain (Salanova et al., 2013). For example, employees view troubleshooting technology and getting an overview of their inbox as unproductive work. Furthermore, they do not acknowledge being available and checking/responding to emails outside working hours. This is problematic, as everyone has to balance the time spent on work and the time spent to rest and recover (Cooper et al., 2001).

It is also interesting to note that our study shows that employees are not trained to tackle all the tasks they feel obligated to engage in, like troubleshooting ICTs. A potential explanation for this could be that since this is not considered part of productive work, then training is not necessary, and vice versa. Since no training is provided, it leads to employees not considering troubleshooting as part of work. However, in practice, we notice that workers often find themselves troubleshooting ICTs. This lack of awareness of what is productive work leads to technostress. Our data reveals employees being annoyed because of ICT errors (technostressor) when they have to be on time or feel they should spend their time on other tasks (technostrain).

Technostress as social constructions

The sociological lens of obligation helps us provide a different account of how technostress plays out in the workplace and how it challenges our current ways of talking about and tackling technostress in the workplace. We have established a link between individuals' felt obligations and the technostress they experience. The picture that emerges is a social construction of felt obligations, which leads to technostress being seen as an individual rather than collective responsibility.

Our interviewees report a hidden culture of showing engagement and passion by being reachable and available. This is in line with Barley et al. (2011), who also find in their study that the employees who respond quickly are seen as professional, really caring, and sensitive towards others in the office. At the same time, when others do not conform to this image, they are admonished, as we saw in the example of the employee whose manager pointed out that they would've appreciated a much faster response. The manager's remark functions as a form of alter-casting, as the employee is reminded of their obligations (Clark, 1990).

Furthermore, we also see how one interviewee reports that she would feel bad if she did not work outside working hours, as others do, and did not adhere to the hidden culture of engagement. According to Clark (1990), some obligations are formed due to wanting to avoid shame or guilt (Barley et al., 2011). In this case, the employee contributes to the hidden culture that she explicitly exposes as a threat to her and others' work-life balance.

We notice an alter-casting of being engaged as being available outside working hours, which creates an electronic leash (Salanova et al., 2013), a common technostressor, for all individuals who want to consider themselves engaged professionals. Hence, it can be said that the hidden culture of engagement appears to be closely related to the technostressors electronic leash and continuous partial attention (Sellberg & Susi, 2014), techno-invasion, and techno-overload (Ragu-Nathan et al. 2008; Tarafdar et al., 2011), as well as to the technostrains addiction and workaholism (Salanova et al., 2013).

Technology obligation – or unplaced responsibilities

An interesting finding is that employees and managers hold an illusion of seamless and perfect technology. Technology does not work as expected, and it creates feelings of anger and fury, which is negative affectivity, a common technostrain (Ayyagari et al., 2011). The obligation alter-casted on technology to work as expected place this obligation in a predicament, as nobody is given the responsibility or task to make it work as such, while at the same time, it is an expectation that ICTs ought to function at all times as expected, as our interviewees explicitly express.

Implications for practice

The social construction so far is that technostress is tackled as a responsibility placed on the individual employee. However, the perceived obligation is, in no small degree, constructed socially. Thus, the organisations and politicians are responsible for shifting the technostress debate from an individual burden to collective responsibility.

In this subchapter, we explore how technostress is tackled at a societal level. We demonstrate how the epistemological stances that are taken impact how technostress is viewed and how the current understanding leads to the vilification of technology and blaming the faulty worker, who needs to continually upgrade themselves to cope with highly digitalised workplaces and society.

These documents, as well as the political material on stress, discuss technostress neither explicitly nor implicitly, despite much research that warns us about technostress and its cumulative impacts on the individual (e.g., Ayyagari et al., 2011; Riedl, 2012; Tarafdar et al., 2011, 2019). As there are no regulations or official guidelines that address technostress, it is up to the organisation and individuals alike to tackle technostress, should they become aware of it.

What we see at the political level is that not only is the transaction approach to stress omitted (Cooper et al., 2001), but neither the stimuli nor the response approach to stress accounts for technostress. If stress is discussed from a response perspective at a societal level, this could lead to individualisation of stress, and a blaming of the 'faulty' employee, who needs to continually become more resilient, as we find in our data. Nevertheless, as technostress research shows, although individuals also play a part in why they become stressed, ICTs bring a new set of challenges beyond what the individual employees themselves can manage (Salanova et al., 2013).

These findings have important implications for motivating the Danish society (and any society) to reformulate how stress and technostress are discussed and explored at a societal level. Besides, as we argue in our theoretical chapter on technostress, the way (techno)stress is defined in any study has profound epistemological implications for the given study, as it influences what the study can

say (Cooper et al., 2001). If the inherited epistemology focuses on the individual (response approach), this limits what can be said about the social environment, and about the technostress arising in the dynamic transactions between the individual and the social environment.

What is striking is that technostress is not discussed between individuals or at a society level. However, workers devise strategies to cope with their stressful ICT-enabled technostress experiences, some of which become work practices and part of their standard work and off time. These practices lead to an exacerbation of the very experiences they try to avoid.

Implications for theory

In this chapter, we have aimed at answering the research question: 'What is the knowledge that the sociological lens of obligation can bring to the theoretical understanding of technostress?' Our data enabled us to establish a connection between obligations co-constructed in the social environment and the technostress that employees experience. Most importantly, we find that technostress is a function of the social environment. This signals a necessity for IS technostress research to further explore technostress from a transactional approach (Cooper et al., 2001), and to consider the environment in its entirety: the technological and sociological aspects, as we portray in Figure 2.
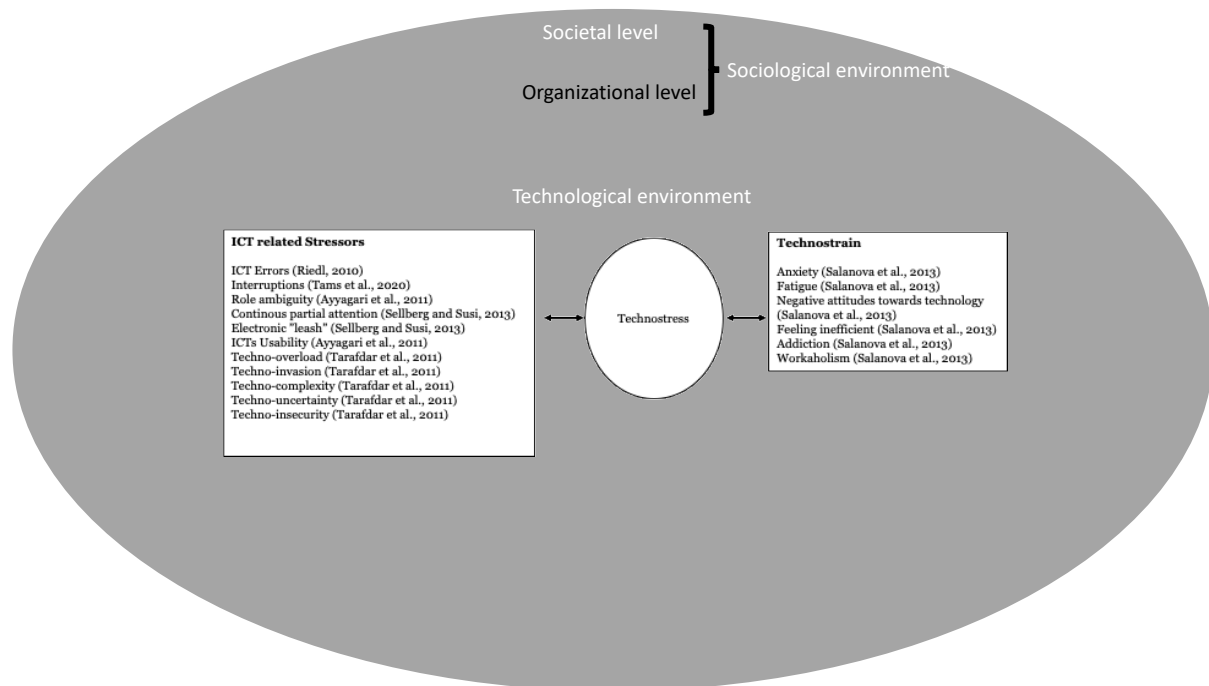

Figure 2. Proposed technostress framework listing ICT related technostressors and technostrain.

Furthermore, we propose a new definition of technostress: technostress is stress experienced by employees in organisations as a result of their interaction with ICTs, in an environment that is not adequate for stress-free work, due to unspoken obligations, unclear responsibilities, and continuously changing physical, social, and cognitive demands on the individual.

On a concluding note, we would like to briefly mention a few future research avenues based on our study. We see two possible research directions. The first direction could expand the sociological focus from obligation theory to other sociological theories and concepts. For example, our finding

that employees feel obligated to show engagement resembles emotional labour, a theory developed by well-renowned sociologist Arlie Hochschild (Hochschild, 1983).

The second direction could choose to zoom in on particular technostressors and the obligations around that technostressor. For example, future research could look into which obligations contribute to the technostress employees experience when dealing with ICT errors.

Conclusion

With this study, we open a new avenue for technostress research by showing how a sociological lens of obligation can provide new insights about technostress in the workplace. This novel approach to researching technostress reveals that: 1) what employees feel is their obligation contributes to their experience of technostress, and 2) the felt obligations are co-constructed in society, organisations, and individuals' use of ICTs.

We point out that although our data show that technostress is a function of the social environment, what we can see in practice is that individuals tackle it as their responsibility. This critical finding helps us understand the connection between how technostress is discussed at the societal level and the implications it has on individual employees. The individual strategies in use often lead to addiction, workaholism, techno-overload, and techno-invasion. We argue that for the society to tackle technostress, a transactional approach to technostress, where the social environment in which technostress arises is accounted for, is needed. This would imply solutions for tackling the social environment, rather than suggesting that individuals need to continually become more resilient. The solutions could include work on when to be available, the need for rest time, what is productive work, and who is in charge of ensuring that ICTs work as promised.

We contribute to theory by proposing a new technostress model, as displayed in Figure 2, in which both the technological and sociological environments are considered. Furthermore, we propose a new technostress definition.

Limitations and future research

The current study is by no means an exhaustive account of obligations that contribute to workplace technostress. Our sample is limited in numbers, type of workers, the national context of Denmark, and the sole focus on ICTs. Further studies departing from the obligations found in this work are needed to deepen the knowledge about obligations and the social dynamics around ICTs and other technologies used in the workplace. These studies could use other types of case studies and include other types of employees, as well as employees and organisations from other national and cultural settings.

Our study is limited to the political agenda, and employees' (including managers) felt and experienced obligations. Organisational case studies could further the insights by looking into organisational policies, guidelines, and practices and contextualised dynamics.

As the use of obligation as a lens for technostress research is new, and the concept is not well defined to run these kinds of analysis, this provides a limitation to the study. Further work on developing obligation as a lens would be valuable.

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📖 Article 5: "I was struggling with my guilt for not being able to log in." Technostressful constructions of obligation in the digitalised workplace. (conference abstract) (Stana, 2020b)

Avenue: The 9th Midterm Conference of the ESA Sociology of Emotions Research Network (RN11), 2020.

Status: Abstract accepted and presented. Nominated for Best Paper Award. Peer-reviewed.

Impact: Presented at the European Sociological Association, one of the largest conferences within sociology.

Authors: Stana, Raluca.

RQ: What is the role of obligation in how technostress is constructed or dealt with in organisations?

Methodology: Longitudinal case study comprised of an IT leaders' reflections for six months, coupled with interviews.

Main Findings:

(1) When technology does not work as expected, it leads to feelings of shame, guilt, and self-doubt.

(2) The employee identifies with the failure or success of the technology.

(3) The individual deals with technostress through humour and sarcasm, as she feels that she is not allowed to feel anger or frustration.

"I was struggling with my guilt for not being able to log in." Techno stressful constructions of obligation in the digitalized workplace

RALUCA STANA

Proposed session: Emotions in organizations

This paper examines the construction of obligations that lead to technostress in organizations through a longitudinal case study comprised of personal reflections of a female IT leader over six months, coupled with in-depth interviews. Technostress, defined as any adverse change in attitudes, perceptions, and affects as a result of interacting with and/or through technology; is currently addressed as a psychologically and neurophysiologically quantitively measurable phenomenon (Tarafdar et al., 2019).

With this study, we would like to show how a sociology of emotions perspective can add to our understanding of technostress in organizations. In particular, we investigate the role of obligation (Clark, 1990). This emotional blend gives us analytical purchase, in how technostress is constructed or dealt with as a result of covert and perceived obligations in organizations. This is important, as when obligations are discovered and articulated, they leave the social and enter the political arena, where they can be negotiated and appended (Ross, 1970).

Among our findings, we see how 1) when technology doesn't work as expected; it leads to feelings of guilt, shame, self-doubt; 2) the employee identifies with the failure or success of technology; 3) the individual deals with technostress through humor and sarcasm, as she feels that she is not allowed to feel anger or frustration. We show how our obligation driven habits, or emotional responses that go unchallenged in both individuals and organizations can lead to technostress.

We contribute to technostress literature by showing how the Sociology of Emotions can provide insights into how and why we construct obligations that lead to technostress, as well as to sociology of emotions by showcasing how Clark's theory on obligation can be used in the context of the digitalized workplace.

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📖 Article 6: Between an online Friday bar and efficient work – A life narrative of obligation and technostress in organisations
(extended abstract for the conference) (Stana, 2020a)

Avenue: IFIP – Paper Development Workshop Proceedings: The Future of Digital Work: The Challenge of Inequality: IFIP Joint working conference, 2020.

Status: Abstract accepted and presented. Peer-reviewed.

Authors: Stana, Raluca**.**

RQ: How are the obligations that lead to technostress constructed in the workplace?

Methodology: Longitudinal case study comprised of an IT leaders' reflections for six months, coupled with interviews.

Main Findings:

(1) When technology does not work as expected, it leads to feelings of shame, guilt, and self-doubt,

(2) The closeness between the employee and the technological artefact leads to an over-identification with the success or failure of the technological artefact,

(3) The individual deals with technostress through humour and sarcasm, as she feels that she is not allowed to feel anger or frustration,

(4) The employee deals with technostress by herself,

(5) There is a tension between not wasting time and socialising in work purposes, as the latter is not emphasised as a valuable part of one's work.

Between an online Friday bar and efficient work – A life narrative of obligation and technostress in organizations

RALUCA STANA

Introduction

Information and Communication Technologies (ICTs) enable us to work and communicate anytime, everywhere [15]. Although ICTs bring many advantages to our work and how we share information, there are also dark sides. For examples, social exclusion [12], over-surveillance [26], over-identification [7], or technostress [3].

In our research, we investigate technostress. We depart from the definition that technostress is a "stress phenomena experienced by employees in organizations due to their interaction with ICTs. This is caused by an individuals' attempts to deal with constantly evolving ICTs and the changing physical, social, and cognitive responses demanded by their use" [23]. In general, stress is shown to lead to high costs for societies, organizations, and individuals. For example, in a highly digitalized country like Denmark, stress costs society over three billion dollars yearly [27]. Research documents that organizations lose 24 days on average for each employee experiencing high stress [14]. For the individual experiencing high levels of stress, stress has an even higher cost, leading to heart problems, diabetes, cancer, sleeping problems, depression, fatigue, and even a reduction in life expectancy [17; 21]. Despite ample evidence about technostress's impact on the individual or the organization [2; 22], technostress seems to not be a part of the discussion as a collective issue.

Since it was first defined in 1982 [6], technostress has attracted much attention from Information Systems (IS) researchers and beyond. However, IS research so far has focused on psychological or neurophysiological quantitative measurements, zooming in either on technostress for the individual [28], ICTs characteristics that create technostress [3], or the dynamic and transactional technostressful interactions between the individual and ICTs [23; 25]. We see the sole focus on psychological or neurophysiological measurements as problematic, as research point that the sociological environment also impacts how employees construct meaning and norms around their usage of ICTs [4; 19]. For example, a study analyzing how employees communicate to conduct their work has shown that it is the norms constructed around technology usage that leads to technostress [4].

In our study, we aim to explore the sociological aspects that lead to employees' experiences of technostress, thus aiming to establish a sociological stream of IS research on technostress, additional to psychological or neurophysiological. To do this, we are employing the analytical lens of obligation [9], borrowed from the discipline Sociology of Emotions [18].

Our research question is: How are the obligations that lead to technostress constructed in the workplace?

Obligation

In our paper, we use the analytical lens of obligation to investigate how the rendering of technostress perceptions occurs and is constructed.

Obligation can be defined as a reciprocal social exchange that ensures our belonging to a group [5; 9]. It can be described as a feeling that we owe something to each other or that we "ought to" do something. In some cases, this is due to our feel responsibilities and duties [9], or due to others alter-casting their expectations on us either implicitly or explicitly [9]. Clark (1990) and Bergson (1977) bring to our attention that some of the mechanisms

that lead to the creation of obligation are avoidance or seeking up certain feelings. They claim that individuals might carry out their obligations to avoid feelings like shame, guilt, or blame or seek feelings like pride and elevated status.

Methodology

To answer our research question, we are conducting qualitative and interpretative research, and we use the analytical concept of obligation to analyze our data.

We are using a longitudinal case study, where we analyze a female leader's journal entries for six months, from the moment she joins a new company. We couple our data with additional and regular interviews with the same employee. We focus on the experiences of one employee (whom we call Emma).

Our study's context is Denmark [10], where it is estimated that one in five employees experience high levels of stress daily [16]. However, the national authorities have not yet included technostress in the official stress guidelines [11; 16], which leaves the individual employees and organizations without tools and methods to discuss and handle technostress.

Emma is a recent IT graduate student who quickly received more responsibility in her work within IT consultancy. After two years working for a big international company, Emma decided to switch her workplace and work in a consultancy company where she could travel less. Furthermore, she would have long-term projects that would allow her to better familiarize herself with co-workers, customers, and the project itself. At the same time, Emma receives more responsibility as she leads a team. She starts her work in January 2020, and she begins to write her weekly journal as soon as she starts on her new job. In total, Emma wrote over 25 entries, beginning January and until the 30th of July. Furthermore, we have also interviewed Emma before starting to write, during, and after, in an informal interviewing format with predefined topics [13]. During this period, Emma experiences the Covid-19 lockdown in Denmark and its implications on her work.

We analyze our data following a life-narrative approach [8]. According to this approach, emotions and perceptions are not necessarily addressed directly and explicitly, but they are organized in themes derived from experiences [e.g., 12]. To make sense of all the data, we conducted two rounds of coding in which we analyzed the journal entries and coded it by using the qualitative analysis software Atlas.ti.

In our analysis, we depart from Emma's articulations that indicate technostress (e.g. feeling inefficient, addiction, ICT errors), and we unfold the obligations connected to these quotes.

Preliminary findings and discussion

This chapter presents some of our preliminary findings and relates it to technostress and obligation literature.

An interesting theme is that when simple ICT functions do not work as expected, this leads to feelings of shame, guilt, and self-doubt for Emma (e.g., "*On my first day – the login details they gave me for my new work PC did not work. There I was, thinking that I was making repeated typing errors in front of my new colleagues. I had to breathe deeply and convince myself that my fingers were not failing me on the keyboard. (...) I was struggling with my own guilt for not being able to do something as simple as logging in*"). As Clark (1990) points out, individuals might develop certain obligations to avoid feeling shame and guilt. Emma explicitly indicates her guilt in the previous quote, and we can notice traces of shame as she explains "*as simple as logging in*". We feel shame when we are being experienced in our own failure [1]. In this particular case, Emma experiences shame as she is gazed upon by another, in her first week of work. Here we show how the gaze of another intensifies how Emma experiences technostress.

Another surprising theme is that Emma and some of her colleagues identify with the failure or success of technology ("*She apologized on behalf of the system and looked a little embarrassed as well*"; "T*hank god it worked! I felt a small victory but acted very casual about it.*"). This lack of distance between the technological artifact and the individual might lead to an over-identification. When the IT artifact fails, we fail, and when it works again, it is our victory. The side effect of this over-identification is that we take upon us the obligations that come with the rhetoric of seamless technology, which can intensify the technostress that employees experience.

Furthermore, what is surprising is that Emma deals with technostress through humor and sarcasm, as she feels that she is not allowed to express anger and frustration ("*I realize that this is how we all deal with our frustration*

over technology - by using humor. There is a certain irony in the fact that we are IT professionals and still have such a hard time working with it"). This is troublesome, as one crucial coping mechanism for dealing with technostress is able to voice frustrations [3].

Another exciting aspect is that Emma deals with her technostress by herself. The context of the following quote is that Emma leaves her phone behind when going to a meeting, in an attempt to manage her phone usage: "*It made me feel like I was disconnected from the world, both private and work-related. Instead of being disturbed by incoming emails or texts, I was now disturbed by not being able to fulfill my craving to check my phone and feel connected. (…) I realize that I am using vocabulary from the drug addict world*". In this quote, we can see how, on the one hand, she feels an obligation to be continuously connected with her work, even while working; on the other hand, this leads to worrying considerations about what she perceives as an addiction. However, she feels it is her obligation to handle this severe technostrain [24], addiction, on her own.

We also notice a tension between what is a time waste and time for socializing, as employees have to switch to socializing online (e.g., "*I have just had the pleasure of my first online Friday bar. It was awkward, as expected (...). I think several of us were working at the same time just to feel like the time was not wasted. (...) We showed up because we had to*"). In this quote, we can note a tension between Emma' s felt obligation to not waste time and the obligation to be present to the online Friday bar. One potential explanation could be that either Emma doesn't see socializing online as part of work or that the expectation to participate in social activities is not articulated and accounted for as part of one's work in the work environment.

These findings are interesting in relation to what we know about technostress, as what the employees feel is their obligation exacerbates their technostress experiences.

We also see how technostress is co-constructed in the social environment, an aspect that has not been previously explored in technostress research within IS, and only partially explored in other fields of research, such as Organizational Science [4; 19].

Contributions

We contribute to theory with novel insights derived from using a new-to-IS theory (obligation) on technostress. This allows us to uncover how technostress might be intensified by the following themes: shame, being gazed upon another while experiencing technological malfunctions, overidentification with the technological artefact, the rhetoric of seamless technology, not feeling allowed to express frustration and anger, feeling an individual responsibility to deal with technostress, or unarticulated work.

Implications

In line with the focus of the IFIP conference: "The Future of Digital Work: The Challenge of Inequality", we point out that digitalization multiplies obligations in the workplace that contribute to technostress. We want to signal that this might intensify work obligations, and lead to a worse quality of life and work. At the same time, we would want to end our Research-in-Progress paper with the remark that it is also a matter of who is privileged enough to be able to manage their felt obligations, and therefore their technostress. For example, Emma decides to create boundaries around her phone usage, but we believe that not everyone can afford or feel they can afford creating such boundaries.

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