

The new normal might be too formal

A study on the effects of remote work on knowledge sharing in social interactions

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Abstract

This study aims to investigate the effects of extensive remote work on knowledge sharing in social interactions. The drastically changed working environments in the wake of the Covid-19 pandemic have raised questions about the effects of remote work, a trend emerging already before the pandemic, considering the absence of physical, social interactions. Using an abductive research approach the study combines existing theoretical concepts on knowledge sharing in social interactions with findings from 18 semi-structured interviews with employees at three companies in the knowledge intensive industry of management consulting. From a literature review, we identify four main aspects of remoteness and go on to empirically identify and analyse cause-effect relationships between these aspects and their effects on knowledge sharing. Our findings suggest that working extensively remote leads to smaller spheres of employees sharing knowledge, fewer occasions of help seeking, decreased amounts of interactions regarding less critical topics, a decreased quality of knowledge shared in interactions, and a decreased amount of passive knowledge sharing. Based on a theoretical framework of different knowledge sharing aspects – individual, collective and organizational – we highlight and analyse the mechanisms behind these cause-effect relationships. Thereby, our findings contribute to the relatively unexplored research area of knowledge sharing in remote work settings with a more detailed understanding as to how various aspects of remoteness affect knowledge sharing in social interactions.

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Clarifications of terms

Term	Clarification
Covid-19 pandemic	The global health crisis caused by the infectious coronavirus (UNDP, 2021). The virus reached Sweden during Q1 2020 and forced the Swedish Public Health Agency to introduce several restrictions and recommendations as of March 2020 (Sveriges Radio, 2020). These included limiting the number of people allowed at public gatherings, limiting travels abroad and recommending people to work from home which are yet to be fully lifted as of the time of writing this paper.
Knowledge intensive companies/industries	Companies and industries where workers process information rather than psychical goods. In a highly knowledge intensive company or industry, work is performed by individuals with high skills and expertise, and the success of the companies are dependent on these skills, as the product sold is the knowledge of workers itself. (Summerhayes and Luo, 2006).
Knowledge sharing	The transfer of knowledge between two or more individuals as members of an organization, generally employees of a particular company (Ahmad, 2018). Our definition includes providing knowledge as well as receiving knowledge, which both are considered to be active parts of knowledge sharing.
Management consultancies	Companies that work with customers in time-limited projects, and provide recommendations for how problems of the clients should be solved (Christensen et al., 2013). The industry is often described as a highly knowledge intensive industry (Summerhayes and Luo, 2006; Werr and Stjernberg, 2003).
Remote work	Defined as a work practice where employees substitute a portion of their work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace and colleagues, and uses technology to interact with colleagues, in previous research referred to as telecommuting or telework. (Allen et al., 2015).

1 Introduction

During the last decades, the status of knowledge as a key strategic recourse for organizations has been well established in research (Cabrera and Cabrera, 2002; Lam, 2000; North and Kumta, 2018). Knowledge sharing is the process of making the knowledge of an individual available for other members of the organization, increasing the organizational benefit of that knowledge. Hence, an organization's ability to share knowledge among its members and apply that knowledge is an important source of competitive advantage (Ahmad and Karim, 2019; Argote and Ingram, 2000; Hass and Hansen, 2007). The research area of knowledge sharing in organizations emerged in the 1990s and peaked in popularity around the early 2000s (Werr, 2012a). As knowledge sharing in an organization is reliant on the highly complex process of knowledge sharing between employees, a major focus area within research has been to identify factors which support or hinder this process (Ahmad and Karim, 2019). Such factors have been found in organizations on both individual, collective and organizational levels (Hass and Hansen, 2007), hence the complexity of the phenomenon. Consequently, there are a variety of aspects that can affect knowledge sharing in an organization, and these are important for organizations to understand in order to be able to promote and ensure successful knowledge sharing.

Early on, the area of knowledge sharing commonly viewed knowledge as an asset which could be articulated, stored and transferred. This meant that the main concerns for supporting the knowledge sharing process were information and communication technology (ICT), and how to structure and ensure quality and quantity of the content within these systems (Werr, 2012b). However, as such knowledge sharing processes received criticism for not sufficiently providing the richness of knowledge needed by employees (Hargadon and Bechky, 2006; Summerhayes and Luo, 2006; Werr, 2012b), a new stream of research emerged, which considered knowledge as socially embedded, thus considering knowledge sharing to occur in social interactions among employees. This view is concerned with a different set of factors which support or hinder knowledge sharing, as it focuses on the factors that shape social interactions in an organization.

One aspect that is likely to affect social interactions between employees in organizations is remote work. Working remotely is not a new phenomenon but has seen an upswing with the rise of new technology, especially ICT systems, and the shift from a manufacturing economy to an information economy (Allen et al., 2015). With employers citing benefits such as increased flexibility and work-life balance, offering remote work has grown in popularity among knowledge intensive companies where physical presence is not required to be able to perform daily tasks (Taskin and Bridoux, 2010). A 2017 study found that around 18 % of employees in 30 European countries worked remotely "at least several times per month" with the Scandinavian countries at the top of the list with around 25 % percent (Ojala and Pyöriä, 2018). In the wake of the Covid-19 pandemic and the social distancing rules enforced to combat the spread of the virus, the trend has been forcefully accelerated with more than a third of respondents in a survey covering 27 European countries answering that they worked exclusively from home during the month of April of 2020 (Eurofound, 2020).

What lies beyond the pandemic in terms of ways of working is a highly debated topic. Numerous companies however, including giants like Spotify and Facebook, have made it clear that they see

their employees working remotely to a larger extent than before (Aktuellt, 2021). A US study interviewing hiring managers quotes 61,9 % of participants saying that their workforce will be more remote in the future (Brynjolfsson et al., 2020), and studies in Stockholm have suggested that the shared preference of employers and office workers is to spend on average 3,1 days a week working remotely (SVT Nyheter Stockholm, 2021). Naturally, this generates questions around what this quite significant change might mean in terms of effects on physical and psychological well-being, productivity and of course, the social aspects of working together in a shared office space. For companies in knowledge intensive industries, such as management consultants, a fourth factor might be of equal importance: the effects on knowledge sharing. With knowledge as the main competitive tool, any negative effects on the spread of knowledge throughout the organization due to a lack of face-to-face interactions should be concerning and raise questions. Unfortunately, these questions mainly remain unanswered with research specifically addressing knowledge sharing in a remote work environment being surprisingly rare (Allen et al., 2015; Taskin and Bridoux, 2010).

The only empirical research conducted within the area quantitatively measures the effects of remote work on knowledge sharing outcomes (Golden and Raghuram, 2010). However, researchers within the area have expressed a need for a deeper understanding of the complex patterns of behaviours and interactions where knowledge is shared among employees working remotely, including the cognitive and emotional factors that support such behaviour (Golden and Raghuram, 2010; Taskin and Bridoux, 2010). Such efforts could not only provide an increased understanding of the knowledge sharing processes in remote work settings, but might also help uncover new aspects that might support or hinder knowledge sharing through social interactions.

1.1 Purpose and research question

The overall purpose of this paper is to contribute to management research within knowledge sharing in remote work settings, a relatively unexplored research area. We distinguish ourselves from the few previous attempts by taking a qualitative approach and aim to enrich the understanding of the social interactions within which knowledge sharing occurs in the new working environment. We also use settings of more extensive remote work in an attempt to further highlight potential effects on knowledge sharing. By doing so, we aim to provide an answer to the following question:

- How is extensive remote work affecting knowledge sharing in social interactions?

As the future of working is undoubtedly more flexible in terms of geographical location (Aktuellt, 2021; Allen et al., 2015; Brynjolfsson et al., 2020; Ojala and Pyöriä, 2018; Taskin and Bridoux, 2010), this study is likely to be of interest for a large number of organizations which are transitioning to a larger extent of remote work and look to manage their workforce. With companies becoming increasingly reliant on knowledge (North and Kumta, 2018), efforts to improve knowledge sharing has increased during the past two decades (Ahmad and Karim, 2019; Hass and Hansen, 2007), demonstrating the importance of the topic for organizations. As organizations look to improve their knowledge sharing processes, knowledge sharing through social interactions is likely to be of importance due to its many benefits over knowledge sharing through articulated material (Summerhayes and Luo, 2006; Werr, 2012b).

1.2 Research contribution

This paper aims to contribute to management research by uncovering the ways in which extensive remote work affects knowledge sharing in social interactions. By using an extreme case, a year with unprecedented amounts of remote work, we hope to shed new light on existing research within the area. With a qualitative method we aim to probe for, identify and gain insights into the mechanisms through which remote work affects knowledge sharing, hopefully allowing us to make theoretical contributions by providing a more detailed understanding of various aspects of remote work and its effects on knowledge sharing in social interactions.

We further aim to contribute by highlighting which cognitive, emotional and relational factors, established in the general research area of knowledge sharing, are of particular importance when companies move towards new, more flexible ways of working. Apart from making theoretical contributions, we hope to be able to provide answers that might be of practical relevance for organizations whose employees work remotely to some extent. As the findings can help organizations understand how remote work affects the knowledge sharing among employees and the underlying factors affecting its success, the findings could help companies adapt to these changes and support knowledge sharing in the most suitable way going forward.

1.3 Research delimitations

Firstly, in regard to the research objects, this study will be delimited to Sweden-based management consultancy firms with employees having spent a majority of their working hours during the past year working remotely. The choice of management consultancy firms ensures a research environment known for being particularly knowledge intensive, making it both a relevant and an effective environment in which to investigate knowledge sharing.

Secondly, the research area is delimited to knowledge sharing in social interactions. This is done for two main reasons: (1) A pre-study was made, indicating that the main effects of remote work are to be found in regard to knowledge shared in social interactions, and (2) Knowledge sharing in social interactions is considered a topical subject within knowledge sharing research, in contrast to previous research that has focused mainly on articulated, storable knowledge. With the two dominant views on organizational knowledge being either knowledge as embedded in social interactions or knowledge as a tangible asset that can be stored and shared through ICT systems, this delimitation differentiates this study from research using the latter as a theoretical outset.

2 Literature review

"In the end, the location of the new economy is not in the technology, be it the microchip or the global telecommunications network. It is in the human mind". (Webber, 1993)

2.1 Knowledge sharing

Knowledge sharing is "the exchange of task-related information, advice and expertise to help others and to collaborate with others to carry out daily tasks, solve problems and develop new ideas" (Ahmad, 2018) and is a fundamental part of managing organizational knowledge, making it a key success factor for companies in knowledge intensive industries (Hass and Hansen, 2007). For companies such as management consultants with knowledge as the main selling point, it is therefore vital to make sure that the knowledge of an individual is shared with the collective. Apart from enhancing the performance in regard to work-related tasks, knowledge sharing has also been shown to positively affect team climate, enhance socialization and build trust within the organization (Ahmad and Karim, 2019).

Werr (2012b) describes how research on the sharing of knowledge has generally taken either a "knowledge as an asset" approach or a "knowledge as socially embedded" approach. As the two approaches consider the very phenomenon of knowledge differently, they also consider the process of knowledge sharing in different ways. This makes it important to understand the different approaches to knowledge in order to understand knowledge sharing in organizations.

2.1.1 Two ways of managing knowledge sharing

Branding knowledge "as an asset" (Werr, 2012a) or "as theory" (Werr and Stjernberg, 2003) generally means defining knowledge as something that can be articulated and stored. Examples of knowledge assets include manuals, databases, notes and videos; the storing and sharing of which have been greatly and widely improved with the rise of complex but user-friendly ICT systems. Approaching knowledge as an asset, a commodity based on theoretical or practical experience, tends to lead to attempts of codifying processes and methods for solving business problems.

With the view of knowledge "as socially embedded" (Werr, 2012a), knowledge is defined as more implicit and situation specific. More specifically, knowledge is seen as the ability to use previous experience and information acquired, make judgements as to which extent this knowledge is applicable to the current situation and adapt previous examples to the current context. As the name suggests, this approach relies on a "continual development of shared understandings and practices among a group of actors sharing a practice" (Werr, 2012a: 26) and knowledge production and integration mainly occurs in social relations, through engagement and participation. From an organizational perspective, the key asset within the "knowledge as socially embedded" approach is not the knowledge itself but the individuals' application of the knowledge as well as the interactions within which it is shared.

The ways in which organizations choose to view and therefore manage knowledge varies. Hansen et al. (1999) divide firms into two main camps: those using a codification strategy and those using a personalization strategy. The former would argue that most, if not all knowledge can be codified,

and work to capture and turn socially embedded knowledge into tangible assets to be stored and shared throughout the organization, while the latter focuses on the generation and sharing of knowledge through personal interactions. Regardless of the path chosen, few companies will take exclusively a personalization or a codification approach to knowledge, but a path combining the two (Hass and Hansen, 2007). What decides which approach suits a certain company best has to do with the work performed and by extension with the knowledge employed when performing that work. As Liu et al. (2013) put it, "for organizations with a small number of reusable knowledge items, personalization is always their best policy". In other words, in knowledge intensive industries where solutions are often tailored to solve unique sets of problems, more focus will generally be put on increasing the quality and quantity of social interactions where personalized knowledge is disseminated (Almeida and Soares, 2014).

Historically within knowledge sharing research as well as practice, however, there has been a greater focus on the creation, storing and sharing of knowledge through technical knowledge management systems, in line with the "knowledge as an asset" approach (Werr, 2012a). Simultaneously, improvements in ICT systems during the last decades have provided increasingly effective opportunities for successful sharing of knowledge through codification. However, enormous investments in these types of systems have rarely led to the intended knowledge sharing outcomes, as it is often underutilized in favour of turning directly to peers and colleagues for knowledge (Abrams et al., 2003). Hence, while the technical infrastructure today is considered less of a challenge compared to the behavioural aspects of knowledge sharing (Werr, 2012b), it is also considered insufficient to fully support successful knowledge sharing in an organization. This is due to a variety of factors, for example:

- Large parts of the knowledge in an organization may be complex expertise that is difficult to formalize in written material and thereby require interaction to be shared. (Summerhayes and Luo, 2006)
- Creating new solutions may require unexpected combinations of previous knowledge through creative interactions. (Hargadon and Bechky, 2006)
- Employees may not know what information to look for. (Werr, 2012b)

This has led both scholars and practitioners to focus more on the behaviour and social interactions that support knowledge sharing, bringing the previously less prominent knowledge "as socially embedded" approach into the spotlight. These knowledge sharing interactions are by many researchers argued to be a key factor in gaining a competitive advantage in any knowledge intensive industry (Abrams et al., 2003; Gardner et al., 2012; Summerhayes and Luo, 2006), narrowing the focus of this paper to such interactions. A key for successful knowledge sharing is for the organization to provide the right environment, tools and settings for these interactions to take place. Research has found barriers and enablers to the transfer of knowledge on both organizational, collective and individual level, meaning organizations need to have all these in mind when trying to promote knowledge sharing.

2.2 Enablers of knowledge sharing on an organizational level

Embracing knowledge as shared in social interactions has implications on how organizations can, and should, work to provide employees with proper environments, tools and settings for

knowledge sharing interactions to take place. Previous research uses various designations and categorizations to describe these organizational enablers of knowledge sharing, but they generally fall into one of three main categories:

- Organizational structures, including internal processes, hierarchy, and interorganizational communities.
- Common language, including shared terminology, frameworks and methodology.
- Incentives, including formal and informal reward systems for participating in knowledge sharing.

2.2.1 Organizational structure

For knowledge sharing to occur continuously and effectively, the organizational structure needs to be suitable for this purpose. This includes incorporating knowledge sharing into the processes of work within the organization in order to make it a regular activity (Kaplan and Thomson Reed, 2007). Processes should encourage participation and collaboration to enable the social mechanisms of knowledge sharing. They can be informal, simply providing temporal and spatial room for reflection among employees (Apostolou and Mentzas, 1999), and formal, providing structured forums for sharing general as well as project specific knowledge (von Krogh, 1998).

Another important aspect of the organizational structure is the formation of communities of practice, i.e. groups of people that are involved in similar functions or areas of work and thus have knowledge in similar domains. These communities can either be created by individuals in the organization on a more informal basis, or as a more formal top-down initiative as part of a knowledge sharing strategy. Either way, the essence of their existence is the sharing of knowledge through coaching, conversation and storytelling. (Kohlbacher and Mukai, 2007)

2.2.2 Common language

For individuals to be able to exchange knowledge through social interactions, some degree of common terminology is needed. This language can stem from templates or methods for approaching a certain task, containing categories of process phases or steps, and categories of activities. By categorizing certain aspects of work and putting them in a sequence, a framework is formed which can serve as a basis of a shared understanding among employees. This framework can be used by employees for relating to information that they receive or referring to when they intend to share knowledge. This makes this type of documentation of structures and previous experiences valuable in facilitating and enabling knowledge sharing in social interactions. (Werr and Stjernberg, 2003)

2.2.3 Incentives

Another key factor in enabling and encouraging knowledge sharing are incentives. As Werr (2012b) notes; even with the right organizational structures in place, knowledge sharing does not come naturally. Often, employees tend to prioritize working with revenue generating projects and focus on billable hours over knowledge sharing. Exactly how these types of incentives could or should be designed has not been widely researched, but there seems to be a consensus towards designing incentives that work in line with the existing knowledge management structure and existing knowledge sharing enablers (Werr, 2012b).

2.3 Knowledge sharing on a collective level

Focusing on knowledge sharing through interpersonal interactions naturally means focusing on a collective process within organizations, as at least two individuals are needed for a social interaction to take place. Werr (2012b) explains how research within knowledge sharing has often made two assumptions regarding these interactions, which he questions. Firstly, it has often been assumed that such knowledge sharing interactions will occur automatically if the structural conditions, i.e. the above-mentioned organizational enablers, are in place. Secondly, it has often been assumed that the quality of the knowledge shared in these interactions will be constant and sufficient. With this in mind, our theoretical approach to collective aspects of knowledge sharing includes determinants of both quantity and quality of knowledge sharing interactions, as neither of these should be taken for granted.

We use two main theories as a theoretical lens for understanding the process of knowledge sharing on a collective level, including the prerequisites for, and barriers to such processes. Firstly, we use the theory on interpersonal trust (Abrams et al., 2003) to understand how the relationships between colleagues in an organization affect the knowledge sharing processes. Secondly, we use the concept of heedful collectives (Werr, 2012b) to understand how groups share, combine and apply their knowledge in the context of a specific problem. These theories, while focusing on different antecedents of collective knowledge sharing processes, are considered to provide a suitably exhaustive understanding of the mechanisms of knowledge sharing on a collective level.

2.3.1 Interpersonal relationships

Abrams et al. (2003) argue that trusting relationships between colleagues are a key component for knowledge sharing through interpersonal interactions to occur frequently and with high quality. The authors argue that trust in others' competence and benevolence are key drivers of knowledge sharing in these relationships. Trusting someone's competence means feeling confident that the individual has the "sufficient expertise to offer solutions" (2003: 65), making them worth listening to and taking advice from. Benevolence, on the other hand, has to do with the risk-taking involved in asking for, or sharing, knowledge. As many, often more junior employees, might consider asking for help or guidance as a weakness, or as a risk of coming across as less knowledgeable, trusting another person's benevolence means trusting that they will share their knowledge without potential negative consequences for the knowledge seeker. The authors emphasize several trustworthy behaviours which managers can use to promote trust and thereby enhance knowledge sharing. These include, for example, being consistent between word and action, ensuring frequent and rich communication, ensuring that decisions are fair and transparent, and creating close personal connections. To increase interpersonal trust and interaction and therefore knowledge sharing, many companies have taken concrete steps towards more frequent social interaction outside day-to-day work settings, both among and across competencies. This allows for the creation and upkeep of internal, social networks built around interpersonal trust where individuals rely on each other's competence and benevolence when asking for, or sharing, knowledge.

2.3.2 Heedful collective

In an attempt to highlight and analyse the quantity and quality of knowledge sharing interactions, Werr (2012b) introduces the concept of heedful interrelating. Heedful interrelating is the process through which collectives accumulate the collective experiences and competences spread among individuals in the organization and apply it to a specific situation. This process of interrelating can be more or less heedful, as the concept considers the extent to which the process is conducted with qualities such as noticing, taking care, attending, applying one's mind, concentrating, alertness and interest (Weick and Roberts, 1993). While these qualities relate to how individual actions are performed, the concept of heedfulness may be seen as a quality of the collective behaviour, i.e. to which extent the collective knowledge sharing processes are characterized by these heedful qualities (Werr, 2012b). Through heedful interrelating, the collective can enact a collective mind where knowledge is not just transferred, but where the knowledge shared by one individual puts the knowledge of other individuals into new perspectives, shaping their subsequent sharing of knowledge, while contributions also alter the meanings of past contributions to everyone involved (Hargadon and Bechky, 2006).

Werr (2012b) does not focus on employees building close relationships with each other as an important enabler of such knowledge sharing behaviours. Instead, Werr (2012b) suggests that shared representations and identities among colleagues and an interactive climate are key cognitive and emotional enablers of knowledge sharing behaviours. Thus, the concept of heedful collectives, as used in this paper, can be seen as an understanding of, and trust in the organization as a whole, rather than among specific individuals, which enable interactions between the individuals in the organization and help individuals absorb the knowledge shared in these interactions. A heedful collective is generally characterized by two key traits.

Firstly, there needs to be a cognitive overlap between the individuals. As Werr (2012b) describes, this includes shared representations, or in other words, a common understanding of the tasks and competences in the organization. This shared representation increases in strength as it becomes broader (more parts of the organization understanding each other's competences and task) and richer (shared representations of tasks being more detailed and complex). Strong shared representations enable an increased number of interactions between employees, as it enables more colleagues to be approached for help regarding a task, and more colleagues to step in and contribute regarding a task (Dougherty and Takacs, 2004). It also facilitates communication in the interactions regarding a certain task, as the lack of shared representations may provide a barrier against effectively communicating knowledge (Dougherty, 1992). Additionally, the cognitive overlap needed also involves a sense of shared identities, meaning the employees' identification with the organization and the other members of it. This is since knowledge sharing interactions are more likely to occur between people that identify with each other (Werr, 2012b). Consequently, creating a broad and inclusive sense of togetherness across the entire organization rather than having employees identify with small social groups within the organization is important for knowledge sharing interactions to occur across occupational boundaries (Orlikowski, 2002).

Secondly, the collectively constructed climate for interactions, consisting of social rules and norms, needs to be suitable for knowledge sharing to take place. Werr (2012b) describes this through the

concept of an interactive climate. This involves a sense of “psychological safety”, meaning a collective feeling of mutual respect where team members feel comfortable in contributing and being themselves in interactions (Edmondson, 1999). Furthermore, positivity, in terms of the relationship between the collective sum of positive and negative statements in team communication is important (Losada and Heaphy, 2004) as well as the more general sense of having fun (Werr, 2012b). Also, a sense of openness and lack of power differences in interactions is important, as knowledge sharing across hierarchical boundaries may otherwise be hindered (Edmondson, 2002).

2.3.3 Knowledge sharing behaviours

In our theoretical framework, knowledge sharing is viewed as the quantity and quality of which certain behaviours, supporting knowledge sharing interactions, are performed within an organization. The collective aspects previously outlined - cognitive overlap, interactive climate and relationships - are viewed as conditions that enable colleagues to interact with each other but are not used as the actual knowledge sharing variable. For this purpose, categories of such behaviours proposed by Hargadon and Bechky (2006) have been used.

This includes, firstly, *help seeking* activities, characterized by an individual recognizing a problem or a situation at hand where assistance is needed and approaching others for assistance. This can be done by inviting someone to a meeting or by approaching that person in the hallway.

Secondly, *help giving* behaviours are crucial for help seeking activities to lead to knowledge sharing interactions. Help giving behaviours involve individuals taking the time and effort to provide assistance to others and doing so in promptly enough manner.

Thirdly, we have the collective act of *reflective reframing*. This is when knowledge is not just transferred from a help giving to the help seeking individual, but when multiple participants in the interaction consider each other’s contributions and build on those with their own contributions. This enables the collective in the interaction to not only progress towards a solution, but also to reshape the meaning of the problem initially sought help for by considering it in light of the different experiences and competencies in the group.

2.4 Knowledge sharing on an individual level

Regardless of existing organizational enablers or collective aspects that might encourage knowledge sharing, prior research finds that understanding the basic socio-psychological processes that constitute the foundation of successful knowledge sharing is crucial to successfully understanding knowledge sharing in an organization (Brock et al., 2005; Cabrera and Cabrera, 2002). Thus, in our theoretical model we strive to incorporate the aspect of individuals decision making process to further nuance the understanding of the knowledge sharing process. Naturally, without individuals willing to share, or seek, knowledge, the collective benefits of knowledge sharing are lost. This social dilemma, where individual decision making affects the collective benefits of knowledge sharing, has been widely researched and it has been found that individuals evaluate perceived benefits in relation to the perceived costs of knowledge sharing before using the resulting cost-benefit analysis as grounds for potential participation in knowledge sharing activities (Hung et al., 2011; Sedighi et al., 2016). Simply put, “participants do not participate if the cost of sharing

knowledge outweighs the potential benefits of knowledge sharing” (Bock et al., as cited in Sedighi et al., 2016: 1252). Although research has suggested and found various aspects affecting the individuals perceived cost and benefit of knowledge sharing, outlined in the following sections, we incorporate the broader theory of cost-benefit analysis into our theoretical framework to find the most prominent aspects of costs and benefits in an extensive remote work environment.

2.4.1 Perceived individual benefits associated with knowledge sharing

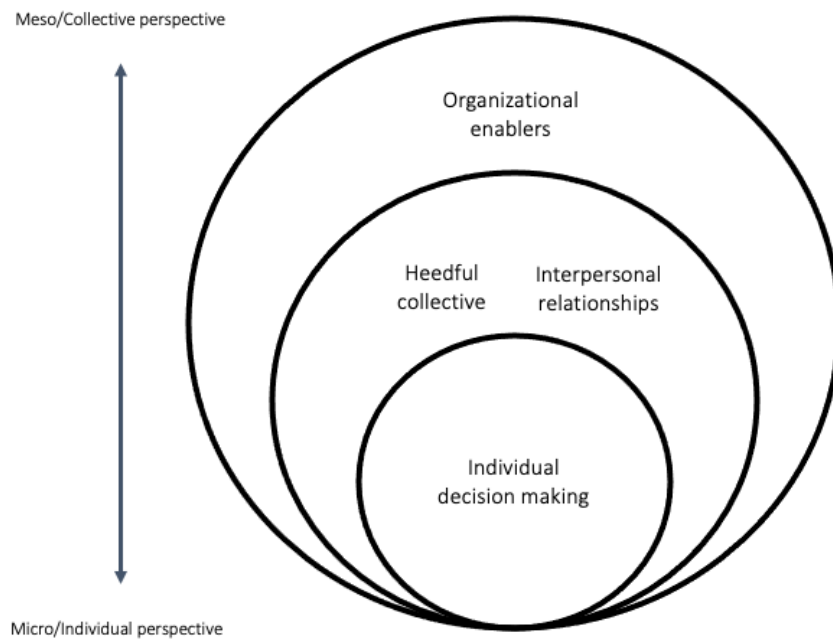
There are several aspects of help giving that existing research establish as benefits in the minds of individuals, outlining them as motivational drivers behind such behaviour. Firstly, other individuals’ reactions are an important aspect. This could involve recognition from others in the organization, such as being given praise from management or gaining a status in the organization as an expert within a certain area (Cabrera and Cabrera, 2002). This could also involve improving relationships with other individuals by providing them with knowledge (Bock and Kim, 2002). Contributing to positive outcomes for the organization is another aspect which may be driven by the individual’s assessment of the value their knowledge might give others (Bock and Kim, 2002; Cabrera and Cabrera, 2002), but also the individual’s sense of expectations from the organization to contribute (Edmondson, 2002). Also, individuals can feel a sense of personal fulfilment when giving help, further motivating such behaviour (Cabrera and Cabrera, 2002). For help seeking individuals an important motivational driver is, quite obviously, learning from the experiences and advice of the help giving individual, which can be both for the sake of performing a task at hand better or for the purpose of more generally growing the personal knowledge base (He and Wei, 2009).

2.4.2 Perceived individual costs associated with knowledge sharing

Turning the focus towards the costs that individuals have been found to associate with knowledge sharing, several empirically based research papers find time consumption, often labelled as the “executorial costs”, and perceived effort, labelled as the “cognitive costs” to be the major factors in the individual’s decision making process (Cabrera and Cabrera, 2002; Hargadon and Bechky, 2006; Hung et al., 2011). In this process, the opportunity cost of the time and effort needed to share knowledge has been proven to be an important aspect of the individual’s decision making, with a study by Connelly et al. (2014) showing that individuals working under time pressure are less likely to share knowledge with their colleagues. For a help seeking individual the potential costs of knowledge sharing often relate to the collective perception of that person. Individuals might fear colleagues perceiving them incompetent, partly by seeking help in the first place and potentially once more if being unable to comprehend and assess the knowledge received (Hargadon and Bechky, 2006; Taskin and Bridoux, 2010; Werr, 2012b).

2.5 Theoretical overview of knowledge sharing research

Figure 1. Key factors of knowledge sharing.



In line with previous research, we argue that the underlying conditions of knowledge sharing should be analysed holistically, but can be found in three different layers within an organization. The point of departure in our view on the knowledge sharing process within organizations is the decision making of individuals. As a way to understand, analyse and concretize choices made on an individual level we use a cost-benefit analysis of the individual's decision making process. The second layer of our model introduces the collective aspects of knowledge sharing. This layer focuses on the cognitive overlaps, interactive climate and interpersonal trust among employees. With the main concepts of heedful collectives and interpersonal relationships, we start to understand the collective aspects that affect both quality and quantity of knowledge sharing within the organization.

Lastly, the outermost organizational layer helps us put knowledge sharing into a meso-level context, providing the organizational context within which knowledge sharing takes place, and includes the aforementioned organizational enablers of knowledge sharing. This paper, being mainly concerned with the previously mentioned inner layers, uses organizational enablers as a tool to deepen the understanding of the role that the organizational context might play in the effects of remote work. The three layers are not independent from each other. Instead, we view knowledge sharing holistically but in three layers to understand the interplay between them, with collective and individual aspects of knowledge sharing both affecting each other, and organizational enablers acting as the context in which knowledge sharing takes place, affecting both the collective and the individuals in it.

2.6 Remote work

Based on several existing conceptualizations, Allen et al. (2015: 44) define remote work, or teleworking/telecommuting as sometimes referred to, as "a work practice that involves members of an organization substituting a portion of their typical work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace—typically principally from home—using technology to interact with others as needed to conduct work tasks". Remote work has generated increasing interest among researchers as well as companies and their employees long before the pandemic, becoming increasingly common in almost all types of organizations during the past two decades (Allen et al., 2015). However, while companies tout benefits such as increased work-life balance and productivity (Lippe and Lippényi, 2020), questions about the downsides have been raised. Halford (2005) notes that working from home is not interchangeable with sharing an office space with co-workers, questioning what effects remote work might have on social, personal and organizational relationships as well as working practices and management. Other researchers go on to question the employer-friendly status placed on remote work, finding negative effects of remote work on managerial relationships, performance, cooperation and well-being (Allen et al., 2015; Crandall and Gao, 2005; Toscano and Zappalà, 2020). Additionally, researchers have found evidence showing that extensive and collective remote work, with several or all employees working remotely a large amount of their working hours, tends to further increase the negative effects (Lippe and Lippényi, 2020).

2.6.1 Selected remote work aspects

Research have suggested various effects of remote work that become especially relevant in a knowledge sharing context. These include changed aspects of communication among colleagues, changed patterns of cooperation, and effects on various emotional, cognitive and relational factors, and range from established findings to potential effects, yet to be empirically investigated. (Allen et al., 2003, 2015; Golden, 2007; Hinds and Mortensen, 2005; Raghuram et al., 2003; Taskin and Bridoux, 2010). Based on a thorough theoretical review, we group these aspects into four main root-causes that we believe cover the most relevant aspects of remote work when addressed in a knowledge sharing context:

- **Lack of informal social interactions.** Remote work could negatively impact informal networking due to an absence of spontaneous and informal interactions. (Allen et al., 2015)
- **Increased formalization of interactions.** Remote work tends to increase the need for planning and formality both before and during interactions. (Allen et al., 2003; Golden, 2007)
- **Decreased quality of communication.** Communication through digital mediums have been proven to insufficiently replicate multi-channel communication, i.e. "verbal, nonverbal, social, personal, and paralinguistic" communication, used in physical face-to-face interactions. (Taskin and Bridoux, 2010: 2510)
- **Inability to observe and overhear colleagues.** Not sharing a physical work space makes employees unable to observe the behaviour of, and overhear colleagues, missing potentially relevant information and other cues. (Hinds and Mortensen, 2005; Raghuram et al., 2003)

Also worth noting is that existing research on knowledge sharing in remote work settings, as presented below, has defined remote work as a single variable, therefore not investigating any connections between different aspects of remote work and various knowledge sharing outcomes.

2.6.2 Previous research on knowledge sharing in remote work settings

With the importance of knowledge sharing among knowledge workers, the possible effects of remote work calls for further investigation. Unfortunately, “[s]urprisingly little research has actually assessed the impact of telecommuting on knowledge sharing” (Allen et al., 2015: 53). Taskin and Bridoux agree, describing knowledge sharing among employees working remotely as a “neglected issue” (2010: 2505). However, some efforts have been made to bring clarity to this neglected research area.

Golden and Raghuram (2010) conduct one of the few, if not the only, empirically based, quantitative studies in the area where they test the frequency of face-to-face interaction as a moderating variable on the effects that trust, interpersonal bonds and organizational commitment have on knowledge sharing when working from distant locations. In studying the relational aspects of trust, which in their definition involves the belief in information received by other, and interpersonal bonds, which involves the sense of attachment, knowing and liking of colleagues, the authors cover aspects similar to Abrams et al. (2003) theory of competence- and benevolence-based trust. In their definition of organizational commitment, which revolves around the individual’s identification with the organization and belief in its goals, the authors also cover aspects similar those Werr (2012b) title as shared identities.

However, in relation to our theoretical framework, the study seems to take a somewhat combined individual and collective perspective on knowledge sharing. Knowledge sharing, as a quantitative output, is studied by asking respondents about their perceived ease, individually, in reaching out for help and their perception of the prevalence of discussions where experiences are shared, collectively. The authors study the effects on individuals’ perceptions of knowledge sharing depending on their relationships and sense of organizational commitment, and how these are moderated by working remotely. While finding a positive effect of all three variables of knowledge sharing, the authors only find a moderating effect on the effect that trust has on knowledge sharing. In other words, no effect is found on the relationship between interpersonal bonds and knowledge sharing, which the authors suggest could be due to the affective-based nature of interpersonal relationships making it strong enough to sustain any effects by remote work.

Another attempt to bring clarity to the research area of knowledge sharing in remote work settings has been made by Taskin and Bridoux (2010), who conduct a literature review and propose a theoretical model covering the effects of remote work on knowledge sharing. More specifically, they look into the determinants of knowledge transfer between remote workers and non-remote workers, where remote work is considered as the frequency, i.e. the share of total working time, spent away from the office. The authors suggest that this frequency has a negative effect on the key aspects of knowledge sharing, which are cognitive and relational aspects that the authors suggest are continuously constructed in a process called organizational socialization. The cognitive aspects, labelled organizational social knowledge, include understanding of the organization and its

specific language, narratives and traditions, and the identification with the organizations goals and values. These cognitive aspects clearly correspond to Werr's (2012b) concept of shared representations and identification. The relational aspect, defined as the quality of the relationship or the closeness of the relationship, has similarities with Abrams et al. (2003) concept interpersonal bonds, although on a more general level. In relation to our theoretical frame of knowledge sharing research, Taskin and Bridoux (2010) are mainly concerned with the collective aspects of knowledge sharing as they suggest that the role of cognitive and relational aspect is such that similar organizational social knowledge and close relationships between colleagues will facilitate the transfer of knowledge between them.

2.7 Need for further research

Knowledge sharing has been proven to be a vital success factor for companies in knowledge intensive industries (Gardner et al., 2012; Hass and Hansen, 2007), with researchers arguing that knowledge shared in social interactions, rather than articulated and stored knowledge, make up the majority of organizational knowledge (Zebal et al., 2019). Also, the sharing of knowledge within knowledge intensive companies has been shown to be highly socially embedded and affected by both cognitive and emotional factors (Abrams et al., 2003; Hargadon and Bechky, 2006; North and Kumta, 2018; Werr, 2012b). So what happens to knowledge sharing in social interactions when the social working environment changes drastically? Increased amounts of remote work during the pandemic has led to remote work and social isolation on a scale never before experienced by companies and their employees. Prior research on the effects of remote work on knowledge sharing is limited. The research that does exist, such as the quantitative study by Golden and Raghuram (2010), and the literature review by Taskin and Bridoux (2010), identify connections between remote work and knowledge sharing, mainly by focusing on collective aspects.

With self-perception in regard to the shortcomings of quantitative research, Golden and Raghuram (2010) emphasize the need for more in-depth investigations into both the relational and cognitive aspects of knowledge sharing in remote work settings, highlighting the lack of qualitative research within the area. They specifically suggest further investigations into the importance of interpersonal relationships among employees working remotely, as well as a focus on the increased complexity of remote work and "particular aspects of a teleworker's altered work environment" (Golden and Raghuram, 2010: 1078) in order to gain a more comprehensive understanding of the effects these aspects have on knowledge sharing. Taskin and Bridoux (2010) point in a similar direction, as they suggest further qualitative research, particularly into the behaviours that people adopt as means of knowledge transfer in remote work settings. The authors argue that a qualitative approach could uncover additional aspects of these complex processes, social and relational, and thereby contribute to the understanding of knowledge sharing in remote work settings.

To summarize: Previous research on knowledge sharing in remote work settings calls for qualitative studies to provide a more in-depth understanding of different aspects of remoteness, various cognitive and relational aspects of knowledge sharing, and how these potentially affect knowledge sharing in remote work settings.

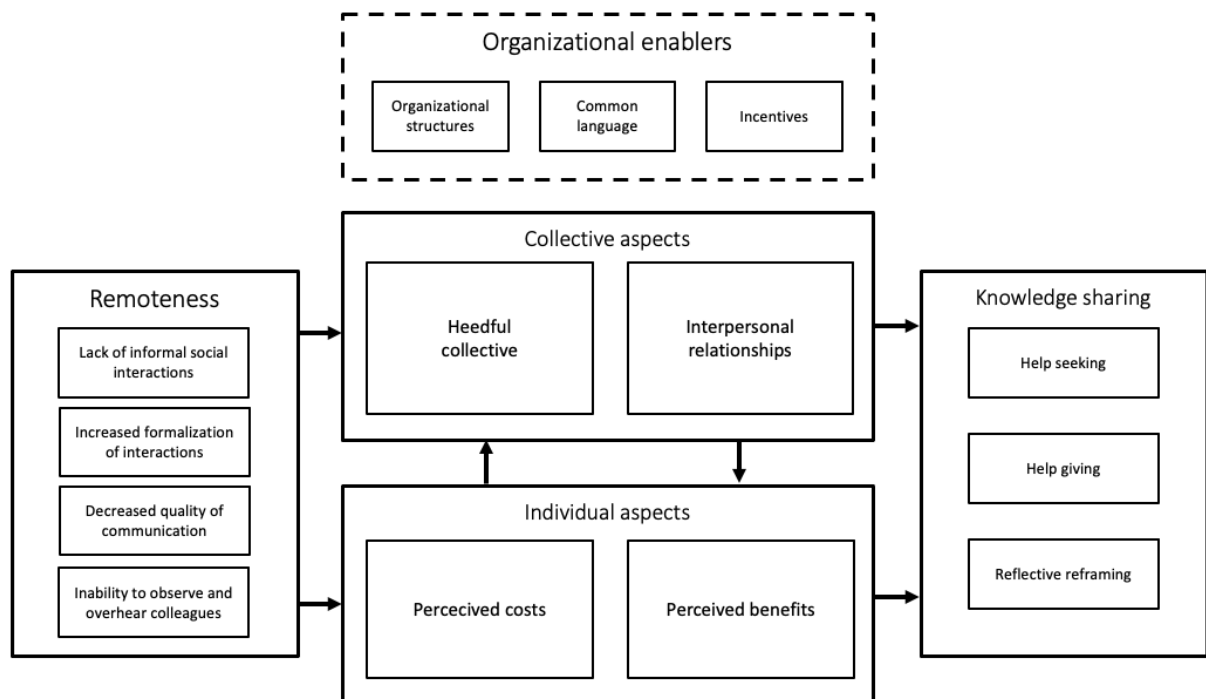
By answering one main research question complemented by a set of sub-questions, this paper aims to bring clarity to the underlying mechanisms of the different aspects of remoteness; organizational, collective and individual aspects of knowledge sharing; and their potential effects on knowledge sharing in social interactions. These questions are:

- How is extensive remote work affecting knowledge sharing in social interactions?
 - How is extensive remote work affecting individual decision making in regard to knowledge sharing, and how does this affect knowledge sharing?
 - How is extensive remote work affecting collective aspects of knowledge sharing, and how does this affect knowledge sharing?
 - What organizational enablers are important for knowledge sharing in extensive remote work settings?

2.8 Theoretical framework

The theoretical framework provides a synthesis of the literature review as well as a foundation for analysing the empirical findings of this paper. From previous research we can conclude that knowledge sharing in social interactions is not reliant on any single factor or condition but rather on the symbiotic relationship of individual and collective aspects, with both aspects being affected by various organizational enablers. Any effects that remote work might have on the individual or collective aspects of knowledge sharing could therefore, by extension, directly or indirectly affect the quality and/or quantity of knowledge sharing.

Figure 2. Theoretical framework.



3 Methodology

3.1 Research approach

Knowledge management, being the broader research area in which knowledge sharing is generally placed, has been extensively researched and subject to varying research approaches during the past decade (Ma and Yu, 2010). Research within knowledge sharing, however, even though seeing a sharp rise in popularity and an increasing amount of empirical research done in the last two decades, has been dominated by quantitative methods (Ahmad and Karim, 2019; Wang and Noe, 2010). A quantitative method means taking a positivistic, hypothesis driven, structured data-collection approach to research, which can be hard to apply to a yet unexplored topic (Antwi and Hamza, 2015). With a lack of research on the effects that remote work might have on knowledge sharing, and with an aim to increase the understanding of a social phenomenon, discussing social, relational and psychological factors in the decision making of individuals, an interpretivist approach was best suited when attempting to find these answers (Antwi and Hamza, 2015). As Antwi and Hamza (2015) note, mixed methods researching the same basic phenomenon can have an additive effect. Consequently, our approach should not infer this study to be interpreted as competing with results from research done using quantitative, positivistic approaches but rather complementary, as we have strived to nuance the findings of research such as the quantitative study by Golden & Raghuram (2010). In other words, by using a qualitative approach our aim was to, just as Taskin and Bridoux suggest, "unravel the complexity of those [knowledge sharing] processes" (2010: 2514).

3.2 Pre-study

A pre-study was conducted to provide preliminary insights into the knowledge management work at a knowledge intensive firm. In the context of this paper, the pre-study has not acted as empirical ground for analysis, but rather as a way of guiding the scope of the research topic and testing the feasibility of our research, a common approach when using pre-studies (Aspers, 2011). The pre-study was conducted at a management consultancy firm with around 60 employees, where 9 interviews were held with employees of varying seniority. Early on, it was apparent that effects of unprecedented amounts of remote work during the past year were a current issue, with a majority of the interviewees testifying to substantial effects on their work in general. The pre-study found strong signs of effects of remote work on knowledge sharing in formal and informal social interactions, which became the main focus of this paper. In addition, the pre-study gave positive indications regarding the feasibility of the approach and methods used in the study of this paper, as we were able to collect relevant and in-depth descriptions of the interviewee's experiences.

3.2 Delimitations

This paper focuses exclusively on knowledge sharing through social interactions. Since its rise in popularity in the late 1990s, the field of knowledge management research has been widely covered, although with a tendency to focus on sharing of articulate knowledge through ICT systems. The area of knowledge sharing through personal interactions remain relatively less unexplored. The relevance of this particular focus is also supported by previous research on remote work which suggest that personal interactions among employees is often heavily impacted by transitioning to remote work (Golden and Raghuram, 2010; Taskin and Bridoux, 2010). Insights from the

conducted pre-study further supported this view, as respondents highlighted such effects while not being overly concerned about any changes in the more formalized structures of articulated knowledge sharing through ICT systems. Consequently, our delimitation to focus on knowledge sharing through personal interactions was done with the intent to focus on areas which could provide findings of both academic and practical relevance.

A second major delimitation was made in relation to the research objects. The research was focused on management consulting firms due to the knowledge intensive nature of their work. Management consulting firms depend heavily on their “ability to mobilize and synthesize professional bodies of expertise in order to create knowledge that satisfies the client’s need” (Summerhayes and Luo, 2006: 2), and are therefore heavily reliant on knowledge sharing. This puts management consulting firms at the forefront of knowledge management practices and thereby makes the industry an interesting and relevant area of study.

3.3 Methodological approach

3.3.1 Abductive reasoning

This study uses an abductive approach which allowed us to go back and forth between theory and empirics during the research project and involved the interpretation of data through the lens of previous research while also being open to the data challenging such previous theories (Alvesson and Kärreman, 2007). An abductive approach allowed us to depart from a theoretical foundation of the well-researched area of knowledge sharing in organizations, while still approaching the consequences of this unprecedented situation of remote work with an open mind. In other words, abductive reasoning allowed us to make use of the existing knowledge sharing theory while at the same time constructing new theory around the relatively more unexplored area of the effects of remote work on knowledge sharing. The pre-study is an example of less deductive elements, where the empirics helped shed light on the relevance and importance of social interactions. As an abductive approach aims to draw theoretical conclusions based on the empirical findings (Mantere and Ketokivi, 2013), it supports our exploratory research purpose well.

3.3.2 Qualitative approach

With the purpose of adding in-depth insights to the research area of knowledge sharing in remote work settings, a qualitative method was used. Qualitative methods are useful for elaborating, testing and generating theory (Edmondson and Mcmanus, 2007) and thus serves this purpose well. Additionally, focusing on individuals’ perceptions as a way to gain a comprehensive understanding of the studied phenomenon, as done by Abrams et al. (2003), and Hargadon and Bechky (2006) in previous studies regarding related topics within knowledge sharing research, requires the ability to venture deep into the reasoning of participants, collecting empirical data at a high level of detail and depth (Guest et al., 2013). Combining this with the “knowledge as socially embedded” approach, thereby viewing knowledge as an abstract phenomenon, using a qualitative method becomes necessary to be able to probe into responses. Also, in line with the abductive approach of this paper, qualitative research allowed us to collect information that we did not expect to receive (Guest et al., 2013), suiting the exploratory purpose of the study well.

3.3.3 Case study

Data collection was conducted through a cross-sectional case study (Bryman and Bell, 2011) of three organizations. Case studies allowed us to gain multiple individual perspectives on knowledge sharing within an organizational context, thereby providing nuanced insights about the collective knowledge sharing processes in the organizations studied. Additionally, case studies allowed for various ways of theorizing, both inductively and by testing and revising theory (Welch et al., 2011), making it a great approach for "further defin[ing] the boundaries of the original theory" (Halkias and Neubert, 2020: 48) and was therefore considered suitable for the abductive approach of this paper. Studying several organizations further allowed us to consider, compare and study varying organizational settings.

3.3.4 Use of extreme case

Studying a phenomenon under extreme conditions, in this case knowledge sharing during a world-wide pandemic with employees working extensively remote is a well acknowledged approach to try to deepen the understanding of a phenomenon (Chen, 2015). As Chen (2015) describes, studies of this kind are useful for shedding new light on aspects that have been taken for granted by previous research and discovering new aspects of organizational practices that have not yet been considered. Additionally, using an extreme case is a useful approach to identify the conditions for which previously suggested organizational practices are applicable. In relation to our study, using an extreme case assisted us in identifying the effects of remote work by making them increasingly evident for participants, in turn making it easier for them to testify about their experiences.

3.4 Data collection

3.4.1 Interview design

The data collection was conducted through personal interviews regarding the interviewees experiences since the implementation of remote work by their employers in the spring of 2020 as a response to social distancing guidelines and regulations. With interviews held during March and April of 2021, this meant a period of roughly one year. The interviews were semi-structured, meaning that an interview guide with topics to be covered was used, but there was still flexibility in terms of the order of the topics, the extent of the response from the interviewee and the use of supplementary questions if the response from the interviewee triggered such (Bryman and Bell, 2011). The initial interview questions generally regarded the interviewees' perceptions of their knowledge sharing behaviours (see Appendix 2).

Probing was used to get interviewees to give examples of behaviours and forums used to both obtain and share their own knowledge with colleagues. Once such examples had been established, the questions focused on the interviewees' reasoning behind such behaviours, where probing questions, covering theoretical areas such as relationships, representations, and norms were used depending on the answer. This allowed interviewees themselves to guide sections of the interviews towards areas that they considered to be of special importance and relevance, which could then be discussed more in-depth with closer connection to theory. However, the general topics remained the same across interviews.

Keeping the interviews semi-structured, as compared to a more free-floating conversation, helped ensure the possibility to compare interview data (Bryman and Bell, 2011). The interviews were conducted by both researchers, with one leading the interview and one taking a more passive and observing role. One reason for doing so was to increase our collective ability to make sense of the empirical data, and to avoid any subjective interpretations during and after interviews.

The interviews were conducted virtually over video communication channels due to social distancing guidelines from Swedish authorities at the time of the interviews. As Taskin and Bridoux (2010), as well as the findings of this paper highlight, this might affect communicative quality negatively. While all interviews took place with the help of video communication tools to provide as much non-verbal cues as possible, it cannot be ruled out that the remote settings of the interviews could possibly have affected the quality of the empirical data to some extent.

Before performing the interviews, a pilot interview was held with a consultant at a company not included in the case studies, but with similar experiences to those of the actual interviewees. The pilot interview had two main purposes:

- Ensuring that the interview guide was formulated and structured in a way that would provide the personal, in-depth perspectives we were looking for and that the questions were interpreted correctly by the interviewee.
- Making sure that the digital tools used, i.e. methods for communicating and recording, worked properly.

Based on feedback and impressions from the pilot-interview, revisions and iterations were made to the interview guide and introductory instructions to the interviewee, including relevant definitions and main areas of interest, were added to increase the interviewee's understanding of the topic and scope. The answers from the pilot interview were not included in the study.

3.4.2 Interview sample

In qualitative research, sampling research objects is often done using purposive sampling. This means putting emphasis on relevance rather than statistical randomization (Bryman and Bell, 2011). In the context of this study, that meant finding management consultancy firms where employees had spent a majority of their working hours at home or at another remote location during the past year. This included both interviewees and their colleagues. Worth noting in regard to these criteria is that, due to social distancing guidelines and restrictions, all of the case companies applied rules regulating maximum number of employees at the office, meaning office-work still resembled a remote working environment more than a traditional workspace full of social, planned and spontaneous, social interactions.

In all qualitative studies, sampling is crucial to make sure there are enough variation in the sample to be able to say anything about the population (in this case, employees at knowledge intensive firms) in general (Trost, 2010). This is achieved by making sure the sample size is large enough as well as evenly distributed across certain variables. In this study, these variables were:

- **Company.** Three companies of varying sizes and organizational structures were chosen for case studies. This enabled the findings generated from the study to be applicable to a broader range of organizational contexts than if one case study would have been conducted (Eisenhardt, 1989). For reasons of accessibility, the study was limited to Sweden-based companies.
- **Seniority.** By interviewing employees of varying seniority, we aimed to create a more exhaustive understanding of the knowledge sharing processes within an organization working remotely, adding another layer to our analysis. We defined three different levels of seniority:
 - **Junior.** Junior employees with 0-4 years of experience, with the common denominator of a lack of clear leadership responsibilities. Not always on the lowest hierarchical level but tend to have a more operational role than managers. Includes titles: Associate, Consultant, Analyst.
 - **Manager.** Mid-level employee with 4-8 years of experience and leadership responsibilities. Often leading the operational work performed in project teams. Includes titles: Team leader, Project leader, Project manager, Manager.
 - **Senior.** Senior level employees with more than 8 years of experience, often acting more in the role of advisors, spending more time with internal projects and client management than with operational, project-related responsibilities. Also includes employees of higher management without any role in projects, but with a large amount of knowledge valuable to the work done in them. Includes titles: CEO, Partner, Client Manager, Head of [business unit/operational area].

The described classification was mainly based on expected differences in knowledge sharing behaviour. For instance, a manager level employee is likely to participate in both help seeking and help giving while a junior level employee without leadership responsibilities would be likely to engage in a relatively larger amount of help seeking. For ethical reasons, companies were kept anonymous in order to avoid revealing internal processes of participating companies to potential competitors. Similarly, interviewees were only labelled with their seniority to make them feel comfortable in expressing their opinions.

Table 1. Employees and interviewees.

	Employees	Interviewees	Interviewees on each level of seniority		
			Junior	Manager	Senior
Company X	~60	6	2	2	2
Company Y	~150*	6	2	2	2
Company Z	~40	6	2	2	2

Current (as of March/April 2021) number of employees at each company, number of interviewees at each company and number of interviewees at each level of seniority.

(* at the Swedish management consulting department of a global firm with >200' employees world-wide)

3.5 Data processing

During the interview phase of the report, interviews were audio-recorded with the consent of the interviewees and transcribed on an ongoing basis. By doing so, themes could be identified early and focused on in later interviews to gain further insights into that specific theme or topic (Gioia et al., 2013). With interviews held exclusively in Swedish, quotes used in the empirics were carefully translated into English. Minor adjustments were in some cases made to the quotes in order to make them more comprehensible for the reader. In cases where further clarification was needed, interviewees were contacted and asked to make clarifications to interview quotes. In analysing the interview transcripts, coding schemes were created using the qualitative data analysis tool NVivo which helped identify, isolate and categorize recurring topics, experiences, and opinions. In order to minimize errors of interpretation both researchers worked with transcription and coding in parallel (Bryman and Bell, 2011).

Inspired by the methodology proposed by Gioia et al. (2013), interview data was labelled and grouped in constructs, beginning with basic empirical concepts (1st order constructs). These concepts were categorized into themes (2nd order constructs), raising the level of abstractness closer to the theoretical concepts used as a basis for the analysis. In line with the abductive approach, this also included a cyclic methodology where existing theoretic concepts and interview themes were intertwined, both in order to either confirm or oppose existing theoretical themes and in order to identify concepts not yet found or considered by previous research (Gioia et al., 2013). Hence, while most 2nd order constructs were closely tied to concepts of the theoretical model, others were not, as there was no obvious connection. Lastly, 2nd order constructs were categorized into aggregate dimensions (3rd order constructs) based on which of the aspects of remoteness outlined in the theoretical framework they related to.

This process was guided by the interviewees, who often aided the process by identifying both specific aspects of remoteness and their subsequent effects on individual decision making, collective aspects of knowledge sharing or knowledge sharing outcomes. The process helped us identify and understand the cause-effect relationships between remote work and knowledge sharing, which would become the main pillars around which our empirical findings would be presented and analysed, as presented later in this paper. When grouping the interview data into constructs, selections were made in to focus on the most important aspects, meaning that findings considered by the interviewees to be of lesser importance were not included, in order to provide reasonably concise findings.

3.6 Methodological critique

3.6.1 Credibility

To ensure the credibility of the findings in this study, we have strived towards full transparency in describing the processes and the decisions that have formed this study. In addition to the methodology chapter, which we have strived to make as detailed as possible, the semi-structured interviewee guide (see Appendix 2) and an example of the coding and analysis process (see Appendix 3) have been included for the sake of transparency. Qualitative research is often criticized for being too subjective and based on the authors' views (Bryman and Bell, 2011). As the study aimed to understand how the interviewees experienced knowledge sharing in a remote work setting,

ensuring that we interpreted them correctly was important for the credibility of the study. We therefore made sure to discuss and question any interpretation of the empirics between us. As the topics discussed might also have been considered of a sensitive nature, both by individual participants and the companies in the study, this was also important from a research ethics perspective.

However, it should be noted that knowledge sharing, and its preceding cognitive and relational aspects are quite complex and abstract topics, meaning that such interpretations might be challenging. Furthermore, interviewees might, due to reasons such as self-justification, provide answers which do not correspond to their actual feelings and behaviours (Bryman and Bell, 2011), and our findings should be considered in light of this. In order to mitigate this problem, we strived to probe for concrete examples of behaviours from the interviewees which formed the basis for probing and further discussions.

3.6.2 Transferability

As this study focuses exclusively on knowledge intensive firms, and more specifically management consultants, the conclusions drawn should be considered to increase the understanding of this specific context. However, as previously described, management consultants are on the forefront of knowledge sharing and we therefore hope that the findings will be of interest for a broader spectrum of organizations. A second factor affecting the transferability of this study is the use of an extreme case as a way to shed new light on existing theory. Even though many companies, including a number major, global companies such as Spotify and Facebook, are expecting an increasing amount of remote work after the pandemic (Aktuell, 2021) it is unlikely to be on the level experienced by employees during the past year. One could therefore argue that the findings and conclusions of this study would only be relevant in this specific situation, with this relatively extreme extent of remote work. However, as previously stated, we argue that the use of an extreme case, as an established method for adding new insights, will increase our ability to contribute to existing research rather than decrease the transferability of our findings. Another relevant consideration in this perspective is the number of organizations and interviewees considered suitable for this study. A certain sense of empirical saturation was reached in the later of the 18 interviews conducted, as new and surprising answers became increasingly rare, and the answer mainly provided additional support to previous findings. However, it cannot be overlooked that additional interviews, especially including additional organizations, could have yielded additional, richer and thereby more transferable insights.

3.6.3 Parsimony

As Eisenhart (1989) describes, an important consideration for the strength of theory building is parsimony. Relying extensively on empirical evidence can lead to the creation of overly complex theory in an attempt to capture all aspects studied in great detail, and thus lack an overall perspective. This has been kept in mind during this research project. In our abductive approach, we have strived to be selective and use the most important and relevant elements of the findings to make fruitful yet suitably straightforward additions to previous research. However, a certain degree of complexity was needed in order to uncover the ways in which extensive remote work affects knowledge sharing in social interactions, and a suitable balance has therefore been aimed for.

4 Findings and analysis

“Knowledge sharing is the most important question of our industry, but also one that no one has really figured out yet. I remember a partner at a previous employer of mine once saying: “If all of [firm] knew what all of [firm] knew, we would be unstoppable.” And that’s really the way it is.” (Interviewee 9. Manager level employee at Company Y)

In the following section, findings of the qualitative study are presented and analysed. By reintroducing the theoretical framework, as presented in the theoretical review, we aim to present and analyse findings in relation to the main theoretical concepts. The section is based on interview data, but quotes will often be complemented with relevant context in order to maintain a logical structure. The findings are split into two sections: (1) Descriptions of the companies and business unit work structures in order to add organizational context to the second section, (2) findings on the effects of extensive remote work on knowledge sharing.

4.1 Organizational contexts

Company X

Company X consists of around 60 employees with varying competences, although with a majority in the roles of management consultants. Company X has undergone organizational changes during the last year which has meant an increased focus on cross competence team formation. Consequently, a project team generally consists of both strategy consultants and employees with expertise within other areas, such as digital innovation, design and data analysis. The exact project team constellation is to a large extent dependent on what is required for each project. With a relatively limited onboarding process, gaining knowledge at Company X is mainly done in projects, with any development of special expertise happening more or less as a consequence of project staffing.

At Company X, effort spent on knowledge management work in general has increased during the past two years, with the company introducing several structured knowledge sharing forums with varying topics and sizes. In parallel with working with structured forums, efforts have been made to enhance the knowledge sharing culture, for example with more active encouragement to participate in knowledge sharing activities. At Company X, almost all of the working hours of each individual interviewee had been spent remotely. Even during periods where employees of many other companies returned to the office, employees at Company X spent at most one or two days per month visiting the office to meet with project team members.

Company Y

As a company with more than 200,000 employees globally, Company Y is by far the largest company in the study. After recent restructurings, the Swedish management consultancy department, is approximately 150 employees. Although varying by project type, the internal working structures are fairly traditional with an average project team generally consisting of one or two junior employees, a manager leading the project, and a senior colleague acting as more of an advisor, often working with parallel external projects as well as with internal projects and sales efforts. Within the management consulting department, employees, usually of higher seniority,

have different areas of special competence which affect the allocations to client projects, naturally creating groups specializing on different business areas such as finance, procurement, IT/digitalization, supply chain management and operations, outsourcing, etc.

Company Y offers new employees a mandatory introduction and a mentorship program where new hires get to know both the company and the colleagues, providing a starting point for the building of their understanding of the company as well as their personal social network. Knowledge is generally shared during project execution, but the company has taken steps to create smaller forums, some based on seniority (i.e. forums for all junior consultants, or all project leaders) and others based on competence. Additionally, new hires also get to work with a performance manager in order to accelerate individual learning and further build the social knowledge network. The company also holds regular updates within the consulting department and forums where knowledge is shared based on performed projects. Remote work at Company Y has been extensive, with a majority of interviewees reporting that approximately 80 % of their working hours the past year have been spent working remotely.

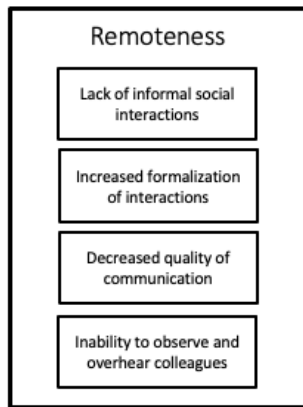
Company Z

Quite similar in size to Company X, Company Z employs around 40 people. The company provide advisory services to management teams in a wide range of sectors and industries, but also educations and workshops to customers where the methods used in projects are shared and taught. The project teams range in size from a single consultant to a project team of 4 to 5 people of varying seniority. There are no clear structures regarding the seniority of the members of a project team, with every team being set up to fit each specific project. Generally, senior colleagues often work as an integrated part of the project team rather than an advisor.

Client projects are presented by the project groups to the rest of the organization in weekly forums, where employees can sign up to present or make requests about presentations regarding a certain topic or project. Additionally, there are formal forums for junior employees, where they socialize together and share knowledge. All employees are also assigned a mentor, with whom they meet continuously to discuss personal development and ambitions rather than project specific topics. Employees at the company have spent the majority of their time working remotely during the last year. This has however not been as drastic of a change internally as it might have been for other companies, as Company Z spent a lot of time working with clients at the clients' offices before the pandemic, creating somewhat of an internal remote working environment.

4.2 Knowledge sharing in remote work settings

This section will present empirical findings on the effects of remote work on knowledge sharing and relate these findings to the main theoretical concepts as presented in the theoretical framework.



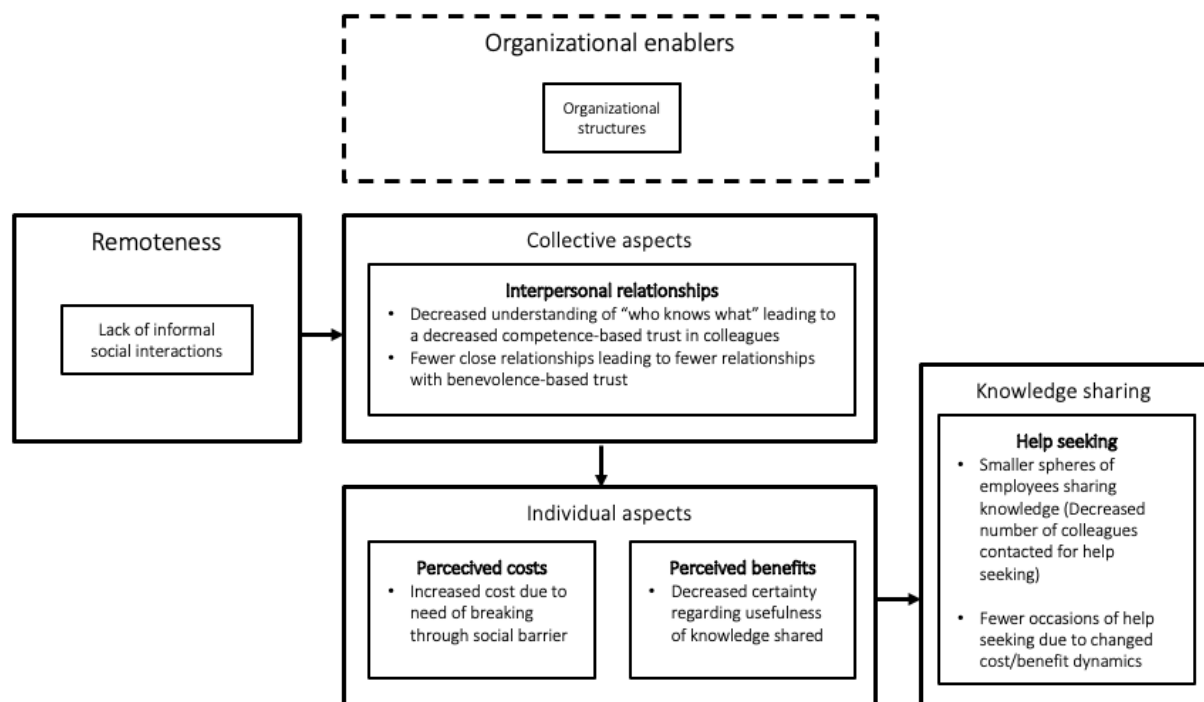
The section will be structured following the four main effects of remote work as identified in the theoretical review. These include:

- Lack of informal social interactions (4.2.1)
- Increased formalization of interactions (4.2.2)
- Decreased quality of communication (4.2.3)
- Inability to observe and overhear colleagues (4.2.4)

The four variables of remoteness represent the root causes of what we, based on empirical findings, have found to be the main effects on knowledge sharing in the organizations studied.

4.2.1 Lack of informal social interactions

Figure 3. Lack of informal social interactions affecting help seeking.



When working together in an office, social interactions among colleagues occur informally and spontaneously in various settings: in the shared office space, in the hallway, at the coffee machine or at social events in connection to work. According to interviewees, these interactions had not occurred in the new digital work setting to the same extent, in line with the proposed effects of remote work.

“After works, breakfasts at the office, or just grabbing a coffee. These are some things you miss now [when working remote] when they don’t happen as naturally. Now you have to

actively search for that. [...] It's easy that they [informal conversations] disappear when they don't occur as naturally as by the coffee machine." (Interviewee 17. Junior level employee at Company Z)

There seemed to be a general consensus among interviewees that, as a consequence, the network of trustful relationships as described in our theoretical framework had decreased in size, or at least that the natural growth of the network that occurs when interacting with colleagues had been negatively affected by working remotely.

"Conferences and parties actually have a professional purpose, and now that a year has gone without this type of activities it has of course had its effects. [...] The number of people that you recognise and have a relationship with is fewer." (Interviewee 9. Manager level employee at Company Y)

"The sphere of colleagues becomes much smaller [when working remote]. From day 1 of working remotely, it went from being the 50-60 people at the company to being my team of 5-6 people. It got reduced immediately and has stayed that size ever since. Depending on the project team, those are the ones you spend your time with." (Interviewee 1. Manager level employee at Company X)

According to the interviewees, the understanding of where knowledge resides in the organization happens in a variety of ways: in parts of introduction programs specifically designed to spread this type of information, by asking certain more experienced colleagues but also, to a large extent, in the informal social conversations with colleagues where relationships are formed. Interviewees expressed that their relationships with colleagues generally involved a decreased understanding of their experiences and current work. While most interviewees, especially junior employees, acknowledged that most of their colleagues were likely to have a large base of knowledge which could be of value to them, knowing what that knowledge was had become more difficult. This meant, in relation to our theoretical framework, a decreased competence-based trust in regard to the topic at hand when seeking help. More specifically, the lack of competence trust towards certain individuals in certain topics led to a decreased perceived benefit on the individual level of the help seeker as the usefulness of the potential help provided became less certain.

"When you are at the office eating lunch, you talk about the job. Then you hear about the projects that others are working on and what stages they are in. Right now I have no idea what others are doing." (Interviewee 3. Junior level employee at Company X)

"Before [the pandemic], when I was more junior, we had a group of juniors which was really tight, where I had a good sense of what projects they were working on and what sort of tasks they had, which meant that I could easily understand who to ask about a specific thing. Now when you're cut off [from colleagues by working remotely] you have no idea what people are working with, what their day looks like or what type of knowledge they have in their projects. So it's [knowing where knowledge resides in the organization] been inhibited by working more in silos and interacting with the same people." (Interviewee 2. Manager level employee at Company X)

Additionally, using this social knowledge network does not only rely on knowing who to ask, but according to many of the interviewees also seemed to be about knowing how and when to ask, which can be connected to the concept of benevolence-based trust in our theoretical framework. This understanding was gained by building personal relationships and as a consequence of the lack of informal social interactions, the interviewees generally feeling less certain in regard to how colleagues would react and think about being approached for help. On an individual level, this led to a higher perceived cost due to the risk of the colleague disliking being approached. Making things even more intricate, interactions within relationships of low benevolence-based trust often involve a larger extent of presenting yourself and your role within the organization before going into the topic of concern. Both of these aspects constitute a social barrier which need to be stepped over in order to approach and receive help from a relatively unfamiliar colleague. This added to the perceived effort and time of help seeking, increasing the overall perceived costs such interactions.

“It’s not like you only ask people you already know, but it’s easier. You’re past a certain social barrier, to get to know someone, and you don’t need that start-up-phase. You can just cut to the point.” (Interviewee 10. Manager level employee at Company Y)

”It feels more natural to reach out to people I know. When you don’t know a person, you don’t know where their limits are, but when you know someone it’s much easier to just bounce ideas. [...] It’s about knowing the workload of the other person, and what they think about spending time helping me.” (Interviewee 8. Senior level employee at Company Y)

The changed relationships within the organization and the shifted individual costs and benefits of help seeking as a consequence, led to interviewees approaching a quite small and formal group of individuals for help, such as the team that they worked with regularly, and assigned mentors.

“I tend to reach out to the same people. If I have an ongoing dialogue with someone, I might as well continue that dialogue. The network tends to decrease in size when working from home because it’s easier to reach out to someone you already have an ongoing dialogue with” (Interviewee 17. Junior level employee at Company Z)

The extent of the effects seemed to depend to some extent on the size of the existing individual’s social knowledge network before the pandemic, with senior employees with more time spent at the company, and therefore with larger, existing social knowledge networks, not being as affected as junior, less experienced employees. Apart from having to do with the time spent at the company, this could also be explained by junior employees not feeling as comfortable with reaching out for help.

“When you work on a project together, you get to know people a bit better. I imagine that can be hard for newer employees especially, not having that social network”. (Interviewee 10. Manager level employee at Company Y)

Some differences between the organizations studied were also seen depending on the organizational structures and work processes, as suggested in the theoretical framework. At Company Z, where project teams and work processes were less fixed, the size of the social knowledge network seemed to have been less affected by the lack of informal social interactions, as employees formed relationships with a larger network of colleagues during more formal work-related interactions. In contrast, at Company Y, where hierarchical structures were more apparent, these structures seemed to increase the negative effects on knowledge sharing.

“Our hierarchy is kind of strict in a way, making knowledge sharing much more difficult in this new [digital] landscape. [...] The question of “Who am I allowed to ask?” has not been made easier. [...] There is a general perception that our senior colleagues have little time and are super busy” (Interviewee 8. Senior level employee at Company Y)

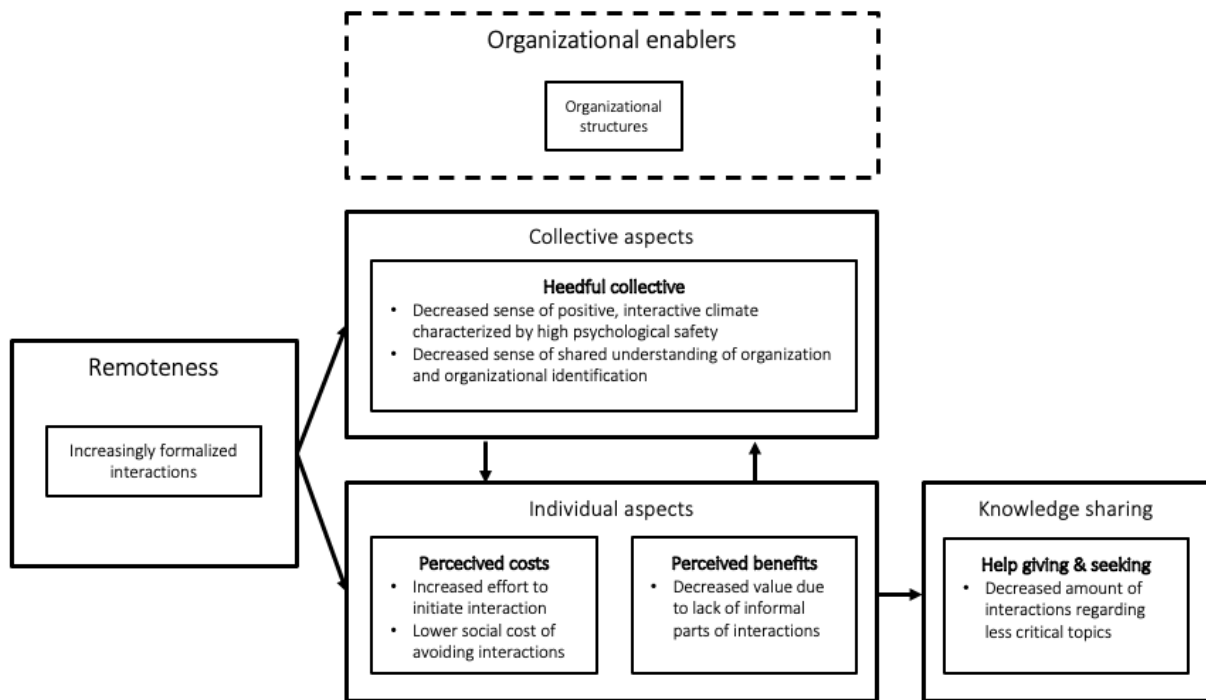
Another important organizational enabler seemed to be experienced colleagues who act as “knowledge brokers”. This was done by pointing colleagues, that were less aware of what and where the knowledge in the organization were to be found, in the right direction. Help seeking employees could, after being directed certain individuals with high competence in a specific topic, approach these unknown colleagues with lesser sense of insecurity.

“There are some people who can find stuff, who’s been around for ages and can remember that “Oh yeah, we did this project back in 2007”.” (Interviewee 13. Manager level employee at Company Z)

“You don’t get it [who knows what] as naturally [when working remote]. [...] In the dialogues with my mentor, if I have a specific problem, he can often direct me to a person who might have good answers and experiences regarding the topic.” (Interviewee 17. Junior level employee at Company Z)

4.2.2 Increased formalization of interactions

Figure 4. Increasingly formalized interactions affecting help giving and help seeking.



Many interviewees testified that working remotely had meant that communication needed to be initiated in a different, more formalized way, in line with our theoretical framework.

“I think that’s the most noticeable effect of working remote, that it feels like you need to book a meeting for everything. Things that you previously discussed by the coffee machine or by stopping by someone’s desk. These small and quick questions, the corridor exchanges if you like, have unfortunately been affected.” (Interviewee 2. Manager level employee at Company X)

The increased formalization was also apparent in the work done within project teams and among team members, where the patterns of interaction had changed.

“You attend [digital] meetings together but you don’t work closely together making it hard to discuss the process in the same way. It’s not as easy to guide. Instead, you have meetings where you discuss, but then you work by yourself. The time spent working together has been limited.” (Interviewee 10. Manager level employee at Company Y)

The increased formality was however not only perceived to have affected the initiation or occurrence of interactions. Our findings also suggest that the character of the interactions had become more formalized, something that was especially apparent in larger forums. The increased formality of meetings meant that the time before and after meetings, which according to many interviewees was often used to ask clarifying questions and have additional discussions in smaller groups, had now vanished as meetings ended sharply on time and simultaneously for everyone.

“Time is limited [when having remote meetings]. In a room, you can grab someone after the meeting. [...] I think the possibility to stay around after meetings [makes it possible to] ask questions about things you thought about during the meeting but did not understand, and it’s still in connection to the meeting. You can always get in touch after the meeting anyways, but that’s a bigger thing than to just ask on the fly”. (Interviewee 8. Senior level employee at Company Y)

“If you’re in a [physical] meeting, you can talk to the person sitting next to you during the meeting. That person can give you short explanations or you may agree on asking for clarification later. These short spaces where you switch your attention from the meeting can save several days of work for people who perhaps would not feel that they could call and ask afterwards. Perhaps they would send a message now [when working remote], but then I might still be in another meeting and have hundreds of unread messages. So it has changed, and it’s not for the better.” (Interviewee 12. Senior level employee at Company Y)

Relating our findings to the individual layer of our theoretical model, the findings imply that with increased formalization, the individual employees’ perceived costs of initiating interactions have also increased.

“You think an extra time before you ask [when working remote], because it is a more active decision call someone.” (Interviewee 3. Junior level employee at Company X)

Adding to this, several interviewees also voiced concerns about how they have to spend more time preparing for interactions, which sometimes hindered them from asking for input.

“When you have the possibility to meet physically, you can just ask someone to have a look at something. Now I have to book a meeting, and I also have to prepare more. It’s much harder to arrange a spontaneous “let’s work on this topic together”-meeting. It takes preparation and structure digitally, and that’s a barrier for asking.” (Interviewee 17. Junior level employee at Company Z)

Additionally, the digital, more formal ways of communicating actually made the costs of avoiding help giving interactions lower for some senior employees, with the remote work environment making them able to make prioritizations they couldn’t do in face-to-face settings.

”It’s harder to prioritize [when working remote]. Other things get in the way and then you don’t take the time to do it [share knowledge]. [...] I think it’s partly about discipline. If someone knocks on your shoulder, it’s hard not to listen. But it’s pretty easy to dodge a question in a [Microsoft] Teams channel since it’s not really a priority. You can just claim that you didn’t have time or that you were in a meeting.” (Interviewee 5. Senior level employee at Company X)

As for the perceived benefits of sharing knowledge, without informal additions to meetings (often gained by small talk), the ability to ask clarifying questions, and discussions before and after the formal parts of the interaction, the knowledge shared becomes less rich. Additionally, such

meetings seemed to be perceived as less fun and positive experiences by many interviewees. Together, these factors constitute to a lesser sense of the concept of an interactive climate, as presented in our theoretical framework. Consequently, the empirical findings suggest that this has led employees to view the knowledge sharing interactions as less valuable.

“We have a lot of forums with all employees of the same seniority where you are supposed to share experiences and learnings, but I think those have been happening less often this year. I think it could be because of the remote work. It’s a completely different thing now. Before [the pandemic] it took place at 17 o’ clock and you could have a beer or a glass of wine. It was a social activity. Now, the focus is much more on learnings - it’s much more formal now.” (Interviewee 1. Manager level employee at Company X)

From a collective perspective, several interviewees expressed that the lack of informal knowledge exchanges led to a decreased understanding of the organization and specifically the parts of it less closely connected to them, which can be connected to the concept of shared representation in our theoretical framework. This lack of understanding in turn, led to a decreased feeling of togetherness and belonging to the organization according to some interviewees, in line with the concept of organizational identification in our theoretical framework.

“What has been affected most for me [by working remote] are the spontaneous meetings where I get to know people that I’m maybe not working with regularly. I may reach out to certain departments that I am interested in and ask questions, but it doesn’t happen to the same extent as when I met people in the hallway and used that opportunity to ask. [...] The knowledge sharing outside of your own focus area disappears.” (Interviewee 8. Senior level employee at Company Y)

“At moment we don’t share a lot of what we do internally. You don’t have the same understanding of what we [the company] are doing. It feels more like I’m working at my client project than at the company. I don’t feel like a part of anything else than the client.” (Interviewee 3. Junior level employee at Company X)

As illustrated in Figure 4 this creates a downward spiral of negative effects with collective and individual aspects both affecting each other. To put this into the context of the theoretical framework: Increased barriers and decreased benefits of knowledge sharing, as well as the general feeling of a heedful collective, i.e. a collective characterized by a shared understanding of the organization, positivity and high psychological safety, are both directly and indirectly affected by this aspect of remoteness. These effects seemed especially significant for the help-seeking individual.

“The responsibility to create informal exchanges is much more on the individual, it’s up to you. It is absolutely something that we as a company encourage, to call someone and have a digital coffee or just talk. But since it is up to the individual, and we have lot of other things to do, it’s easy that it doesn’t happen since those situations do not occur naturally, like at the coffee machine. Then you lose those conversations.” (Interviewee 17. Junior level employee at Company Z)

Ultimately, lower amounts of informal interactions taking place within and around existing, formal knowledge sharing interactions as well as the disappearance of some interactions did, according to many interviewees, lead to less knowledge being shared around topics which could be considered less critical and in need of immediate action, but still of interest and relevance to share.

“It [knowledge sharing] is more structured. There is less of the general talk about business trends. [...] Previously, it happened more on an ongoing basis. I have colleagues that I talk to about random things digitally now, but they are fewer than before, and it’s not as randomized as it was at the office. Then, I could be talking to anyone at lunch about a topical subject. That type of spontaneous and randomized knowledge exchanges is down to zero now. It’s much more structured. You must actively search for knowledge, which means that knowledge doesn’t come to you randomly. The things that I am not aware of not knowing will not come to me.” (Interviewee 15. Manager level employee at Company Z)

“There is almost no informal [knowledge sharing]. I can get a question in the chat, but it is not as much as it would have been at the office. [...] In the long run I think it can lead to lower quality in our deliveries because of reinventing the wheel, that you don’t gain access to the knowledge that other people, that have done similar things, have.” (Interviewee 5. Senior level employee at Company X)

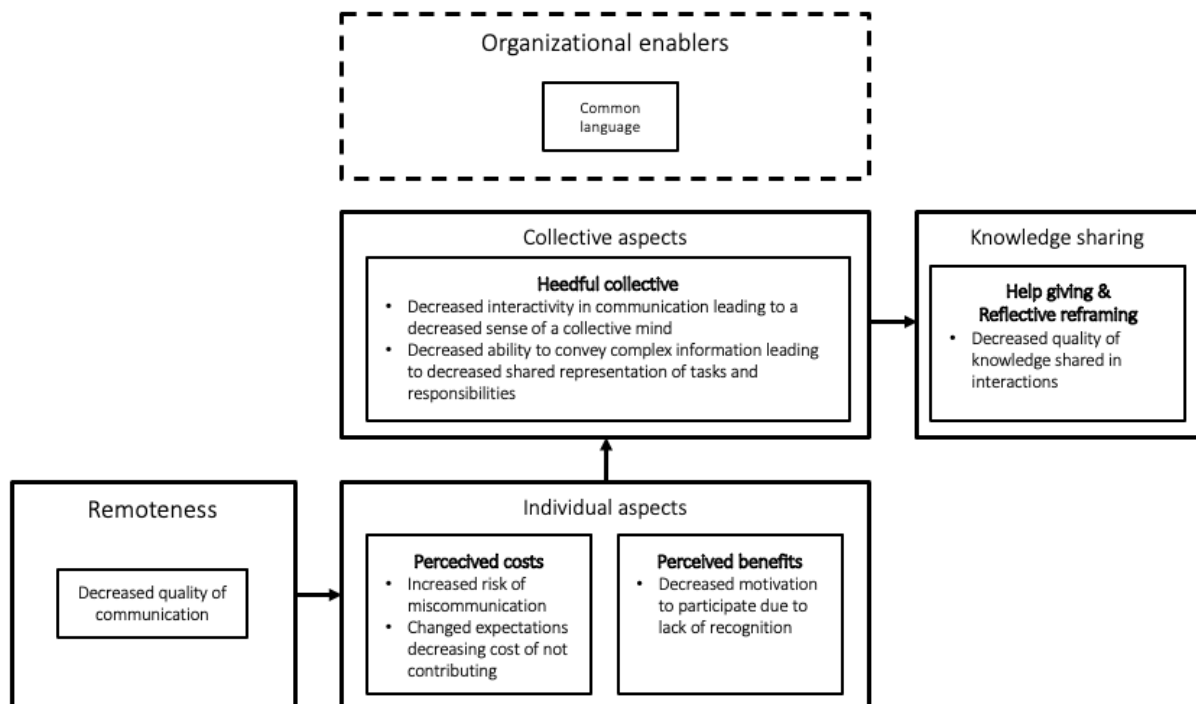
The issue with increasingly formalized interactions is one that all three companies had struggled with during the past year, as well as having tried to compensate for, partly by introducing structured, informal, social forums. These constructed “communities of practice”, as described by Kolbacher and Mukai (2007), were unfortunately largely disregarded by employees who voiced the general opinion that these forums were a long way from replacing physical, informal gatherings. The extent to which the formality of interactions increased, as well as the collective heedfulness among employees, also seemed to depend somewhat on the culture within the organization. At Company Z for instance, informal interactions seemed to take place to a larger extent by allowing for informal talk and less structured elements in structured, and traditionally more formal, forums. This appears to have set the norms for other interactions as well, allowing for more informal knowledge exchange throughout the organization.

“It’s a cultural question. We have a weekly check-in where we talk a lot of nonsense. [...] We want people to feel that they can call without having a specific purpose with the call. If you are new, and you join the weekly check-in where we talk about all sorts of things, you get a feeling for the culture.” (Interviewee 16. Senior level employee at Company Z)

“These digital check-ins that we have where we meet and tell each other about our week. You can see it as just being chitchat, but it is surprising how you can pick up things from hearing what people are doing and what problems they have in a way that is very rewarding, as new.” (Interviewee 18. Junior level employee at Company Z)

4.2.3 Decreased quality of communication

Figure 5. Decreased quality of communication affecting help giving and reflective reframing.



Turning the attention from the initiations and settings of interactions to the actual communication in them, most interviewees touched upon the perceived decrease in quality of interpersonal communication in meetings when working remote, as suggested in our theoretical framework. This stemmed from factors such the lack of body language, visual tools and lack of engagement in meetings.

“In a physical format you can use your body language to seem engaging and to get people engaged. There is a presence in the room which means that you can’t look at your phone when someone is presenting. But when you’re remote, it’s hard to know how interested people really are.” (Interviewee 17. Junior level employee at Company Z)

“How you convey your message with words becomes more important. Before [working remotely] you could just draw [using a whiteboard], and the other person would understand immediately, but now you have to use a lot of detours to create understanding.” (Interviewee 11. Junior level employee at Company Y)

Our findings suggest that the effects of a decreased quality of communications were two-fold. Firstly, interviewees felt that the decreased quality led to decreased interactivity and engagement. Many meant that this was due to practical difficulties in having an interactive discussion digitally, such as not being able to show with your body language that you want to say something, increasing the perceived cost of making short comments, reflections or asking questions.

“Someone’s on delay, you interrupt someone, talk at the same time by accident, someone’s muted. It’s not the same quick interaction that is required to reach a conclusion or come up

with an existing solution. You get limited by technical aspects somehow. You don't get the flow of knowledge sharing.” (Interviewee 2. Manager level employee at Company X)

The decreased quality of communication also meant that the perceived benefits of contributing to discussions decreased according to some interviewees, as plaudits from other meeting participants when sharing knowledge could not be noticed to the same extent. This contributed to an even lesser extent of interactivity in meetings.

“Knowledge sharing is more fun when there is active participation [...] Questions, comments, reactions [...] Otherwise it feels dreary to spend two days on a PowerPoint-presentation that you're going to present. A lot of knowledge sharing is about prestige, to show your projects and what you know. There is a recognition component, being acknowledged for something you have done or created. When you don't get that acknowledgement as naturally, I think it affects the commitment to share knowledge as well” (Interviewee 2. Manager level employee at Company X)

Others pointed to changed norms regarding the active participation in meetings digitally, which led to lower expectations on attention and contribution for meeting participants, decreasing the perceived individual costs formerly attributed with not participating.

”Suddenly, it's okay to take a walk while having meetings because you work from home. Then you're not going to be as active. [...] It's also easier to work while in a meeting, like answering an email while being in a meeting. You haven't been able to turn off your camera or mute yourself before. When you're in a physical meeting, you at least had to sit there and pretend to be active. So it has become easier to escape”. (Interviewee 1. Manager level employee at Company X)

Secondly, in addition to the lack of interactivity, several interviewees pointed to a decreased richness of the information flow in the interactions. This concerned the lack of possibility to convey more abstract information by using body-language, white-board drawings and other visual cues during meetings. In relation to our theoretical framework, this points to a decreased shared understanding of tasks and roles.

”When you want to teach the professional craftsmanship to younger colleagues then there's a lot of hands-on reasoning. How do we build the storyline in this presentation or how do we execute this analysis. It's knowledge that I believe benefits from being together physically”. (Interviewee 9. Manager level employee at Company Y)

“It is more difficult [sharing knowledge remotely]. Especially conveying nuances. There are layers of knowledge, from facts up to philosophy and opinions. The higher up you go in those layers, the harder it is to systematize, conceptualize and write the knowledge down. How we sell for example, that type of more emotional and opinion-based knowledge, is much more difficult to understand. You can't get that in an email, you can barely get it in a video meeting. (Interviewee 15. Manager level employee at Company Z)

To summarize – the decreased interactivity and the decreased ability to convey relatively more complex information – our findings suggest a fundamentally changed perceived cost-benefit scenario where individuals are less likely to share knowledge to the same extent as in physical settings. Connecting this to the collective aspects of our framework, this led to a partly decreased prevalence of shared representation of tasks and projects in meetings. Additionally, this led to a decreased enactment of a collective mind as the collective activity of reflective reframing, as introduced by Hargadon and Bechky (2006), became increasingly difficult. Many interviewees expressed that building on each other's contributions and co-creating became less common when working remotely.

“When we have a workshop, a key component is building on each other's thoughts. Someone throws out a thought, and the someone else jumps in. The dynamics of an internal workshop is hard to get digitally.” (Interviewee 2. Manager level employee at Company X)

This meant, according to many interviewees, that certain types of meetings had suffered substantially more from being remote than others, depending on the abstractness of the knowledge shared, as well as the level of interactivity needed. The interviewees agreed that more creative settings were affected the most. One interviewee highlighted the overall effects this had on the collective ability to solve unique problems in need of a collaborative, creative process.

“The creative process becomes much more template-based, which lowers the effectiveness or the possibility to customize [...] We work with unique customer problems, and the process of getting to the unique things needed for the customer is much slower.” (Interviewee 12. Senior level employee at Company Y)

We find common language to be the key organizational enabler of this phenomenon, with several interviewees emphasizing the importance of a shared language, an internal terminology, to some degree assisting in making communication richer, without necessarily making it more time consuming.

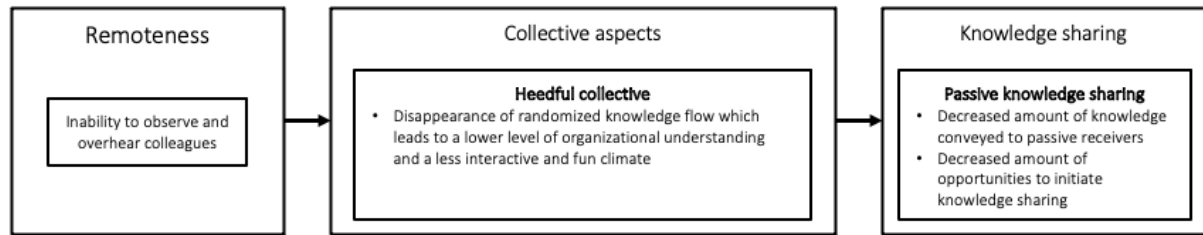
“You create a type of language, where, if you use a certain phrase the other person knows exactly what you mean.” (Interviewee 11. Junior level employee at Company Y)

This, however, meant that junior employees struggled noticeable more so than more senior colleagues, with no help from the common language they had yet to learn.

“I think the ones hurt the most by this are junior employees. They don't get the lingo so they need to ask follow up questions and get the whole communications package to fully understand, while senior employees will understand right away.” (Interviewee 5. Senior level employee at Company X)

4.2.4 Inability to observe and overhear colleagues

Figure 6. Inability to observe and overhear colleagues affecting passive knowledge sharing.



As highlighted in the theoretical review, this paper takes the approach of viewing knowledge sharing as socially embedded. But taking part in social interactions does not have to be an active exercise. Sharing an office space with colleagues meant, according to several interviewees, overhearing conversations, accidentally seeing what your co-worker is working on, increasing your personal understanding of company norms, culture and ways of working, and gaining an understanding of organizational knowledge (“who knows what?”).

“It’s hard to replace the overhearing [...] You don’t have to actively participate in a conversation to understand it” (Interviewee 12. Senior level employee at Company Y)

“I think it’s not knowing what other people know and what they’re working on, something you otherwise pick up in an office landscape. It’s the overhearing, picking things up, that’s such an important part in knowledge sharing, that you lose one hundred percent of [in a remote work setting].” (Interviewee 2. Manager level employee at Company X)

Of all the effects remote work has on knowledge sharing, this is likely to be the one hardest to both identify and compensate for, due to the simple reason of it being extremely difficult to understand what you don’t know, or what knowledge you might have missed out on. In a shared office space, overhearing someone discussing a topic that might be of value in your own work might often lead to you approaching that person. In other words, passive, unintended knowledge sharing may, besides the actual overhearing, led to active knowledge seeking.

You don’t really know what knowledge you’re missing until other people notice. So if you’re not aware that you’re not getting the knowledge, it’s very hard to go looking for it. (Interviewee 7. Junior level employee at Company Y)

“You miss out on walking in the office landscape, seeing what people are working on. Maybe you see a nice looking Excel model or something, and walk up to them to ask “What are you up to?” That has disappeared completely.” (Interviewee 10. Manager level employee at Company Y)

According to some interviewees, the random and spontaneous information flow made possible by sharing a physical work space created a more interactive and fun climate, indirectly implying that a remote work setting lacked these characteristics. Adding some detail to the extent of these effects, employees who started working at the company during the pandemic stressed the difficulties of

understanding the ways of working, as well as the company culture when working remote, suggesting junior employees once again being the group hit the hardest.

“It was hard as a new employee to get a feeling for the culture. You can interact with individuals, but it is hard to observe the collective, as you do at the office. To get a feeling for how the organization works. Everything you previously could get a feel for in just a millisecond is gone. It’s like you are a bit blind or a bit stupid when you’re in a digital meeting.”
(Interviewee 15. Manager level employee at Company Z)

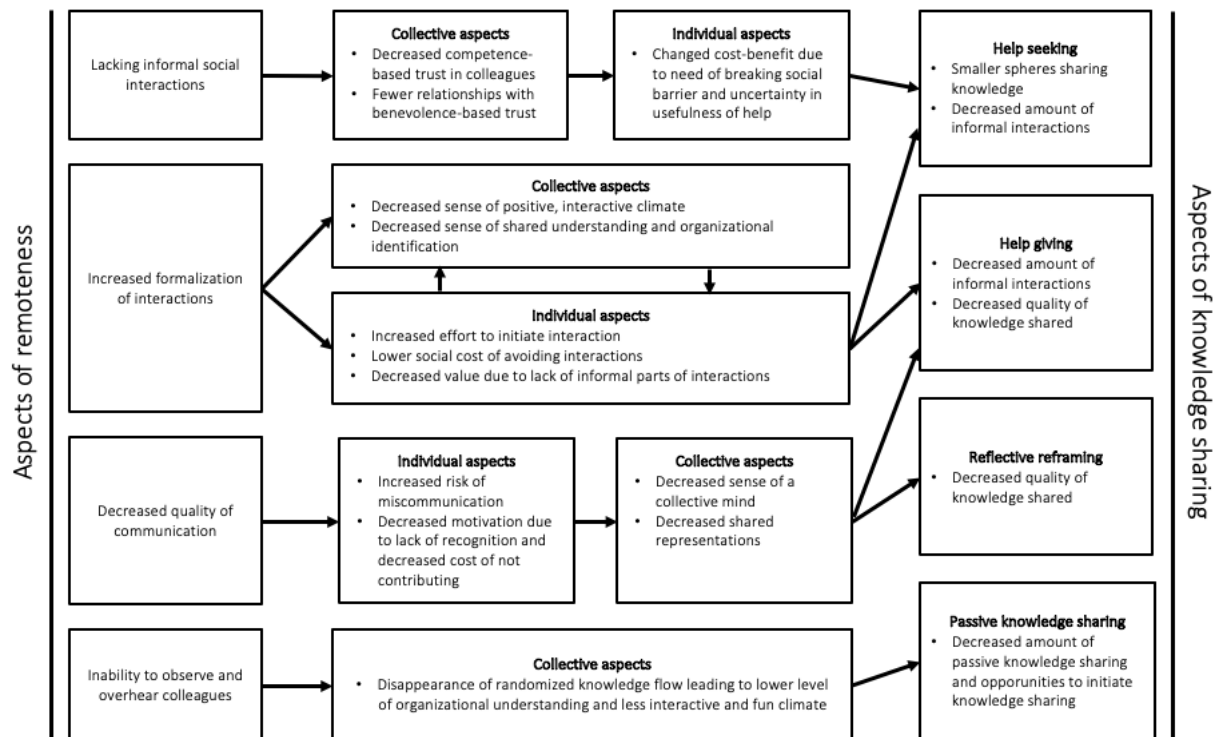
Relating these findings to our theoretical framework, we are unable to find any evidence of the listed organizational enablers affecting the occurrence of passive knowledge sharing. All three companies in our study have with varying success made efforts to replace passive knowledge sharing with forums, message boards, and social events. Listening to interviewees, however, so far no one seems to have properly succeeded. And for employees themselves to try and compensate for the loss of knowledge gained becomes near impossible, seeing that they are admittedly having a hard time identifying exactly what knowledge they are losing out on.

5 Discussion

The purpose of this paper has been to investigate the effects of extensive remote work on knowledge sharing in social interactions. Our findings aim to provide further understanding to the research area of knowledge sharing in remote work settings, in this paper mainly represented by the studies by Golden & Raghuram (2010) and Taskin & Bridoux (2010). We have strived to do so by taking a qualitative, in-depth approach and by studying cases of extensive remote work. In addition to previous research on the effects of remote work on knowledge sharing, our findings generally add nuances by considering different aspects of the changed working environments and their specific effects on various knowledge sharing outcomes. Breaking down the knowledge sharing process into three main organizational layers - individual aspects, collective aspects and key organizational enablers – has further allowed us to uncover the mechanisms through which the connection between remote work and knowledge sharing, as found by previous research, occur.

The purpose of this section is thereby to discuss our main findings, providing a holistic understanding of knowledge sharing in remote work settings. We do so by presenting a comprehensive view of our main findings (see Figure 7). This is followed by a brief discussion of the aspects of remoteness (5.1), followed by the two layers of knowledge sharing conditions within an organization (5.2, 5.3), and lastly the organizational enablers adding organizational context to our findings (5.4). The three sections 5.2, 5.3 and 5.4 each relate to one of the three sub-questions to the overall research question of this paper.

Figure 7. All four aspects of remoteness and their effects on knowledge sharing.



5.1 Aspects of remote work

Our findings provide empirical support for the aspects of remote work presented in our theoretical framework. The findings point to all four aspects playing a significant role in the overall effect that remote work evidently has on knowledge sharing, and that the aspects collectively seem to provide an exhaustive understanding of the overall effect. In relation to previous studies defining remote work as a single variable, such as the studies by Golden and Raghuram (2010), and Taskin and Bridoux (2010), these findings add to the understanding of remote work, how it can be broken down into less abstract aspects, and in turn how these aspects might affect knowledge sharing in different ways, as presented in Figure 7.

5.2 Individual aspects

In this section, we aim to provide an answer to the following question:

- How is extensive remote work affecting individual decision making in regard to knowledge sharing, and how does this affect knowledge sharing?

Firstly, our findings point to the importance of individual decisions to initiate interactions and seek knowledge for knowledge sharing to occur effectively within organizations. Extensive remote work seems to alter the balance between costs and benefits of such behaviour, as increased barriers to initiate communication and decreased quality of social knowledge networks increase the cognitive effort of help seeking. Simultaneously, our findings point to an increased responsibility for the knowledge sharing within organizations being placed on the individuals in need of knowledge. As decreased quality of communication, increased formalization of interactions and decreased amount of passively received knowledge negatively impact the amount of unprompted knowledge shared with employees, active help seeking was needed in order for the individual to gain similar amounts of knowledge as they would have done in a physical work setting. Placing these findings in relation to previous research, our study contributes by emphasizing the importance of considering the effects on help seeking behaviour specifically when considering the effects of remote work on knowledge sharing.

Considering help giving behaviour, extensive remote work mainly affected the perceived costs and benefits of the individual in regard to colleagues' reactions to such behaviour. While decreased quality of communication meant that positive reactions from colleagues could not be registered to the same extent, decreasing the perceived benefit of help giving, increased formalization of interactions and changed norms also decreased the perceived cost of not sharing experiences and advice by making it easier to avoid interactions. These findings point to the importance of social factors, such as perceived norms, as a motivational driver for help giving in a remote work context, adding to previous research by suggesting that the effects on such social factors should be taken into account when considering the effects of remote work on knowledge sharing.

In relation to findings by Golden and Raghuram (2010), and Taskin and Bridoux (2010), our findings on the individuals' decision making generally add a new layer of understanding to the effects that remote work evidently has on knowledge sharing. By acknowledging that certain aspects of remoteness directly or indirectly alter the individual's cost-benefit analysis, highlighting

how this seem to occur, and how this ultimately leads to effects on knowledge sharing outcomes, we contribute to an increased understanding of the mechanisms through which extensive remote work affects knowledge sharing.

5.3 Collective aspects

In this section, we aim to provide an answer to the following question:

- How is extensive remote work affecting collective aspects of knowledge sharing, and how does this affect knowledge sharing?

Our findings point to the importance of considering the effects on the relational aspects of knowledge sharing when considering the effects of extensive remote work, in line with what has been done in previous research (Golden and Raghuram, 2010; Taskin and Bridoux, 2010). Our findings suggest that extensive remote work has led to a decreased size of networks of trustful relationships within the organizations and instead point to an increased prevalence of small knowledge sharing groups, rather than a collective unit, within organizations. In relation to the findings of Golden and Raghuram (2010), who suggest that interpersonal relationships might be resilient to the challenges to knowledge sharing that remote work pose, our findings suggest that this may be somewhat true. We find that the strong interpersonal relationships that remained in the extensive remote work setting served as an important channel of knowledge sharing, but that the network of such strong interpersonal relationships decreased in size, empirically supporting what has been suggested by Taskin and Bridoux (2010). Our findings add a deeper understanding to previous research by suggesting that this is mainly driven by the lack of informal social interactions when working remotely. Furthermore, in light of Abrams (2003) theory of interpersonal relationships, we add a deeper understanding to the suggestion of Taskin and Bridoux (2010), by highlighting that this occurs through a decreased understanding of colleagues' experiences and tasks, decreasing competence-based trust, and through negative effects on the formation of close, personal relationships, decreasing the benevolence-based trust among colleagues.

Our findings also suggest that extensive remote work has led to a less heedful collective. By highlighting a decreased understanding of adjacent parts of the organization, a decreased depth of the understanding of projects and a decreased organizational identification, our findings point to a decreased cognitive overlap between employees. Moreover, our findings highlight that extensive remote work has negative effects on the perceived interactive climate, as changed norms for interactions have affected this perception. This has resulted in a decreased quality and quantity of interactions, and thereby less knowledge being shared, especially around less urgent, often non project-related, topics. This empirically supports the suggestion by Taskin and Bridoux (2010), in that what they call organizational social knowledge, similar to the concept of shared representations and identification, is an important precondition for knowledge sharing in remote work settings. We also add to previous research by suggesting that an interactive climate, including social rules and norms, seems to deserve being taken into consideration as an important factor of knowledge sharing. Additionally, our findings contribute to a deeper understanding of how these effects occur as they show that aspects of remote work such as increased formalization of interactions, a

decreased quality of communication, and an inability to overhear and observe colleagues, all contribute to these effects.

As a consequence of the decreased quality of communication when working remote, the collective ability to conduct reflective reframing (Hargadon and Bechky, 2006), building on each other's contributions in interactions, also seems to have been negatively affected. This means that the process of enacting a collective mind (Werr, 2012b), where knowledge is put in new perspectives and applied to the specific context of a task, has decreased in prevalence. Thereby, our findings add to previous research by suggesting that the effects on the collective ability to combine knowledge from several individuals in a group and apply it to a specific context, not just the transfer of knowledge between individuals, should be taken into consideration when discussing the effects of remote work on knowledge sharing.

Lastly, we turn our focus to an aspect entirely unexplored in the research area, making it a clear addition. We found evidence suggesting that passive knowledge sharing, including both overhearing and observing colleagues, decrease considerably when working remotely. This leads to disappearance of a previously randomized information flow, which apart from providing employees with knowledge, also provides opportunities to actively seek relevant knowledge. Among the effects of this, we found a decreased understanding of company norms, culture and ways of working, as well as a decreased understanding of the competencies and expertise of colleagues.

5.4 Organizational enablers

In this section, we aim to provide an answer to the following question:

- What organizational enablers are important for knowledge sharing in extensive remote work settings?

By performing multiple case studies we have been able to identify and analyse organizational differences that might affect individual and collective knowledge sharing during extensive remote work. In our review of previous research we found organizational structure, common language and incentives to be key drivers in facilitating and encouraging knowledge sharing.

Firstly, our findings suggest that the role of an organizational structure enabling and encouraging knowledge sharing remains a key factor in an extensive remote work setting. We find that in organizations where work processes provide opportunities to interact with a larger number of colleagues, for instance mixing of project teams, the negative effects of remote work on the social knowledge network become less evident. Also, with an increased formalization of interactions leading to a decreased organizational understanding among employees, the creation of dedicated forums for knowledge sharing regarding more general topics seems to alleviate this effect. While these forums did not fully mitigate the negative effects of extensive remote work on knowledge sharing, they helped increase organizational understanding, especially for junior employees. Thus, our findings contribute to the research area by highlighting aspects of organizational structures that are crucial in an extensive remote work setting.

Secondly, and in line with findings of previous research, our interview data suggest that a common language plays a key role in counteracting the negative effects of a decreased communicative richness due to deficient non-verbal communication. This becomes especially apparent in knowledge sharing between junior and senior employees, with the former rarely possessing the same understanding of professional, often organization specific, terminology. These findings add to the findings of Taskin and Bridoux (2010) who simply, but correctly, state that shared mental schemes, languages and narratives aid the knowledge sharing process and that remote work might negatively affect this key enabler. However, based on the empirics and our theoretical framework, we argue that this can also be seen as an organizational enabler rather than something collectively constructed, as the common language often refer to terminology, processes and categories which can be articulated, stored and taught by the organization.

Finally, we are unable to find any empirical support for incentives having a role in the effects of remote work on knowledge sharing in social interactions. With our findings suggesting that knowledge becomes an increasingly demand-driven activity in remote work settings, and help seeking in turn primarily being affected by a task-related need for knowledge, incentives do not seem to play a role in any form of knowledge sharing activities. With previous research not being able to find consensus around the role of incentives in knowledge sharing, our findings might help bring clarity as to which scenarios and knowledge sharing processes are affected by incentives to a lesser extent.

6 Conclusion

The overall purpose of this paper has been to provide an answer the following question:

- How is extensive remote work affecting knowledge sharing in social interactions?

Our findings suggest that extensive remote work affects knowledge sharing in social interactions through the individual decision making of individuals due to an altered balance between costs and benefits of knowledge sharing behaviour, as well as through effects on the collective aspects - cognitive overlaps, interactive climate and relationships - of knowledge sharing. We find that all four aspects of remoteness, selected based on previous research, affect knowledge sharing, with (i) a lack of informal interactions leading to smaller spheres of employees sharing knowledge and fewer occasions of help seeking, (ii) increasingly formalized interactions leading to decreased amounts of interactions regarding less critical topics, (iii) decreased quality of communication leading to a decreased quality of knowledge shared in interactions, and (iv) a decreased ability to overhear and observe colleagues leading to a decreased amount of passive knowledge sharing and a decreased amount of opportunities to initiate knowledge sharing.

6.1 Research contributions

Our findings largely confirm the relevance of established aspects, cognitive and relational, of the effects of remote work on knowledge sharing in previous research. However, by using a qualitative, abductive approach we are able to make contributions to the quantitative study by Golden and Raghuram (2010) and the findings from the extensive literature review by Taskin and Bridoux (2010), with our research approach allowing us to add complexity to these findings. This has been achieved through clarifying the cause-effect relationships between four key aspects of remoteness and their subsequent effects on knowledge sharing outcomes. In doing so, we have also been able to make additions to the understanding of the roles that various individual, collective and organizational aspects play when examining these relationships.

6.2 Practical contributions

As outlined in the introduction of this paper, companies of varying sizes and in varying industries look to the future not as a reversal to the way work environments generally looked and worked before the pandemic, but to an opportunity for a new normal that might be able to improve employee performance and well-being. With our research taking a knowledge as socially embedded-approach, companies taking a personalization rather than a codification approach to knowledge, transferring knowledge mainly in social interactions, might be able to put our findings into use when shaping their future work environments.

A solution discussed with several interviewees was a form of hybrid approach, where benefits of remote work, including increased flexibility for employees, are combined with the benefits of sharing a physical workplace. Our findings might give clues about the benefits of sharing a physical workplace by highlighting the effects that remote work might have on knowledge sharing. The findings highlight the positive effects of social, informal meetings, particularly for less senior employees, by creating a wider and stronger social knowledge network among employees, as well as stimulating passive knowledge sharing. Additionally, our findings imply that interactions

demanding a level of creativeness or include the transfer of abstract knowledge to some degree might require physical presence to a larger extent due to a deficient communicative quality in digital interactions. Consequently, our findings could be relevant for knowledge intensive companies when designing such hybrid solutions.

Additionally, as our findings provide a detailed description of how extensive remote work affects the basic mechanisms of knowledge sharing, it may also support companies in trying to mitigate such effects, if choosing to work extensively remote. This is primarily relevant in regard to the suggested organizational enablers provided by this paper, such as mixed project teams, dedicated knowledge sharing forums and a common language, which our findings point to as crucial in extensive remote settings, as these are factors companies can actively work with.

Finally, with our findings clearly implying differences in the magnitude of the suggested effects of remote work depending on seniority, our findings might motivate companies to exercise special caution in regard to employees in the early stages of their professional careers. This could mean implications on both general work environments and on processes targeted especially towards junior employees, such as onboarding processes and personal development plans. Based on our findings, companies might benefit from keeping all, or large part of these processes in physical, social settings to mitigate the negative effects of remote work.

6.3 Study limitations

With improvements to the use of ICT systems during the past year, it becomes reasonable to assume that this type of knowledge sharing has been affected by the new work environments as well. However, the chosen scope of this study naturally limit findings to knowledge shared in social interactions, disregarding any changes to knowledge shared in work done to codify and store organizational knowledge.

Secondly, and in regard to the research objects of our study, including only Stockholm based management consultancy firms was a choice made due to accessibility, but we have to acknowledge the effects that this might have had on our findings. For instance, our findings could be argued to have been affected by regional, cultural differences in collective and organizational aspects such as hierarchy and norms that have been shown to be key aspects of knowledge sharing. An additional limitation in regard to the research objects is the fact that, although including 18 employees at three different companies and of varying seniority could be argued to be enough to be able to draw plausible conclusions in regard to the research questions at hand, we cannot fully eliminate the possibility of another set of research objects potentially providing additional answers.

Thirdly, and finally, we recognize potential shortcomings of the methodological approach of our research. Qualitatively investigating an abstract phenomenon has allowed us to probe for underlying mechanisms of knowledge sharing, but could also be argued to be prone to a level of subjectivity that could affect the interpretation, selection, presentation and analysis of empirical data. Empirical evidence around abstract components such as thoughts, feelings and recollections has, to some degree, been forced to be interpreted by us as researchers in order to become comparable and analysable, entailing the possibility of bias and prejudice affecting the outcome.

6.4 Suggestions for future research

The use of ICT systems and the effects of that use on knowledge sharing has, as addressed in our theoretical review, been widely researched. Future research could, however, while keeping the focus on knowledge sharing in social interactions, investigate the use of different digital tools and aids and their role in mitigating the negative effects on communicative quality, as found in our research. This could add to our theoretical framework around organizational enablers of knowledge sharing in remote work settings and provide companies with further suggestions on how to build their future working environments where these systems will undoubtedly play an important role in interpersonal communication, and therefore knowledge sharing.

Additionally, future research could take on the mission of quantitatively assessing the several cause-effect chains suggested in this paper to establish their relative importance to knowledge sharing outcomes. Confirming our findings and suggested connections between remote work and knowledge sharing using a quantitative approach could both add reliability and provide additional insights on the characteristics of these connections, as well as establish yet undiscovered effects of the various aspects of remote work outlined in our research.

Future research could also take a more focused approach on the on-boarding processes of new employees in a remote work environment. Among the interviewees, several newly hired employees raised concerns in regard to topics such as self-esteem, which may be more closely related to other aspects of remote work than knowledge sharing. Research specifically targeting on-boarding processes in remote work environments might help bring clarity as to which factors become especially important, both contributing to the research within the area and assisting companies in designing future on-boarding processes suitable for remote working environments.

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8 Appendices

Appendix 1 – Respondents

Interviewee	Company	Date of interview	Seniority
Interviewee 1	Company X	March 18, 2021	Manager
Interviewee 2	Company X	March 17, 2021	Manager
Interviewee 3	Company X	March 25, 2021	Junior
Interviewee 4	Company X	March 29, 2021	Junior
Interviewee 5	Company X	March 29, 2021	Senior
Interviewee 6	Company X	April 1, 2021	Senior
Interviewee 7	Company Y	March 9, 2021	Junior
Interviewee 8	Company Y	March 15, 2021	Senior
Interviewee 9	Company Y	March 15, 2021	Manager
Interviewee 10	Company Y	March 17, 2021	Manager
Interviewee 11	Company Y	March 19, 2021	Junior
Interviewee 12	Company Y	March 26, 2021	Senior
Interviewee 13	Company Z	March 23, 2021	Manager
Interviewee 14	Company Z	March 25, 2021	Senior
Interviewee 15	Company Z	March 26, 2021	Manager
Interviewee 16	Company Z	March 31, 2021	Senior
Interviewee 17	Company Z	March 31, 2021	Junior
Interviewee 18	Company Z	April 9, 2021	Junior

Appendix 2 – Interview guide

Below follows the interview guide used during interviews, divided into main questions and examples of probing questions frequently used.

Main question	Probing questions
Background & Introduction	
Tell us at bit about yourself and your position.	<ul style="list-style-type: none"> For how long have you been with the company? How much time have you spent working remotely during the last year?
Tell us a bit about what you do and your role at [Company].	<ul style="list-style-type: none"> Position in project team? Responsibility for others? Who do you report to? Regular day-to-day activities?
Knowledge sharing	
How have you shared or gained new knowledge with/from colleagues during the past year (when working remotely)?	<ul style="list-style-type: none"> In what forums? Why these specific ways of knowledge sharing? Has the choice of forums changed (in relation to when working in a physical office)? Why? Have the forums changed? If so, how? Does this affect knowledge sharing?
	<ul style="list-style-type: none"> Around which topics? Has the topics changed (in relation to when working in a physical office)? If so, how? Why? Does this affect knowledge sharing?
	<ul style="list-style-type: none"> Could you give an example of a forum where you could share knowledge but you choose not to? If so, why not? Has this changed (in relation to when working in a physical office)? If so, how? Why?
Who do you share knowledge with during an average working day when working remotely?	<ul style="list-style-type: none"> If you have a question or want to discuss something, how do you decide who you talk to? Why are those specific criteria(s) important? Has this changed during when working remotely? If so, how? Why? Does this affect knowledge sharing?
Have your relationships with colleagues changed when working remotely?	<ul style="list-style-type: none"> If so, how? If so, has this affected the quality and quantity of the knowledge you share? How? If so, has this affected the number of questions you get?
How do you perceive the culture and norms around knowledge sharing at [Company]?	<ul style="list-style-type: none"> Has this changed when working remotely? How? Does this affect knowledge sharing? Do you feel that anyone can ask anyone else for help when working remotely?

	<ul style="list-style-type: none"> ▪ If not, what keeps you from asking for help? ▪ Does this effect your motivation to share knowledge? How?
Are you satisfied with the amount of knowledge you have shared/received when working remotely?	<ul style="list-style-type: none"> ▪ Why/why not? ▪ Has this changed since going remote?
Are there any incentives to share knowledge outside settings constructed for knowledge sharing?	<ul style="list-style-type: none"> ▪ If so, how does this affect your knowledge sharing behaviour? ▪ If so, have they, and/or their effect on your behaviour changed when working remotely?

Appendix 3 – Coding scheme

Below follows an example of the data process, which in this case led to the analysis outlined in chapter 4.2.1. Empirical constructs may consist of several quotes from different interviewees which were considered similar enough to be grouped.

1 st order constructs (Empirical)	2 nd order (Theoretical)	3 rd order construct (Mechanism)
<p>More detached from the rest of organization, rarely talks to new people</p> <p>Easier to get to know people when working at the office</p> <p>Digital social events not the same as physical ones, not working as a replacement</p> <p>Decreased quality and quantity of relationships decreased when going remote</p>	<p>Lack of informal social interactions</p> <p>Decreased social network</p>	Lack of informal social interactions affecting help seeking
<p>More comfortable in asking when knowing the person</p> <p>Hard to understand expectations and personal boundaries of others when working remote, which increases barrier to ask</p> <p>Much longer conversation before getting to the question when asking people you don't know personally</p> <p>Not knowing about peoples workload and what they think about helping, which hinders asking</p>	<p>Decreased benevolence-based trust</p> <p>Increased cost of help seeking</p>	
<p>Lesser understanding of what colleagues worked on when going remote leading to fewer occasion of reaching out</p> <p>Informal social interactions important for learning about others work</p> <p>Difficult to understand the informal status of colleagues</p>	<p>Decreased competence-based trust</p> <p>Decreased benefit of help seeking</p>	
<p>Talking to a smaller network of people</p> <p>Talked to almost everyone in the company before, only talks to the project team when being remote</p> <p>Sometimes not reaching out although wanting to</p>	<p>Smaller spheres of employees sharing knowledge</p> <p>Fewer occasions of help seeking</p>	