Creativity in Remote and Hybrid Work Environments

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In dear memory of my mother and father

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Abstract

Workplace creativity is crucial for innovation and navigation in a dynamic technology-driven world. This dissertation sheds light on individual and group creativity within flexible work arrangements (FWA), an expanding yet understudied field. Specifically, the four appended research papers explore creativity in two remote work settings – work from home (WFH) and corporate coworking (working remotely from coworking spaces), as well as within hybrid work combining remote and office work. The overarching research objective is to understand how creativity unfolds in remote and hybrid work environments. The papers include a systematic literature review on corporate coworking and creativity, a quantitative study of creative performance in an enforced WFH setting, a phenomenological study of collective creativity, and a case study investigating creative processes in a hybrid work environment. All the papers are intertwined with the profound shifts in work practices occurring before, during, and after the COVID-19 pandemic.

The findings emphasize the importance of social interaction and knowledge sharing for workplace creativity. In remote work settings, challenges due to digital communication barriers and complexities of building social ties and trust are identified. Extensive use of digital platforms during the initial pandemic lockdown was found to promote creative performance. In contrast, information technology (IT) professionals working from home experienced that the absence of informal face-to-face (FTF) interaction hindered creativity. However, well-facilitated digital sessions triggered collective creativity. Analysis of creative processes in a multinational technology company suggested that in-person interaction was favorable for problem identification, whereas idea generation should be conducted either entirely remotely or FTF. Hybrid work in real time was perceived beneficial for idea evaluation only. By combining the two research fields of creativity and FWA, this dissertation expands both literatures. Utilizing social capital theory and social information processing theory deepens our understanding of the social dynamics of creativity in remote and hybrid work. Organizations should design physical and digital work environments that promote informal social interaction, knowledge sharing, and a creative climate. To facilitate creativity, this dissertation recommends hybrid models that balance employee and employer needs, and optimize the benefits of both FTF interaction and remote work.

Sammendrag

Kreativitet på arbeidsplassen er avgjørende for innovasjon og navigasjon i en dynamisk og teknologidrevet verden. Denne avhandlingen belyser individuell og kollektiv kreativitet blant ansatte med fleksible arbeidsordninger (FWA), et felt i vekst som hittil har vært lite utforsket. De fire inkluderte forskningsartiklene utforsker kreativitet i to ulike remote settinger – hjemmekontor (WFH) og corporate coworking (remote arbeid fra et coworking space), i tillegg til hybridarbeid som kombinerer remote og tradisjonelt kontor. Forskningens overordnede formål er å forstå hvordan kreativitet utfolder seg i remote og hybride arbeidsmiljøer. Artiklene omfatter en systematisk litteraturgjennomgang av corporate coworking og kreativitet, en kvantitativ studie av kreativ ytelse i en tvungen WFH kontekst, en fenomenologisk studie av kollektiv kreativitet, og en casestudie av kreative prosesser i et hybrid arbeidsmiljø. Alle studiene er knyttet til de omfattende endringene i arbeidspraksis som inntraff før, under og etter koronapandemien.

Funnene i avhandlingen understreker den avgjørende rollen sosial interaksjon og kunnskapsdeling spiller for kreativitet på arbeidsplassen. Samtidig avdekkes det utfordringer med digitale kommunikasjonsbarrierer og utvikling av sosiale bånd og tillit i forbindelse med remote arbeid. Utstrakt bruk av digitale plattformer under korona-nedstengningen fremmet kreativ ytelse. IT-ansatte som jobbet hjemmefra, opplevde derimot at fravær av uformell interaksjon ansikt-til-ansikt (FTF) hemmet kreativiteten. Velorganiserte digitale møter var imidlertid gunstige for kollektiv kreativitet. Analyser av kreative prosesser i et multinasjonalt teknologiselskap viste at FTF interaksjon var gunstig under problemidentifisering, mens idégenerering burde utføres utelukkende remote eller utelukkende FTF. Hybridarbeid i sanntid ble ansett som fordelaktig kun for idéevaluering. Ved å kombinere de to feltene kreativitet og FWA, utvider denne avhandlingen forskningslitteraturen innen begge områdene. Anvendelsen av teorier om sosial kapital og sosial informasjonsbehandling øker forståelsen vår av den sosiale dynamikken knyttet til kreativitet i remote og hybride settinger. Organisasjoner oppfordres til å utvikle fysiske og digitale arbeidsmiljøer som fremmer uformell sosial interaksjon, bidrar til kunnskapsdeling og skaper et kreativt klima. For å stimulere kreativitet anbefales hybridmodeller som balanserer behovene hos ansatte og arbeidsgivere, og som optimaliserer fordelene med både FTF interaksjon og remote arbeid.

List of studies

This doctoral dissertation consists of the following four research papers:

Tønnessen, Ø. (2022). Employee Creativity in Coworking Spaces: Towards a Conceptual Framework. *European Journal of Workplace Innovation*, 7(1), 53–83. https://doi.org/10.46364/ejwi.v7i1.891

Tønnessen, Ø., Dhir, A., & Flåten, B.-T. (2021). Digital knowledge sharing and creative performance: Work from home during the COVID-19 pandemic. *Technological Forecasting and Social Change*, 170, 120866. https://doi.org/10.1016/j.techfore.2021.120866

Tønnessen, Ø. & Flåten, B.-T. (2023). Work from Home and Collective Creativity: Exploring the Experiences of IT Professionals. *Cogent Business & Management*, 10: 2262219. https://doi.org/10.1080/23311975.2023.2262219

Tønnessen, Ø. & Flåten, B.-T. (2023). Creative processes in a hybrid work environment: A case study. In peer-review process at *The Journal of Creative Behavior*.

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Overture to Doctoral Dissertation

1. Introduction

Creativity is a complex phenomenon. By better understanding its aspects and drivers, researchers across disciplines can contribute to developing theories, applications, and practices that promote creativity and its benefits for individuals and society. Workplace creativity commonly refers to the generation of novel and original ideas that are appropriate and useful in an organizational setting (Amabile, 1988). When employees are encouraged to think and act creatively, they are more likely to generate ideas which can solve complex problems and lead to new products, services, business models or working methods (Oldham & Cummings, 1996; Shalley & Gilson, 2004; Woodman et al., 1993). Creative ideas constitute the basis for innovations ranging from minor adaptions to ground-breaking inventions (Mumford & Gustafson, 1988).

During the last few decades, creativity has become increasingly critical to organizations' success. This growing importance can be attributed to intensified market competition, rapid technological changes, and fast-paced work environments (Reiter-Palmon et al., 2021; Zhou & Hoever, 2014). Furthermore, in turbulent times of crisis, when organizations face unpredictable challenges, creativity is crucial to their survival and growth (Anderson et al., 2014). Accordingly, in a global survey of 1,541 CEOs across multiple industries, IBM (2010) found that CEOs believe creativity is the most important leadership quality of the 21st century. Given the role and benefits of creativity in contemporary organizations, scholarly effort is more pivotal than ever to provide knowledge on how it can be supported and enhanced.

Early research on creativity primarily focused on individuals' cognitive processes and personality traits (Guilford, 1950; Wallas, 1926). However, creative work does not take place in a vacuum. Much of the later literature has taken into consideration the work environment in which creativity occurs (Amabile, 1996; Shalley & Gilson, 2004; Woodman et al., 1993; Zhou et al., 2017). The concept of work environment encompasses various physical, social, psychological, and

organizational factors surrounding employees in their workplace, influencing their creative performance (Amabile, 1988; Dul et al., 2011). These contextual factors comprise a wide range of elements, such as office space, job autonomy, interpersonal relationships, group diversity, communication patterns, supervisor support, and organizational climate (Dul et al., 2011; Oldham & Cummings, 1996; Woodman et al., 1993).

With the ongoing acceleration of digital transformation, the use of information and communication technology emerges as an essential dimension of the work environment. However, the potential impacts of this contextual factor on creative work have received limited scholarly attention so far (Cai et al., 2020; d'Ovidio & Gandini, 2019). Moreover, previous research has focused on how contextual factors impact individual creative performance (CP) (Reiter-Palmon & Sands, 2015). Considering that applicable ideas primarily originate from interactions between people with diverse expertise, a deeper understanding of workplace creativity from a social perspective is crucial (Curşeu et al., 2022; Paulus & Nijstad, 2003). Accordingly, his dissertation takes a comprehensive approach to the work environment, addressing physical, digital, and social dimensions, and exploring their influence on creativity (Lindeberg et al., 2022).

The emergence of flexible work arrangements (FWA) has fundamentally changed the way creativity unfolds in organizations. FWA refers to a flexibility in where and/or when employees conduct their work (Rau & Hyland, 2002). The current dissertation applies three distinct forms of FWA – corporate coworking, work from home (WFH) and hybrid work – as the guiding context for studying workplace creativity. The first two modes are categorized as remote work. Recent studies have suggested that different forms of FWA may have profound impact on various aspects of creativity (Babapour Chafi et al., 2022; Jiang et al., 2023). However, there is limited theoretical understanding and empirical evidence available for such associations. Accordingly, a key motivation driving this dissertation was to fill the existing research gap concerning EC and group creative processes in remote and hybrid work environments.

One prominent concern associated with remote work is the reduction of informal face-to-face (FTF) interaction happening in traditional offices (Golden & Veiga, 2005). Studies conducted prior to the pandemic suggest that remote work

(including WFH) may decrease the generation of creative ideas due to less frequent FTF communication (McAlpine, 2018; Oldham & Da Silva, 2015). In contrast, other studies indicate that remote work leads to higher levels of EC compared to onsite work (Naotunna & Zhou, 2018; Vega et al., 2015). Identified reasons include flexibility, autonomy, and reduced distractions (Alge et al., 2006). Currently, only a few scholars have investigated whether these associations held true during the extreme WFH situation caused by the COVID-19 pandemic (Babapour Chafi et al., 2022; Mercier et al., 2021; Michinov et al., 2022). The findings are inconsistent, and the focus is at the individual level (i.e., the impact of enforced WFH on individual creativity). Hence, the social side of creativity in the remote work context is largely understudied.

The need to explore and understand creativity in the post-pandemic era is equally important since the practice of remote work continues to evolve in various forms (Smite et al., 2023). The current and widely expanding phenomenon within FWA is hybrid work which combines elements of remote and onsite work (Halford, 2005; Mitchell, 2021). The lack of research on hybrid work, especially when it comes to group creativity and innovation, highlights the urgent need for theoretical and practical insight (Chaudhury & Deng, 2022; Reiter-Palmon et al., 2021). In other words, to facilitate creativity in contemporary organizations, it is crucial to gain a deeper understanding of how employees experience creativity when they work fully or partly remote.

Given the background information provided above, the overarching research objective for the dissertation was as follows:

How does creativity unfold in remote and hybrid work environments?

The primary aim of the dissertation is to contribute new knowledge and enhance our understanding of EC and creative processes within remote and hybrid work environments. To achieve this goal, four research papers were developed, each making distinct contributions to the field. A brief overview of the appended papers is presented in Table 1. Together, they address the research objective of the dissertation.

This Industrial PhD project was carried out from 2019 to 2023. Remarkably, this particular period corresponded with a pivotal moment in history that redefined the very essence of work (Müller et al., 2023). These few years encompassed series of distinct phases: the pre-pandemic "normal" situation, the WFH shock caused by the COVID-19 lockdown in March 2020, the unpredictable waves and unstable work conditions during the pandemic, the lift of the social distancing measures in February 2022, and the subsequent post-pandemic era (Gradidge et al., 2023). This unique sequence of events has presented an exceptional opportunity to explore creativity in remote and hybrid work environments. Accordingly, the four appended papers are grounded in four distinct FWA settings: corporate coworking in the pre-pandemic period, WFH in the early phase of the pandemic, WFH during the mid-phase, and hybrid work in the post-pandemic stage. The overview below (Table 1) briefly presents research context, theoretical view, methodological approach, and key findings of the four appended papers.

Table 1. Overview of appended papers

Study	**Paper 1**	**Paper 2**	**Paper 3**	**Paper 4**
Period	Pre-pandemic period (2019)	First pandemic lockdown (2020)	Mid-phase of the pandemic (2021)	Post-pandemic period (2022–2023)
Work mode context	Corporate coworking	WFH	WFH	Hybrid work
Subject of analysis	Individual creativity	Individual creativity	Collective creativity	Group creative processes
Theoretical perspective	Social capital theory	Social capital theory	Social information processing theory	Social information processing theory
Methodological approach	Systematic literature review	Quantitative: Cross-sectional survey	Qualitative: Descriptive phenomenology	Qualitative: Exploratory single case study
Key findings	• 13 identified factors influencing EC in	• WFH significantly affects CP and DKS (digital	• Collective creativity paradox: Lack of informal FTF	• Problem identification: FTF interaction is preferred

	coworking spaces • Social interaction and knowledge sharing are the foremost factors	knowledge sharing) • Internal and external DKS predict CP significantly • Extensive digital platform use encourages CP	hinders collective creativity, while well-facilitated digital sessions promote it • Digital barriers curb weak tie interaction, inhibiting collective creativity	• Idea generation: fully remote or in-person is preferred • Idea evaluation: hybrid mode is appropriate • Crucial themes: psychological safety, social interaction, knowledge sharing

1.1 Structure of the dissertation

In classical music, an overture acts as an introductory section within a larger musical work, often setting the tone and themes that will unfold throughout the composition (Kennedy, 2004). Using terms from the world of music, this opening piece acts as an overture to the dissertation, setting the stage for the subsequent four research papers.

The rest of the introductory section is organized as follows: Chapter 2 outlines the theoretical foundations of the dissertation. Chapter 3 delves into the methodological foundations, including its philosophical underpinnings and how these have influenced the different methods used in the four papers. Chapter 4 presents a summary of the key findings from each paper and establishes a connection between them. Chapter 5 discusses the key theoretical contributions and practical implications of the dissertation. Chapter 6 outlines limitations of the dissertation and proposes avenues for future research. The remaining core section of the dissertation comprises the complete versions of the four research papers.

1.2 Abbreviations

The abbreviations utilized in the dissertation include the following:
CEO: Chief Executive Officer
CP: Creative performance
CPS: Creative problem solving
CWS: Coworking space

DKS: Digital knowledge sharing
EC: Employee creativity
E.g.: exempli gratia (English: for example)
Et al.: et alli (English: and additional)
FTF: Face-to-face
FWA: Flexible work arrangements
IT: Information technology
KM: Knowledge management
KS: Knowledge sharing
I.e.: id est (English: that is)
SIP: Social information processing
SC: Social capital
SCT: Social capital theory
SLR: Systematic literature review
WFH: Work from home

2. Theoretical foundation

The four appended papers in the dissertation employed different research designs, resulting in distinct approaches to the use of theory. The first paper utilized dimensions of social capital (SC) along with the interactionist perspective of creativity to propose a conceptual framework for studying creativity in a corporate coworking context. In Paper 2, components from knowledge management (KM) were integrated in the research model developed, while social capital theory (SCT) served as the theoretical lens to examine the hypothesized associations between the variables. The last two papers, both qualitative in nature, social information processing (SIP) theory were used to better understand the phenomena and to explain the study findings. Moreover, in the final case study in Paper 4, the theoretical concepts of psychological safety, social interaction and knowledge sharing were adopted in the thematic analysis process. The various applications and fragmentation of theories in the dissertation illustrate the need for a more in-depth review.

2.1 Organizational perspective

The dissertation is rooted in the research field of organizational studies, which spans a broad interdisciplinary domain. It draws upon insights and theories derived from various disciplines such as psychology, sociology, economics, and management to understand how organizations function and how they can be effectively managed (Scott & Davis, 2015). Organizational theory is built on classic work by highly influential theorist such as Max Weber (1922), Ronald Coase (1937), Chester Barnard (1938), and Herbert Simon (1947). Commonly, organizational research is based on the premise that organization is the site for working life as well as providing the analytical frame (Klemsdal & Clegg, 2022).

However, the traditional theoretical perspective that revolves solely around the organization as the context of work may restrict our understanding of the range and complexity of contemporary work environments. Particularly, this is relevant due to the transition from centralized bureaucracies to more flexible, dispersed and digitally mediated work forms (Maurer et al., 2022). Accordingly, the new research field of FWA has emerged, encompassing alternative spatial and temporal dimensions of work arrangements. FWA commonly refers to a flexibility in terms of where and/or when employees conduct their work tasks (Rau & Hyland, 2002). Scholars have offered various conceptualizations of FWA, e.g., project work (Bechky, 2006), telework (Bailey & Kurland, 2002) distributed work (Swan et al., 2004), virtual work (Griffith et al., 2003), digital nomadism (Müller, 2016), and third spaces (Kingma, 2016).

The primary objective of this dissertation was to explore creative work conducted entirely or partially away from the employer's premises. Two main concepts within FWA were addressed: 1) remote work and 2) hybrid work. Both terms are commonly used by practitioners in the post-pandemic working life. However, theorists have long debated how to define and operationalize these concepts (Felstead & Henseke, 2017). As a response to this challenge, the dissertation takes a pragmatic approach by defining remote and hybrid work according to what the concepts mean in the empirical setting. This follows from the fact that the current work arrangements constitute a contextual frame for the study of EC. In the appended papers, remote work generally refers to the practice of performing work outside of the employer’s physical office by utilizing

communication technology (Allen et al., 2015; Spreitzer et al., 2017).

Two distinct subcategories of remote work constituted research context in the dissertation: corporate coworking (Paper 1) and WFH (Paper 2 and 3). Corporate coworking is a novel phenomenon which implies that employees work remotely from a CWS instead of the employer's office space (Bouncken et al., 2017; Jakonen et al., 2017). CWS(s) can be understood as localized spaces and knowledge sharing communities of entrepreneurs, freelancers and employees who work alongside other unaffiliated professionals (Bouncken & Reuschl, 2016; Capdevila, 2013). Conversely, WFH refers to the work practice in which employees carry out work from their private home (i.e., home office) instead of a traditional office (Allen et al., 2015; Garrett & Danziger, 2007).

Paper 4 employed hybrid work as the context for investigating creative processes. Despite a lack of unifying definitions and conceptualizations, scholars typically describe hybrid work as a FWA in which ‘ (Beno, 2021; Halford, 2005; Mitchell, 2021; Sewell & Taskin, 2015). Hybrid work models typically allow employees to work remotely for a certain number of days or hours per week, while coming into the office for specific tasks, e.g., collaborative meetings. The primary remote location studied in Paper 4 was home office (WFH), consistent with numerous studies (e.g., Adamovic, 2022; Fayard et al., 2021; Halford, 2005). However, the paper introduced a third space within the hybrid work model: the clients' office location, where several of the respondents work either fully or partially during specific projects. This alternative space exists beyond the employer's premises, yet it retains the characteristics of a traditional physical office. In the dissertation, this distinct mode was considered a form of remote work based on the spatial separation from the employer and the extensive use of digital platforms for interaction with colleagues. Finally, a brief explanation of the hybrid meeting phenomenon is necessary, considering its adoption in the final study. Hybrid meetings refer to real time communication sessions with a mixture of co-located and remote attendees where in-person participants sit together in a meeting room while the others join the meeting via common online video meeting platform such as MS Teams or Zoom (Constantinides & Quercia, 2022).

Currently, there is no single unified “remote work theory”, but several different

perspectives and theories closely relate to key aspects of remote and hybrid work and its influences on employees and organizations. Theoretical concepts applied in the present dissertation are briefly discussed later, due to their parallel relevance to creativity in organizations.

2.2 Theoretical views on creativity

The body of research on creativity in conventional, physically co-located settings is substantial (Chamakiotis & Panteli, 2017). Scholars have focused on various aspects such as personality traits and cognitive styles (Guilford, 1950; Torrance, 1974), skills, knowledge, and motivation (Amabile, 1988), creative products (O'Quin & Besemer, 1989), creative processes (Drazin et al., 1999; Wallas, 1926), social influences (Amabile, 1982) and the physical environment (Dul et al., 2011). One of the most utilized traditional frameworks for studying creativity is the 4Ps model (Rhodes, 1961). The approach implies that four interconnected components affect creativity; the person(s) who creates, the cognitive processes involved in the creation of ideas, the press or influences of the work environment, and the product generated by creative activity. Although the 4Ps model provides a fixed multidimensional framework, it may not adequately address the unique challenges and opportunities faced by different organizations and sectors in remote and hybrid work contexts.

Two prominent theoretical frameworks dominate within the workplace creativity literature: the componential model and the interactionist model. Amabile's componential theory of creativity (1983, 1988) describes three major components contributing to individual or small group creativity: domain-relevant skills, creativity-relevant skills, and task motivation. The componential theory allows studying EC using a motivational approach by highlighting the crucial role of intrinsic motivation, which is an important factor in Paper 1 and 2. Nevertheless, the second prominent framework within workplace creativity referred to as the interactionist perspective, is the one what most underpins this dissertation.

The interactionist theory of organizational creativity, developed by Woodman et al. (1993) provides a perspective on creativity highlighting the dynamic interplay between individual attributes and behaviors, interpersonal interaction and the organizational context in which creativity occurs. According to the authors, employees are most creative when they are given autonomy, provided with

resources and support, and receive feedback and recognition for their efforts. Furthermore, the interactionist theory posits that creative processes are influenced by interactions and exchanges among individuals. Hence, collaboration, communication, and social relationships play a vital role in fostering creativity. In their literature review on workplace creativity, Zhou and Hoever (2014) state that the interactionist perspective shows great promise for understanding creativity in its complexity and powerful potential. The rationale for drawing inspiration from this this model in the current dissertation include its multi-level view, emphasis on social interactions, recognition of diverse individuals' perspectives, and integration of various contextual factors such as technology and organizational culture.

The first two papers in the dissertation benefit from the interactionist perspective on creativity as an underlying theoretical approach. Although the theory is of a multilevel nature, the principal object is the individual employee. This corresponds with both studies due to their emphasis on individual CP. As Reiter-Palmon and Sands (2015) comment, much previous research on creativity has primarily examined workplace creativity at the individual level. However, more scholarly attention has recently been paid to group and team creativity (e.g., Gilson & Shalley, 2004; Hargadon & Bechky, 2006; Zhang & Hou, 2011). Groups are commonly understood as collections of individuals who are focusing on a specific goal or task (Forsyth, 2018). According to Paulus et al. (2012), group creativity in the organizational setting occurs when two or more employees collaborate to explore novel and useful ideas. Drawing on sociocultural theory, Sawyer and DeZutter (2009) demonstrated how collaborative creative outcomes emerge from social interaction within the group rather than cognitive processes in the isolated minds of group members (Glăveanu, 2020). The third paper in the dissertation rely on the theoretical concept of *collective creativity*. defined as a "purposeful set of processes and activities established by a group of individuals working in a specific environment, through which a novel idea, product, service or procedure is generated" (Cirella et al., 2012, p. 289). At its core, the collective creativity perspective proposes that social interactions catalyze new interpretations and ideas that the individual employees involved could not have achieved alone (Hargadon & Bechky, 2006).

The first three studies in the dissertation considered workplace creativity from an outcome perspective, which typically focuses on the originality and usefulness of the ideas or solutions produced (Zhang & Bartol, 2010). However, creativity in organizations can be theorized both as an outcome and a process (Shalley & Zhou, 2008). Numerous scholars acknowledge that creativity can best be understood as a multistage process, with different phases being influenced by various individual and contextual factors, in line with the interactionist perspective (Caniëls & Rietzschel, 2015). Nevertheless, substantially fewer studies within the organizational creativity literature have adopted the creative process orientation compared to the output view (Tolkamp et al., 2022). This applies to the highest degree to research in the remote and hybrid work context (Reiter-Palmon et al., 2021).

Accordingly, Paper 4 employed a three-phase creative process model consisting of problem identification, idea generation, and idea evaluation. Conceptually, this model was built upon an empirical adaption of previous creative process models (e.g., Caniëls & Rietzschel, 2015; Reiter-Palmon & Illies, 2004; Warr & O'Neill, 2005). Some researchers identify idea generation as the final phase (Tolkamp et al., 2022; Zhang & Bartol, 2010), while others operate with idea implementation (Stein, 1974) or validation (Amabile, 1996). In the modified model of creative processes, idea evaluation constitutes the final phase (Osborn, 1963; Runco & Dow, 1999). Following Reiter-Palmon and Illies (2004), idea selection was also integrated into this phase.

Worth noting, the inclusion of idea evaluation raises a separate discussion related to the parallel and comprehensive research stream of creative problem solving (CPS), where the evaluation and selection stage is more widely incorporated (Mumford et al., 1991). The many contributions in this line of literature are based upon the assumption of that the creative process leads to a creative outcome (e.g., Isaksen & Treffinger, 2004; Osborn, 1963; Wimmer, 2016). In contrast, other researchers claim that a process of organizational creativity is about employees' engagement in creative activities, regardless of whether the outcome is evidently creative or not (Drazin et al., 1999). One way to distinguish the two closely related theoretical approaches is that successful problem solving relies on a creative process, while a creative process does not guarantee successful problem solving (Wimmer, 2016).

Paper 4 followed up the collective creativity approach of Paper 3 by studying creative processes at the group level. This research endeavor can be justified by statements in prior literature. As organizations face increasingly complex problems that go beyond the capabilities of individuals, an in-depth understanding of the various aspects of group and team creative process becomes critical (Reiter-Palmon & Murugavel, 2018). Moreover, studying creative processes at the group level may provide valuable insights into how social dynamics and interpersonal interaction affect collective creativity (West et al., 2004).

The concept of knowledge sharing (KS) plays a crucial role at all stages of a creative process (Cummings, 2004). Prior research has found that sharing diverse information, expertise, perspectives, and ideas among employees increase creative capability and performance (Carmeli et al., 2013; Lee, 2018; Oldham, 2003; Sternberg & Lubart, 1999). Paper 1 showed that this phenomenon is highly relevant in coworking spaces (CWS) with its associated sharing culture (Rese et al., 2020). Additionally, KS is an intensively debated topic within the recent remote and hybrid work literature (Gifford, 2022; Van der Meulen et al., 2019). Hence, KS is a vital concept which is incorporated throughout the dissertation.

2.3 Defining creativity

As the above section indicates, scholars have proposed various definitions and conceptualizations that emphasize different aspects of creativity. While the terms "creativity" and "innovation are often used interchangeably, it has been argued in the management literature that they are distinct (Mumford & Gustafson, 1988). In her seminal work, Amabile (1988) emphasizes that "creativity is the most crucial element of organizational innovation, but it is not, by itself, sufficient" (p. 125). This implies that innovation goes further than creativity to encompass the introduction and implementation of what is creatively generated (West & Farr, 1990). The implementation involves resources, personnel, financing, and technology beyond the scope of the original creative idea (Shalley & Gilson, 2017). However, the research focus of the present dissertation is creativity, which can be viewed as the crucial starting point for innovation (Van de Ven, 1986).

Throughout the dissertation, the term "workplace creativity" is utilized holistically, encompassing individual and group creativity, personal, social, and

contextual factors, as well as process and outcome perspectives in a work context. A commonly agreed-upon definition of creativity in organizational settings is the production of novel and useful ideas (Amabile, 1988; Oldham & Cummings, 1996). Novelty refers to originality, that is, the production of something new and unconventional. Usefulness relates to the value and appropriateness of an idea in addressing a considered problem (Hennessey & Amabile, 2010). The first two papers examined workplace creativity at the individual level using different terms which are interchangeably applied in the literature. *Employee creativity* refers to the ability to generate novel and useful ideas or solutions at work (Amabile, 1996). Within the interactionist perspective, creativity is defined as "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (Woodman et al., 1993, p. 293). *Creative performance* includes active engagement in creative behaviors that involve taking risks, generating, and championing new ideas, and effectively solving issues (Goh et al., 2020). Paper 3 explored creativity at the group level and adopted the concept of *collective creativity*, defined as a "purposeful set of processes and activities established by a group of individuals working in a specific environment, through which a novel idea, product, service or procedure is generated" (Cirella et al., 2012, p. 289). Essentially, collective creativity arises from social interactions (Hargadon & Bechky, 2006).

Common to these applied definitions of workplace creativity is the emphasis on observable results, such as new ideas, products, and services (Zhou & Hoever, 2014). By viewing creativity as an outcome rather than a cognitive process, it becomes easier to quantify and reach a consensus on what constitutes creativity (Amabile, 1996). On the other hand, process-oriented definitions highlight the cognitive and behavioral aspects, focusing on employees' active participation in complex processes through which creative ideas ultimately arise (Drazin et al., 1999; Zhang & Bartol, 2010). Accordingly, a *creative process* refers to the sequence of employees' thoughts and actions which may potentially lead to a creative outcome (Caniëls et al., 2014; Lubart, 2001; Pham et al., 2023). This perspective acknowledges that the originality and effectiveness of creative endeavors may not be immediately realized (Corazza, 2016). Paper 4 in the dissertation explored the phenomenon of *group creative process*, understood as a multiphase succession of thoughts and actions involving interaction and

collaboration among employees to reach a common creative goal (Lubart, 2001; Paulus & Nijstad, 2003; Zhang & Hou, 2011). Emphasizing interactions between individuals in a social system and their working conditions, the group creative process view relates to the interactionist view of creativity (Woodman et al., 1993), even though the latter has an outcome-oriented approach.
Given the complex and multifaceted nature of creativity in remote and hybrid work settings, the dissertation adopted a flexible and dynamic overall approach to creativity. This resonates with Cai et al. (2020) who suggest that future research should adopt broader definitions of creativity to understand the full spectrum of interactions in predicting workplace creativity. It is assumed that a dynamic approach which considers the social, situational, and contextual complexity is crucial for understanding and fostering creativity in remote and hybrid work environments. Based on the above discussion, workplace creativity in the present dissertation includes employees' activities and processes in an individual-collective interplay that involve the generation of potentially original and appropriate ideas, as well as the outcome characterized by novel and useful products, services, or methods.

2.4 The concept of knowledge sharing

Knowledge management (KM) is a key research field within organizational studies which is concerned with how knowledge is created, managed, shared, and used within an organization (Davenport & Prusak, 1998; Nonaka & Takeuchi, 1995). Alavi and Leidner (2001) propose that KM involves the creation of knowledge infrastructure, including technology, processes, and organizational culture, which are necessary to support the effective sharing and use of knowledge. Thus, KS is an essential part of the KM process (Blankenship & Ruona, 2009). KS is one of the most prominent building blocks of workplace creativity as it allows employees to capitalize on diverse information, expertise and perspectives and thus enable them to generate novel ideas and creative solutions (Carmeli et al., 2013).

The concept of KS is used throughout the appended papers. It can be defined as "a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organization" (Lin, 2007, p. 315). In the WFH context, the modified concept of digital knowledge sharing (DKS) was employed. Scholars state that DKS is a cornerstone of the

knowledge management process in remote work environments which utilize technology for the KS process (Nguyen et al., 2021). This distinct KS modality refers to employees' sharing of knowledge and ideas within their organization (internal DKS) or outside its boundaries (external DKS) using digital platforms (Luo et al., 2021).

One aspect of KM that deserves greater attention than afforded by the appended papers is the differentiation and interconnection between two fundamental forms of knowledge: explicit and tacit. This epistemological perspective was originally adopted from Polanyi's theory of knowledge (Polanyi, 1966). Explicit knowledge is easy to express in words and numbers, codify, store, and share, while tacit knowledge is intuitive, context specific, based on personal experience and hard to share formally (Davenport & Prusak, 1998; Nonaka & Takeuchi, 1995). Both explicit and tacit knowledge are important drivers of workplace creativity, as the interactions between them can lead to new insight and ideas (He et al., 2013; Zhang & Hou, 2011). However, scholars have emphasized the substantial complexity of sharing different types of knowledge in remote work environments (Golden & Raghuram, 2010). d'Ovidio and Gandini (2019) argue that FTF interactions are conducive to sharing tacit knowledge, while digital platforms are beneficial and efficient to explicit knowledge exchange. Waight et al. (2022) found that the informal interaction and non-verbal communication onsite, which foster serendipitous sharing of tacit knowledge, were seriously damaged by WFH during the COVID-19 pandemic. Furthermore, extensive research demonstrate that tacit KS is critical to workplace creativity (e.g., He et al., 2013; Seidler-de Alwis & Hartmann, 2008; Zhang & Hou, 2011). This constituted the dissertation's theoretical rationale for exploring informal KS through social interaction in online and offline work environments.

2.5 Social capital theory

Employees are more likely to generate novel ideas when they have access to diverse knowledge and information through social interactions (Gibson & Gibbs, 2006; Sosa, 2011). Moreover, social interaction is conductive to interpersonal trust and psychological safety, strongly influencing EC (Chen et al., 2020; Edmondson & Lei, 2014). To study the interaction between individuals working together in a complex social system outside of their employer's office premises, a well-established theoretical concept within organizational studies is adopted,

namely SC. In the dissertation, SC is conceptualized as the valuable resources, including knowledge and ideas, that employees acquire through their social relationships and networks (Coleman, 1988; Lin, 2002). SCT encompasses social interaction, network ties, interpersonal trust, and shared values that facilitate KS, and subsequently CP (Chen et al., 2008).

One related perspective drawn from social network theory is the concept of strength of social ties (Granovetter, 1973). This notion has also served as a source of inspiration for the dissertation. Liu (2013) examined how strong relational ties among colleagues based on trust and KS may improve creativity. On the other hand, Perry-Smith and Shalley (2003) investigated how weak ties (e.g., relationships with more peripheral actors) benefit EC due to the range of connections and access to more diverse sources and heterogeneous perspectives. Furthermore, SC and network ties are highly relevant to remote and hybrid work. Studies on WFH point out the challenges associated with maintaining social relationships, interpersonal interaction and shared interpretations needed for tacit KS and CP (Allen et al., 2015; Golden & Raghuram, 2010; Lal et al., 2021). On the contrary, digital platforms may provide means for employees to interact within and beyond organizations, thereby create online networks for sharing knowledge and ideas in parallel with FTF based social networks (Cai et al., 2020; Aalbers & Whelan, 2021). To shed light on this complex duality, paper 3 and 4 in the dissertation used insight from the social information processing theory (Walther, 1992).

2.6 Social information processing theory

Social information processing theory of computer-mediated communication (SIP) explains how individuals use digital tools to develop social relations through digital interpersonal interaction over time (Walther, 2015). To compensate for the absence of FTF nonverbal social cues, people rely on cues mediated through digital means, such as instant messages and video communication. Based on the SIP theory, scholars have indicated that video meetings in WFH settings increase the richness of interpersonal interaction and social cues compared to several other digital communication channels, e.g., emails (McGloin et al., 2022). However, the spontaneous and informal interactions that fuel idea generation and sharing are hindered by the typical formalized communication in the digital setting (Baumeister et al., 2016;

McAlpine, 2018). This tension and dynamic interplay between digital and physical interaction is highly relevant in a hybrid work environment, which served as the research context in Paper 4.

3. Research approach

The research approach involves determining how one goes about finding out whatever one believes can be known (Guba & Lincoln, 1994). It refers to the way researchers conduct their study, including their philosophical stance and methodological choices (Creswell, 2014). This chapter provides an overview of the ontological, epistemological, and methodological assumptions that have guided the dissertation, along with a detailed description of the methods employed to collect and analyze data. It ends with a reflection on research quality and ethics.

3.1 Research philosophy

The term "philosophy" originates from ancient Greek and means "the love of wisdom" (Grafton et al., 2010). It involves a deep desire to understand the reality which entails acquiring knowledge and insight based on reflection (Maslow, 1962; Sternberg, 1998). Research philosophy is defined as "a way of thinking about and making sense of the complexities of the real world" (Patton, 2002, p. 69). Researchers are influenced by philosophical assumptions or basic sets of beliefs that define their worldview. In social sciences, the term "paradigm" is used to describe the patterns of philosophical assumptions that guide the research actions (Kuhn, 1962; Lincoln & Guba, 1985). Although there are several paradigms that structure and organize modern social sciences, they all encompass the basic elements of ontology and epistemology (Creswell, 2014). Ontology or "the study of being" is concerned with how we view the world (Crotty, 1998). Furthermore, epistemology, the "study of knowledge", refers to how we know the world, how we gain knowledge and the relationship between the knower and the known (Denzin & Lincoln, 2011).

Research paradigms are based on certain ontological and epistemological assumptions that shape the research process. The positivist or post-positivist paradigm is rooted in the objective ontological belief that there one single reality

and this encompasses only what can be measured and directly observed (Bryman, 2016; Lincoln & Guba, 1985). Positivists aim at developing empirically testable hypotheses and theories that can be generalized to various settings (Eisenhardt, 1989). On the contrary, the interpretive paradigm is explicitly subjectivist and concerned with understanding complex social phenomena which are time-bound and context-dependent (Creswell, 2014; Denzin & Lincoln, 2011). Interpretivists seek to capture meaning of human interaction and make sense of what humans perceive as reality (Burrell & Morgan, 1979). Ontologically, interpretivists assume that social relations and organizations are produced and reinforced by humans through their actions and interactions. Their epistemological belief premises that "understanding social process involves getting inside the world of those generating it" (Orlikowski & Baroudi, 1991, p. 15). Moreover, interpretivism is used to group approaches that reject the objectivist view, including social constructivism and phenomenology.

A third philosophical paradigm positioned in between positivism and interpretivism is critical realism, which posits that there are different layers of reality: empirical, actual, and real (Bhaskar, 1975). Critical realists argue that there is a distinction between the observed world and the underlying reality that produces it, and that empirical research can help uncover this reality (Reed, 2009). A fourth paradigm is pragmatism which sidesteps the debates about truth and reality (Feilzer, 2010) and focuses instead on "what works as the truth regarding the research questions under investigation" (Tashakkori & Teddlie, 2010, p. 713). In the following the ontological and epistemological assumptions that underpinned the research process are discussed.

3.2 Studying workplace creativity

How do we know what creativity is in the workplace, and how should we investigate it? Different philosophical stances may have a major impact on how scholars approach these challenges, including data collection methods employed and their resulting outcomes (Taylor & Callahan, 2005). In the context of workplace creativity research, a positivist typically concentrates on measuring creativity, such as counting and rating ideas (e.g., Oldham & Cummings, 1996; Tierney & Farmer, 2002). Pragmatism might center around identifying practical strategies and techniques that organizations can use to solve complex problems and promote creativity, such as brainstorming or design thinking (Dalsgaard,

2014). On the other hand, interpretivism will attempt to understand how individuals perceive and interpret the ways in which their work influences creativity within the social and organizational context. According to Taylor and Callahan (2005), an interpretive view of workplace creativity tends to focus more on the experiences of the creative process, rather than the creative output. Interpretivism may also emphasize the importance of context in shaping both creative processes and outcomes (Drazin et al., 1999; Ford et al., 1995). However, it is worth noting that the different research perspectives are not mutually exclusive, and scholars may draw on multiple paradigms to develop a more nuanced understanding of creativity (Glăveanu, 2010).

The philosophical foundation of this dissertation is closely connected with its aim of describing and understanding novel and multifaceted social phenomena firmly situated in a distinct context. The phenomena under study are individual and group creativity within the frames of remote and hybrid work environments. A better understanding of these complex working life phenomena requires an approach that grasps the social interaction and makes sense of what the participating knowledge workers perceive as reality (Burrell & Morgan, 1979; Drazin et al., 1999). Accordingly, in this dissertation, an interpretive research perspective was adopted. The interpretive stance entailed a focus on understanding knowledge workers' experiences and perceptions of creativity in remote and hybrid work environments, recognizing that both qualitative and quantitative data were subjective constructions of reality. Similarly, the dissertation was framed using terms and concepts that aligned with the perspectives of the participants. However, some specific methodological choices, especially in Paper 2, have elements of other paradigms, such as pragmatism. Nevertheless, as Yanow and Ybema (2009) note regarding organizational research "a multiparadigm itself rests on a philosophical foundation that is interpretivist in nature" (p. 46).

The main drawbacks of interpretivism are related to its subjective nature and the potential for researcher biases, which can undermine the reliability and representativeness of the data (Creswell, 2014). Due to the heavy influence of personal viewpoints and values, data generated in interpretive studies cannot be generalized to a wider population. However, interpretivism enables in-depth exploration of qualitative research areas, such as KS and creative processes in

organizations (e.g., Roy & Mohapatra, 2023; Ulrich & Mengiste, 2014; Vorakulpipat & Rezgui, 2008). The adoption of interpretive methodologies may lead to high levels of validity in primary data since the data tend to be honest and trustworthy (Lincoln & Guba, 1985).

3.3 Research design

Research design refers to the overall strategy for conducting a study, including the selection of research methods, data collection techniques, the sampling process, and data analysis (Creswell, 2014). According to Yin (2009), the research design provides an action plan for getting from initial questions to final conclusions. It is a critical aspect of the research process as it ensures that the research is conducted methodically effectively and produces valid and reliable results (Babbie, 2020). Methodology concerns how we obtain practical knowledge about the world, focusing on the procedures and tools used to investigate a phenomenon (Bryman, 2016; Creswell, 2014). It outlines the way in which a research project is to be undertaken and, among other things, identifies the methods to be used.

The methodological approach and research design are closely related to the ontological and epistemological positioning, and researchers tend to outline study designs that align with their philosophical perspectives (Crotty, 1998). Basic worldviews will often determine the choice of a quantitative, qualitative, or mixed methods approach. Positivist assumptions are applicable to quantitative research by virtue of testing theories, examining the relationship among variables, and analyzing numbered data statistically (Creswell, 2014). This approach typically involves the “top-down” approach of deductive reasoning beginning with theory and testing it empirically (Babbie, 2020). On the contrary, interpretivism is typically associated with a qualitative approach and inductive “bottom-up” logic to identify patterns of meanings that individuals attach to complex phenomena (Creswell, 2007; Denzin & Lincoln, 2011). Hence, interpretive research designs often rely on qualitative methods such as interviews, participant observation and document analysis to gain a deep understanding of the social world (Bryman, 2016).

Although qualitative and quantitative approaches are often perceived as opposites, Creswell (2014) notes that they should not be viewed as two rigid

categories, rather tendencies towards different ends of a continuum. A third methodological approach is the mixed methods research commonly advocated within the pragmatic paradigm. In social and organizational sciences, pragmatists typically put methods and tools drawn from different strands in a "toolkit", which they are prepared to use for solving a research problem (Jackson, 1999). The core assumption is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem (Creswell & Clark, 2017).

The purpose of this dissertation is to generate a rich and deep understanding of the phenomenon of EC and creative processes in remote and hybrid work environments. Interpretivist assumptions prepare the ground for digging into the unique situation of dispersed creative work in the current disruptive context. Accordingly, a qualitative research strategy was chosen as the general approach in this dissertation. This choice is justified by the aim of exploring the complex social phenomena of creativity along with corporate coworking, CP during enforced WFH, collective creativity in the mid-pandemic phase and creative processes in a hybrid work mode. Given the time-bound context, these novel phenomena have rarely been studied before and are difficult to capture quantitatively. Additionally, a rationale for the main strategy is to enable rich descriptions and subjective meanings of the phenomena from the perspective of the individuals involved, rather than trying to explain it from the outside. Table 2 provides an overview of the overall research approach, including data collection methods which are described in more detail in the next section.

Table 2. Overview of research approach and strategies

Elements of the research approach	**Stance and strategies in the dissertation**
Philosophical paradigm	Interpretivism
Ontological assumption	Reality is multifaceted and socially constructed
Epistemological assumption	Knowledge is time-bound, context-dependent and constituted by perceptions and interpretations

Role of theory	To explain and understand complex social phenomena in a real-life context as well as theory development
Methodology	Primarily qualitative, including descriptive phenomenology and exploratory case study approach
Methods	In-depth interviews, observation, document analysis, survey
Role of the researcher	Researcher and informants are interdependent and mutually interactive, though elements of outside observer role
Level of analysis	Individual and group
Sought-after information	What a smaller selection of people thinks and does, what kind of problems they are confronted with, and how they deal with them

3.4 Methods and context

Despite the overall dissertation's positioning in the interpretive paradigm, the four appended papers differentiates significantly when it comes to research design. The empirical studies (Paper 2, 3 and 4) took mutually dissimilar methodological approaches and subsequently they employed distinct research methods. Paper 2 was based on a cross-sectional survey, paper 3 applied a phenomenological approach, while Paper 4 adopted a case study design. This scenario is largely a result of the unpredictable and rapid contextual shifts from the pandemic lockdown to the post pandemic era. With other words, this dissertation has been strongly influenced by the unforeseen COVID-19 pandemic, which propelled digitalization and caused the biggest remote work shock ever.

Paper 1 was developed prior to the pandemic, aligning with the initial research plan to investigate creativity and innovation within the corporate coworking context. Given that CWS emerged in practice around 2012, the related existing

literature prior to 2019 remained relatively limited. Moreover, research specifically focusing on corporate coworking was even more constrained (Fuzi et al., 2018; Orel & Almeida, 2019). Furthermore, published studies on creativity and innovation within the distinct context of corporate coworking were still in its infancy (Rese et al., 2020). Considering the gaps in the existing coworking literature, Paper 1 aimed to lay the groundwork for studying EC in a corporate coworking context. To establish a knowledge foundation and construct a conceptual framework, a systematic literature review (SLR) was conducted. According to Denyer and Tranfield (2009), a SLR involves a thorough strategy for locating existing literature, evaluating its relevance, analyzing, and synthesizing the findings, and presenting the evidence to draw conclusions about the current state of knowledge.

Paper 2 was conducted during the onset of the pandemic in 2020. Prior to the unprecedented lockdown, the original research plan was inspired by the conceptual framework developed in Paper 1. The initial design was qualitative in nature and involved FTF interviews with employees working remotely from a CWS as well as onsite observations. However, like all other physical office locations, coworking spaces worldwide were also temporarily closed due to the social distancing measures imposed to curb the spread of the virus (Cabral & van Winden, 2022). The intention of studying EC by exploring social interaction and KS in shared office environments was no longer possible to fulfill. Consequently, the initial research strategy and study design needed to be revised.

Due to the pandemic crisis and sudden full-scale WFH scenario, the most rational and feasible approach for gaining insight into individuals' experiences of creativity in the new remote context seemed to be an online survey. Since no one knew how long the crisis and the state of emergency would last, a research model was effectively developed and relationships between 13 study variables were evaluated using an online cross-sectional survey design. Study measures were examined using a questionnaire with closed-ended questions except one open-ended question to evaluate respondents’ expectations of post-pandemic work practices. The data were collected among knowledge workers in public and private sector in April 2020, during the first lockdown. Knowledge workers refer to professionals who have high education or experience and whose work relates to the creation, transformation, or utilization of knowledge (Davenport, 2005).

The online survey was distributed in Norway via emails as well as social media platforms (e.g., LinkedIn and Facebook). In total, 282 knowledge workers (N=282) responded to the survey.

It can be argued that the choice of method contradicts an interpretive stance. In this regard, incorporating methodological pluralism (Lee, 1991) into the dissertation could be a relevant characteristic, as both interpretive and positivist approaches were integrated. On the other hand, scholars have claimed that most research is basically interpretive as there is interpretation from the very start of a research project until the very end (Gummesson, 2003). Furthermore, the online questionnaire focused on individuals' self-reported experiences of the sudden changes and extraordinary work situation. Most importantly, the intention was to seize the opportunity to efficiently collect unique data in this historical and completely unpredictable real-life setting. Hence, there are valid grounds for arguing that the interpretive underpinning in the dissertation remains consistent, despite the use of a typically positivist quantitative method in one of the papers. This pragmatic choice was made due to the extreme lockdown situation, ensuring practical feasibility.

Paper 3 considered the limitations of the survey design in the former study, which might not capture the complexity of the phenomenon under study and further limit respondents' ability to express feelings and reveal unexpected experiences. Thus, a phenomenological research approach was adopted to allow for more genuine two-way communication with the participants and provide a deeper understanding of their thoughts and experiences of collective creativity in the WFH context (Creswell, 2007; Denzin & Lincoln, 2011). For this purpose, descriptive phenomenology was considered an appropriate methodology because it enables a comprehensive description of what was experienced and how it was experienced (Giorgi, 1985). The data collection took place in May 2021, during a less restrictive lockdown period approximately one year after the previous study was conducted. By that time, WFH had become a well-established and effective practice among many knowledge workers. 10 in-depth interviews were conducted online with employees in a medium-sized Norwegian IT firm. Purposeful sampling was used to recruit participants who had the ability and willingness to contribute rich information (Patton, 1990). Data were gathered through individual conversations with broad, open-ended questions. A flexible

interview guide was developed that met descriptive phenomenological criteria (Englander, 2012). Spontaneous thematic tracks and follow-up questions characterized all the interactive and personal sessions.

In descriptive phenomenology, it is essential for researchers to possess personal experience of the phenomenon being studied. However, it is equally important to set aside one's own beliefs and attitudes in order to approach participants' feelings and perceptions with an open mind (Moustakas, 1994). Both authors had firsthand experience of WFH during the pandemic, which shaped their individual perspectives on the impact of this exceptional context on collaboration and creativity. Consequently, in accordance with the descriptive phenomenological tradition, the bias-suspending technique known as "bracketing" (Colaizzi, 1978) was applied prior to the data collection. This process aimed to ensure a more objective and accurate understanding of the participants' experiences and to uncover the underlying meaning of collective creativity in the unique WFH setting.

Paper 4 continued the interpretive research path by adopting an exploratory single case study design. This study was conducted in the context of post-pandemic work during the latter part of 2022 and early 2023, specifically 8-10 months after western countries removed the WFH restrictions (Aksoy et al., 2022). The novel and rapidly growing hybrid work phenomenon now emerged as the new research context (Smite et al., 2023). Insufficient prior research and unclear boundaries between the new context and social processes demonstrated the need for a comprehensive qualitative investigation (Merriam & Tisdell, 2015). Accordingly, a single case study focusing on a major multinational IT enterprise allowed for rich contextual and in-depth understanding of interaction patterns and creative processes (Dyer & Wilkins, 1991). In 2021, this American-owned company with employees all over the world announced that it would adopt hybrid work for approximately 80 percent of its staff, building on its long-standing tradition of remote work. Notably, the company's hybrid practice involves a distinct attribute for several of its consultants, who have ambiguous onsite locations and alternate between the home office, the employer's office, and the customer's office.

In total, 31 semi-structured interviews were carried out with employees in Norway and Denmark. Purposeful sampling was used to select the case study

participants to capture major variations of hybrid work practices and creative process experiences. Taylor and Callahan (2005) stated that semi-structured interviews are well-suited for exploring creativity within the interpretive paradigm and encourage interviewees to give a detailed account of their personal insights and experiences. Due to the participants' different linguistic affiliations, the interviews were carried out using three different languages (Norwegian, Danish, and English). Aside from FTF interviews with four managers onsite, all interviews were conducted digitally using Zoom. In addition to the in-depth interviews, non-participant onsite observations and document analysis were used as data collection methods. Altogether, the collected dataset enabled an in-depth multi-perspective exploration of the unique phenomenon of group creative processes in a contemporary hybrid work context.

3.5 Data analysis

Data analysis in the interpretive paradigm seeks to uncover the underlying meanings and patterns within the data collected, and to develop a rich understanding of the social phenomena under study (Creswell, 2007). The various methodological approaches across the four appended papers involve diverse analytical procedures (Palvia et al., 2007).

By systematically reviewing the coworking literature, the first study identified 18 articles that met the inclusion and exclusion criteria on how CWS can foster EC. Content analysis was employed to interpret and present insights from the relevant literature. As described by Palvia et al. (2007) content analysis involves identification, grouping, coding, and classification of data into various categories. In Paper 1, categories were derived from SCT as well as an individual and contextual view of creativity. The 18 included articles were analyzed to extract useful insight that aligned with the theoretical perspective, conceptual framework, and proposed variables.

In Paper 2, cross-sectional data were analyzed using a variety of statistical techniques, more specifically independent sample *t*-test, a one-way ANOVA test, and linear regression analysis. Multiple regression analysis was performed to examine the relative influences of demographic, individual, and organizational factors (independent variables) in predicting internal and external DKS and CP (dependent variables) among employees in the forced WFH setting during the

first COVID-19 pandemic lockdown. The analysis was carried out utilizing IBM SPSS, a widely used software for statistical analysis in the social sciences (Field, 2013). Textual data generated from the one open-ended survey question on subjective post-pandemic views were analyzed using thematic analysis.

The phenomenological study in Paper 3 provided rich descriptions of the participants' lived experiences of collective creativity in the WFH context. The textual data prepared the ground for a reflective structural analysis, which identified the central underlying meaning of the perceptions shared by individuals and subsequently revealed the essence of the experience (Giorgi, 1985; Patton, 2002). Data were analyzed following the modified Stevick-Colaizzi-Keen method, a systematic step-by-step procedure within the descriptive phenomenological tradition (Creswell, 2007; Moustakas, 1994). This distinct analysis technique was chosen as it suited the question under investigation and gave a unique voice to the 10 IT professionals participating in the study. Synthesized textural and structural descriptions culminated in a paragraph capturing the essence of the experience.

In the case study (Paper 4), thematic analysis was employed to explore commonalities in the experiences of the participants and identify patterns of meaning (Braun & Clarke, 2006). Upon completion of the interview transcription, all raw data were imported into the qualitative analysis software HyperRESEARCH. The data were analyzed using an abductive thematic analysis approach (Thompson, 2022), involving data familiarization, initial coding, searching for themes, theorizing, reviewing themes, and defining themes and sub-themes. Abductive thematic analysis was employed to anchor the findings in both existing literature and the collected data (Alvesson & Kärreman, 2007). Thus, the distinct analysis procedure aimed at preventing abstract results irrelevant to the research question under investigation.

3.6 Quality assessment

Scholars agree that assessment of the quality of a research study is essential to ensure its credibility, rigor, and usefulness (Lincoln & Guba, 1985; Miles & Huberman, 1994; Yin, 2009). Lincoln and Guba (1985) proposed four criteria for evaluating trustworthiness of qualitative research relevant to the interpretive approach of the dissertation: credibility, confirmability, transferability, and

dependability. Credibility refers to the degree to which the research findings accurately reflect the social reality of the study participants. In the qualitative studies (Paper 3 and 4) this was pursued by this was pursued by careful sampling strategies, critical assessment of data saturation to ensure sufficient depth and volume, adherence to systematic methodical steps, and collecting multiple sources of data and perspectives to confirm the accuracy and authenticity of the research findings. Paper 3 also followed Moustakas' (1994) guidance for quality and rigor. The analysis process involved continually engaging with the data, writing reflections, re-reading and re-writing until the ultimate reduction and description of the essence of the lived experience were consistent for the IT professionals.

Confirmability relates to the objectivity and the extent to which the study findings are shaped by the respondents and not researcher's bias or self-interest. In the phenomenological study (Paper 3) this was sought through bracketing which involved reflecting carefully on and writing up one's own experiences with the phenomenon to minimize pre-assumptions (Colaizzi, 1978). Furthermore, the qualitative studies in the dissertation highlight the presentation of findings through detailed descriptions and extensive use of quotes.

Transferability concerns whether the study findings may be transferred to other settings. Based on this criterion, a detailed description was made in Paper 3 and 4, outlining the contexts in which the research was performed and how this shaped the findings. Dependability refers to the consistency of the research findings and ensures the process is described in sufficient details to enable researchers to repeat the work in a different context. To retain dependability, an exposition of the research strategy including research context and methodological choices has been thoroughly explained in the papers. Furthermore, intercoder reliability was assessed in the first joint coding session during the final study to enhance rigor and transparency of the coding framework and to ensure that data collected in three different languages was consistently coded (O'Connor & Joffe, 2020). Moreover, the use of HyperRESEARCH for analysis in Paper 4 improved the dependability by allowing other researchers to code the same case with the codes applied in the study to see if the same results are obtained.

In quantitative research, scholars must consider the reliability and validity of the

methods and measurements used (Babbie, 2020). There are several criteria commonly used for quality assessment of studies employing a cross-sectional survey design (Fowler, 2013). The overall evaluative judgment of validity implies the degree to which interpretation of statistical tests are supported by empirical evidence and theoretical logic (Messick, 1995). Basic sources of validity evidence concern content, criterion, and construct. In Paper 2, content validity was determined by efforts such as carefully designing and critically appraising the survey questions to cover relevant aspects of the constructs being measured. This, along with other validity discussions and judgements, was done by drawing on the co-authors' expertise and by many fruitful discussions with an external subject matter expert. Not least, the quality assessment of Paper 2 is ensured by the peer-review process and publication in a high ranked research journal.

A systematic literature review (SLR) relies on data from other studies. Hence, the findings in Paper 1 are only as rigorous and credible as the included studies (Petticrew & Roberts, 2008). Quality assessment was performed before data extraction and the methodological quality of each individual study included in SLR was assessed. This process included appraising and judging potential risks of biases. To avoid having to compromise on study quality, I decided to include only peer-reviewed published work in the SLR. After carrying out the quality assessment process, the studies selected were considered to provide valuable insights for addressing the research question of how CWS can foster EC.

3.7 Ethical considerations

Research ethics are crucial in this dissertation due to the interpretive approach that involves understanding and interpreting the subjective experiences of human participants. Ethical considerations also ensure that the data collected are accurate and trustworthy, and that interpretations are not influenced by the researcher's biases or personal interests (Lincoln & Guba, 1985). The Norwegian National Committee for Research Ethics in the Social Sciences and the Humanities state that the purpose of ethical considerations is promoting free, reliable, and responsible research (NESH, 2022). Accordingly, the author has dedicated effort to conducting the research in an ethical and responsible manner, ensuring the rights and well-being of the study participants.

Ethical considerations were of particular concern in the qualitative interview-based studies (Paper 3 and 4). The research adhered to the guidelines of voluntary participation and the right to withdraw from the study at any point. Every participant was provided with a written informed consent that outlined the interview procedures, confidentiality, and data processing procedures. In the case study (Paper 4), a confidentiality agreement was established between the case company and the researchers' affiliated university. To ensure confidentiality, all data were anonymized during the transcription process, and the results were presented in a manner that preserved the anonymity and integrity of the participants. The Norwegian Centre for Research Data (NSD) assessed and approved both qualitative interview-based research projects (Paper 3 and 4). Data used in the dissertation were provided by employees representing organizations, and no personally sensitive information was collected. Every effort has been made to utilize the obtained information in a way that is assumed to align with its original intended purpose.

4. Key findings

This chapter summarizes the main findings from each of the four studies and explains how the papers are interrelated and connected. The findings aim to address the overarching research objective of the dissertation, which is to investigate how creativity unfolds in remote and hybrid work environments.

4.1 Findings in Paper 1

The purpose of the first paper in the dissertation was to identify and evaluate existing research related to EC in a corporate coworking context. By utilizing Nahapiet and Ghoshal’s (1998) three dimensions of SC, the findings suggested the following factors influencing EC in CWS: Diversity, network ties and social interaction (structural dimension); Trust and social support (relational dimension) and Shared values and identification (cognitive dimension). Based on a contextual and interactionist perspective on creativity (Amabile, 1996; Woodman et al., 1993), the SLR indicated that the individual factors flexibility, autonomy, and motivation as well as the contextual factors design and digital platforms impact EC in CWS. Moreover, KS was identified as a key driver of EC and

suggested as a mediating variable in relation to the other factors in the proposed integrated conceptual framework. The synthesis revealed that the most frequently highlighted and emphasized factors among the above factors were social interaction and KS.

Furthermore, the findings suggested that creativity in the context of corporate coworking aligns with the concept of Workplace Innovation (Totterdill, 2015) by promoting the breakdown of silos and enabling creative collaboration. Finally, the results of the SLR indicated a prevailing assumption that coworking consistently leads to creativity and innovation. However, the study illustrated that fostering EC in CWS implies complex and unpredictable social processes.

Summary of findings in Paper 1:

- Employee creativity in coworking spaces is shaped by the following factors: flexibility, autonomy, motivation, design, digital platforms, diversity, network ties, social interaction, trust, social support, shared values, identification, and knowledge sharing.
- The two most emphasized factors influencing creativity in the corporate coworking context are social interaction and knowledge sharing.
- Promoting employee creativity in coworking spaces involves complex social processes that require further research.

4.2 Findings in Paper 2

Social interaction and KS – the two prominent factors found to impact EC in CWS in Paper 1, were brought forward into a new study context. Paper 2 examined CP and digital KS (DKS) in the WFH context. Three research questions were investigated:

RQ1: What is the association between the DKS and CP of knowledge workers while WFH during the pandemic?

RQ2: What is the association between the demographic, individual, and organizational factors and the DKS and CP of knowledge workers while WFH during the pandemic?

RQ3: How do knowledge workers evaluate their work practices, DKS, and CP in the post-COVID-19 pandemic era?

To address the research questions, a research model was developed and tested

empirically through an online cross-sectional survey during the first COVID-19 pandemic lockdown.

Regarding RQ1, the study found that internal and external DKS were significant predictors of CP in the WFH setting. With respect to RQ2, the results indicated that individual motivation and extensive use of digital platforms were positively associated with CP. That is, increased use of digital platforms improved CP in the WFH setting due to lockdown. However, taken as a whole, the picture appeared more complex in that 41 percent of the respondents believed that their CP had increased, and 22 percent considered their CP to have decreased due to the extraordinary WFH situation. Surprisingly, the study found no association between innovative climate and CP. This result is inconsistent with prior literature (e.g., Goh et al., 2020). Our suggested explanation was that the full-time WFH practice decreased employees' organizational activities and, consequently, neutralized the impact of innovative climate on CP.

In response to RQ3, the study found that 89 percent of the respondents expected their everyday work practice to change permanently due to newly acquired perceptions during the pandemic lockdown. Most frequently predicted changes were increased use of digital platforms, more WFH than pre-pandemic, continued digitalization, less work-related travel, and increased flexibility. In addition, employees voiced their concerns about the lack of evaluation routines and inadequate support from managers in WFH situation during lockdown.

Summary of findings in Paper 2:

- Creative performance and digital knowledge sharing are significantly affected by large-scale work from home practice.
- Internal and external digital knowledge sharing are significant predictors of creative performance.
- Extensive use of digital platforms during the COVID-19 pandemic lockdown encourages creative performance.

4.3 Findings in Paper 3

One potential direction for future research proposed in Paper 2 was qualitative interviews to provide a deeper understanding of KS and creativity in a WFH setting. This recommendation served as a basis for Paper 3. The purpose of this

study was to explore the phenomenon of collective creativity in a WFH context. The research question was how IT professionals experience collective creativity when they were working from home in the mature phase of the COVID-19 pandemic.

The phenomenological study unveiled important and meaningful patterns regarding subjective experiences of the phenomenon. The culminating essence of the real-life experience was captured by the notion of the "collective creativity paradox". Participants expressed the feeling of both impeded and improved collective creativity concurrently. On one hand, the absence of FTF interactions hindered collective creativity, as spontaneous discussions and informal sharing of knowledge and ideas were limited. Conversely, well-facilitated digital sessions were found to promote collective creativity, and even able to surpass FTF interactions in generating creative ideas and solutions. However, a shared perception among participants was the increasing need for FTF interaction when engaging in collective creative problem solving with high complexity.

Digital barriers emerged as a shared perceived challenge in the remote work setting, particularly for interactions between individuals with weak social ties. Participants articulated that limited digital connectivity inhibited the flow of diverse perspectives and ideas, crucial to collective creativity. Furthermore, the study underscored the importance of the perceived creative climate in fostering collective creativity in the WFH setting. The IT professionals highlighted that experiencing a supportive and encouraging creative climate within the organization played a pivotal role for collaborative creative work in the distinctive remote work context.

Summary of findings in Paper 3:

- The "collective creativity paradox": Absence of informal FTF interaction hindered creativity, but well-facilitated digital sessions were perceived to promote collective creativity in the WFH context.
- Digital knowledge sharing barriers: Perceived obstacles to interpersonal interaction digitally among individuals with weak social ties limited the sharing of diverse knowledge and ideas.

- Importance of a creative climate: Participants emphasized the experience of a supportive creative climate as crucially important for collective creativity in the unique WFH context.

4.4 Findings in Paper 4

The previous study highlighted the challenging absence of informal FTF interaction and proposed future investigations on how hybrid work may influence creativity. With the ending of the pandemic, opportunities for FTF communication were restored and hybrid work practices rapidly evolved. The purpose of the final paper in the dissertation was to explore and understand creative processes in a hybrid work context. A case study approach was employed, and a three-phase creative process model was adopted to address the research question of how creative processes unfold in a hybrid work environment.

The study findings emphasized the effectiveness of FTF interaction during the initial problem identification phase. Idea generation was perceived as being most appropriate when conducted either entirely remotely or entirely in-person. Surprisingly, the study suggested that a hybrid work mode could be beneficial only during the idea evaluation phase. The latter discovery displayed the potential of integrating synchronous digital and FTF interaction during specific phases of creative processes in hybrid work settings. However, study 4 confirmed the findings in study 3 that the absence of informal interaction is a major disadvantage when working fully remote during essential phases of creative processes.

Furthermore, the study identified psychological safety, social interaction, and KS as interconnected key concepts crucial to group creative processes in hybrid work environments. The findings suggested that aspects of psychological safety, social interaction and KS can be developed remotely, and a virtual extension of social cues (e.g., body language) can provide additional layers of non-verbal interaction in hybrid work environments. Such technologies may increase psychological safety, informal KS, and creative process engagement. Nevertheless, the study participants believe that digitally mediated cues cannot fully replace the superior FTF interpersonal interaction (e.g., eye contact) in a physical workspace.

Finally, the case study uncovered a broad spectrum of individual hybrid work practices, preferences, and motivations within the same company across different units and disciplines. The observations deepened the understanding of the highly multifaceted phenomenon of creative processes in a hybrid work environment.

Summary of findings in Paper 4:

- In-person interaction is favorable for the problem identification phase, whereas idea generation is preferred to be conducted either entirely remotely or entirely in-person.
- Idea evaluation is the only creative process phase where hybrid work in real time is considered beneficial.
- Psychological safety, social interaction, and knowledge sharing are identified as interconnected concepts essential for facilitating group creative processes in a hybrid work environment.

4.5 Paper interconnections

The four appended papers are interrelated in several ways. A unifying key element is the discourse surrounding remote work and the complex dynamics between physical and digital work environments. Three different modes of FWA constitute the research context in the dissertation: two subcategories of remote work – coworking space (Paper 1) and WFH (Paper 2 and 3), and the mixed format of hybrid work (Paper 4). The SLR on corporate coworking shed light on the phenomenon of working remotely from a shared physical workspace. The WFH studies conducted during the pandemic were situated in a temporary full-time remote setting (home offices). The final case study delved into an intricate hybrid work environment that involves alternating between WFH, traditional office settings, and customer office locations. Nevertheless, all the studies encompassed employees who worked either fully or partially outside of their employer's office premises, extensively using digital technology for communication and interaction.

All the papers are intertwined with the profound shifts in work practices that occurred before, during, and after the COVID-19 pandemic. The distinct timeframe serves as a factor promoting cohesion in the dissertation. The first study was carried out right before the onset of the pandemic and the global “shut down”. The final study was initiated shortly after the pandemic was officially

declared ended. Hence, studying workplace creativity in the context of remote work before, during, and after the unprecedented COVID-19 pandemic has been an incredible journey with dramatically changing circumstances. Within the short period of time, a paradigm shift for knowledge workers worldwide has taken place in terms of where, when, and how creative work may be conducted. "Forced digitalization" and the experiences gained from managing remote workforces have changed leaders' mindsets and compelled reconsidering how to foster EC and support collective creative processes in the current evolving work landscape. This dissertation has been crafted amidst the ongoing course of events. Thus, the research project provides insights and understanding in a unique temporal perspective.

Through the lens of SCT, social interaction and KS were recognized in Paper 1 as the two primary concepts to promote EC in a remote work setting. These interconnected concepts were employed in all the subsequent studies. Thus, social interaction and KS play a key role in the overarching theoretical approach of the dissertation for organizing information, identifying patterns, and understanding phenomena. Moreover, the closely related perspective of weak and strong interpersonal ties (Granovetter, 1973) also served as a coherent element in the dissertation to understand creative collaboration in remote and hybrid work environments. Findings in paper 3 and 4 were discussed considering the micro-level SIP perspective (Walther, 2015) on social cues during remote work. The relationship between SIP theory and SCT lies in the understanding that social interactions contribute to the formation of SC, which, in turn, has implications for individual and collective creativity FTF and virtually (Chen et al., 2008; Jarvenpaa & Leidner, 1999).

The conceptual understanding of workplace creativity can be argued to tie the studies together. The interactionist perspective (Woodman et al., 1993), referenced in all the papers, encompasses social and contextual aspects of individual and group creativity, as well as the influence of previous events and the present circumstances. This view resonates with the temporality of the dissertation where each individual paper is situated within a distinct context and remote work mode, shaped by the onset and conclusion of the pandemic. Moreover, the interactionist perspective on creativity is primarily associated with interpretive philosophical assumptions, but also influenced by a more functional

and pragmatic approach (Taylor & Callahan, 2005). Additional conceptualizations of creativity were also incorporated to shed light on collective creativity in Paper 3 (Hargadon & Bechky, 2006) and group creative processes in Paper 4 (Drazin et al., 1999). However, adopting a comprehensive, flexible, and multidimensional approach to explore the complex phenomenon of creativity has proved its usefulness, particularly in the novel context of remote and hybrid work.

Finally, a cohesive element of the dissertation is the recognition that informality and spontaneity play highly influential roles in shaping creativity within remote and hybrid work environments. The SLR (Paper 1) highlighted that coworking spaces are associated with informal interpersonal communication and spontaneous interactions among its members. Paper 2 suggested that the absence of spontaneous meetings in the forced WFH setting during the pandemic lockdown hampered KS and CP. In Paper 3, participants reported that the absence of informal FTF interaction and spontaneous conversations inhibited collective creativity. Finally, the case study (Paper 4) emphasizes the critical role of informal interaction during distinct creative process phases in a hybrid work environment. These findings contribute to the ongoing discussion on strategies to enhance informal interaction digitally, such as utilizing chat platforms and dedicated virtual spaces commonly known as “virtual water coolers” (Fayard & Weeks, 2007). While managers are encouraged to adopt innovative technologies that allow for more spontaneous interaction online, participants in the studies clearly state that FTF interaction can never be replaced virtually when it comes to fostering the generating and sharing of creative ideas. To summarize, Figure 1 illustrates five key elements that link the studies together.

Figure 1: Key elements interconnecting the appended papers

The first component underscores that the appended papers were situated in the context of the COVID-19 crisis and intertwined with the profound shifts that

occurred prior to, during, and in the aftermath of the pandemic. Second, the papers investigated the use of digital tools in creative work across dynamic physical and virtual boundaries, highlighting the benefits of balancing remote and onsite work modes. Third, within this complex sphere, the studies emphasize the importance of social interaction for workplace creativity, while suggesting challenges of reduced physical presence, communication barriers and obstacles in building social bonds and trust. Fourth, social interaction provides the platform for knowledge sharing, consistently stressed as a precondition for accessing diverse ideas and perspectives, which in turn fosters creativity. The final component indicates that all the papers have acknowledged the crucial role of informal interaction and spontaneous meetings for promoting creativity, while highlighting the challenges of this in a remote work setting. Throughout the dissertation, these five key elements played a fundamental role in exploring and understanding creativity within the remote and hybrid work context.

5.Contributions

The major contributions of this research project lie in enriching our knowledge and understanding of creativity in the context of remote and hybrid work. Study findings in the appendant papers offer valuable insights for both scholars and practitioners. This chapter provides a summary of the various contributions, encompassing theoretical contributions, practical implications, and implications for policymakers.

5.1 Theoretical contributions

The dissertation makes substantial contributions to the existing body of research on workplace creativity by deepening the understanding of creativity within current remote and hybrid work environments. The papers support existing creativity literature by highlighting the essential role of social interaction and KS in fostering creativity (e.g., Carmeli et al., 2013; Hargadon & Bechky, 2006; Lin et al., 2023; Sosa, 2011). However, the dissertation emphasizes the crucial role of informality, and sheds light on the complex interplay between physical and digital interactions in creative work. Thus, the studies advance the interactionist theory (Woodman et al., 1993) by integrating the comprehensive role of digitalization. For instance, remote work relying on digital means may influence knowledge access and motivation at the individual level, diversity, and problem-

solving approaches in groups, as well as culture and creative climate at the organizational level.

By studying EC in the novel context of corporate coworking, Paper 1 provides a conceptual framework that enables scholars to examine EC in various CWS settings, focusing on KS and dimensions of SC. Paper 2 confirms prior research by demonstrating that both internal and external KS foster CP (e.g., Carmeli et al., 2013). However, the study demonstrates that these relations also apply to DKS in a temporary full-time WFH setting. Additionally, the first two papers contribute to SCT by investigating the relationship between SC and creativity in two distinct remote work settings. For example, Paper 2 shows that social relationships existing prior to the COVID-19 pandemic play a critical role in fostering DKS and CP during the lockdown. However, this perspective is nuanced in the dissertation by the suggestion that digital collaboration may foster workplace creativity by providing unique access to diverse knowledge and ideas, regardless of the strength of social ties.

Paper 3 increases our understanding of collective creativity in a WFH context by exposing the crucial role of well-planned facilitation when using digital platforms for collaborative creative work. Similarly, the vital importance of informal FTF interaction for complex problem solving and spontaneous idea sharing is emphasized. Paper 4 addresses several calls for investigating creative processes instead of focusing on outcomes (e.g., Caniëls, 2019; Tolkamp et al., 2022). By adopting a modified three-phase process model and empirically demonstrating its applicability in a hybrid work context, the study expands the literature on creative processes as well as creative problem-solving. Furthermore, the paper contributes to workplace creativity research by connecting psychological safety, social interaction, and KS to group creative processes, confirming similar relations found in the psychological safety literature (Edmondson & Bransby, 2023).

The last two papers challenge the SIP theory (Walther, 1992; 2015) by highlighting the limitations of cue-rich digital platforms (e.g., video meeting) in developing social relations, crucial to workplace creativity. According to the study findings, FTF interaction is superior to digital interaction in developing trusting interpersonal connections, contradicting the principles of the SIP theory.

Furthermore, the SIP theory is advanced by the observation that digital platforms can sufficiently maintain social relationships and facilitate effective sharing of diverse knowledge and ideas in remote work settings.

Finally, the dissertation makes important contributions to the wide-ranging research stream on FWA. Paper 1 critically evaluates the emerging CWS literature and addresses a research gap by unpacking the novel phenomenon of corporate coworking. Paper 2 extends the literature on WFH by demonstrating outcomes of enforced and large-scale WFH practice within the unparalleled context of the initial COVID-19 pandemic lockdown. Additionally, the study highlights the crucial role of internal and external DKS when employees work from home. Furthermore, Paper 3 advances the WFH literature by providing a deeper and more nuanced insight into IT professionals' paradoxical experiences of WFH, thereby responding to research calls on exploring knowledge workers' WFH experience during the pandemic (Waizenegger et al., 2020). Ultimately, by using abductive reasoning, Paper 4 enriches the theoretical understanding of hybrid work as a complex post-pandemic work configuration. In general, conducting studies within the pandemic-defined timeframe and employing diverse research approaches contributes valuable theoretical insights into FWA.

5.2 Practical implications

Practitioners have identified decreased creativity and innovation as a major risk associated with remote and hybrid work. Ways to design FWA that facilitate creativity in the post-pandemic era lack established guidelines or prototypes. In this endeavor, the present dissertation highlights substantial implications and offers practical recommendations for organizations and managers. These can be summarized as following: promote informal social interaction, support internal and external KS, foster a creative climate, adapt leadership styles, invest in learning and training, design engaging work environments both physically and digitally, adopt new appropriate technologies, and carefully develop an agile and inclusive flexible work strategy.

The appended papers suggest that promoting informal social interaction is of crucial importance for workplace creativity. Spontaneity and unstructured sharing of diverse ideas and perspectives are needed for successful creative processes. Furthermore, informality is found to cultivate trusting relationships

with strong ties, which is essential to develop a creative climate. Organizations are encouraged to embrace and implement innovative technologies that allow for more unplanned communication, especially with weak tie connections. For example, the findings suggest that a virtual extension of visual cues can provide additional layers of non-verbal interaction in hybrid work environments. Improvement of technological tools may also overcome social asymmetries, and thus increase psychological safety and KS during creative processes. However, a noteworthy finding is that even tech optimists with advanced digital skills do not necessarily believe in the ability of new technologies to replace FTF interaction. Consequently, creating vibrant physical as well as digital work environments and fostering dynamic interaction between them becomes a critical organizational challenge to improve hybrid creative group work.

The dissertation shows that DKS enables effective exchange of ideas, fostering creative collaboration when employees are working from home. KS in the remote work context empowers individuals and groups to generate innovative solutions and adapt to ever-changing circumstances. External KS with other departments or actors outside the organization's boundaries is, however, more difficult remotely. Overcoming perceived digital barriers requires both training and behavioral changes. Similarly, the advantage of using common and appropriate digital tools is emphasized. The study findings suggest that for employees to engage in creative processes within remote and hybrid work environments, they should undergo learning and competence development to enhance their skills and expertise. Considering that hybrid creative sessions are expected to persist, it becomes pivotal to invest in continuous development of competence and know-how among project managers and facilitators. This may involve providing training and mentoring programs that focus on specific aspects such as digital collaboration tools, remote brainstorming techniques, and inclusive hybrid communication strategies. Managers are encouraged to refine and enhance their leadership skills, including attributes such as empathy, adaptability, and communication. In their leadership practice, they should strive to create a psychologically safe environment, while simultaneously fostering a culture that promotes and supports creative initiatives and ideas. Moreover, as role models, managers should consider allocated time for FTF collaboration and informal interaction with their employees.

Overall, organizations should acknowledge the distinctive challenges and opportunities associated with remote and hybrid work to foster creativity. The knowledge gained from the appended studies can assist organizations, groups, and individuals in adapting and optimizing their approaches to creativity in modern workplaces. More specifically, the dissertation provides useful insights into facilitating individual and collective creativity within three distinct FWA contexts: corporate coworking, WFH and hybrid work. Although there is no "one-size-fits-all" solution, findings presented in this dissertation suggest that a hybrid work environment may offer the best of two worlds. A well-designed hybrid work model should acknowledge the unique needs and preferences of both employees and employer, while recognizing the advantages of both in-person and remote work mode. Striking a balance between these factors may create an environment that facilitates informal interaction, KS, and group creativity, thereby driving innovation and growth. In any case, to improve creative processes and outcomes, companies are encouraged to craft an agile and inclusive flexible work strategy. Regardless of the specific work practice, any changes implemented should aim to promote a level of physical co-presence that nurtures a creative climate within the organization.

5.3 Implications for policymakers

The dissertation informs public decision-makers about relevant factors to consider when designing regulations for remote and hybrid work. Policymakers can offer incentives and financial support to encourage organizations to invest in new digital technologies and remote work infrastructure which may enhance creativity and innovation. Public funding can also play a critical role for CWS owners during their start-up phase and contribute to establishing corporate coworking arrangements that offer value for other members, such as entrepreneurs and freelancers. Moreover, supporting mentorship programs and incubators in CWS settings may stimulate entrepreneurial creativity as well.

Remote work involves the transfer and storage of sensitive data, making it crucial for government authorities to establish a digital infrastructure that ensures data security and prevents cyber threats. Clear guidelines and standards can enhance trust and confidence in remote and hybrid work solutions, thereby stimulating creativity and innovation. Ultimately, policymakers can foster an innovative

ecosystem by facilitating networking and collaboration between businesses, academic institutions, and public organizations. One potential strategy is to support joint research projects on workplace creativity and create platforms for sharing knowledge and developing ideas. Such initiatives can lead to the generation of creative solutions that benefit both organizations and society.

6. Limitations and future research

The present dissertation has several study limitations that should be acknowledged. These limitations pave the way for future research opportunities. Although this chapter proposes key directions, the author recommends reading the four appended papers for more detailed suggestions for further scholarly work.

First, it is important to consider the limiting contextual nature of the studies. All data in the dissertation were collected during or shortly after the unprecedented COVID-19 pandemic. The period from 2020 to 2023 is unparalleled in terms of rapid and fundamental changes in the world of work. Although the enforced and full-scale WFH situation during the pandemic constituted a highly valued research context, the findings in Paper 2 and 3 may be applicable primarily to the distinct setting in which the research was conducted. Furthermore, Paper 4 is situated in the aftermath of the pandemic restrictions, a time when many organizations were just starting to experiment with different hybrid work models. Moreover, it is worth noting that the SLR in Paper 1 does not consider the profound changes in remote work attitudes and practices due to the pandemic, which may reduce the current relevance of the results. Consequently, readers should be cautious when extending the conclusions beyond the temporal and contextual scope of the appended studies. One suggestion for further research that may address these contextual limitations is to conduct follow-up studies. This will enable scholars to investigate the phenomena under other circumstances, providing a more comprehensive understanding. Additionally, longitudinal studies are recommended to capture dynamic shifts and observe how contextual factors evolve over time. For example, researchers could explore the potential long-term effects of the widespread adoption of hybrid work arrangements on creative processes.

Second, the dissertation has geographical and sector-specific limitations that should be considered. All data were collected in Nordic countries (Norway and Denmark). Hence, the study findings are closely tied to the distinct Scandinavian working culture which has specific characteristics including leadership style, collaborative climate, and employee empowerment strategies. Due to the increasing global phenomenon of creative collaboration in remote and hybrid work environments, collecting data from multiple countries and conducting cross-cultural analyses should be considered in future work. Furthermore, Paper 3 and 4 are based on data exclusively from the technology sector. Besides, the research focuses solely on IT professionals from one single company in each of the studies. Obviously, EC and creative processes may be dissimilar in other organizations and industries. One promising research avenue is to conduct multiple case studies that encompass both the private and public sectors. This approach allows for an exploration of the similarities and differences among various professional domains, enhancing the trustworthiness of the data, and improving the opportunities for theory development.

Third, the appended studies have methodological limitations that affect the generalizability of the findings. Their applicability to wider populations and varied contexts is constrained by factors such as temporality, the extraordinary circumstances of the pandemic, sample characteristics, and research design limitations. The purposeful sampling technique used for participant selection in the qualitative studies (Paper 3 and 4) limits the representativeness and increases the risk of researcher bias. Additionally, the researchers' pre-assumptions and subjective experience with the phenomena may have influenced the data collection process, analysis, and interpretation, potentially impacting the objectivity of the findings across the studies. Setting aside all perceptions and personal views to focus entirely on the study participants' experiences has not been fully achievable. In future studies, scholars are encouraged to document any potential biases and strive for transparency throughout the research process to enhance the credibility and validity of the results. Furthermore, future investigations may employ mixed methods to gain a more comprehensive understanding of creativity in remote and hybrid work environments. This may allow researchers to overcome limitations and benefit from the strengths of both qualitative and quantitative methods. Additionally, diverse analytical approaches may be considered to address the unique characteristics of the evolving

phenomenon, e.g., comparative analysis of multiple countries or diverse types of FWA.

Forth, the dissertation relies on two distinct social theories, namely SCT and SIP theory. Restricting the theoretical views on complex social phenomena to only these two theories, can be considered as a limitation due to the exclusion of other relevant theoretical approaches. This may have narrowed the understanding of the phenomena and led to an insufficient interpretation and discussion of the results. To address this challenge, future research should start by clearly defining and conceptualizing the novel phenomena under study to enable a sufficient theoretical foundation. Furthermore, scholars may apply and extend other social theories, such as Social Identity Theory and Adaptive Structuration Theory. Various media and communication theories such as Media Richness Theory and Media Synchronicity Theory could be employed to better understand the remote and hybrid work context. Socio-technical System Theory can serve as a lens to examine how creativity in organizations is affected by the relationship between digital tools and social interaction. Not least, the interactionist perspective is the creativity theory most frequently referred to in the dissertation. In future studies, scholars should consider other creativity theories, including the Dynamic Componential Theory of Creativity and Systems Model of Creativity, and apply such models more comprehensively. Moreover, researchers are indeed encouraged to develop new theoretical framework when investigating creativity in remote and hybrid work environments.

Finally, the minimal attention paid to the application and utilization of specific digital tools represents a limitation. Both the findings presented in this dissertation and prior literature have demonstrated the significant influence of distinct digital solutions on EC, given their diverse applications, including synchronous and asynchronous communication. However, due to the analytical scope of the appended studies, future research could focus on evaluating various technological tools and assess how effective they are in facilitating creativity in remote work settings. Additionally, scholars are strongly recommended to investigate how the adoption of new technologies, such as artificial intelligence (AI) will impact the future of work and affect creativity in organizations.

Overall, studying the multifaceted phenomenon of creativity in the rapidly

evolving context of remote and hybrid work calls for interdisciplinarity, innovative research approaches, and open-mindedness. The creative genius and successful innovator, Walt Disney (1901-1966) once said, “We keep moving forward, opening new doors, and doing new things, because we're curious and curiosity keeps leading us down new paths”. It is the author's hope that this dissertation will trigger a thirst for knowledge and an urge to explore the mysteries of creativity in the new world of work.

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PAPER 1:
Employee Creativity in Coworking Spaces: Towards a Conceptual Framework

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Abstract

Creative performance of knowledge workers outside the traditional office setting has become highly relevant during the COVID-19 pandemic. The pre-pandemic trend of corporate coworking: companies using coworking spaces as an alternative workplace solution, is predicted to grow further. This study aims to fill a research gap by identifying how corporate coworking may foster employee creativity, crucial to company's innovation and competitiveness. A systematic review of the coworking literature is conducted to critically evaluate employee creativity in coworking spaces. Structural, relational, and cognitive social capital along with an individual and contextual view of creativity are utilised as the theoretical foundation for analysis and synthesis. A conceptual framework is proposed for empirical examination of creative performance in a corporate coworking context. The findings suggest thirteen factors influencing creativity in corporate coworking settings. The most prominent factors identified are social interaction and knowledge sharing. Moreover, we argue that corporate coworking corresponds with key dimensions of the Workplace Innovation concept. The literature review indicates a common assumption that creativity and innovation are consistently outcomes of coworking. Nonetheless, our study highlights that fostering employee creativity in shared office environments involves a complex social process, worth closer scholarly attention. Theoretical and practical implications are discussed, and future research avenues are proposed.

Keywords

Alternative workplace solutions; Corporate coworking; Coworking spaces; Employee creativity; Knowledge sharing; Social capital theory; Workplace Innovation

1. Introduction

The COVID-19 pandemic has brought about ground-breaking changes in the world of work. A paradigm shift, in how, when and where knowledge work is being performed, seems to be taking place (Baert et al., 2020). Alternative workplace solutions have evolved since long before the pandemic, including the practice of employees working outside employers´ spatial premises, enabled by information and communication technologies (Kojo & Nenonen, 2014; Morgan, 2004). Key drivers are globalisation, emergence of the sharing economy, and a growing need of flexibility and autonomy (Bouncken & Reuschl, 2016; Ross & Ressia, 2015; Spurk & Straub, 2020). Responding to these streams, the shared office concept of coworking spaces (CWS) has increased its popularity among entrepreneurs, freelancers, and corporates (Tremblay & Scaillerez, 2020).

Simultaneously, the Workplace Innovation movement has emerged in Europe as a policy and instrumental approach (Oeij & Dhondt, 2017; Pot et al., 2016; Totterdill, 2018). The concept of Workplace Innovation (WPI) emphasises work environment factors which can enhance creativity and quality of working life, and subsequently improve organisational performance and innovation (Kibowski et al., 2019). WPI aims to reconcile the rational organisation of work driven by new technologies with the creative and serendipitous social interactions that can stimulate innovation (Totterdill, 2018). The promotion of a working culture characterised by openness and sharing of ideas (Totterdill & Exton, 2014) corresponds with the core values of the coworking movement (Capdevila, 2013).

Research on CWS is still at an early and conceptual stage (Bouncken et al., 2017) and several issues have been largely ignored (Leclercq-Vandelannoitte & Isaac, 2016). One concern is that a major part of the literature uncritically presumes that coworking improves creativity and innovation (Botsman & Rogers, 2011). Nonetheless, creative and innovative outcomes of coworking practices are insufficiently explored (Schmidt & Brinks, 2017). Moreover, the idea of CWS as communities exclusively for independents “working alone, together” (Spinuzzi, 2012) still dominates the scholarly discussion. Josef and Back (2018) argue that new user groups should lead to a more profound debate. Mature companies have recently taken interest in coworking (Fuzi et al., 2018; Orel & Almeida, 2019). In this study, corporate coworking is understood as employees working remotely from a CWS, and whose activity is done on behalf of a company based outside the

CWS (Leclercq-Vandelannoitte & Isaac, 2016; Parrino, 2015). To explore the novel phenomenon of corporate coworking, the current study takes on a contextual perspective by evaluating coworking as an alternative workplace solution for stimulating creativity in organisations.

The relation between corporate coworking and employee creativity (EC) is barely studied. However, research on individual creativity in alternative work practices is important due to the digital transformation and new workplace demands in the COVID-19 era. Creativity scholars acknowledge the importance of both individual, contextual, and social factors for creativity (Amabile et al., 1996; Dul & Ceylan, 2011; Woodman et al., 1993). Moreover, WPI encourages an organisation of work that enhances the development of "soft skills" including flexibility, collaboration, creative thinking and problem solving to meet the challenges of the 21st century (Pot et al., 2020). Corporate coworking may potentially be a way to meet these challenges.

Considering the research gap on EC in a corporate coworking context, the research question of the present study is how coworking spaces can foster employee creativity. To build a knowledge base for exploring the research question, a systematic literature review (SLR) focusing on EC in CWS is conducted. Very few thorough SLRs of the CWS literature have been conducted to date. Ivaldi (2017) includes a comprehensive review in her PhD thesis, while the coworking literature review by Gandini (2015) is related to the knowledge labour market. To our knowledge, Josef and Back (2018) present the only review specifically focusing on coworking from companies´ perspective. Furthermore, literature on EC in CWS is still in its infancy and yet not systematically reviewed (Rese et al., 2020).

The rest of this paper is structured as followed: In Section 2, the research context is more thoroughly explained. Section 3 is dedicated to the theoretical background. The method and procedures are presented in Section 4. Section 5 presents the study findings, the proposed conceptual framework, and the research model. Finally, conclusions, implications, limitations, and future research directions are addressed in Section 6.

1.1 The research context

1.1.1 Coworking spaces (CWS)

The coworking movement arose in San Francisco in 2005, promoting shared office space for independent knowledge workers, mainly to avoid social isolation (Brown, 2017; Lumley, 2014). Coworking is initially based on the core values of openness, accessibility, sustainability, community, and collaboration (Kwiatkowski & Buczynski, 2011). CWS can be understood as a "third place" in between traditional office and home office (Oldenburg, 1989). Bouncken and Reuschl (2016, p. 322) describe CWS as office and social spaces that ease the direct personal interaction among users for social, learning, cultural and business-related interests. CWS are often distinguished by a sense of community (Garrett, 2017) where members are open to share knowledge and ideas (Rus & Orel, 2015). Typically, the sharing culture is facilitated by a community manager who connects people and promotes a vibrant and creative work environment (Cabral & Winden, 2016). CWS have seen a remarkable growth (Merkel, 2015). In 2019 there were 2,2 million coworkers spread in more than 22,400 CWS around the globe (Foertsch, 2019). Despite social distancing rules during the pandemic, CWS are expected to grow further (Appel-Meulenbroek et al., 2020).

1.1.2 Corporate coworking

Companies are constantly looking for new ways to learn from startups and potential clients (Fuzi et al., 2018) and to support creativity to drive innovation (Dul & Ceylan, 2011). Partnering up with CWS is one way to inject creativity and innovation into old work routines, habits and processes (Bouncken & Aslam, 2019). Consequently, an increasing number of corporations have started to integrate coworking into their business strategy (Fuzi et al., 2018). Big companies such as Google, Facebook and Bosch have established internal spaces (Bouncken et al., 2017). Other firms locate employees in external CWS with the expectation of innovation outcomes (Raffaele & Connell, 2016).

Despite the temporary social distancing measures in response to the COVID-19 pandemic, the corporate coworking trend is suggested to continue (Heinzel et al., 2021). Due to the profound changes in the world of work, many companies will require flexible and cost-effective office solutions (Gusain, 2020). Moreover, organisations need to focus more on employee flexibility and wellbeing, alongside with breaking down silos and building competence through creative

collaboration (Totterdill, 2015). In the post-pandemic era corporate coworking can be perceived as a remote work model solving the isolation issues associated with working from home (Görmar et al., 2020). In that way employees working remotely from a CWS may increase job satisfaction and subsequently stimulate creativity and innovation (Appel-Meulenbroek et al., 2020; Marchegiani & Arcese, 2018).

2. Theoretical background

2.1 Social capital theory (SCT)

In an organisational context, social capital (SC) can be understood as the resources employees obtain through their social networks (Coleman, 1988; Lin, 2002). Social capital theory (SCT) suggests that social relationships among colleagues and those with external actors embody vital resources such as knowledge and ideas (Chen & Kaufmann, 2008). According to Nahapiet and Ghoshal (1998) the fundamental proposition of SCT is that social network ties provide access to these resources. Weak ties between persons can be useful for information retrieval (Granovetter, 1983), while strong ties are more accessible and may involve willingness to help colleagues and peers (Krackhardt et al., 2003). Although network relations may have both positive and negative effects on creativity (Soda & Bizzi, 2012), it is commonly assumed that ideas flow between individuals through weak ties rather than strong ties in social networks (Granovetter, 1973; Perry-Smith & Shalley, 2003).

The main justifications behind utilising SCT as a theoretical lens in the present paper are as follows: (a) Two major creativity models suggest that creativity is partly a social process (Amabile, 1988; Woodman et al., 1993). Hence, SCT has become a frequently used framework to better understand EC, and seminal literature proposes SC as a critical facilitator of creativity in workplaces (Chen et al., 2008; Jain & Jain, 2017; Liu, 2013; Soda et al., 2019); (b) Several CWS scholars have drawn on SCT in their research (Bilandzic & Foth, 2013; Bouncken & Reuschl, 2016; Cabral & Winden, 2016). CWS can be examined as social networks with a sense of community (Parrino, 2015). Rese et al. (2020) incorporate “community commitment” referring to members´ attitudes regarding the CWS community, comprising SCT concepts including affective commitment,

togetherness, and belonging (Chiu et al., 2006).

In the present study, SC is conceptualised following the framework by Nahapiet and Ghoshal (1998). The scholars identified three distinct dimensions of SC, namely structural (e.g., social interaction), relational (e.g., trust), and cognitive (e.g., shared values). These dimensions promote interactions and community building in CWS (Cabral & Winden, 2016) and encourage members to act collectively and share knowledge and ideas (Lee, 2018).

2.2 Employee creativity

In line with the research question, employee creativity (EC) is the main output which this study aims to investigate. Following Gong et al. (2009), EC relates to overall job performance, with obvious implications for the innovative performance of an organisation. When employees perform creatively, they "suggest useful products, ideas, or procedures that provide an organisation important raw material for subsequent development and possible implementation" (Oldham & Cummings, 1996, p. 607). In the present paper, "employee" refers to a person fulltime employed in a large or medium sized corporation. It does not include contractors or hired consultants.

Influential creativity theories (Amabile, 1996; Woodman et al., 1993), as well as several empirical studies (e.g. Dul & Ceylan, 2011; Perry-Smith, 2006), support that EC is affected by both individual and contextual factors. Individual factors include personality dimensions (e.g. Kaufman et al., 2013), cognitive characteristics (e.g. Woodman et al., 1993), knowledge (e.g. Ford, 1996), autonomy (West & Farr, 1990) and intrinsic motivation (e.g. Amabile et al., 1996). Contextual factors refer to work environment dimensions that potentially influence creativity (Shalley et al., 2004). Amabile et al. (1996, p. 249) advocate that "physical environments that are engineered to be cognitively and perceptually stimulating can enhance creativity". Shalley and Gilson (2004) suggest that future research should address the effect of design and the physical layout of the workspace on EC. Some scholars also integrate technological infrastructure and digital platforms (Cai et al., 2020; Lee, 2018) as contextual factors influencing creativity. Golden and Raghuram (2010) found that extensive use of digital tools will provide more information crucial for EC.

Several CWS scholars have adopted a combined individual and contextual view of creativity. The autonomy of coworkers is suggested to increase motivation and EC, while the CWS context provides infrastructure, spatiality and atmosphere which is assumed to stimulate KS (Appel-Meulenbroek et al., 2020; Bouncken et al., 2017; Merkel, 2015). Following this research stream, both individual and contextual factors are included in the present study.

3. Method

To build a solid knowledge base for exploring the research question and developing a conceptual framework, a SLR focusing on EC in CWS is conducted. Denyer and Tranfield (2009) suggest that a SLR is a process of using a comprehensive pre-planned strategy to locate existing literature, evaluate the contribution, analyse, and synthesise the findings and report the evidence to allow conclusions to be reached about what is known and what is not known. Following this, the purpose of the SLR in this paper is to identify, select, examine, and analyse relevant research on EC in CWS.

3.1 Searching

Digital databases were used for the search process, which was conducted during December 2020. Scopus was selected as the first database, as it is claimed to contain the largest citation and abstract source of multidisciplinary literature which is continually expanded and updated (Aghaei Chadegani et al., 2013). Later in the process, Web of Science, Ebsco and Google Scholar were used to identify new unduplicated articles.

First, corporate coworking studies were identified. Various search terms were used for the distinct shared office concept (“coworking”, “co-working”, “coworking space”, “co-working space”, “collaborative space”, “shared space”, “shared workspace”, “flexible workspace” and “shared office”). “Coworker” and “co-worker” were not included because they are commonly used as a synonym for a colleague. Additionally, corporate coworking was searched for using different terms (“corporate”, “employee”, “enterprise”, “company”, “firm”). Second, the creativity dimension was searched for within the identified corporate coworking studies. Terms used were “creativity”, “creative”, “innovation” and “innovative”.

The rationale behind the inclusion of "innovation" is that creativity and innovation are quite often used interchangeably (Sarri Katerina et al., 2010).

The time frame was 2005 – 2020 since contemporary coworking originated in 2005 (Gandini, 2015). Later in the search process, studies from 2016 onwards became the main focus, since internal and external corporate coworking was developed extensively in this period (Bouncken et al., 2017). Language was limited to English, but the geographical area was not bounded, as CWS is a global phenomenon (Orel & Almeida, 2019). No scientific discipline was specified because of the multidisciplinary nature of coworking research (Waters-Lynch et al., 2016). The search concentrated on peer reviewed articles published in scientific journals. However, book chapters, conference proceedings and thesis were included to shed further light on the novel phenomenon.

Number of hits related to EC in CWS was 121. The screening process of examining titles, keywords and abstracts was conducted utilising the following inclusion and exclusion criteria: (a) 1. CWS with community aspect, with ordinary shared offices; (b) Open independent CWS with a diversity of users, not with "closed" spaces exclusively for company employees; (c) Creativity as generation and sharing of ideas, not innovation as implementation of ideas; (d) EC on the individual level, not the organisational level. Studies focusing entirely on creative industries, creative cities and the creative class are excluded, as they do not represent the individual creative performance across sectors and disciplines, which are particularly being searched for.

The screening resulted in 46 qualified studies. A critical and comprehensive examination was performed following three criteria: (a) Relevance to the research question; (b) Empirical research due to the aim of a SLR to identify empirical evidence responding to the research question (Snyder, 2019); (c) peer reviewed work to ensure the scientific quality and integrity. Both qualitative and quantitative studies are included to expand and strengthen the foundation for investigating the phenomenon of EC in CWS. The process of searching, screening, and selecting studies are visualised in Figure 1.

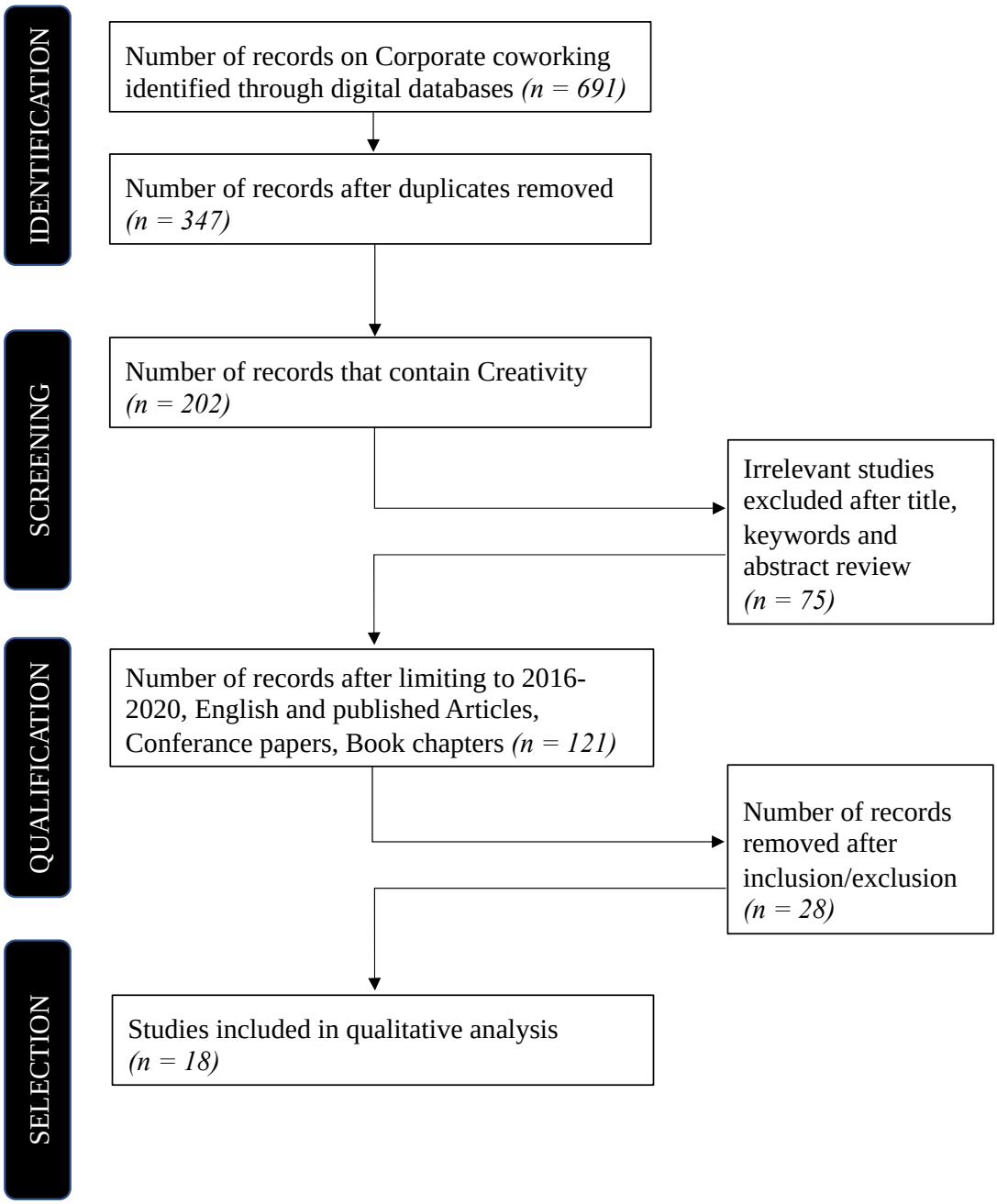

Figure 1. The study selection process of the systematic literature review

3.2 Selecting and analysing

A critical assessment concluded that exclusively 18 studies met all the above criteria and delimitations. These scientific works are considered to provide valuable insights for responding to the research question. Accordingly, the 18 studies were selected for the qualitative synthesis and analysis. Table 1 provides a detailed overview (see Appendices for Table 1. Overview of the selected studies).

EC in CWS is a novel and ambiguous phenomenon which require an explorative approach. In the present study, a qualitative approach is used to assess the articles and analyse the findings related to the research question (Grant & Booth, 2009). Content analysis is used to interpret and present insights from the respective literature. The method is commonly used to understand the context underlying a large body of textual data (Hsieh & Shannon, 2005). According to Palvia et al. (2007) content analysis involves identification, grouping, coding, and classification into different categories. The categories are derived from SCT and the individual and contextual view of creativity. The 18 selected studies are examined to extract relevant insights in line with the theoretical perspective, conceptual framework, and proposed variables (see Appendices for Table 2. Corporate coworking review).

4. Findings

4.1 Coworking from a company view

To investigate how CWS can foster EC the concept of corporate coworking needs to be more clarified. Table 2 provides an overview of company views of corporate coworking in the selected studies.

The analysis reveals a lack of definition regarding corporate coworking. However, various sources provide different classifications of CWS in general (e.g. Kojo & Nenonen, 2016; Salovaara, 2015; Waters-Lynch et al., 2016). Three of the selected studies provide typologies which include corporate coworking (Bouncken et al., 2017; Jakonen et al., 2017; Schmidt & Brinks, 2017). A common distinction is between internal spaces operated by the company and external independent CWS. Bouncken et al. (2017) identify four prototypes of corporate CWS: (a) Internal

corporate CWS for employees only; (b) Open internal corporate CWS for both employees and outside actors; (c) External CWS operated by an external consultancy; (d) External independent CWS open for public memberships.

The latter prototype represents the main context of the present study of employees working outside their employers´ spatial premises in an independent and diverse coworking community. The analysis unveils that coworking from a company view, especially external arrangements, is insufficiently explored. Despite the suggestions in the selected studies (see Table 3), there are no mapping of motivations nor evidence of benefits or outputs.

4.2 Corporate coworking and creativity

The analysis exposes that CWS are commonly characterised by a dynamic and creative atmosphere (Orel & Almeida, 2019) where ideas are being created and shared through the social interaction between members of the coworking community (Jakonen et al., 2017). Rese et al. (2020) suggest that the unique sharing culture and KS behaviour in CWS improve EC. However, the scale of novel ideas and whether they are being successfully implemented has not yet been exhaustively studied (Schmidt & Brinks, 2017). Table 3 illustrates how the creativity dimension from a corporate coworking standpoint are being evaluated. (See Appendices for Table 3. Employee creativity view)

Several of the selected studies emphasise the function of CWS as communities designed to stimulate creativity and sharing of ideas (e.g. Bouncken et al., 2020; Tremblay & Scaillerez, 2020). Scholars suggest that corporate coworking potentially stimulate EC, but not necessarily (Tremblay & Scaillerez, 2020). Interestingly, Josef (2017, p. 269) notes in her study of IT company employees in Switzerland that “participants rated the corporate office followed by the home office as the location where they were most creative, coworking only ranked as third”. Although the interviewees reported elements of creative impulses when coworking, it indicates that corporate coworking fostering EC is not a matter of course.

The relevant findings from the selected studies are synthesised using six categories with associated subcategories (factors). These factors are suggested to influence EC in CWS. All categories are derived from the theoretical foundation of the

present paper. The first two categories with related factors relate to the individual and contextual view of EC (Amabile, 1996; Woodman et al., 1993). Individual factors are employees´ flexibility, autonomy, and motivation. Contextual factors are design, layout and atmosphere, and digital platforms in CWS. The next three categories follow the dimensions of SC (Nahapiet & Ghoshal, 1998). Structural factors are task-oriented diversity and network ties. Relational factors are trust among members and social support, while cognitive factors are shared values and identification focused on the community aspect of CWS. The final category represents the KS factor. Table 4 presents an overview of categories, factors, article hits and content examples.

Table 4. Categories and factors

Categories (dimensions)	**Subcategories (factors)**	**Article hits**	**Content examples**
Individual	Flexibility	11	Coworking offers attractive opportunities from a boundary management perspective, where the benefit of individual flexibility is more important than mingling with others (Josef, 2017)
	Autonomy	6	Big companies develop corporate CWS to allow their members greater autonomy to improve creativity and innovation (Bouncken et al., 2017)
	Motivation	7	Participants may have a mix of individual and collective motivations to join innovative activities (Capdevila, 2019)

Contextual	Design	11	Interior design and architecture incorporate emotional and social values that may benefit companies and make employees more motivated and inspired (Bouncken et al. 2020)
	Digital platforms	8	Some CWS apply digital networking tools which aim at stimulating creativity and innovativeness through exploration of knowledge connections (Kopplin, 2020)
Structural	Diversity	9	By using CWS, corporates have access to ideas external to their firm, which can be a source of innovation because of the diversity of knowledge they can provide (Tremblay & Scaillerez, 2020)
	Network ties	8	CWS aim to build quality social network ties which may increase opportunities for collaboration among members (Cheah & Ho, 2019)
	Social interaction	18	Face-to-face interaction strengthen community identity and facilitate peer-to-peer learning (Capdevila, 2019)
Relational	Trust	10	Trust is a central value for the concept of community and crucial for KS (Rese et al., 2020)

	Social support	11	Coworking activities result in outputs of interaction and mutual support, i.e., feedback and moral support (Clifton et al., 2019)
Cognitive	Shared values	11	Values of openness, collaboration, and community enable users to find the solution of their problem through interaction with diverse professionals who have relevant domain specific knowledge (Bouncken et al., 2017)
	Identification	8	CWS can provide essential platforms for networking, knowledge exchange, and identification (Blagoev et al., 2019)
Mediator	Knowledge sharing	18	An ideology of KS, creativity and innovation are embedded into CWS (Jakonen et al., 2017)
Outcome	Employee creativity	18	The attitude towards knowledge sharing and actual sharing behaviour in CWS improve coworkers´ creativity (Rese et al., 2020)

In the selected studies, the most prominent factors influencing EC in CWS are social interaction and knowledge sharing. Below, each of the factors are evaluated based on content analysis and theoretical views.

4.3 Individual factors

4.3.1 Flexibility

Two thirds of the selected studies emphasise flexibility as a primary characteristic of corporate coworking. Tremblay and Scaillerez (2020) suggest that employees have new aspirations related to more freedom of choosing the physical place to work and their own flexible working schedule. Flexibility is inherent to CWS, as tenants can rent an office or a desk for a shorter period of time (Cheah & Ho, 2019). Capdevila (2019) highlights that the flexibility in the CWS workstyle may benefit EC. This is supported by seminal creativity research demonstrating that flexibility is one of the factors critical to individual creative performance (Guilford, 1950; Jain & Jain, 2017).

4.3.2 Autonomy

Creativity scholars have concluded that EC is fostered when individuals and teams have relatively high autonomy and a sense of ownership and control over their own activities and ideas (Amabile et al., 1996). In terms of corporate coworking, companies allow employees greater autonomy to improve creativity and innovation (Bouncken et al., 2017). Kopplin (2020) suggests that different degrees of autonomy moderate creative behaviour in CWS.

4.3.3 Motivation

Motivation is an essential factor in most prominent creativity theories (Amabile, 1988; Ford, 1996; Woodman et al., 1993). Individuals are expected to be most creative when they have a high level of intrinsic motivation (Oldham & Cummings, 1996). Bouncken et al. (2020) found that employees profit foremost on intangible levels, including greater job satisfaction and increased intrinsic motivation. In CWS, other members are sources of extrinsic motivation for corporates. However, pure extrinsic motivation might inhibit creativity (Capdevila, 2019).

4.4 Contextual factors

4.4.1 Design

Previous studies have suggested that the design of a work place, including architecture and layout, can motivate and inspire people to be creative (Kopplin, 2020). The physical design of a CWS is found to play a role in not only

encouraging creative thinking, but also generating ideas of higher quality (Cheah & Ho, 2019). The purposeful design of the social and work zones in CWS can improve communication (Bouncken et al., 2020), and more stylish settings may promote inspiration and creativity (Marchegiani & Arcese, 2018). Shalley and Gilson (2004) suggest that future research should address the effect of the physical layout of the workspace on creative performance.

4.4.2 Digital platforms

According to Marchegiani and Arcese (2018), CWS are a demonstration of how the symbiosis between technology and community is facilitated by the evolution of digital technologies. Bouncken et al. (2020) suggest that digital platforms are used to support space functions, e.g., booking of meeting rooms, and to support communication among CWS users, e.g., social networking forums. Hofeditz et al. (2020) demonstrate how digital tools can be applied to increase motivation, interaction, and creativity in CWS.

4.5 Structural factors

4.5.1 Diversity

It is generally assumed that diversity is positively related to EC (Jain & Jain, 2017; Kurtzberg, 2005). Previous research has distinguished between task-oriented and relations-oriented aspects of diversity (Jackson et al., 1995). The latter include gender, age, and ethnicity. However, the task-oriented diversity in the present CWS study include education, skills, and expertise (Kurtzberg, 2005). The SLR shows a scholarly consensus that corporates working with people from different professional backgrounds will be exposed to new ideas (Bouncken & Aslam, 2019; Weijs-Perrée et al., 2018). However, Weijs-Perrée et al. (2018) suggest that diversity may also negatively impact both KS and EC. A “culture clash” between entrepreneurs and corporates may cause undesirable effects and too much diversity may obstruct KS.

4.5.2 Network ties

Castilho and Quandt (2017) suggest that CWS are shaped by people with both strong and weak social ties. Social relations and network ties are the fundamental proposition of SCT (Nahapiet & Ghoshal, 1998), a commonly accepted concept in creativity research (Perry-Smith & Shalley, 2003), and a highly relevant factor when examining EC in CWS (Bouncken et al., 2018; Cabral & Winden, 2016). CWS comprising stronger and weaker ties between diverse members are characterised by informal interpersonal communication and KS (Orel & Almeida, 2019). The quality and strength of social ties are important for corporates to identify innovative opportunities in CWS (Cheah & Ho, 2019). In extended CWS networks, more distant acquaintances are sources of knowledge, and ideas that may not be available within a strong ties network of company colleagues (Granovetter, 1973).

4.5.3 Social interaction

Social interaction is a precondition for building network ties between CWS members, and to stimulate creative work (Jakonen et al., 2017). Interpersonal interaction is one of the most prominent characteristics of coworking (Weijs-Perrée et al., 2018), and a widespread motivation behind corporate coworking (Orel & Almeida, 2019). Social interactions in CWS may come in various forms (Gerdenitsch et al., 2016). Members may engage in casual conversations, but also participate in events, seek and obtain feedback, and share ideas (Spinuzzi, 2012). WPI literature suggest that people who otherwise would not meet, are mixed together, and can generate a pool of dialogue and creativity (Totterdill & Exton, 2014). However, interaction in CWS bears the risk of opportunistic behaviours (Bouncken et al., 2018). Moreover, conflicts may arise when interaction entails interruptions and distractions (Tremblay & Scaillerez, 2020). Nevertheless, Cheah and Ho (2019) underline that social interaction in CWS provides a variety of innovative inputs, and Chen et al. (2009) suggest that social interaction has a significant positive impact on creativity.

4.6 Relational factors

4.6.1 Trust

Nahapiet and Ghoshal (1998) suggest that a high level of social interaction strengthens the willingness to share resources and information in networks,

consequently mutual trust is being built. CWS can be studied as a foundation for relationship building between independent workers and employees (Orel & Almeida, 2019). The coworking community facilitates the formation of informal networks by a trust based social environment which supports learning and KS (Cheah & Ho, 2019; Fuzi, 2015). When there is overlapping knowledge, a positive social atmosphere and sense of trust enhance the capabilities of coworkers to adopt other members´ ideas and views (Cheah & Ho, 2019). Hence, quality relationships in terms of mutual trust serve to promote EC (Gong et al., 2009; Liu, 2013)

4.6.2 Social support

Social support can be understood as social interactions that are beneficial to one or both parties (Shinn et al., 1984). Mutual support is also one of the primary reasons for joining a CWS (Fuzi et al., 2014; Rese et al., 2020). Being part of the same community promotes supportive behaviour, and makes it easier to ask coworkers to listen to job-related as well as personal problems (Bouncken et al., 2020). Scholars propose that a supportive and non-hierarchical environment fosters KS (Bouncken & Reuschl, 2016) and EC (Perry-Smith & Shalley, 2003). However, Gerdenitsch et al. (2016) emphasise that it is still unclear whether social interaction in a CWS takes the form of social support, as it often does between colleagues in traditional workplaces.

4.7 Cognitive factors

4.7.1 Shared values

In SCT shared values are seen as antecedents of trusting relationships (Tsai & Ghoshal, 1998). Chen et al. (2008) suggest that shared value systems can facilitate EC. CWS provide not only a community of likeminded others, but also organisational elements such as shared values, rituals and routines (Blagoev et al., 2019) The coworking values have been a guiding star for the global coworking movement (Rus & Orel, 2015). Rese et al. (2020) argue that the distinct shared values in CWS increase KS possibilities by diminishing miscommunications.

4.7.2 Identification

Employees with a high level of identification are more loyal towards organisations, and show willingness to maintain committed relationships and supportive

behaviours (Lee, 2018). Nahapiet and Ghoshal (1998) indicated that social identification is a SC resource that can enhance members´ motivation to share knowledge. In their study of millennial employees, Hui Li et al. (2020) suggest that identification significantly influences EC positively. The community dimension of CWS provides a sense of social belongingness to their diverse members (Jakonen et al., 2017). Social interactions, mutual trust, shared values and supportive behaviour are essential for the users to identify with the coworking community (Orel & Almeida, 2019). This illustrates how factors from the three dimensions of SC relate, and how they impact the facilitation of KS and EC in CWS.

4.8 Mediating factor

4.8.1 Knowledge sharing (KS)

KS refers to activities involved in transferring knowledge among individuals (Lee, 2001). Scholars argue that employees are more likely to generate novel ideas if they can access diverse information, by interacting with people who have a variety of knowledge (Perry-Smith & Mannucci, 2017; Sosa, 2011). Seminal literature on KS has found that both internal and external KS lead to increased creativity and innovation (Carmeli et al., 2013; Damanpour, 1991).

Findings in the present study suggest that social network ties in CWS allow KS (Bouncken et al., 2017) and contribute significantly to creative ideas (Rese et al., 2020). Corporates and entrepreneurs building network ties in CWS can spark the exchange of tacit (intuitive) knowledge and promote cross-domain learning (Bouncken & Aslam, 2019). KS is expected to be influenced by the interaction and collaboration culture in the individual CWS (Orel & Almeida, 2019). The other way around, KS may increase social interaction (Cabrera & Cabrera, 2005). Although these concepts are interconnected in a CWS, the SLR indicates that the correlation is complex and unclear (Josef, 2017). Nonetheless, prior coworking literature suggest that social interaction and KS predict EC in CWS (Bouncken et al., 2017; Capdevila, 2014a).

4.9 An integrated framework

In this proposed framework, the dimensions of creativity (individual and contextual) and SC (structural, relational, and cognitive) are integrated as

independent variables. Interrelations between the different constructs are ignored in this paper for the sake of simplification of the proposed research model. KS serve as mediator variable, while EC is the dependent (output) variable. Following prior literature, the proposed independent variables may influence KS, as well as EC. Seminal research demonstrates the distinct impact of the three SC dimensions on KS (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998; Wasko & Faraj, 2005). Scholars have also suggested that KS is affected by individual factors (Cabrera et al., 2006) and contextual factors, such as physical work environment (Weijs-Perrée et al., 2018). Hence, the rationale behind our proposed framework is that the individual variables are related to both KS and EC, although KS directly relates to EC. Based on this outline, the following conceptual model (Figure 2) is proposed for investigating EC in CWS:

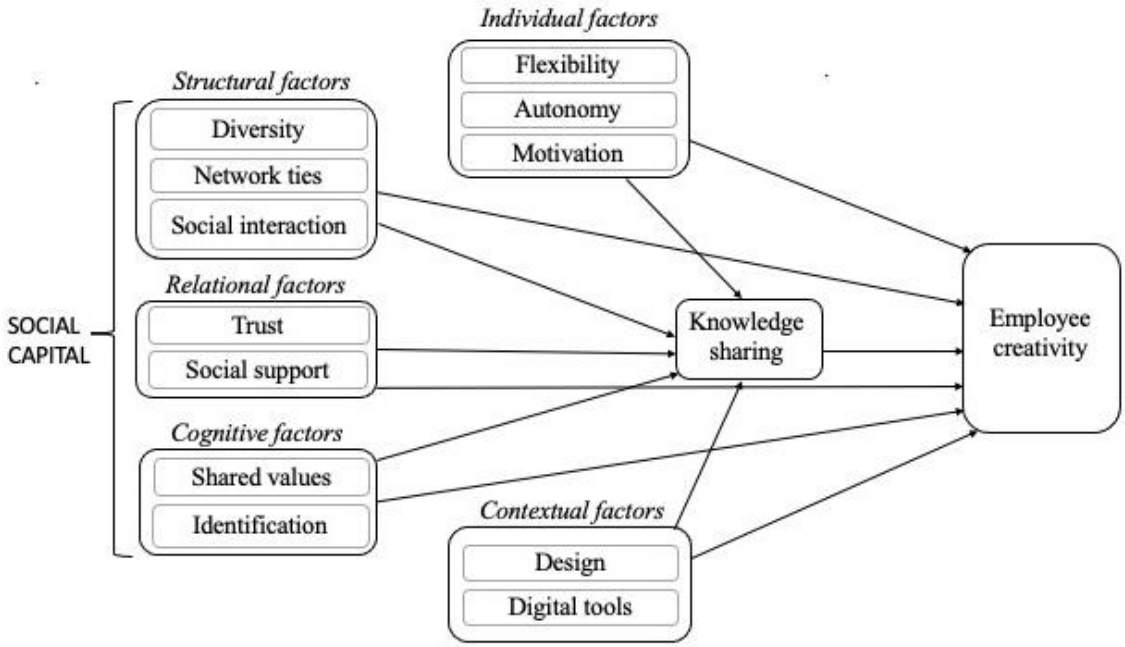

Figure 2. A conceptual model of employee creativity in coworking spaces

It must be underlined that the proposed model is considered a preliminary outline to systemise the SLR findings, integrate theoretical constructs, and illustrate a potential research path. However, the novelty and complexity of the phenomena indicate an initial exploratory research approach to derive meaning from employees´ own experiences, feelings, and opinions, and to gain a deeper understanding of how EC takes place in shared work environments.

5. Conclusion

In this paper we have systematically reviewed the coworking literature focusing on EC in CWS. Constructs from SCT and creativity theory have been utilised to develop a conceptual framework. The study findings suggest that the two most crucial factors influencing EC in CWS are social interaction and KS. Moreover, we argue that corporate coworking corresponds with the Workplace Innovation concept in the sense of breaking down silos and facilitating creative collaboration. The SLR indicates a common assumption that creativity and innovation are consistently outcomes of coworking. Nonetheless, our study highlights that fostering EC in shared office environments is an ambiguous phenomenon, which involves a complex social process. A conceptual framework is proposed to further develop research questions and hypothesis and to guide future empirical studies. Based on the SLR and theoretical viewpoint thirteen factors are identified to influence EC in CWS.

5.1 Theoretical contributions

The SLR of EC in CWS enables scholars to better understand corporate coworking and to critically evaluate creativity outcomes of such work arrangements. Secondly, the paper contributes to the emerging research streams of coworking and remote work in shared office environments. Specifically, it adds to the currently limited research on corporate coworking by reviewing the literature and clarifying the phenomenon. Finally, the focus on EC in CWS adds to the creativity literature by suggesting an individual and contextual view of creativity utilised in a novel research context.

5.2 Implications for practice

The study has implications for companies revisiting work policies and crafting short-term and long-term work practices due to the COVID-19 disruptions. Managers may benefit from the study considering EC and corporate coworking models when designing and implementing flexible work arrangements. Secondly, the findings offer insights to CWS operators into the corporate market and may inspire promotion of creative collaboration across boundaries. Thirdly, by suggesting thirteen factors for enhancing EC in CWS, the study may provide knowledge to corporations, CWS, real estate developers and policymakers

relevant to strategic decision-making processes. Additionally, the study may contribute insights relevant to the WPI approach to organisational redesign.

5.3 Limitations and future work

The inclusion process of the SLR is limited to English language and a short period of time. Relevant studies may also have been ignored because of the exclusion of internal corporate coworking. In addition, an important limitation is that the study does not consider the profound changes in work practices and attitudes due to the COVID-19 pandemic. Only one of the selected studies mentions that the results may be less relevant, or even invalid, because of permanent changes caused by the pandemic (Appel-Meulenbroek et al., 2020).

The insufficient scholarly attention drawn to EC in CWS requires future research. The growing phenomenon of corporate coworking needs to be further clarified, defined, and categorised. A deeper understanding is necessary, including creativity outcomes. Future research can take different theoretical approaches, e.g., open innovation, corporate entrepreneurship, knowledge management and organisational behaviour. One pathway is to examine how corporates working from various CWS perform creatively in communities with different practices and user profiles. A potential research question is to what extent corporate coworking impacts real idea production and problem solving, beyond inspiration from a creative environment. Scholars should also examine the innovation processes, evaluate employers´ support and investigate the implementation of new ideas at the organisational level. In conclusion, this study illuminates the need to better understand companies´ challenges and opportunities in facilitating creativity and innovation in the new world of work.

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Appendices

Table 1. Overview of the selected studies

Year	Author(s)	Journal	Methodology	Theory	Relevance
2017	Bouncken, Laudien, Fredrich & Görmar	*Review of Managerial Science*	Qualitative	Institutional theory	Typology: 4 CWS prototypes. Benefits for employees.
2017	Jakonen, Kivinen, Salovaara & Hirkman	*Scandinavian Journal of Management*	Qualitative	Affect theory	Typology: 3 CWS prototypes. Benefits of corporate coworking.
2017	Josef	*BLED Proceedings at AIS Electronic Library*	Qualitative	Socio-material theory Boundary Management	Benefits and obstacles.
2017	Schmidt & Brinks	*Creativity and Innovation Management*	Qualitative	Situated Learning	4 CWS prototypes - "open creative labs". Relation between communities and spaces.
2018	Marchegiani and Arcese	*Learning and Innovation in Hybrid Organization (Book)*	Qualitative	Open innovation	CWS as organisational hybrids. Impact on learning and innovation.

2018	Weijs-Perrée, van de Koevering, Appel-Meulenbroek & Arentze	*Building Research & Information*	Quantitative	Preference theory	Preferences of CWS users. Motivations to work at a CWS.
2019	Blagoev, Costas & Kärreman	*Organization*	Qualitative	Organisation theory	Conceptualisation of the social order in CWS by theorizing the organisational dimension. Organising outside traditional organisations.
2019	Bounchen & Aslam	*Journal of Knowledge Management*	Qualitative	Practice theory Knowledge management theory	Role of spatial co-location in KS and idea generation. Synthesising the KS processes.
2019	Capdevila	*Journal of Business Strategy*	Qualitative	Open innovation	External sources of creativity. Motivations to participate in collective creativity.
2019	Clifton, Fuzi & Loudon	*Futures*	Quantitative	Knowledge management theory	Conceptualising community, collaboration, and KS. Facilitate outcomes of innovation and increased productivity. Individual motivations.

2019	Orel & Almeida	*Journal of Corporate Real Estate*	Qualitative	Social network theory	Coworking ambience. Architecture and design.
2019	Cheah & Ho	*Sustainability*	Quantitative	Spatial theory	Relationship between space creativity and company innovation.
2020	Appel-Meulenbroek, Weijs-Perrée, Orel, Gauger & Pfnür	*Review of Managerial Science*	Quantitative	Institutional theory Spatial theory	User preferences. CWS attributes. Motivations.
2020	Bouncken, Aslam & Qiu	*Business Horizons*	Qualitative	Socio-material theory	Matchmaking tools.
2020	Kopplin	*Review of Managerial Science*	Quantitative	Game theory Technology acceptance model	Digital tools for networking and collaboration. Integrating the role of personal innovativeness.
2020	Paje, Boco, Gloria & Go	*Journal of Physics: Conference Series*	Quantitative	Motivation-hygiene theory Yerkes-Dodson Law	Employee engagement. Collaborative capability.
2020	Rese, Kopplin & Nielebock	*Journal of Knowledge Management*	Quantitative	Knowledge management theory. SCT	Factors influencing KS and creative performance in CWS.
2020	Tremblay & Scaillerez	*Journal of Innovation Economics & Management*	Qualitative	Open innovation	Corporate strategies Source of external knowledge.

Table 2. Corporate coworking review

Author(s)	Corporate view	Motivations	Outcomes	Interferences
Bouncken et al. (2017)	Internal types (open and closed). External types in independent CWS.	Creative atmosphere. Open and flexible collaboration. Architecture and design.	Job satisfaction. Motivation. Autonomy. Knowledge sharing. Idea creation.	Opportunistic behaviour. Undermining competition. IP rights and regulations.
Jakonen et al. (2017)	Internal.	Flexibility.	Internal corporate coworking lacks employee freedom. Serendipitous encounters. Social support.	Ignorance of contemporary work.
Josef (2017)	Third work location.	Flexibility. Boundary management.	New impulses. Signal for change and trust. Networking, serendipity, and knowledge sharing. Productivity and creativity.	Possibility of retreat. Data protection and privacy. Employers' coordination. Challenging work and leadership culture. No measures of outcomes.
Schmidt and Brinks (2017)	Boundaryless work.	Idea testing. Alternative business models. Flexible	Develop new ideas. Interdisciplinary collaboration.	Challenging facilitation of interdisciplinary collaboration. Limited research on innovation

		cooperative structure.		processes in CWS.
Marchegiani and Arcese (2018)	Distributed organisational practice.	Design and atmosphere. Teleworking facilities. Collaboration opportunity. Physical and digital social interaction.	Inter-organisational relationships. Increase employees´ well-being, motivation, and productivity.	Learning difficulties in a hybrid and distributed work context.
Weijs-Perrée et al. (2018)	Real-estate development.	Cross-team work.	Fresh talent. Promote innovation. Raise productivity.	Too much diversity may obstruct knowledge sharing. Users frequently change. Change of user characteristics and preferences.
Blagoev et al. (2019)	Commercial CWS.	Work-leisure. Flexibility.	Interplay of formal and informal relationships.	CWS can become ‘‘organisational’’ to varying degrees at different times.

Bounchen and Aslam (2019)	Spatial co-locations.	Support projects. Diversity. Teams with internal members and external partners. Shared resources.	Short distance, easy exchange, trust, openness, cooperation, tacit knowledge sharing. Enhance the knowledge base for innovative projects.	Negative interpersonal relationships. Challenges in the knowledge sharing processes. Challenges of collaboration–competition "coopetition". Managerial challenges.
Capdevila (2019)	Corporate social innovation.	Social innovation possibilities. Attraction for local communities.	External sources of creativity. Extrinsic motivation. Co-developed knowledge. Economic benefits.	Solely extrinsic motivation might inhibit creativity.
Cheah & Ho (2019)	Young companies.	Support operations. Flexibility. Physical design.	Ideas of higher quality. Economic value creation.	CWS operators struggle to configure the social climate to meaningful support.
Clifton et al. (2019)	Independent. Serviced. Franchise based.	Expand social and professional network. Creative environment. Flexibility. Cost-effectivity.	New business opportunities. New products or services. Increased productivity.	Blurring distinctions between CWS and "corporate coworking" in franchise-based serviced offices.

Orel and Almeida (2019)	SMEs and employees of large firms as new target groups.	Inspiring and dynamic atmosphere. Affordability. Design. Flexibility.	Knowledge sharing. Efficiency and productivity. Spontaneous and moderated social interaction.	Optimised comfort levels for diverse users. Users´ identification with both community and CWS itself.
Appel-Meulenbroek et al. (2020)	Alternative form of space provision.	Support. Flexibility. Affordability. Creative atmosphere.	Access to necessary resources. Knowledge sharing. Generate new ideas.	Too much diversity may obstruct knowledge sharing. Frequent replacement of members.
Bouncken et al. (2020)	Internal CWS. External corporate coworking.	Interior design and architecture. Motivate and inspire. Expose employees to external talent and expertise.	Serendipitous environment boost creativity and imagination. Feedback on new ideas.	Struggle to understand and adapt the socio-emotional effects of CWS. Challenging to focus on one idea at a time. Shared resource unavailability.
Kopplin (2020)	Employees sited at same or different CWS.	Infrastructure enabling online and offline environments to achieve goals.	Help with challenges. Learning. Connecting with collaboration partners.	No evidence of an impact of personal innovativeness. Coordination problems.
Paje et al. (2020)	New creative workspace.	Flexible workplace design.	Autonomy. Multiplied connections with	Employees may hesitate in initiating

		Learning and networking opportunities.	talents. Easy flow of ideas and knowledge. Social support. Maximise skills.	interaction with other coworkers.
Rese et al. (2020)	SMEs and large enterprises.	Interaction. Mutual support. Inspiration and exploration. Flexibility.	Knowledge sharing. Stimulation of creativity. Collaboration.	Exchange relationships may suffer from opportunistic behaviour. Risk of misuse of information.
Tremblay & Scaillerez (2020)	Employees from companies of all sizes.	Networking possibilities and access to external knowledge. Flexibility. Cost reductions.	Improve quality of life. Reduce commuting time. Increase knowledge exchange. Fuel creativity and innovation.	Noise and distractions.

Table 3. Employee creativity view

Author(s)	Creativity view	Key findings
Bouncken et al. (2017)	Creativity and innovation possibilities.	Creativity and innovation emerge from the open and flexible collaboration. Stimulating architecture and design.
Jakonen et al. (2017)	Ideology of creativity and innovation embedded into CWS. CWS as creative spaces.	Creative work can be accomplished only through social interaction.
Josef (2017)	Innovation management perspective. Individual creativity.	Surprisingly, the majority of the corporates did not prefer CWS for creative work. Some employees got new impulses and ideas.
Schmidt and Brinks (2017)	Communities of practice as drivers of creativity and innovation.	Design and layout foster creativity. Communities are perceived a fertile ground for creative processes.
Marchegiani and Arcese (2018)	Organisational design and office layout to foster creativity.	Layout, community, and digital support foster creativity. Simultaneous physical and digital interactions lead to innovative outcome.
Weijs-Perrée et al. (2018)	Creative workflow by spontaneous communication and interaction.	Enterprises try out CWS to promote innovation by optimising cross-team work.
Blagoev et al. (2019)	Place for spontaneous sharing of ideas. Focus on creative workers.	Sense of both community and individuality foster creative spirit.

Bounchen and Aslam (2019)	Co-location that ignites the social disembodiment of ideas.	Co-location can synthesise domain-related knowledge sharing and promote inter-domain learning. Combination and recombination of ideas open new creative horizons.
Capdevila (2019)	Collaborative spaces that motivate individuals to participate in collective creative dynamics.	Companies benefit from external sources of creativity. Flexibility and improvisation in CWS may foster creativity.
Cheah & Ho (2019)	Space creativity of CWS.	CWS designed for creativity generate better ideas. Creativity in CWS can have significant impacts on business model innovation of tenant firms.
Clifton et al. (2019)	Encourages idea development and idea evaluation.	Mechanisms for developing new ideas. Creativity through fair and constructive idea evaluation.
Orel and Almeida (2019)	Vibrant and creative atmosphere for sharing ideas.	Knowledge sharing attitude and behaviour improve coworkers' creativity. The outcome depends on collaboration orientation.
Appel-Meulenbroek et al. (2020)	Vibrant and creative atmosphere.	Most important CWS attribute is the creative atmosphere.
Bouncken et al. (2020)	CWS aim to inspire and enhance creativity.	CWS may use colour themes, casual furniture, and multiple lighting arrangements to foster creativity. CWS should provide infrastructure, resources, and technology for idea development.

Kopplin (2020)	Creativity as a process of combining knowledge. Aim at stimulating creativity and innovativeness.	Degree of autonomy moderate creative behaviour. CWS may encourage collaborative work groups with diverse skills and norms sharing ideas and knowledge.
Paje et al. (2020)	CWS as creative hubs.	CWS is an opportunity for HR to redefine traditional workspaces to infuse diversity and knowledge flow.
Rese et al. (2020)	Creativity as an individual-level construct.	Knowledge sharing attitude and behaviour improve coworkers´ creativity. The outcome depends on the collaboration orientation.
Tremblay & Scaillerez (2020)	CWS designed to stimulate creativity and innovative spirit. Access to ideas from outside the company.	Spatial planning, meeting possibilities, conviviality, facilitators, and human recourses are crucial for knowledge sharing and creativity. Shared values promote trust, exchange, and creativity CWS may stimulate creativity but not necessarily.

PAPER 2:
Digital knowledge sharing and creative performance: Work from home during the COVID-19 pandemic

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Abstract

The outbreak of the COVID-19 pandemic and the resulting social distancing requirements have led to major disruptions in the world of work. The outcomes of the enforced and large-scale work from home (WFH) practices are currently largely unexplored. This study aims to address this gap in the research by investigating the external and internal digital knowledge sharing (DKS) and creative performance (CP) of employees under these extraordinary circumstances. The social capital theory was utilized as the theoretical lens for examining the associations of DKS and CP with demographic, individual, and organizational factors. An online cross-sectional survey was carried out among knowledge workers based in Norway during the pandemic lockdown. The study results indicate that internal and external DKS are significant predictors of CP in the WFH context during the COVID-19 pandemic. Females and older employees are more likely to engage in external DKS than their counterparts. Furthermore, individual motivation is found to be positively associated with internal DKS, external DKS, and CP. The findings suggest that increased use of digital platforms helps increase CP in the WFH setting resulting from the pandemic. Various theoretical and practical implications are discussed, and future research avenues are proposed.

Keywords

COVID-19 pandemic; Creative performance; Digital knowledge sharing; Social capital; Work from home

1. Introduction

The year 1666—when the Great Plague of London had led King Charles II to impose a lockdown—was Sir Isaac Newton's *annus mirabilis*, or "year of wonders," during which he made groundbreaking discoveries, including the law of gravitation (Whiteside, 1966). Enforced work from home sparked his creativity and problem-solving skills. Given the current situation with the COVID-19 pandemic and widespread lockdowns, the objective of this study is to investigate whether higher creative performance could be a potential outcome for individuals who work from home during these times.

The COVID-19 pandemic is one of the most devastating crises of the modern times, with profound consequences for economies, organizations, and workers all over the globe (Choudhury et al., 2020; Margherita et al., 2021). By March 2021, approximately 123 million have been infected with COVID-19 globally and more than 2.7 million have perished because of the disease (WHO, 2021). Experts have proclaimed that the COVID-19 pandemic has caused a deep economic crisis—i.e., declining economic growth and deteriorating employment prospects (Baert et al., 2020; OECD, 2020). Preliminary studies have suggested that the negative implications of the pandemic and associated control measures (e.g., lockdowns, social distancing, working from home, etc.) have resulted in increased anxiety (Usher et al., 2020), stress (Mimoun et al., 2020), and productivity loss (Goodell, 2020). However, scholars have also highlighted that the crisis has a silver lining. Recent studies have indicated that the pandemic has led to an exponential boost in the growth and use of digital communication and supporting technologies because organizations are being forced to innovate and change (Chandra et al., 2020; Savić, 2020). In addition, the pandemic has resulted in a paradigm shift in terms of flexible work arrangements (Lee & Lee, 2021).

At the beginning of March 2020, numerous countries began implementing various regulations in an attempt to contain the spread of COVID-19, including lockdown (partial or total), self-isolation, and social distancing measures (Davison, 2020; Yoo & Managi, 2020). Organizations were also instructed to implement measures related to social distancing at their workplaces. As a result, they were forced to impose work from home (WFH) on their employees (Jaiswal

& Arun, 2020). Immediately, an overwhelming majority of knowledge workers had no other choice but to switch to the WFH practice overnight (Yang et al., 2020).

In the present study, WFH is understood as a work practice in which an employee carries out work-related activities from their home instead of being physically present at an employer's office or other location, predominantly using digital technology (Allen et al., 2015; Garrett & Danziger, 2007). WFH practice during the COVID-19 pandemic implies that knowledge workers must accomplish their work tasks from their homes with almost no face-to-face communication (Brem et al., 2021). Due to the absence of face-to-face interaction for purposes of knowledge sharing, they must rely on digital platforms to replace their previous co-located interactivity. Digital platforms refer to shared, common sets of communication and collaboration tools that connect knowledge workers digitally to one another in real-time (Elia et al., 2020). Numerous platforms have been adopted and are widely being used by employees who WFH during the pandemic (Brem et al., 2021), including video conferencing solutions (e.g., Zoom, Skype, Google Meet), enterprise social media (e.g., Slack, Workplace), and file-sharing tools (e.g., SharePoint, Dropbox, Google Drive). Scholars have suggested that digital platforms are extensively used to build professional relationships (Golden, 2006) and that they influence the creative performance (CP) and knowledge sharing (KS) of employees (Chandra et al., 2020; Van der Meulen et al., 2019). CP refers to the individual production of novel and appropriate ideas (Zhou & Oldham, 2001). In the current study, CP is utilized to evaluate creativity because it relates to how employee work performance is influenced by social interactions, contextual factors, and access to heterogenous knowledge (Amabile, 1996; Perry-Smith & Shalley, 2003).

Studies on WFH prior to the COVID-19 pandemic have indicated that teleworking (including WFH) results in higher CP of employees in comparison to work from office settings (Naotunna & Zhou, 2018; Vega et al., 2015). The major reasons for this include flexibility, autonomy, and lack of distractions in WFH setting (Alge et al., 2006; Amabile et al., 2002). Furthermore, scholars have already observed that KS practices positively influence the CP of employees in telework environments (including WFH ones) prior to the COVID-

19 pandemic (Bélanger & Allport, 2008; Van der Meulen et al., 2019). In other words, KS is one of the most important antecedents of CP (Kremer et al., 2019; Lee, 2018). However, these associations might not hold true during the large-scale enforcement of the WFH situation in the ongoing COVID-19 pandemic. WFH during the pandemic primarily differs from the WFH practice in the pre-COVID-19 era because the former is unprecedented (Choudhury et al., 2020), rapidly introduced (Dwivedi et al., 2020), and enforced (Waizenegger et al., 2020).

There is barely any research on how WFH during the pandemic affects the digital knowledge sharing (DKS) and CP of employees. Jaiswal and Arun (2020, p. 18) have examined the impacts of WFH during the lockdown in India and have discovered "sparks of creativity" among employees. Similarly, other scholars have pointed out that DKS is crucial for CP (Chen et al., 2020), especially in a WFH context (Van der Meulen et al., 2019). In contrast, a recent French study has found that employees who WFH do not display an increase in CP (Mercier et al., 2021). Furthermore, Waizenegger et al. (2020) have found that the reduction of spontaneous meetings while WFH during the pandemic inhibits KS. The WFH literature before the COVID-19 crisis suggested that influential roles were played by demographics (Soda et al., 2019), individual factors (Kim et al., 2018), and organizational factors (Moolenaar et al., 2014) in relation to the KS and CP of knowledge workers. However, it is unclear whether these and similar results are still valid during pandemic related WFH. Additionally, we do not yet know what kinds of work practices will exist in the post-COVID-19 era in terms of DKS and CP. The COVID-19 crisis involves disruptions that are worthy of examination, especially considering the fact that DKS and CP are widely regarded as main determinants of organizational survival and competitiveness (Anderson et al., 2004). This becomes particularly important during uncertain times—like the current COVID-19 crisis—because the generating and sharing of knowledge and ideas are essential activities for adapting to changing demands (Roskes, 2015).

To uncover how DKS and CP are linked and affected by the current distinct WFH practice, we conducted a cross-sectional survey among 282 knowledge workers in Norway during the lockdown period. Norway is an open and small economy (Aastveit & Trovik, 2012), frequently considered to be an early adopter of digital technologies (European Commission, 2020). Knowledge workers are

professionals who have high education or experience and whose work relates to the creation, transformation, or utilization of knowledge (Davenport, 2005). The three main research questions (**RQs**) investigated by the current study are:

- **RQ1**. What is the association between the DKS and CP of knowledge workers while WFH during the pandemic?
- **RQ2**. What is the association between the demographic, individual, and organizational factors and the DKS and CP of knowledge workers while WFH during the pandemic?
- **RQ3.** How do knowledge workers evaluate their work practices, DKS, and CP in the post-COVID-19 pandemic era?

The study utilized the social capital theory (SCT) as its theoretical framework to examine the empirical associations between the study variables. **RQ1** and **RQ2** were answered using the cross-sectional survey data, while **RQ3** was answered using the qualitive data provided by the study participants in response to an open-ended essay question that was also part of the survey.

The novelty and contribution of this study are threefold. First, it explored contemporary phenomena—i.e., DKS and CP—during the WFH practice in midst of an ongoing pandemic. Second, the study considered associations that have not been investigated in the current pandemic context. Third, the research context of the study is Norway, a technologically advanced country (Breene, 2016) with high social capital in terms of trust in the society (Newton, 2001) that is recognized by a strong social safety net (Bakko, 2002).

The rest of the paper is structured in the following manner. Section 2 presents the background literature. Section 3 is dedicated to the theoretical foundation and hypotheses development. Methods and results are presented in Sections 4 and 5, respectively, while Section 6 focuses on discussion. Finally, the conclusions, implications, limitations, and future research recommendations are addressed in Section 7.

2. Background literature

2.1 Creative performance (CP)

In turbulent times of crisis, when organizations face unpredictable challenges, creativity is of crucial importance (Anderson et al., 2014). Scholars recognize creativity to be a way of coping with uncertainty by challenging old assumptions and trying new things (Ford, 1996). CP refers to individual creativity and includes risk-taking, adopting new ways of thinking and doing, and initiating change (Ford et al., 2008; Goh et al., 2020). Similarly, CP at the workplace is defined as an individual employee's generation of novel ideas, products, services or procedures, that are potentially useful for the organization (Amabile, 1996; Zhou & Oldham, 2001). Woodman et al. (1993) have provided an interactional perspective on CP, which posits that CP is a consequence of complex interactions between individual (e.g., motivation) and contextual factors (e.g., organizational climate).

Research across disciplines has demonstrated that integrating digital technologies can effectively stimulate CP (Aral & Weill, 2007; Cai et al., 2020). A growing body of research has suggested that social relations that are mediated by digital platforms could be just as important as co-presence for fostering creativity (d'Ovidio & Gandini, 2019). Cai et al. (2020) have noted that employees with digital skills, who are motivated and provided with necessary digital tools, become more engaged in creative problem solving.

Scholars have argued that creativity and innovation are crucial for firms—not just to survive but in order to thrive in the post-COVID-19 world (Chesbrough, 2020; Cohen & Cromwell, 2020). Hence, it is more important than ever to study how CP can be fostered in these challenging times. However, since COVID-19 is a recent phenomenon, we do not presently know how firms can facilitate creativity while their workforce is WFH during this ongoing crisis—and is likely to continue WFH even in the post-pandemic era.

2.2 Digital knowledge sharing (DKS)

KS is a critical success factor of knowledge management (Blankenship & Ruona, 2009). It can be defined as activities that involve the transfer of knowledge

between individuals and organizations (Lee, 2001). In the present study, DKS refers to those activities through which employees share knowledge digitally with actors within or outside their organization (Lin, 2007; Luo et al., 2021). Scholars have argued that the use of digital platforms is a critical KS enabler in contemporary organizations (Lee, 2018). Rather than co-located KS, DKS is the phenomenon under examination in this study because of the completely digitally mediated exchange of information and ideas in the pandemic-related WFH setting. DKS goes beyond the standard knowledge transfer process and should, in light of the "practice-based orientation" of knowledge, be regarded as a social phenomenon (Brown & Duguid, 2001).

DKS can proceed at both the internal level (e.g., colleagues and supervisors) as well as the external level (e.g., customers and external experts), and scholars have recommended including both of these dimensions when investigating DKS (Charband & Navimipour, 2016; Lee et al., 2020). However, limited prior literature has examined the associations between internal and external DKS and CP (Rese et al., 2020). Carmeli et al. (2013) have highlighted the complex associations between the internal and external DKS and the creative problem-solving capacity of employees, thereby improving the overall CP. Similarly, Van der Maulen (2019) has suggested that the integration of diverse expertise from multiple digital sources, both within and outside an organization (i.e., internal and external DKS), can foster a higher level of CP in a WFH context.

Scholars have further argued that fostering DKS during the pandemic is invaluable for firms (Duarte Alonso et al., 2020). However, at present, we have only a limited understanding of how DKS unfolds in large-scale WFH settings (Waizenegger et al., 2020). This is an important area to understand because, in the post-COVID-19 era, the assumption is that hybrid work models that include a mixture of office work and WFH are becoming the new normal (Jaiswal & Arun, 2020).

2.2.1 Internal DKS

Internal knowledge refers to knowledge that is present within organizational borders (Jensen & Szulanski, 2004). It is based on the insight and expertise that an organization's employees already possess (Carmeli et al., 2013). According to the knowledge-based view (Grant, 1996), the knowledge that is embedded

within a firm is a crucial resource for generation of ideas. Internal DKS involves the virtual dissemination of this internal knowledge throughout a department or an entire organization (Yang, 2004).

The pivotal role of DKS in CP has widely been acknowledged among scholars (Charband & Navimipour, 2016). According to Cummings (2004), one main objectives of DKS is collaboration with colleagues to solve problems and generate new ideas. A high degree of internal DKS supports the learning process of employees and may consequently enhance the creative skills of individuals, which constitutes a fundamental building block of CP (Sosa, 2011). However, there currently a lack of research on how the pandemic impacts the association between internal DKS and CP.

2.2.2 External DKS

Individuals and organizations might also need outside sources of expertise to complement their own and assist them in generating new knowledge (Nonaka & Takeuchi, 1995). Firms are increasingly following an open innovation approach, combining internal ideas with external knowledge (Chesbrough, 2020; Ferraris, Vrontis, et al., 2020). Scholars have shown that employees with relations that go beyond organizational boundaries perform better (Cross & Cummings, 2004; Ferraris, Bogers, et al., 2020). In an online environment, DKS between actors with different expertise and know-how makes it possible to approach a problem or task from alternative angles (Tortoriello et al., 2012). External DKS provides diversified knowledge through employees' boundary spanning knowledge networks (Carmeli et al., 2013). However, it is not known at present how the pandemic-related disruptions in organizations—including the acceleration of digital transformation—affect DKS with sources outside a firm (Savić, 2020).

3. Theoretical framework and hypothesis

In this study, SCT served as the theoretical lens through which we examined the associations between the DKS and CP and the demographic, individual, and organizational variables. Social capital (SC) can be understood as the resources that employees obtain through their social relationships and networks (Lin, 2002). Nahapiet and Ghoshal (1998) have posited that these relationships and resources influence the extent to which KS occurs among colleagues (internal

DKS) and within interorganizational networks (external DKS). The structural dimension of SC involves relationship patterns and can be analyzed from the perspective of social interaction and network ties among the actors (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998). Strong ties involve frequent interactions and a high level of emotional closeness, while weak ties represent the opposite (Granovetter, 1973). Scholars have also considered the intensity of social interactions and the strength of network ties in relation to facilitating and constraining creative work (Perry-Smith & Shalley, 2003).

SCT is a framework that is frequently used to better understand KS and CP as well as the associations between them (Chen et al., 2008). Previous literature has suggested that social interactions and network ties can explain how KS positively influences CP in offline (Carmeli et al., 2013) as well as online settings (Korzynski et al., 2019). Similarly, scholars have highlighted the importance of interactions and ties in explaining internal and external DKS in telework settings (Golden & Raghuram, 2010; Van der Meulen et al., 2019). Furthermore, researchers have applied SCT to explore associations between KS and CP using demographic variables such as age and gender (Soda et al., 2019), individual factors such as intrinsic motivation (Kim et al., 2018), and organizational factors such as innovative climate (Moolenaar et al., 2014).

Hence, in line with the seminal literature, we drew on SCT to evaluate DKS and CP among employees who WFH during the COVID-19 pandemic. Our proposed research model consisted of five main components. DKS (internal and external) and CP were the dependent variables, while the independent variables were demographic, individual, and organizational factors. The proposed relationships between the study variables are presented in Figure 1. A detailed description of the variables is presented in the Table 1.

Table 1

Study Measures and Their Operationalization

Study Measures	Operationalization (References)
Internal DKS	Digital sharing of knowledge throughout a department or an entire organization (Cummings, 2004; Yang, 2004).
External DKS	Digital sharing of knowledge through knowledge networks outside an organization (Carmeli et al., 2013; Pacheco et al., 2020).
CP	Individual employee's generation of novel ideas, products, procedures, or problem solutions that are potentially useful for an organization (Amabile, 1996; Zhou & Oldham, 2001).
Demographics	Demographics are operationalized as age (Romero et al., 2012), gender (Ma & Yuen, 2011), position of an employee as either a manager or non-manager (Hu & Randel, 2014), organization size in terms of the number of employees (Serenko et al., 2007), and organization type as either private or public (Hartley & Benington, 2006).
Individual factors	Individual factors are operationalized as stress (work-related) (Hon et al., 2013), motivation (intrinsic and pro-social) (Golden & Gajendran, 2019; Grant & Berry, 2011), and use of digital platforms (tools for video meetings, enterprise social media, file-sharing, etc.) (Golden & Raghuram, 2010; Wasko & Faraj, 2005).
Organizational factors	Organizational factors taken into consideration are the impact of the pandemic crisis and innovative climate. Impact of crisis refers to the implications of a crisis for an organization in terms of KS and creativity (Cohen & Cromwell, 2020; Ford et al., 2008). Innovative climate refers to the shared perception among the employees regarding openness to new ideas (Goh et al., 2020; Van der Vegt et al., 2005).

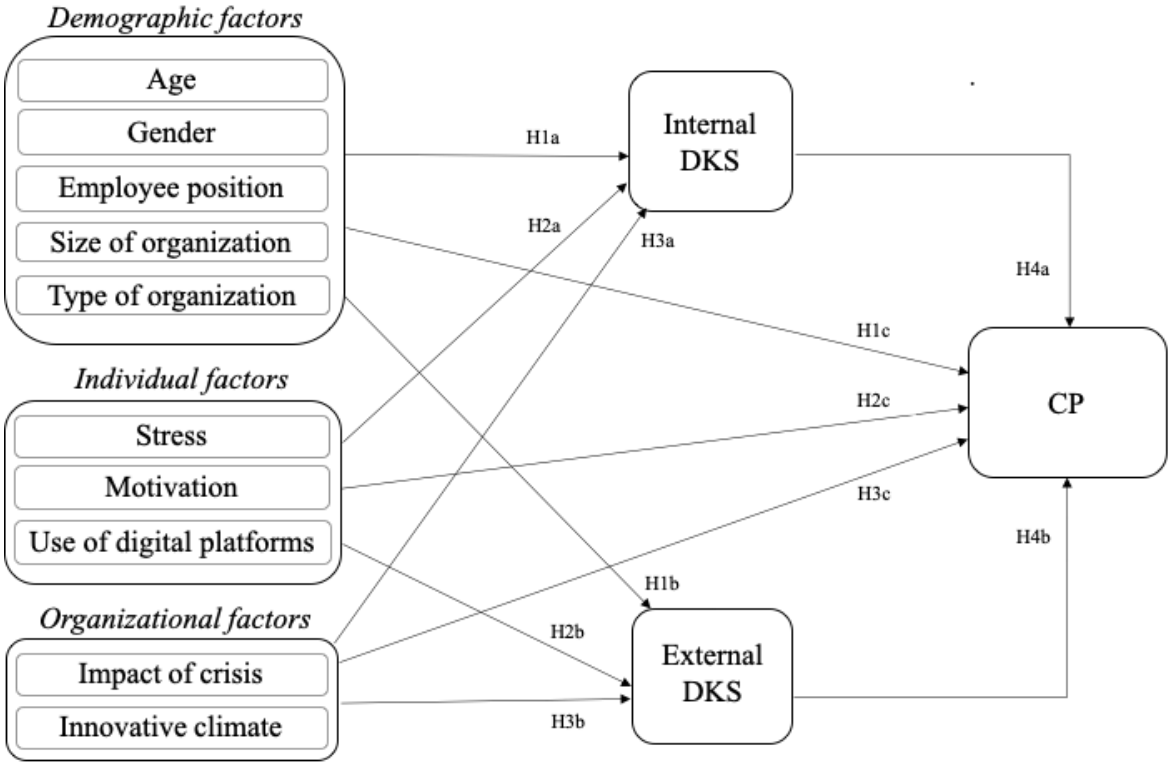

Fig. 1. *Our Research Model*

3.1 Demographic variables, DKS, and CP

Prior literature has suggested that demographic variables—such as employee age, gender, and position, organization size (number of employees), and organization type (private vs. public)—are influential variables for predicting DKS (Wang & Noe, 2010) and CP (Sousa & Coelho, 2011). A major reason for this is the fact that demographic factors can impact social interactions, which in turn facilitates the formation of network ties—a crucial element for KS and CP (Soda et al., 2019).

With respect to age, Romero et al. (2012) have suggested that middle-aged employees are better equipped to solve complex problems in which they are more experienced than their young counterparts. However, other studies have suggested that in networks that require the use of digital tools, older employees experience more difficulties with DKS in comparison to their younger colleagues (Marquié et al., 2002; Nielsen, 2002).

Regarding gender, some scholars have implied that there might be slight differences between DKS and CP. Ma and Yuen (2011) have demonstrated that male participants rate digital social networks for KS more highly than their female counterparts. In addition, researchers have suggested that females might have a lower CP capability in some cases as a result of gender stereotyping (Foss et al., 2013). Prior literature has also highlighted that the position of an employee in an organization (manager vs. non-manager) could affect DKS, especially when it comes to heterogenous knowledge sharing, which is essential for CP (Hu & Randel, 2014). Managers might have better access to knowledge and ideas because they are often involved in multiple networks with both strong and weak ties (Soda et al., 2019). In relation to organization size, Serenko et al. (2007) have found that the more employees that an organization has, the less effective its internal KS is. Recent literature has suggested that small and medium-sized enterprises (SMEs) are at the forefront of DKS and CP partly due to their limited size (Tassabehji et al., 2019).

Internal and external DKS are contemporary characteristics of both private and public organizations (Sandhu et al., 2011). Hartley and Benington (2006) have noted that in the private sector, external KS unfolds in relatively closed networks. Nevertheless, public service settings are characterized by more open and widespread KS. These scholars have concluded that the strength and quality of network ties means more than the scope of the network when it comes to creativity and innovation. Based on this, the following hypothesis was proposed:

H1. Demographic variables (age, gender, employee position, organization size, and organization type) are significantly associated with (a) Internal DKS, (b) External DKS, and (c) CP.

3.2 Individual variables, DKS and CP

At the individual level, stress and motivation are believed to affect both DKS and CP. Scholars have demonstrated that a decreased level of stress and an increased level of employee well-being support both KS and CP (Hoff & Öberg, 2015; Wagner & Growe, 2019). However, this appears to be more complex. Hon et al. (2013) have indicated that challenge stressors are associated with high CP, while stress related to job insecurity and role ambiguity can have the opposite effect.

Golden and Gajendran (2019) have suggested that CP significantly relies on intrinsic motivation and less on employee work location, which is also supported by seminal research (Amabile, 1988; Ford, 1996). Other scholars have highlighted that prosocial motivation, with a focus on outcome that is useful for others, is strongly associated with CP (Grant & Berry, 2011). Utilizing SCT, Wasko and Faraj (2005) have concluded that individual motivations foster DKS in online social networks.

In their study of employees who are spatially separated from each other, Golden and Raghuram (2010) have found that limited use of digital platforms might create uncertainty and undermine KS in general. In contrast, extensive use of digital platforms tends to provide more information crucial for CP. However, researchers who build on SCT have also noted that the availability of digital technologies does not guarantee that either internal or external DKS will actually occur (Wasko & Faraj, 2005). Based on this, the following hypothesis was proposed:

H2. Individual factors (stress, motivation, and digital platform use) are significantly associated with (a) Internal DKS, (b) External DKS, and (c) CP.

3.3 Organizational variables, DKS, and CP

The impacts of the COVID-19 crisis on organizations might include slowdown of activity, client and customer defection, lower revenue, layoffs and dismissals, supply disruptions, and cybersecurity threats (Alstadsaeter et al., 2020). Jaiswal and Arun (2020) have emphasized that massive COVID-19 disruptions involve involuntary organizational responses. A pandemic lockdown could inarguably have negative consequences for many companies in terms of both internal/external KS and creativity (Cohen & Cromwell, 2020). On the other hand, scholars have proposed that uncertainty in times of crisis actually motivates exploration and is at the root of creative endeavors (Ford et al., 2008). Hence, the extent to which the pandemic crisis impacts organizations negatively is an aspect worth investigating.

Innovative climate is generally understood as a shared perception among employees regarding the procedures and practices that promote the production

and implementation of novel ideas (Van der Vegt et al., 2005). It includes openness to challenging traditional ways of doing things, encouraging idea exploration, and learning from internal and external actors (Van der Vegt et al., 2005). Previous research has shown that an organization's innovative climate plays a vital role in shaping its employees' CP (Jaiswal & Dhar, 2015) and improving KS behavior (Liu et al., 2012). Thus, the following hypothesis was formulated:

H3. Organizational factors (impact of COVID-19 crisis and innovative climate) are significantly associated with (a) Internal DKS, (b) External DKS, and (c) CP.

3.4 DKS and CP

Theoretical contributions from studies on SC have suggested that a significant relationship exists between KS and CP in non-digital settings (Chen et al., 2008). Similarly, scholars have found a positive association between both internal and external DKS and CP (Korzynski et al., 2019). Based on an SCT perspective, the following hypothesis was proposed:

H4 (a) Internal DKS and (b) external DKS have a positive association with CP.

4. Methodology

4.1 Sample and procedure

The participants in this study were knowledge workers based in Norway. They were recruited from both private and public firms located in southern and eastern parts of Norway. The developed research model was evaluated using an online cross-sectional survey design. The distribution of the survey was made nationally via emails as well as social media platforms (e.g., LinkedIn and Facebook). The participants were assured of confidentiality and anonymity with regard to their participation.

The Norwegian government imposed a nationwide lockdown beginning on March 12, 2020. We wanted to study various associations after the disruption shock and sudden change in the work setting had somewhat stabilized and employees had some time to consider and adjust to unforeseen WFH

arrangements before we conducted the study. Hence, data collection was performed from April 2 to May 4, 2020. A total of 282 individuals participated in the study but 45 responses were removed—either because of incomplete data or because respondents did not engage in WFH. Thus, the final dataset comprised 237 respondents and was used for subsequent data analysis. The mean age of the respondents was 42 years, 50% were females, and 61% worked in the private sector.

4.2 Measures

All study measures were examined using closed-ended questions. However, respondents´ expectations of work practices post-COVID-19 was evaluated using an open-ended question. Qualitative data were necessary to obtain an in-depth understanding of opinions and attitudes to the future of work.

4.2.1 Demographics

The study considered the demographic profiles of the respondents and the organizations at which they were employed. Respondent profiles were assessed sing five survey items. Three of these items were related to the respondent profiles, while the remaining two items evaluated the profile of their organizations (see Table 2). The demographic profile consisted of age, gender (male vs. female), and position of the employee within the organizational hierarchy (manager vs. non-manager), organization type (private or public), and organization size (less than 100 employees vs. more than 100 employees). The average age of the respondents was 42 years (SD = 6.6) and 50% of respondents were female.

4.2.2 Organizational factors

Organizational factors were assessed using two variables—namely, (a) How does the COVID-19 crisis affect your organization and (b) Innovative climate in the organization during COVID-19—where respondents were asked to evaluate their company’s attitude toward testing new ideas and solutions. Both items were evaluated using a 5-point Likert scale, where 1 = Very negative and 5 = Very positive.

4.2.3 Individual factors

Individual factors were assessed using three variables, which asked the respondents how the COVID-19 crisis affects them—namely, their (a) Motivation, (b) Stress, and (c) Use of digital platforms. Both items were evaluated using a 5-point Likert scale where 1 = Much less and 5 = Much more.

4.2.4 Creative performance

CP was measured using a single item, where the respondents were asked to compare and evaluate how their capability of coming up with new ideas and solutions has changed during the pandemic. It was evaluated using a 5-point Likert scale where 1 = Much lower and 5 = Much better.

4.2.5 Digital knowledge sharing

The study differentiates between two types of DKS—namely, internal DKS (sharing within an organization) and external DKS (sharing outside an organization). The response options were evaluated using a 5-point Linkert scale, where 1 = Much lower and 5 = Much better.

(a) Internal DKS: Internal DKS was reported based on the question: “How have internal interactions and knowledge sharing been during the lockdown?”
(b) External DKS: Survey participants reported on external DKS by responding to the question: “How have interactions and knowledge sharing been with people outside the company during the lockdown?”

4.2.6 Work practices post-COVID-19

The respondents were asked for their opinion about the future of work practices in post-COVID-19 times. These opinions were assessed using an open-ended question, where participants were asked to share their opinions concerning how work practices will permanently change after the COVID-19 pandemic.

4.3 Data analysis

The study utilized IBM SPSS 26.0, which is a widely used software for statistical analysis in the social science field. Cross-sectional data were analyzed using a variety of techniques—namely, an independent sample t-

test, a one-way ANOVA test, and linear regression analysis. The responses to the open-ended question related to the post-COVID-19 work practices were analyzed using thematic analysis of the qualitative comments or opinions of the participants.

Table 2

Descriptive Statistics on the Study Variables

Study Measures	**Study variable**	**Category**	**Percentage (Frequency)**
Demographics	Age	Below 30 years	16 (36)
		40-49 years	50 (111)
		Above 50 years	33 (44)
	Gender	Female	50 (111)
		Male	49 (109)
	Position	Manager	37 (85)
		Non-manager	62 (142)
	Type of organization	Private	61 (145)
		Public	39 (92)
	Size of organization	≤ 100 employees	58 (138) with less than a hundred employees
		> 100 employees	42 (99) with more than a hundred employees
Future of work practices	Permanent change	Yes	89 (174)
		No	11 (22)
	Type of changes	Open-ended question	(see table 8)

5. Results

The survey data suggest that 41% of the participating knowledge workers believed that their CP has increased and 22% believed that their CP has decreased while WFH during the COVID-19 pandemic. About 42% of knowledge workers indicated an increase in internal DKS, while 29% indicated a decrease in internal DKS. Similarly, 26% of knowledge workers believed that their external DKS has increased, while 31% suggested otherwise.

5.1 Relationships between demographic factors, DKS, and CP

The results of the Pearson correlation analysis revealed that external DKS has a weak positive correlation with age ($r = .18$, $p < 0.01$), a weak negative correlation with gender ($r = -0.15$, $p < 0.05$), and a weak negative correlation with organization size ($r = .17$, $p < 0.01$) (see Table 3). However, no significant relationship was found with employee position and organization type.

Independent sample t-test results suggest that females tend to engage more in external DKS than their male counterparts and that smaller organizations (< 100 employees) are more likely to share knowledge externally (see Table 4). Independent ANOVA-test results indicate insignificant age differences in relation to CP and internal DKS (see Table 5). However, the ANOVA-test results suggest significant differences between employees 30–40 years of age and those 50–60 years of age in terms of external DKS. Furthermore, the Post Hoc test results reveal that those 30–40 years of age possess higher external DKS in comparison to employees 50–60 years of age (see Table 6).

Table 3

Correlations Between the Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CP	1	0.24***	0.40***	0.05	-0.13	-0.14*	-0.07	0.09	0.06	0.34***	0.27**	0.19**	0.13
2. Internal DKS	.24***	1	0.31***	.05	-.06	-.01	-.07	-.08	0.16*	0.18**	0.14**	0.07	0.38***
3. External DKS	0.40***	0.31***	1	0.18**	-0.15*	-0.07	-0.17*	0.03	0.14*	0.20**	0.05	0.18*	0.01
4. Age	0.05	0.05	0.18**	1	0.12	-0.18**	0.10	0.01	-0.08	0.15*	-0.01	-0.11	0.03
5. Gender	-0.13	-0.06	-0.15*	0.12	1	-0.14*	-0.05	-0.28***	-0.06	0.01	-0.11	0.01	-0.06
6. Position	-0.14*	-0.01	-0.07	-0.18**	-0.14*	1	0.14*	0.17**	-0.01	-0.14	0.03	0.06	-0.04
7. Size of organization	-0.07	-0.07	-0.17*	0.10	-0.05	0.14*	1	0.24**	-0.03	-0.02	-0.03	0.05	0.17*
8. Type of organization	0.09	-0.08	0.03	0.01	-0.28***	0.17**	0.24***	1	-0.15	-0.02	0.17**	0.11	0.10
9. Stress	0.06	0.16*	0.14*	-0.08	-0.06	-0.01	-0.03	-0.15	1	-0.06	0.11	-0.02	-0.02
10. Motivation	0.34***	0.18**	0.20**	0.15*	0.01	-0.14*	-0.02	-0.02	-0.06	1	-0.07	0.12	0.20**
11. Use of digital platforms	0.27**	0.14*	0.05	-0.01	-0.11	0.03	-0.03	0.17**	4.11	-0.07	1	0.03	0.07
12. Impact of crisis	.19**	.07	.18*	-.11	0.01	0.06	0.05	0.11	-0.02	0.12	0.03	1	0.16*
13. Innovative climate	.13	.38***	.01	.03	-.06	-.04	0.17*	0.10	-0.02	0.20**	0.07	0.16*	1

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 4

Demographic Differences in CP, Internal and External DKS

CP							
Demographic variables	**Categories**	**Mean (SD)**	***F***	***t-value***	***df***	***p***	***d***
Gender	Female	4.40 (0.91)					
	Male	4.16 (0.92)	0.93	1.96	216	0.34	0.27
Position	Manager	4.43 (0.93)					
	Non-manager	4.17 (0.97)	0.19	2.00	213	0.67	0.28
Size of organization	<100 employee	4.32 (0.93)					
	>100 employee	4.19 (0.97)	0.06	1.00	222	0.81	0.14
Type of organization	Private	4.20 (0.94)					
	Public	4.37 (0.96)	0.65	-1.36	222	0.42	-0.19
Internal DKS							
Gender	Female	3.32 (1.14)					
	Male	3.19 (1.00)	**7.22**	**0.84**	**213**	**0.01***	**0.12**
Position	Manager	3.23 (1.08)					
	Non-manager	3.23 (1.07)	0.23	0.05	211	0.88	0.01
Size of organization	<100 employee	3.32 (1.11)					
	>100 employee	3.13 (1.00)	2.07	1.24	216	0.15	0.17
Type of organization	Private	3.31 (1.07)					
	Public	3.14 (1.06)	0.27	1.13	216	0.61	0.16
External DKS							
Gender	Female	3.13 (1.09)					
	Male	2.83 (0.98)	0.65	2.09	202	0.42	0.29
Position	Manager	3.06 (1.08)					
	Non-manager	2.92 (0.99)	1.62	0.94	193	0.20	0.14
Size of organization	<100 employee	3.11 (1.06)					
	>100 employee	2.76 (0.98)	0.08	2.38	202	0.77	0.34
Type of organization	Private	2.95 (0.99)					
	Public	3.01 (1.12)	1.56	-0.41	202	0.21	-0.06

Table 5

Results of the ANOVA-test Using Age, CP and DKS

	Sum of Squares	*df*	*Mean Square*	*F*	*p*
CP	1.51	2	0.75	0.84	0.43
Internal DKS	0.85	2	0.43	3.58	0.69
External DKS	7.60	2	3.80	3.58	< 0.05

Note. Degrees of freedom = *df*

Table 6

Results of the Post Hoc Test

Posthoc test	Variable	Groups		*Mean difference*	*Standard error*	*p*
Tukey's test	External DKS	30-40 years	40-50 years	-0.36	0.22	0.23
		40-50 years	50-60 years	-0.60	0.23	< 0.05

Note. *$p < 0.05$

5.2 Relationships between individual factors, DKS, and CP

The Pearson correlation analysis results show that internal DKS scores have a weak positive correlation with stress ($r = .16$, $p < 0.05$). On the other hand, external DKS scores have no significant relationships with individual variables. However, CP scores have positive correlations with two of the individual variables—namely, motivation ($r = .34$, $p < 0.001$) and use of digital platforms ($r = .27$, $p < 0.01$).

5.3 Relationship between organizational factors, DKS and CP

The correlation analysis results suggest that internal DKS scores have a medium positive correlation with innovative climate ($r = .38$, $p < 0.001$), while external DKS scores have a medium positive correlation with impact of crisis ($r = .38$, $p < 0.001$). The latter indicates that the more that organizations are negatively affected by the crisis, the less their employees engage in external DKS. No relationships between CP and organizational variables are revealed.

5.4 Relationship between DKS and CP

The analysis results reveal that CP has a moderate positive correlation with external DKS ($r = .40$, $p < 0.001$) and a weak positive correlation with internal DKS ($r = .24$, $p < 0.001$).

5.5 Predicting DKS and CP

Multiple regression analysis was performed to examine the relative influences of demographic, individual, and organizational variables in predicting internal and external DKS and CP among employees who WFH during the COVID-19 pandemic (see Table 7). The study results suggest that stress (individual) ($\beta = 0.16$, $p < 0.05$) and innovative climate (organizational) ($\beta = 0.40$, $p < 0.01$) positively predict internal DKS. Similarly, demographic variables—namely, age ($\beta = 0.15$, $p < 0.05$), gender ($\beta = -0.16$, $p < 0.05$), and organization size ($\beta = -0.18$, $p < 0.05$)—as well as one organizational variable—namely, impact of crisis ($\beta = 0.15$, $p < 0.05$)—significantly predict external DKS. Finally, the results of the multiple regression analysis suggest that individual factors—namely,

motivation (β = 0.28, p < 0.001) and use of digital platform (β = 0.29, p < 0.001)—as well as external DKS (β = 0.28, p < 0.001) positively predict CP. The multiple regression analysis explains 26.9%, 26.5%, and 37.4% of the variance found in internal DKS, external DKS, and CP, respectively.

Table 7

Predicting DKS and CP

Measures	Internal DKS			External DKS			CP		
Demographic	β	t	p	β	t	p	β	t	p
Age	0.10	1.41	0.16	**0.15**	**2.09**	**< 0.05**	0.04	0.55	0.58
Gender	-0.10	-1.45	0.15	**-0.16**	**-2.27**	**< 0.05**	-0.05	-0.73	0.47
Position	0.06	0.95	0.34	-0.01	-0.06	0.95	-0.09	-1.44	0.15
Type of organization	-0.12	-1.60	0.11	0.03	0.33	0.74	0.04	0.56	0.57
Size of organization	-0.11	-1.56	0.12	**-0.18**	**-2.47**	**< 0.05**	-0.01	-0.08	0.94
Individual									
Stress	**0.16**	**2.46**	**< 0.05**	0.11	1.58	0.12	0.06	0.84	0.40
Motivation	0.11	1.51	0.13	0.01	0.06	0.95	**0.28**	**4.17**	**< 0.001**
Use of digital platforms	0.04	0.59	0.56	-0.07	-0.96	0.34	**0.29**	**4.31**	**< 0.001**
Organizational									
Impact of crisis	-0.02	-0.25	0.81	**0.15**	**2.10**	**< 0.05**	0.08	1.22	0.23
Innovative climate	**0.40**	**5.91**	**< 0.001**	-0.05	-0.77	0.45	0.05	0.63	0.53
DV: KS									
Internal DKS							0.03	0.45	0.66
External DKS							**0.28**	**3.96**	**< 0.001**
R^2		26.9%			26.5%			37.4%	

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, β = Beta, t = t-value

5.6 Work practices post-COVID-19 pandemic

The thematic analysis of the open-ended item related to work practices after the COVID-19 pandemic suggest five broad themes—namely, digital platforms, WFH, flexibility, mobility, and supervision. The categorization and coding of the open-ended textual responses are presented in Table 8.

Table 8

Open and Axial Codes for the Qualitative Data

Axial code	**Open code**	**Some quotes**
Digital platforms	Digital collaboration tools	*"Forced use of digital collaboration tools (Hangouts, Teams) will open up for this to become a more widespread collaboration form"* [Male, Non-manager, Private sector]
	Video meetings	*"I think we will have more meetings with less physical participants. More meetings with external actors via Teams, Skype or similar"* [Female, Non-manager, Public sector]
	File-sharing platforms	*"We´ll share much more documents on sharing platforms, and we´ll work together on documents in the future"* [Male, Manager, Private sector]
	Webinars	*"More use of webinars to facilitate events with more participants"* [Male, Manager, Public sector]
	Online teaching	*"The coronavirus crisis has accelerated the use of digital tools for teaching and*

		meetings in higher education" [Male, Non-manager, Public sector]
	Adoption	*"I think we will adopt new technology and solutions faster. Now it has been proven that it went well when we were forced to do it"* [Male, Manager, Private sector]
Work from home (WFH)	Facilitation	*"My employer has now provided all with the necessary tools for home-office*" [Male, Manager, Public sector]
	Effectivity	*"I´m more effective when working from home, but of course without the kids running around my legs"* [Female, Non-manager, Private sector]
	Productivity	*"It is clear to me that my productivity doesn´t decrease when I work from home"* [Female, Non-manager, Public sector]
	Work satisfaction	*"Home-office is great! I want more of this in the future"* [Male, Non-manager, Private sector]
	Frequency	*"I think partly home-office will be more accepted, with emphasis on partly"* [Male, Non-manager, Private sector]
Flexibility	Working hours	*"Flextime contributes to increased creativity and loyalty"* [Female, Non-manager, Public sector]
	Work-family balance	*"More flexibility makes it easier for me to take care of the kids"* [Female, Non-manager, Public sector]

	Hybrid work	*"This will open up a more balanced way of working between my regular office and home"* [Female, Non-manager, Private sector]
	Performance	*"Work without deadlines is more difficult, especially if you work alone"* [Female, Non-manager, Private sector]
Mobility	Commuting	*"Especially for those who need to commute, it will be opened up for more home-office"* [Female, Non-manager, Private sector]
	Business travels	*"I´ll spend less time on traveling for meetings"* [Male, Non-manager, Public sector]
	Cost reductions	*"There will probably be tighter travel budgets in the future"* [Male, Non-manager, Public sector]
	Greenhouse gas emissions	*"Our new ways of working will reduce greenhouse gas emissions*" [Female, Non-manager, Public sector]
Supervision	Support	*"We need better support from managers and more internal training"* [Male, Non-manager, Private sector]
	Evaluation	*"There´s a lack of routines for evaluation"* [Female, Non-manager, Public sector]
	Project management	*"I hope our managers will introduce more distributed teams"* [Male, Non-manager, Private sector]

6. Discussion

The present study examined the relationship between DKS and CP while employees WFH during the COVID-19 pandemic. The associations between demographic, individual, and organizational factors, as well as DKS and CP, were examined. The study examined cross-sectional data obtained from 282 knowledge workers from Norway.

H1-H4 addresses the **RQ1** and **RQ2.** To begin with, **H1a–c** examined the associations between various demographic variables, DKS, and CP. The study results suggest insignificant relationships between demographic variables and internal DKS. A possible reason for such results could be the sudden transition to large-scale WFH practices, which allowed for internal DKS procedures and tools to be available to all employees, regardless of their age, gender, and position, as well as across all organization types (big vs. small, public vs. private), in order to maintain "business as usual" during the pandemic (Kirchner et al., 2021; Waizenegger et al., 2020). Following SCT, social relationships between colleagues existed prior to the pandemic (Zhang et al., 2021); hence, the enforced WFH practice did not affect the association between demographics and internal DKS.

In contrast, the results indicate that age does have a positive association with external DKS. This finding can be explained by the fact that older employees might have a broader social network outside the organization, as confirmed by prior research (Ng & Feldman, 2013). Consequently, older employees might have a higher external DKS capability that also applies in a WFH context.

With respect to gender, the results suggest that females engage in external DKS more than their male counterparts. This is consistent with the findings of Anderson and Haddad (2005), who have also suggested that females tend to build stronger social connections than males in DKS settings. The study results indicate a strong negative relationship between external DKS and organization size. A possible reason for this could be that larger organizations have larger in-house knowledge resources and are consequently less dependent on outside actors (external DKS), which is in line with previous research (Cummings, 2004).

The results indicate insignificant associations between external DKS, employee position, and organization type. The possible reasons for this finding could be: (a) Managers, as well as non-managers, have to rely on digital platforms for external DKS due to the WFH setting during the pandemic, so it is reasonable to assume that the preconditions for this are the same for both types of employees; (b) External DKS has no relationship with organization type. The enforced WFH practice hit both private and public sectors simultaneously with the same strength and scope (Bailey et al., 2020), which can help us make sense of this particular result. Furthermore, the results indicate insignificant associations between demographic variables and CP. These findings are inconsistent with prior literature, where significant associations were found (Foss et al., 2013). The possible reason for this finding could be the relatively flat structure of Norwegian organizations, which could facilitate broad inclusion in creative processes. Another possible reason could be that the joint confrontation of the COVID-19 crisis might have abolished the demographic dividing lines in relation to CP.

H2a–c examined the associations between various individual variables, DKS, and CP. A significant relationship between stress and internal DKS is found. Recent literature has suggested that the collective trauma of the pandemic might have increased the employees' levels of stress (Garfin, 2020), as a result of which employees tend to seek knowledge and social support from their colleagues and managers within the company (Wang et al., 2021). Similarly, it is reasonable to assume that an increase in stress is related to an increase in internal DKS. In comparison, the study does not find any significant association between stress and external DKS. This result can be explained using the aforementioned analogy that professional stressors caused by the pandemic and the related unforeseen lockdown have resulted in an increase in internal DKS, while they have had no impact on nor association with external DKS.

The study results suggest that motivation is positively associated with both internal and external DKS. This finding is consistent with Lin (2007) who has found motivational factors to be significantly associated with KS attitudes and intentions. Furthermore, (Nguyen, 2019) has also suggested that motivation is the primary trigger for DKS.

With respect to digital platforms, the results suggest—rather surprisingly—an insignificant association with both internal and external DKS. This finding, however, is consistent with Wasko and Faraj (2005), who have suggested that employees highly engaging in DKS are equally committed to the use of digital platforms in comparison to their counterparts. In addition, we also believe that the unprecedented shift from widespread face-to-face interaction to exclusively DKS during the enforced WFH situation could be another major reason why the association is found to be insignificant.

The results suggest that individual motivation and use of digital platforms are positively associated with CP. Prior literature has shown similar findings—e.g., Cai et al. (2020) have demonstrated that employees with digital skills and motivation to utilize digital tools become more engaged in creative problem solving. Hence, our results confirm that integrating digital platforms can effectively stimulate CP. Moreover, the significant relationship between motivation and CP is supported by a wide consensus in the previous literature (e.g. Ford, 1999; Shalley & Perry-Smith, 2001). In comparison, no significant relationship is found between stress and CP. Despite the fact that scholars have suggested such an association (Hon et al., 2013), the complexity of stressors during lockdowns (i.e., job insecurity, loneliness, anxiety, workload, work-life boundaries, etc.) might provide one possible reason for our finding that the relationship between stress and CP is insignificant.

H3a–c examined the associations between organizational variables, DKS, and CP. The study results suggest that innovative climate has a positive association with internal DKS. This finding is consistent with prior research, which has indicated that an organization's innovative climate plays a vital role in encouraging KS behavior (Goh et al., 2020; Liu et al., 2012). However, innovative climate is found to have an insignificant relation with external DKS. One potential explanation for this result could be that spatial isolation during WFH causes a perceived social distance from the organization, thus erasing the relationship between innovative climate and external DKS.

Surprisingly, our study results indicate no association between the organizational impact caused by the pandemic crisis and internal DKS. A possible reason for this could be that organizations have been affected differently, depending on the

business sector and market segment they are in (Nicola et al., 2020). Consequently, during the early pandemic phase (i.e., March–April 2020), no significant relationship between crisis impact and internal DKS had yet been able to manifest. However, the study results suggest that the impact of the crisis has a negative relationship with external DKS because more firms are negatively affected by the COVID-19 crisis, the less likely their employees are to engage in external DKS. The unprecedented pandemic lockdowns have caused major disruptions and have had dramatic consequences for many companies, as suggested by the recent literature (Cohen & Cromwell, 2020).

We did not find any significant associations between organizational factors and CP. This result is inconsistent with a recent study (Mercier et al., 2021) that has suggested that a negative organizational impact caused by the pandemic may motivate creative exploration (Mercier et al., 2021). In contrast, another study has suggested that the negative impact of the crisis may decrease CP (Cohen & Cromwell, 2020). One of the possible reasons for an insignificant association in the present study could be the fact that the participating Norwegian companies have broadly been affected by COVID-19, which is why organizational factors have no relationship with CP.

Similarly, the current study results reveal no association between innovative climate and CP, which is inconsistent with the prior literature (Goh et al., 2020; Jaiswal & Dhar, 2015). Scholars have indicated that strong ties and active participation in organizational actions support the employees' perception of innovative climate (Moolenaar et al., 2010). The full-time WFH practice resulting from the pandemic lockdowns might have decreased the employees' organizational activities and, consequently, neutralized the impact of innovative climate on CP.

H4a–b examined the associations between DKS and CP. The study results indicate that both (a) internal DKS and (b) external DKS have a positive significant relationship with CP. Scholars agree that information from multiple social networks with both strong and weak ties trigger idea generation in digital WFH settings (Carmeli et al., 2013; Oldham & Da Silva, 2015; Van der Meulen et al., 2019). Hence, the significant relation between internal DKS and CP is supported by prior literature (Goh et al., 2020; Lee, 2018). Similarly, the strong

association between external DKS and CP could be explained by the fact that digital connections outside organizational boundaries give employees access to new and heterogenous knowledge, which is crucial for CP (Chen et al., 2015; Ferraris, Bogers, et al., 2020).

Finally, **RQ3** explored how knowledge workers perceive their work practices, DKS, and CP in the post-COVID-19 pandemic phase. As much as 89% of the respondents stated that they expect their everyday work practices to change permanently because of the individual experiences and organizational insights acquired during the COVID-19 pandemic. The open and axial coding performed indicates that the predicted changes that were most frequently highlighted by the respondents are: increased use of digital platforms, more frequent WFH than pre-COVID-19, reduced business-related travel, and increased work flexibility.

The results suggest an overall positive attitude toward digitalization, travel reduction, and flexibility. Our findings regarding flexible work satisfaction support those of recent studies (Baert et al., 2020; Lee & Lee, 2021). Although it has been reported that these changes could increase the daily working hours (Kumar et al., 2021), this issue is not addressed by the respondents in our study. One possible reason for this may be that the data were collected shortly after the pandemic began and the negative effects of WFH practices were overshadowed by joint efforts in facing this extraordinary crisis.

Employees pointed out major managerial challenges regarding new ways of organizing and managing distanced knowledge work. Lack of evaluation routines and unsatisfactory support from managers were the commonly expressed concerns. The latter is consistent with recent literature, which has noted that WFH during the COVID-19 pandemic could decrease managerial support in relation to employees' personal and professional development (Venkatesh, 2020).

Despite the contrasting preferences and experiences of employees, recent studies suggest that WFH and digital collaboration will become much more common in the future (Brem et al., 2021; Wang et al., 2021). However, we do not have sufficient knowledge about the perceptions, expectations, and capabilities of employees in terms of work practices, DKS, and CP in the post-COVID-19 era.

7. Conclusions

The economic and health-related crisis caused by the COVID-19 pandemic has shown us that stimulating creativity and innovation is more crucial than ever for the survival and growth of organizations. As we strive to cope with the challenges the pandemic has posed, opportunities arise for both scholars and practitioners to explore new horizons, share newly acquired knowledge, and engage in creative work. The current study offers some of the first insights into the pivotal yet understudied impact of enforced WFH practice on DKS and CP during the pandemic. Furthermore, the study utilizes SCT and considers an exhaustive set of demographic, individual, and organizational variables to better understand their association with DKS and CP.

7.1 Theoretical implications

First, the present study examines novel and ongoing phenomena. The literature on WFH practices during the COVID-19 pandemic is currently very limited. By examining various impacts of the mandatory and large-scale WFH practice through an SCT lens, the study extends and complements the growing body of research on telework and WFH. The findings contribute to SCT by showing that enforced WFH practices did not affect the association between demographics and intra-organizational KS. Furthermore, the findings also extend the theory by suggesting that both internal and external DKS have a positive and significant relationship with CP.

Second, our study contributes to the knowledge management literature by including demographic, individual, and organizational variables and by examining internal and external KS that is entirely dependent on digital platforms. By integrating the concept of DKS, we add to the research stream of digitally mediated KS. We emphasize the social aspect and complexity of KS among strong and weak network ties, adding to the literature in terms of KS via online social networks and digital collaboration.

Third, the findings extend creativity research by highlighting that increased DKS within and outside of organizational boundaries could foster CP in a full-scale WFH context. Moreover, the study supports and augments the literature by

emphasizing the importance of individual motivation for CP in the extraordinary lockdown situation caused by the COVID-19 pandemic.

7.2 Practical implications

A primary practical implication of the study is that both internal and external DKS affects CP in the WFH context. Managers can use this insight when responding to the demanding need of rethinking work practices and facilitating KS in view of the pandemic disruption. Our findings show that promoting DKS among colleagues, as well as actors outside the organization, is of crucial importance for CP in a WFH setting.

Second, the study has implications for managers regarding revisiting WFH policies and crafting short-term and long-term work practices. The findings encourage leaders to consider alternative work practice options before making decisions that will deeply affect the future workforce. Based on SCT, our findings provide practical suggestions to help managers facilitate social relationships prior to introducing WFH solutions. This is presumed to ease the transition to DKS and to encourage CP in new work arrangements.

Third, by including demographic, individual, and organizational variables, companies are offered a broader understanding of factors that affect CP among employees in the pandemic context. In addition, the results underline the pivotal role that DKS play in enhancing CP, highlighting the vital role of new digital technology in this endeavor. Hence, our study may serve to enlighten policymakers regarding the crucial importance of digital transformation in the new world of work and to encourage public government to provide the infrastructure needed for accelerating technological evolution. Furthermore, the study provides insights into the changes and challenges in the conditions of working life as a consequence of the pandemic, which may be useful for policymakers and trade unions.

7.3 Limitations and future research

The cross-sectional design of the present study has predictive limitations. Since exposures and outcomes are simultaneously measured, there is generally no evidence of a temporal relationship between the two. A second limitation is the

convenience sampling, taken from a group of knowledge workers who were easy to contact digitally, primarily through the social media channels of the main author, employer, and collaborating network organizations. A major disadvantage of convenience sampling is that the sample is not generalizable—thus, the results are not representative of the entire population. Third, the study is country-specific. Consequently, the potential generalizability of the results is limited by the exclusively Norwegian context. While pandemic measures and policies might be similar across nations, their application and effectiveness remain dependent on the demographic, social, economic, and cultural characteristics of each country.

One direction for future research is to enlarge the geographical scope and conduct multi-country studies of both COVID-19 related measures and WFH arrangements affecting CP. This could broaden our understanding of cultural influences on work practices and governmental differences in managing COVID-19, which may influence both KS and CP in organizations. Methodologically, we encourage scholars to develop designs that assess variables over time in order to determine cause and effect. True experiments, quasi-experiments, and longitudinal observational studies are advantageous for addressing future causal research questions regarding DKS and CP in a WFH setting. Preferably, the sampling procedure should be advantageously randomized sampling—e.g., probabilistic sampling.

Future studies may also include validated multi-item constructs, such as types of knowledge (i.e., explicit and tacit), types of motivation (i.e., intrinsic, extrinsic, and prosocial), and various stages of creative processes (i.e., idea generation, idea promotion, and idea implementation). Also, different organizational factors (e.g., location, culture, strategy, and technology infrastructure) and individual attributes (e.g., personality, cognitive style, expertise, and self-efficacy) can be utilized. SCT and other theories could be used to explore how internal and external DKS and CP are affected by hybrid work models in the post-COVID-19 era.

Furthermore, supervisor-rated measures of CP should be utilized in addition to self-rated measures. In-depth interviews with managers could provide a deeper understanding of the relations between work practices, DKS, and CP. How will

managers evaluate employee creativity and review individual performance in a newly emerged mixture of on-site-work, WFH, and various hybrid models? How will leaders motivate and support knowledge workers in this conglomerate of work practices in order to foster creativity and innovation? We believe that all these avenues are worth exploring in the future.

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PAPER 3:
Work from Home and Collective Creativity: Exploring the Experiences of IT Professionals

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Abstract

This study explores collective creativity in a work from home (WFH) context. A phenomenological approach is adopted to describe and understand employees´ experiences of the phenomenon. Based on in-depth interviews with 10 Norwegian information technology (IT) professionals in the mature phase of the COVID-19 pandemic, the essence of the experience is captured and described as the "collective creativity paradox". The paradox suggests that while the absence of informal face-to-face (FTF) interaction in the WFH context hinders collective creativity, it is concurrently promoted through well-facilitated digital sessions. However, complex problem-solving is generally preferred to be conducted FTF. Perceived digital barriers inhibit knowledge sharing beyond strong-tie relations, which limits access to diverse perspectives and ideas. Moreover, the findings indicate that a supportive creative climate is crucial for fostering collective creativity in the WFH setting. The study offers scholars and managers a deeper understanding of collective creativity in digital work environments and provides valuable insights into employees' WFH experiences.

Keywords

Collective creativity; Creative climate; Informal interaction; Phenomenology; Work from home

1. Introduction

Creativity is crucial for organizations to innovate, adapt and thrive in a dynamic and digitalized business environment (Shalley & Gilson, 2017; Zhang et al., 2022). Workplace creativity involves the generation of original and useful ideas, products, processes, or solutions to complex problems (Amabile, 1996; Mumford & Gustafson, 1988). Previous research has predominantly studied workplace creativity at the individual level (Kurtzberg & Amabile, 2001). However, more attention has recently been paid to group creativity (Reiter-Palmon et al., 2012). This is important because group creativity is a critical driver of innovation, as groups increasingly are involved with innovation processes in organizations (Curşeu et al., 2022). It is argued that creative ideas always emerge from individuals, while the actual source of ideas and solutions is mostly interactions between people (Paulus & Nijstad, 2003). Hence, *collective creativity* is essential to produce creative outcomes (Cirella, 2021). Collective creativity has been defined as creative actions and processes arising from social interactions (Hargadon & Bechky, 2006; Parjanen, 2012). When individuals engage in social interactions, their diverse experiences, knowledge, and perspectives enable them to analyse problems from different angles and generate novel solutions (Paulus & Nijstad, 2003).

Scholars have recently shown interest in the social aspect of creativity in digital or virtual work environments. Remote work, commonly understood as employees working outside the employer's physical premises mediated by digital tools, has evolved significantly during the last decades enabled by technological advancements (Gandini & Garavaglia, 2023; Klemsdal & Clegg, 2022; Messenger & Gschwind, 2016). In their bibliometric analysis of creativity research in the European Union, De-Marchis and Shchebetenko (2022) propose that collective creativity within remote work environments is a promising area for future research. Much of the existing literature on digitally mediated creativity refers to virtual teams (e.g., Chamakiotis et al., 2013; Nemiro, 2002; Ocker, 2005; Reiter-Palmon et al., 2021). However, the distinct work from home (WFH) modality that abruptly became dominant due to the COVID-19 pandemic (Gandini & Garavaglia, 2023) constitutes a key context in which collective creativity is largely unexplored. The practice of employees carrying out work from their private homes continues in various forms in the post-pandemic era (Smite et al., 2023). Accordingly, to enable facilitation of collective creativity in

modern organization, it is critical to better understand how workers experience social interaction and creativity when WFH.

The COVID-19 pandemic entailed a dramatic disruption of social interactions because of the sudden imposed social distancing measures and enforced WFH arrangements (Anderson & Kelliher, 2020). Hence, the pandemic constitutes a unique empirical context to study the phenomenon of collective creativity in the large-scale and experimental WFH setting (Brynjolfsson et al., 2020; Gandini & Garavaglia, 2023). Currently, there are limited empirical studies on WFH and creativity during the pandemic, with some exceptions (e.g., Babapour Chafi et al., 2021; Mercier et al., 2021; Michinov & Michinov, 2020; Tønnessen et al., 2021). Common to these studies is the focus on the individual level, i.e., the impact of enforced WFH on individual creativity. Moreover, most research is still based on data collected in the early phase of the pandemic when the situation was characterized by shock and anxiety (Akkermans et al., 2020; Brodeur et al., 2021). On the contrary, the present study relies on data from the mature phase of the pandemic (i.e., May 2021). The WFH regulations included IT professionals, described as the people developing, selling, maintaining, or supporting IT systems (Holtgrewe, 2014). IT professionals were chosen for the present study given their experience in using digital tools for collaborative work tasks (Kinsella et al., 2021). Nevertheless, during the rapid shift caused by the COVID-19 pandemic, IT professionals did not have any established shared understanding in terms of how social relationships and interpersonal interaction should be maintained in the WFH setting (Lal et al., 2021) and, subsequently, how collective creativity might be carried out in a WFH context. Based on the above account, the following research question guided the present study: *How do IT professionals experience collective creativity when they work from home in the mature phase of the COVID-19 pandemic?*

To explore the phenomenon of collective creativity in the WFH context, a phenomenological approach is adopted. Phenomenology is recognized as a suitable philosophical method to study creativity as a unique human experience (Bindeman, 1998). Phenomenological research is a qualitative strategy to understand lived experiences as described by the study participants (Creswell, 2014; Moustakas, 1994). Previous research has employed phenomenology in studies of WFH and online interaction (Long & Glenn, 2012; Terason et al.,

2022) as well as creativity (Kimmel & Hristova, 2021; Schaefer, 2019). In the present study, 10 IT professionals are in-depth interviewed to capture the shared essence of their lived experience of WFH and collective creativity. The aim is to extract wider meaning, illuminate what is not obvious, and explore the structure of the experience along with the underlying conditions (Giorgi & Giorgi, 2003; Willig, 2007).

The study findings suggest that the essence of the experience is the "collective creativity paradox". The paradox implies that the participants experienced both impeded and improved collective creativity concurrently. On one hand, the absence of FTF interactions hindered collective creativity, as spontaneous discussions and informal sharing of knowledge and ideas were limited. Conversely, well-facilitated digital sessions were found to promote collective creativity, and even able to surpass FTF interactions in generating creative ideas and solutions. Furthermore, the findings indicate that idea sharing is limited to pre-existing relations with strong social ties. Digital barriers blocked weak tie interaction and hindered the flow of diverse perspectives and ideas. Finally, participants' perception of the company's creative climate appears to be even more crucial when working from home than on-site. These findings are highly relevant for organizations' endeavor to design and implement remote and hybrid work practices that foster creativity. Theoretically, the study expands the literature on collective creativity by highlighting the successful use of digital means to foster group creativity while concurrently emphasizing the critical role of informal FTF interaction. Secondly, the paper advances the research stream on digital creativity by providing a deeper insight into employees' experiences of creative collaboration in the WFH context. Thirdly, the study expands the range of methodological approaches to studying creativity in remote work settings by applying descriptive phenomenology.

2. Background literature

In line with the phenomenological tradition, theory and prior literature are used for descriptive rather than explanatory purposes (Husserl, 1931). Theoretical concepts are applied in the present study to inform the development of themes and inspire the discussion. In the following, background literature on collective

creativity, WFH, and social information processing theory is presented.

2.1 Collective creativity and work from home

Collective creativity involves creative activities that rely on multiple participants (Glăveanu, 2011). It occurs through interpersonal interaction in small groups of individuals which can give rise to new ideas, discoveries, and solutions that a single employee would not have achieved alone (Cirella, 2016; Hargadon & Bechky, 2006; Parjanen, 2012). Contrary to individual and organizational creativity, scant scholarly attention has been paid to collective creativity despite its significant importance for fostering innovation (Taggar, 2002). Furthermore, studies have shown that collective creativity has a direct positive impact on customer satisfaction and economic results (Cirella, 2016). In the present study, collective creativity refers to collaborative creative actions and processes among employees.

In a WFH environment, the lack of social proximity may have a profound impact on interpersonal interaction and sharing of knowledge and ideas (Allen et al., 2015; Golden & Raghuram, 2010). Unlike the office environment, WFH reduces informal communication and minimizes social interactions other than communication mediated by technologies (Cooper & Kurland, 2002; Naotunna & Zhou, 2018). A digital workforce risks losing spontaneous FTF conversations that facilitate the generation and sharing of ideas (Oldham & Da Silva, 2015). Moreover, Chamakiotis and Panteli (2017) observed that the artificial nature of digital tools itself could have a constraining effect on creativity. On the contrary, research suggests that digital technologies can effectively stimulate creativity (Cai et al., 2020; d'Ovidio & Gandini, 2019). Competent use of digital platforms may foster collective creativity by supporting the development of creative ideas (Cirella, 2021). As an example, Chamakiotis and Panteli (2017) found asynchronous collaboration software (e.g., SharePoint and Huddle) to enhance creativity in a remote work setting. However, we lack a deeper understanding of employees' experience of social interaction and creativity in the WFH context due to enforced social distancing (Manroop & Petrovski, 2022; Waizenegger et al., 2020).

2.2 Collective creativity and social information processing theory

The theoretical rationale for studying collective creativity in the digitally mediated WFH context is supported by the social information processing (SIP) theory (Walther, 1992). SIP theory suggests that individuals adapt to the absence of FTF nonverbal social cues by relying on digitally mediated cues (e.g., language style and rate of responses). Social cues are essential in the current study context, as they are found to shape creativity (Goncalo & Duguid, 2012). Prior literature indicate that collective creativity draws on the ability to select and encode social cues (Mouchiroud & Bernoussi, 2008). Additionally, scholars suggest that the ability of social cues to improve creative performance also applies to online environments (Bourgeois-Bougrine et al., 2022; Guegan et al., 2017).

Walther (2015) advocated that extended time and optimized use of digital channels are required to achieve the same closeness in social relationships as in co-presence. In the COVID-19 pandemic context, Terason et al. (2022) noted that despite limitations in delivering or interpreting certain nonverbal cues, virtual meetings demonstrated themselves as an essential replacement for in-person interactions. However, video meetings are typically scheduled with a strict agenda, which hinders spontaneous conversations (McGloin et al., 2022). Moreover, scholars have also demonstrated that informal interaction is a more effective driver of idea generation and sharing than formal interaction, which is dominant in video meetings (e.g., Baumeister et al., 2016; McAlpine, 2018). It remains unclear whether the absence of creativity-enhancing informal interaction also applies to IT professionals, who have the expertise to optimize their use of digital tools when working from home.

3. Methodology

3.1 Research design

To describe and understand IT professionals' experience of collective creativity in the WFH context, an appropriate research design is one that provides participants the opportunity to extensively share their thoughts, feelings, and perceptions. The phenomenological approach was selected for the present study as it allows a comprehensive exploration of conscious experiences of participants who are similarly and directly involved in the phenomenon being studied

(Creswell, 2007). Rich descriptions of real-life experiences prepare the ground for a reflective structural analysis that portrays the central underlying meaning of the perceptions shared by individuals, identified as the *essence* of the experience (Giorgi, 1985; Patton, 2002). Given the present study's aim to describe IT professionals' experience of collective creativity when working from home, descriptive phenomenology is considered a suitable strategy, as it enables a comprehensive description of *what* was experienced and *how* it was experienced (Creswell, 2014). Morrow et al. (2015) argue that descriptive phenomenology is particularly valuable in underexplored research domains, which applies to collective creativity when working from home, as well as digitally mediated creative collaboration in the extraordinary COVID-19 pandemic situation. In line with the methodology, the bias-suspending technique known as "bracketing" was applied to gain a more accurate understanding of the participants' experiences and uncover the underlying meaning of collective creativity in the distinct WFH setting. Furthermore, the research procedure included collecting subjective data through in-depth interviews, analyzing the data by reducing the information following systematic phenomenological steps and, finally, capture the culminating essence of the participants´ experience.

In descriptive phenomenology, it is crucial for researchers to have personally experienced the same phenomenon as the study participants, establishing a connection between their own experiences and those of the participants. Accordingly, the researchers practiced bracketing before collecting data (Colaizzi, 1978). This technique involves setting aside one's own viewpoints, assumptions, and feelings to be more open to the phenomenon (Moustakas, 1994). Both authors practiced WFH during the COVID-19 pandemic and experienced digitally mediated social interaction and to some extent collective creativity within that context. Their perceptions of the phenomenon closely align. In the early phase of the pandemic (i.e., Spring 2020), they experienced how the extraordinary situation provided fertile ground for new thoughts and ideas emerging from collaboration through digital platforms. However, as the pandemic entered its mature phase (i.e., Spring 2021), they both felt the lack of FTF interaction and informal communication and consequently inhibited creative collaboration. On the other hand, having the opportunity to work concentrated on problem-solving tasks which required creative ways of thinking, was beneficial in a more well-established WFH environment. Fewer distractions enabled both

the authors to focus better on problem solving as a contribution to collective processes. Overall, recognition of the complexity and contradictory facets of collective creativity in the unique WFH situation and awareness of personal experiences provided useful insights underpinning the research approach of the present study.

3.2 Sample and data collection

As the source of phenomenological data, a Norwegian IT consultancy with approximately 100 employees was selected owing to their extensive WFH practice throughout the pandemic and their high degree of both individual and collective creative work tasks. Norway was chosen as the geographical setting as it is considered a technologically advanced country (Breene, 2016) with a high-trust society, which seems to facilitate workers' compliance to COVID-19 measures (Christensen & Lægreid, 2020). The IT company operates within business and technology consultancy, software development, data analysis and machine learning, digital security, user experience and design and project management. It has a comprehensive and interdisciplinary approach to creatively solving problems and assisting customers in complex processes across various sectors. Prior to the pandemic, the employees were usually distributed across three office locations: main office, satellite office and shared office (i.e., a workspace shared with employees from other companies). However, most of the participants in the study had also worked at customers' physical office premises. This implies that the respondents had experience with various work locations and digitally mediated interactions with colleagues and customers even before the pandemic.

Purposeful intensity sampling was used to recruit participants who had the capacity and willingness to provide comprehensive and rich information (Patton, 2002). To enable the informants to convey their current experiences considering their past physical co-presence, it was a requirement that their main workplace prior to the pandemic was situated within the company's office premises. The other recruitment criteria were as follows: various positions and team affiliations, regular onsite work location, internal versus customer focus, seniority, gender, and age. Without the authors' involvement, the general manager of the company prepared a list of 17 potential interviewees following the above criteria. The

researchers proceeded to arrange the candidates in a prioritized sequence, taking into consideration how closely the individual profile aligned with the selection criteria. The final number of participants in the study was not predetermined. However, scholars recommend up to 10 participants to reach saturation in a phenomenological study (Boyd, 2001; Creswell, 2007). Likewise, the current study ultimately resulted in a final sample size comprising 10 IT professionals. The average age of the participants was 39 years, with a gender distribution of 70 percent men and 30 percent women. It is worth noting that the representation of women in the study sample was slightly higher than the actual percentage within the firm. Table 1 (see Appendices) provides a more detailed description of the anonymized participants.

In phenomenological research, semi-structured interviews are commonly employed as the primary method for investigating lived experiences (Creswell, 2007). In the present study, data were gathered by conducting individual interviews that involved the use of broad, open-ended questions. A flexible interview guide was developed with interview questions that met the descriptive phenomenological criteria (Englander, 2012). Sample questions include “How do you feel about creativity when you work from home?” and “Tell me about informal interaction and your experience of how it applies to creativity”. The guide was a dynamic support to tap more deeply into the participants’ experiences and help keep the relatively informal conversation grounded in the research topic (Kvale & Brinkmann, 2009). As more and more participants were interviewed, overlapping experiences and perceptions were gradually noticed. Saturation was considered reached after 10 interviews as the discovery of new opinions, patterns and themes responding to the research question discontinued. Furthermore, conducting a smaller number of interviews enabled collecting in-depth and detailed information from each participant. This led to a richer understanding of the complex interplay between individual experiences and the distinct WFH context in which they occurred.

The interviews were conducted in May and early June 2021. At that point, the pandemic had been ongoing for more than a year, and WFH had become a standard practice for IT professionals. However, certain restrictions had been eased, leading participants to work partially from the company's office premises during specific periods. Nevertheless, WFH remained the prevailing work

practice, and the interviews were conducted with both participants and the interviewer situated in their respective home offices. Consequently, the data were consistently collected within the pertinent WFH setting. All interviews were carried out using a digital dictaphone for audio recording. The first author conducted all the interviews, and observational notes were made throughout the whole process. The individual interviews lasted slightly less than an hour, which is relatively brief compared to the typical duration in the phenomenological tradition. Several factors contributed to this time efficiency. Firstly, participants were provided with comprehensive information regarding the purpose and research topics beforehand. Secondly, the utilization of online interviews, renowned for their time efficiency compared to in-person interviews, contributed to the shorter duration (Termini et al., 2021). Thirdly, the context of the ongoing COVID-19 crisis intensified the interviews, prompting participants to willingly share profound thoughts and feelings. Despite the concise nature of the individual conversations, they allowed for a deeper exploration of each participant's experiences and perspectives, leading to a richer understanding of the phenomenon under investigation. Immediately after each interview, the audio recordings were transcribed by the authors assisted by the transcription feature in Microsoft Word with Azure AI technology. Furthermore, the transcriptions were manually translated from Norwegian to English by the researchers. This comprehensive process provided a thorough overview of the data which constituted a beneficial starting point for further analysis.

3.3 Data analysis

The data analysis process started with both authors carefully reading and re-reading the interview transcripts together with the information provided by the observational notes to obtain an overall impression. Further, the data were analyzed utilizing a descriptive phenomenological procedure, that is, the modified Stevick-Colaizzi-Keen method developed by Moustakas (1994) and adapted by Creswell (2007). This specific analysis method was chosen as it fits the research question and gives a unique voice to the participants. The approach involves a pragmatic step-by-step procedure with a clear description of each step. This systematic method holds promise for achieving the goal of exploring and understanding collective creativity in the WFH setting as described by the 10 IT professionals. Microsoft Excel was used to organize and structure the data when

the analysis process was carried out.

With the modified Stevick-Colaizzi-Keen method adopted, the analysis was undertaken as follows. First, bracketing was performed as described above. Second, a list of significant statements was developed containing expressions of how the participants experienced the phenomenon. Third, after carefully examining the material and removing repetitive and overlapping data, the remaining significant statements highly relevant to the research question were clustered into larger "meaning units" (i.e., themes). Fourth, a "textural description" was formulated to express *what* the participants experienced with the phenomenon. Fifth, a "structural description" of *how* the experience occurred was created by reflecting on the setting and context. Finally, a comprehensive and synthesized description of the phenomenon was written incorporating both textural and structural descriptions. The culminating paragraph represents the essence of the experience. Following Moustakas (1994) guidance for quality and rigor, the analysis process involved continually engaging with the data, writing reflections, re-reading and re-writing until the ultimate reduction and description of the essence of the lived experience were consistent for the IT professionals.

3.4 Ethical considerations

The ethical guidelines of voluntary participation and possibility of withdrawal at any point, were followed. A written informed consent was sent to the individuals to clarify the purpose of the study, interview procedures, confidentiality, and data storage and processing, which was confirmed by each participant. All data were anonymized during the transcription process. The results are presented in a way ensuring the participants' anonymity and integrity. Hence, exact age, job title and educational background are not included in the detailed overview of the study participants (Table 1). Furthermore, pseudonyms are used for all participants. The Norwegian Centre for Research Data (NSD) assessed and approved the research project (Ref. 542231).

4. Findings

In the search for significant statements in the interview transcripts, 194 individual verbatim statements shared by the participants were identified. These

expressions of experience regarding collective creativity when working from home were subject to the descriptive phenomenological reduction process (Creswell, 2007). In response to the research question, five overall themes emerged from this process: social relations, informal interaction, sharing of knowledge and ideas, creative climate, and digital collective creativity. Table 2 (see Appendices) shows an excerpt of the findings structured in line with the methodological procedure, including significant statement samples as expressed by the participants. In the presentation of the main findings below, statements were carefully chosen to encompass the experiences shared by multiple participants, thereby complementing the themes and descriptions.

4.1 Social relations

The IT professionals agree that social relations and interaction are essential factors influencing collective creativity in the company. However, they share perceptions of significant social barriers because of the WFH situation, including threshold of contacting people and challenges in developing new relationships. Amanda expresses her experience of how social relations unfold in the distinct situation as follows:

> It's very exciting to discuss with people you don't really know. But currently, the barrier to contact people is greater, unless you know them quite well. You are afraid of disturbing. The conversation doesn't flow as easily in a video meeting. You may not get to know new people that well, so you interact with those you have worked closely with before. (Strategic advisor, female, employee)

This experience aligns with recent empirical findings on social relations in remote work settings (e.g., Yang et al., 2022). The present data indicate that social network ties have an impact in this regard (Granovetter, 1973). Strong social ties (i.e., close and trusting relationships) that existed prior to the COVID-19 pandemic are transferred into the remote work environment. In the WFH setting, participants engage in interactions that are primarily limited to their close connections, typically individuals within their own team. On the

other hand, weak ties constituted by distant colleagues and customers seems more challenging in the WFH situation. Ian confirms this experience:

> Now, it is rare that you contact people outside the team. But within our team, we are very closely connected. There is a very low barrier to contact other team members when we are working from home. (Designer, male, employee)

Although digital communication platforms provide efficient tools for internal communication, the IT professionals feel that approaching colleagues and managers beyond scheduled video meetings is more demanding in the WFH setting than on-site. The developer Charles recognizes that when trying to contact individuals directly through digital means, there are significant obstacles that require more meticulous planning and coordination. Consequently, the respondents experience a distinct digital barrier which limits their access to new perspectives, knowledge, and ideas.

4.2 Informal interaction

The participants hold diverse perceptions regarding the occurrence of creativity in their daily work. Nevertheless, in the analysis process an intriguing pattern arises, highlighting the pivotal role of unplanned and informal social interactions in fostering collective creativity.

Similarly, previous research emphasizes the importance of informality for fostering creativity in remote work environments (Kohonen-Aho & Tiilikainen, 2017; Naotunna & Zhou, 2018). Douglas supports the finding by reflecting upon his own experiences:

> I get a little stressed by hearing the word creativity, because it typically doesn´t work when you want. It is difficult to just decide that “now we are going to be creative”. Perhaps it works best by the coffee machine when it is not planned. (Team manager, male, employee)

Digital platforms seem to offer effective tools for regular internal communication and routine interactions as well as video conferences. Furthermore, digital tools hold promises for facilitating various formal procedures, including document management, and sharing. However, participants feel that approaching colleagues and managers informally beyond scheduled online meetings is more difficult. The respondents commonly perceive a reduction in social cues and the challenging absence of informality and spontaneity in the WFH setting. The senior consultant Fernando expresses a longing for serendipitous encounters and eye contact with colleagues. According to his opinion and that of several other participants, replicating these experiences virtually is difficult, if not impossible. This perception is consistent with the findings from studies on WFH conducted prior to the pandemic (e.g., Cooper & Kurland, 2002).

The IT professionals express concern about the lack of informal interaction and how this may inhibit collective creativity in the WFH setting. They frequently express a sense of longing for the casual conversations that used to occur around the coffee machine, in the lunchroom, or in the office corridors. Additionally, participants mention the absence of chance encounters and informal meetings with individuals at physical events and conferences. A common perception is that impromptu interpersonal interactions using digital platforms never reach the same level of quality and richness as FTF communication, as Ian articulates:

> Digitally, you lose so much of the social interaction and communication. You're not able to read body language properly. It's about basic human needs. Face-to-face can never be replaced virtually. I mean it. That's just a fact. (Designer, male, employee)

This statement, which essentially captures a common experience among tech experts, is somewhat unexpected given the IT professionals´ typical optimistic outlook on technological advancements and the continuous advancement of digital collaboration tools.

4.3 Sharing of knowledge and ideas

The third identified theme refers to activities through which employees share ideas, knowledge, and insight digitally with actors within or outside the company (Lin, 2007; Luo et al., 2021). Participants hold partially divergent views on these activities in the WFH situation. The software developer Harold puts it this way:

> In the consulting sphere that we are in, we have a lot of available expertise. When I need inputs on a creative task, I address everyone in the company and use the communication channels that we have available. But I guess there are many who think that someone else should respond. (Software developer, male, employee)

This experience is notably different from what developer Charles expresses. He informs that he primarily shares knowledge with only one colleague when working from home. From this one person with whom he has strong social ties, he feels that he gets a sufficient inputs and feedback on his ideas. The latter is in line with the finding that interaction in the WFH context is essentially limited to strong tie relations for many of the study participants. Moreover, challenges regarding external knowledge sharing are being emphasized by several of the IT professionals, including Ian:

> At the start of the pandemic, everyone seemed eager to share. Webinars were popping up all the time, and it honestly got a bit overwhelming. Some knowledge-based forums emerged that were more reliable, but it feels like the industry itself has become less visible. We're missing out on those conferences and meetups that used to be essential for sharing insights and ideas. (Designer, male, employee)

Software developer Harold also expresses his experience of digitally sharing expertise and delivering feedback, encompassing an interdisciplinary aspect. He perceives an implicit expectation of expert status within the IT sector, which is deemed necessary to obtain inputs or feedback from credible external sources during a creative problem-solving process. Some participants find that

they need to exert more effort in the WFH setting to obtain inputs from professionals who offer diverse perspectives. Such experts serve as valuable sources of heterogeneous knowledge. Scholars agree that sharing heterogenous knowledge internally and externally is conductive to creativity (Carmeli et al., 2013; Rese et al., 2020). This also applies to the WFH environment (Tønnessen et al., 2021; Van der Meulen et al., 2019). Consequently, the WFH context can be inhibiting for the acquisition of different perspectives in the creative work.

4.4 Creative climate

Most of the respondents highlight the crucial role of organizational culture and the creative climate in fostering collective creativity within the WFH context. According to Ekvall (1996), creative climate describes employees' perceptions of an organizational environment that promotes creativity, including idea support, openness, trust, challenge, risk taking, playfulness and time available. IT professionals share their experiences regarding social cues that indicate a creative climate within their company. Strategic advisor Amanda perceives that supervisors encourage initiative and respond positively. She feels that there is a high degree of openness for new ideas within the company, and rarely any competitive atmosphere among colleagues. Project manager Brian enjoys the freedom to experiment within the company:

> You can try new ways of doing things without anyone asking why you spend time on this. There are no strict rules. I feel that our company encourages experimentation and allows failure along the way. (Project manager, male, employee)

This perception of creative climate may cultivate both individual and collective creativity, in line with prior study findings (Curşeu et al., 2022; Ekvall & Ryhammar, 1999). However, some participants believe that there is room for improvement, as they perceive the initiative and responsibility to be solely assigned to individual employees. Middle manager Grace shares her opinion as follows:

> I think the way it works suits many of us, but certainly not all. I think some [employees] need more structure and leadership to be able to suggest new ways of doing things. (Middle manager, female, manager)

Software developer Harold notices a tendency within the organization to attribute certain avoidance of offering support and feedback to being excessively busy. However, he detects a potential within the company's norms to foster a more conducive environment for creativity. It often becomes convenient to apologize for prioritizing work with customers or other obligations. He suggests that perhaps the existing norm should have provided clearer guidance on the importance of mutual commitment and actively supporting one another.

Furthermore, the respondents indicate that management's individual follow-up occur less frequently in the mature phase of the pandemic. Some interviewees share the feeling of being left to themselves. When the barrier for direct contact is heightened due to digital platforms, colleagues with strong ties are perceived as even more critical for providing feedback and support in creative endeavors.

4.5 Digital collective creativity

Middle manager Grace is one of the participants who experience the benefits of using digital tools for collective creativity. She speaks enthusiastically about an increased engagement, energy and creative flow in her project team and her experience of almost having to “step on the brakes”. The exciting mixture of diverse skills and approaches is highlighted by Teams and Miro as enabling digital platforms for creative sessions.

> What triggers me the most about creativity is when you really manage to work interdisciplinary and not just talk about it. It is a completely different way of solving problems when working interdisciplinary. In our last project a bit of magic has happened because people have really managed to play on each other’s strengths. (Middle manager, female, manager)

Others highlight the drawback of being unable to work with complex problem solving FTF in a meeting room. Video meetings are considered an effective format, but at the same time, they are not equally convenient for everyone. Senior consultant Fernando faces constraints when it comes to digitally enabled collective creativity:

> In the early phase of the pandemic, we were very clear that we wanted to postpone difficult topics which required more creativity, but in the end, we had to carry it out on Teams, and that's not the same. Many are much less active, although the digital platform is okay. All creative sessions are being shortened, typically from full day to two–three hours. At the same time, video meetings have worked for the development and implementation of ideas. It has also been a proper platform for brainstorming with digital whiteboards, but we have not been creative enough to find new and better ways to solve complex problems together. (Senior consultant, male, employee)

The participants' perceptions of a complex problem align with established literature, in which key characteristics of the problem include dynamics of the situation, absence of clearly defined goals, and need for nonconventional solutions (Dörner & Funke, 2017; Frensch & Funke, 1995). Moreover, complex problem solving is considered particularly challenging in a social context (Badke-Schaub & Buerschaper, 2001). However, participants perceive digital platforms as suitable for brainstorming and believe that they have the potential to enhance creative outcomes when the sessions are well organized and effectively facilitated. According to respondents, criteria for well-facilitated creative sessions include thorough preparation, a structured agenda that is distributed in advance, a clearly defined topic and goals that are commonly understood, the use of suitable digital tools that are shared among all participants, active inclusion of all participants, and a structured approach to handling the outputs of the session. Similar characteristics of efficient creative sessions online have been discussed in recent literature (Gaggioli et al., 2020). The collective creative potential of well-facilitated digital sessions corresponds with Grace's experience:

> A year ago, when we returned to the office for a short while, we organized a traditional workshop where we got lots of notes on the board. In my experience it is easier to facilitate workshops digitally because you have more freedom on a Miro board than having too many notes to manage. However, I would probably choose face to face, especially when it comes to discussions on complex problems. Then, it is better to be physically together. But I would digitize the outcome afterwards! (Middle manager, female, manager)

Overall, the IT professionals consistently experience a duality in that creativity can be promoted by using digital tools, yet simultaneously hindered by the absence of FTF interaction. This indicates a perceived complex paradox of collective creativity which the participants share in the WFH context in the mature phase of the COVID-19 pandemic.

4.6 Essence of the experience

Table 2 illustrates the participants' expression of what they experience (textual description) and how or in which situation these experiences occurred (structural description). Following Moustakas (1994), the last step of the analysis process is to merge these common descriptions into a cohesive essence of the experience of collective creativity while working from home. The textual description of social aspects demonstrates a common perception of struggling with weak-tie relationships and the absence of informal and spontaneous idea exchange. Combined with the structural description of the WFH situation where interpersonal contact depends on digital communication tools, the IT professionals share this experience relevant to collective creativity. The data clearly and consequently indicate that the absence of informal FTF interaction inhibits collective creativity. Concurrently, the respondents experience that well-planned and well-facilitated creative sessions tend to work better digitally than FTF. Consequently, the essence of the IT professionals' lived experience in the WFH context can be described as the *collective creativity paradox.* The paradox implies that the absence of unplanned informal FTF interaction hinders creativity, while well-facilitated digital sessions promote creativity. Additionally, the participants experience that the more complex problems to be solved, the

greater the need to meet FTF. The study findings suggest that idea sharing is limited to pre-existing strong tie relations. Digital barriers block weak tie interaction and constrains the diversity of new ideas and viewpoints. Finally, participants' perception of the company's creative climate appears to be even more crucial when employees WFH compared to onsite.

5. Discussion

Based on the shared lived experiences of the participants, five themes are identified to respond to the research question of how IT professionals experience the phenomenon of collective creativity in the WFH context. The discussion of the findings is structured according to these themes. Firstly, respondents express their emotions of how the full-scale WFH situation inhibits social relationships and interaction. Contrary to Walther's SIP theory (1992; 2015), long-term digital interpersonal interaction and online social cues does not seem to strengthen social relationships. Certainly, withdrawal from the office space and absence of proximity have diminished the frequency of ad-hoc meetings during the COVID-19 pandemic (Waizenegger et al., 2020), a finding still valid in the mature phase of the pandemic. Spontaneous informal interaction is considered problematically poor by the interviewees in the distinct context. Previous research has demonstrated correlations between informal, unplanned interactions and collective creativity (e.g. Baumeister et al., 2016; McAlpine, 2018). Scholars argue that impromptu meetings and serendipitous encounters boost idea generation (Anderson et al., 2014). Unstructured interpersonal interaction is proved to be essential in creating shared context remotely, especially for creative performance (Kohonen-Aho & Tiilikainen, 2017). Similarly, Oldham and Da Silva (2015) emphasize the potential risks associated with digital platforms, specifically in reducing the occurrence of spontaneous casual conversations that play a vital role in fostering ideas sharing.

However, current research suggests that virtual coffee breaks or lunches may create psychological proximity while being physically isolated (Manroop & Petrovski, 2022). This sense of co-presence and informal interpersonal interaction could be expected to stimulate creativity. However, the IT professionals do not experience this outcome of the online interaction. Rather, the common perception is that the virtual space can never replace the physical

"coffee machine effect" with its associated creative energy. One possible explanation is the experience of greater social distance and the major digital barriers concerning interaction with weak tie relationships. Additionally, the shortcoming of social FTF cues (i.e., body language and physical proximity) are components that seem to weaken idea exchange among the participants. Morrison-Smith and Ruiz (2020, p. 9) advocate that "existing tools and infrastructures have limitations that are preventing communication technology from fully supporting informal interactions". Nevertheless, Gibson (2020) argues that the key is in understanding which digital tool is most effective in a given circumstance and for a given purpose. Thus, IT experts obviously have a competence advantage of being able to develop and implement new technological solutions for spontaneous interaction and sharing of ideas virtually. In that regard, it is somewhat surprising that digital experts and "tech optimists" categorically reject the possibility of virtual interaction for collective creativity reaching the level of FTF, not even in the future.

As an extension of the experiences related to social interaction, the respondents' perceptions of sharing knowledge and ideas also seems to be strongly affected by the WFH situation. The IT professionals experience challenges with knowledge sharing in the full-scale WFH setting, especially external sharing (e.g., with customers or stakeholders). The participants experience disruption and decrease in their weak tie interactions caused by the WFH situation. For example, a developer expresses that he shares ideas mostly with only one close colleague. Hence, it is reason to believe that collective creativity is negatively affected by the limitation of wider knowledge sharing, both internally and externally. Especially, the notion of external knowledge sharing characterized by weak social ties being crucial to creative problem solving, supports the study findings (Carmeli et al., 2013). However, the abovementioned developer experiences having more time to acquire new insights and perspectives from external online forums in the WFH setting. According to previous findings, this experience may enhance individual creativity because the integration of diverse insight and expertise from multiple digital sources fosters creativity in the WFH context (Van der Meulen et al., 2019). This complexity supports the idea of the paradoxical nature of digitally mediated creative work.

The participants experience a stimulating creative climate in the company and

consider this to be particularly important given the distinct work practice. The perceived prominence resonates with prior research showing that creative climate fosters collective creativity (Amabile et al., 1996; Anderson & West, 1998; Somech & Drach-Zahavy, 2013). Similarly, Curşeu et al. (2022) note that the social information processing perspective recognizes that a perceived open and supportive work environment offers employees cues for role expectations and shared positive attitudes toward collaborative creative tasks. However, Tønnessen et al. (2021) found no association between creative climate and creative performance in the WFH setting during the early phase of the pandemic. In the present study, the participants share the feeling of openness to experimentation and new ideas as well as supervisor support for individual initiatives. Amabile et al. (1996) suggest that creative climate is a culturally determined perception regardless of time and place of work. However, the study findings indicate that perceived creative climate is even more critical in the full-scale WFH context, which can possibly be explained by the social distance.

The study findings suggest a certain difference in experiences and approaches to digitally enabled collaborative creativity. Some participants explain the perceived constraints of digital platforms to solve complex problems collectively. Drawing on media richness theory (Daft & Lengel, 1986), Yang et al. (2021) argue that in-person interaction is best suited for sharing fine-grained ideas and solving complex problems. Several interviewees sense a lack of effort to fully bring in divergent perspectives in digital creative collaborative work. One possible explanation is provided by Waizenegger et al. (2020), who find that an overwhelming amount of video meetings during the pandemic affects creative collaboration negatively due to exhaustion and disengagement outside the online meetings. Similarly, in a study across five countries during the pandemic, Brucks and Levav (2022) found that videoconferencing inhibits idea generation. However, the IT professionals primarily experience effective and inspiring online collaboration across disciplines, which drive creative behavior. This observation corresponds with prior research as well. For instance, Lee (2018) observed that individual creativity was improved through the use of digital tools. Likewise at the group level, scholars suggest that online platforms can promote collaborative creativity (Hewett, 2005; Oldham & Da Silva, 2015). The overall perception in the present study is that digital collaboration technology is feasible for digital collective creativity to flourish in the WFH context, given accomplished

facilitation, insightful inclusion, and matching tools. Accordingly, the theme of digitally enabled collaborative creativity illustrates a shared experience in the present study, which is supported by existing literature. However, the essence of the IT professionals' experience of WFH in the mature phase of the COVID-19 pandemic is described as the collective creativity paradox. Specifically, the absence of FTF interaction decreases collective creativity, while digital creative sessions lead to the opposite.

6. Conclusion

This study explores the phenomenon of collective creativity when IT professionals work from home in the mature phase of the COVID-19 pandemic. The essence of the experience is the "collective creativity paradox". The paradox implies that the study participants experience both impeded and improved collective creativity simultaneously in the distinct WFH context. In particular, the absence of informal FTF interaction hinders collective creativity, while well-facilitated creative sessions on digital platforms promote collective creativity. Furthermore, idea sharing is limited to strong social ties, while the experience of digital barriers blocks weak tie interaction and curbs diverse perspectives. In addition, the respondents highlight the significance of perceived creative climate when working from home. Finally, the IT professionals express that the more complex the problems to be solved creatively, the greater the need to meet FTF.

The study findings add to creativity research by exposing the successful use of digital means for fostering collective creativity while emphasizing the critical role of informal FTF interaction for complex creative problem solving and spontaneous idea sharing. Thus, the study contributes to a better understanding of the dynamics between physical and digital environments for collective creative work. Secondly, the study advances the WFH literature by providing a deeper and more nuanced insight into the experiences of knowledge workers in an unprecedented WFH context. According to Waizenegger et al. (2020), understanding knowledge workers' experience of carrying out work exclusively from their home office during the pandemic is essential in contributing to the WFH literature. Thirdly, the inquiry expands the range of methodological approaches to studying creativity in remote work settings by applying descriptive phenomenology and systematically following a phenomenological analysis

procedure.

A primary practical implication of the study is that it offers a deeper understanding of employee experiences and perceptions that may prove useful for the successful management of remote and hybrid organizations. Leaders are provided insight which enables them to design, implement and adjust flexible work models that facilitate and foster collective creativity. Awareness of the collective creativity paradox allows for a more appropriate distribution of human resources and various creative tasks in a physical-digital work setting. Furthermore, the findings show that promoting informal interaction and internal and external knowledge sharing is of critical importance for creativity in a WFH context. The study results also highlight the cruciality of fostering a creative climate that will cultivate collective creativity in organizations. Finally, this study encourages knowledge workers not to ignore the full-scale WFH experiences but to let them inform the co-creation of flexible work arrangements in the post-pandemic era.

There are several study limitations that should be acknowledged. Firstly, as the authors have extensive personal experiences of the phenomenon under study, setting aside all biases and assumptions to focus entirely on the participants' experiences has not been fully achievable. Secondly, the essence articulated can only reflect a particular time and place and the experiences of individuals with different backgrounds and preferences (Moerer-Urdahl & Creswell, 2004). Another sample could have given different results. Moreover, critical analyses of various digital tools used for creative work would most likely have provided a richer understanding of the results. Finally, the research focuses solely on employees from a single IT consultancy, but creative processes may be dissimilar in other organizations, contexts, and industries.

The suggested collective creativity paradox emphasizes the complexity of creative processes in general and particularly the intricate ambiguity of collective creativity in the WFH context. Given the crucial role of creativity and innovation for companies' competitiveness, the phenomenon is worth further scholarly attention. Future work could address the issue of collective creativity when working from home in other businesses and in the public sector. Comparative studies may be conducted across disciplines, organizations, and countries.

Scholars are encouraged to use different theoretical perspectives to investigate the phenomenon. Similarly, future studies should utilize different research designs, including quantitative methods, which can lead to statistically generalizable results. A new research agenda is rapidly evolving when knowledge workers have fully or partially returned to office and organizations strive to develop and implement new work practices. How will a hybrid workforce with various alternations between onsite and remote work influence creativity at the individual, group, and organizational level? What will the implementation of new technologies such as artificial intelligence (AI) and virtual reality (VR) mean to employees' experience of collective creativity? How can managers facilitate informal interaction, knowledge sharing and creative collaboration considering the wide range of remote work preferences among their employees? Greater scholarly attention is needed to investigate how to foster collective creativity in the rapidly changing world of work.

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Appendices

Table 1. Details of study participants

Participant (pseudonym)	Gender	Age range	Education level	Tenure	Position/Job role
Amanda	Female	40-44	Master	1,5 years	Strategic advisor
Brian	Male	30-34	Master	2 years	Project manager
Charles	Male	30-34	Master	3 months	Developer
Douglas	Male	40-44	Master	5 years	Team manager
Edward	Male	45-49	Bachelor	1,5 years	Advisor
Fernando	Male	30-34	Master	2 years	Senior consultant
Grace	Female	30-34	Master	2 years	Middle manager
Harold	Male	35-39	Bachelor	1 year	Software developer
Ian	Male	35-39	Master	1,5 years	Designer
Jennifer	Female	55-59	Bachelor	5 years	Supervisor

Table 2. Statements, themes, and descriptions

Significant statement example	Theme	Textual description	Structural description
You may not get to know people that well. The conversation and interaction doesn´t flow easily in a video meeting. Everything is so formal and set. (Strategic advisor, female, employee)	Social relations	Difficulties in building social relations and lack of informal meetings	Interpersonal interaction using digital communication platforms
Digitally, little happens by chance. It is rare that you just stumble across someone. Standing coffee chat, eye contact, having lunch together... I really miss those things. It´s difficult to replace virtually. (Senior consultant, male, employee)	Informal interaction	Lack of spontaneity and unplanned encounters	Absence of interpersonal FTF interaction
In the office, it's easy to ask someone around you who you know has the knowledge needed for solving the problem. When working from home, I mostly share ideas with only one colleague. But I also learn new things online. (Developer, male, employee)	Sharing of knowledge and ideas	Digital platforms are effective for sharing ideas internally, but external knowledge sharing is hampered by WFH	Internal and external digital knowledge sharing
I really like that it´s allowed to experiment, to try and fail. In my current project, I sense that they give me enough time and freedom for that. (Developer, male, employee)	Creative climate	Openness to experimentation and individual initiatives	Voicing creative ideas in the WFH context

I'm not very creative now when I´m alone. I need to be together with others. The absence of the informal physical arenas is really hampering. But in a good digital meeting, creativity can flourish just as well as in a physical meeting room. (Team manager, male, employee)	Digital collaborative creativity	Well-facilitated online sessions drive creativity, but complex problem solving depends on FTF interaction	Creative sessions using video conferencing and digital collaboration tools

PAPER 4:
Creative processes in a hybrid work environment: A case study

Øystein Tønnessen and Bjørn-Tore Flåten

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Abstract

This study explores creative processes in a hybrid work context where employees work partly from an office location and partly from home. A case study approach was adopted to shed light on the complex phenomenon, and a three-phase model for group creative processes was applied to identify proper work modes for each phase. Data from 31 interviews with employees in a multinational information technology corporation were analyzed thematically. The results indicate that face-to-face interaction is most suitable for problem identification, whereas idea generation is preferable to be conducted either fully remote or fully in-person. Surprisingly, the study suggests that idea evaluation is the only phase that benefits from a real-time hybrid work mode. Furthermore, we propose psychological safety, social interaction, and knowledge sharing as fundamental concepts crucial to hybrid group creative processes. The study emphasizes the critical role of informal interaction during distinct creative process phases. Along with developing vibrant physical office spaces, organizations are encouraged to embrace technologies that allow for more spontaneous interaction digitally.

Keywords

Creative process; Group creativity; Hybrid work; Knowledge sharing; Psychological safety; Remote work; Social interaction

1. Introduction

The widespread adoption of hybrid work requires organizations to rethink how to foster creative collaboration to remain competitive and innovative (Amigoni, 2021; Babapour Chafi et al., 2022; Aalbers & Whelan, 2021). The present study aims to explore and understand creative processes in a hybrid work setting. Hybrid work refers to flexible arrangements in which employees work partly from an office location and partly remotely (e.g., from home) (Halford, 2005; Mitchell, 2021). Within the context of work, previous studies have typically examined creativity at the individual level (Kurtzberg & Amabile, 2001). However, more attention has recently been paid to group and team creativity (Hargadon & Bechky, 2006; Reiter-Palmon et al., 2012). Numerous organizations rely on groups to generate original ideas, solve complex problems, and drive innovation (Curşeu et al., 2022; Kristensson & Norlander, 2003). Accordingly, scholars have commonly understood creativity as an outcome encompassing novel and useful ideas, products, services, or solutions (Amabile, 1996; Oldham & Cummings, 1996; Woodman et al., 1993).

However, significantly less research has focused on the creative process itself, which can be defined as the sequence of employees' thoughts and actions towards a potential creative outcome (Caniëls et al., 2014; Lubart, 2001; Pham et al., 2023). In the present study, we conceptualize the creative process as a socially interactive, multistage process that involves problem identification, idea generation, and idea evaluation (Caniëls & Rietzschel, 2015; Reiter-Palmon & Illies, 2004; Warr & O'Neill, 2005). The limited presence of a process view in the creativity literature notably applies to work settings (Tolkamp et al., 2022), and this gap becomes even more evident in hybrid work environments (Reiter-Palmon et al., 2021).

In the wake of the COVID-19 pandemic, hybrid work has emerged as a universal trend. A recent global survey among employees who worked from home during the pandemic shows that 68 percent favor a hybrid working model (Ipsos, 2022). Due to the challenges experienced with full-time remote work during the pandemic, including tendencies towards reduced social interaction, knowledge sharing, and creative collaboration, many organizations encourage employees to return to the office fully or partially (Babapour Chafi et al., 2022; Smite et al.,

2023). In other words, the current trend of hybrid work may also be driven by companies' concern about fostering creativity and innovation (Hirsch, 2023; Jackson et al., 2022).

However, many organizations struggle with outlining proper hybrid work policies and practices for their employees and teams. The scant research on hybrid group work, especially when it comes to creativity and innovation, demonstrates the need for theoretical and practical insights (Reiter-Palmon et al., 2021). Based on survey data collected from students, Chaudhury and Deng (2022) found that creative processes in a hybrid setting were promoted by close social relations and trust, as well as appropriate digital platforms. Nobuyuki (2022) examined a company division introducing hybrid work, observing a dilemma related to employee creativity: both increased face-to-face (FTF) interactions on-site and increased autonomy when working remotely enhanced creativity. Reiter-Palmon et al. (2021) encouraged studies on how social interactions affect creative problem solving in hybrid teams. Ultimately, we do not know in what way distinct phases of group creative processes are carried out in organizations with an individual variety of hybrid practices or how this new dynamic work setting is experienced and perceived by employees. Accordingly, the current study addresses the following overall research question: How do creative processes unfold in a hybrid work environment?

Given the insufficient prior research and our aim to better understand the novel and complex phenomenon in a real-world setting, we adopted a qualitative case study approach. A major multinational information technology (IT) company practicing hybrid work was selected for the exploration because of its potential to shed light on various aspects of the phenomenon. To provide a rich picture and increase data reliability, multiple data collection methods were used (semi-structured interviews, nonparticipant observation, document analysis). Abductive thematic analysis was employed to anchor the findings in both current knowledge and empirical discovery (Alvesson & Kärreman, 2007).

Our study contributes to the creativity literature and emerging research stream on hybrid work. We have adopted a three-phase creative process model, which we empirically confirm to be applicable in a post-pandemic hybrid work environment. The findings suggest that FTF interaction is most critical during the

initial problem identification phase of the creative process. Idea generation is preferable to be conducted either fully digitally or fully FTF. Surprisingly, idea evaluation is the only phase in which the study participants propose a synchronous hybrid work mode. Furthermore, we identify psychological safety, social interaction and knowledge sharing as critical to hybrid collaboration, linking these concepts to group creative processes. Our findings suggest that the features of all three essential elements may be developed digitally when working remotely. However, the current study shows that digitally mediated social cues can never replace physical interpersonal interaction.

By highlighting the crucial role of informal FTF interaction during distinct creative process phases, the findings provide new understanding where existing knowledge falls short in explaining the phenomenon. Consequently, to promote hybrid creative collaboration, we encourage managers to embrace technologies that allow for more spontaneous interaction virtually. Simultaneously, companies should develop a dynamic physical office space that serves as a hub for building psychological safety and creative culture.

2. Background literature

Before entering the empirical field, an abductive approach requires familiarity with literature to provide theoretical resources for novel insights (Piekkari & Welch, 2018; Timmermans & Tavory, 2012). In addition to the foundation of the research question, psychological safety and knowledge sharing are included as empirically motivated concepts.

2.1 Creative processes in hybrid work environments

Creative processes may encompass engagement in creative projects with inherent value and relevance going beyond specific problem solving (Drazin et al., 1999; Wimmer, 2016). Creative process at the group level has been defined as employees ‘working together in such a manner that they link ideas from multiple sources, delve into unknown areas to find better or unique approaches to a problem, or seek out novel ways of performing a task’ (Gilson & Shalley, 2004, p. 454). For almost a century, scholars have described creative processes using multiphase models (Amabile, 1996; Mumford et al., 1994; Osborn, 1963; Sadler-Smith, 2015; Wallas, 1926). Although the scope and number of stages vary, three

common core phases may be identified: problem identification, idea generation and idea evaluation (Murugavel & Reiter-Palmon, 2023; Reiter-Palmon & Illies, 2004). Each phase of the creative process is associated with its own critical success factors (Caniëls et al., 2014). Problem identification involves defining and constructing the problem or task to be solved, identifying directions and goals, and determining the procedures and information required (Mumford et al., 1994; Reiter-Palmon & Robinson, 2009). The idea generation phase refers to the production of alternative solutions and building on others' ideas (Gillier & Bayus, 2022; Osborn, 1963). Finally, idea evaluation implies assessing the quality, originality and usefulness of the generated ideas, as well as a decision-making process, through which groups select ideas for further implementation (Harvey & Kou, 2013; Runco & Charles, 1993).

A hybrid work model is expected to increase the possibilities for creative collaboration among colleagues (Babapour Chafi et al., 2022; Fayard et al., 2021). Research has indicated that the extensive remote work during the COVID-19 pandemic entailed creativity-impeding consequences (e.g., Jaiswal & Arun, 2022), as well as the potential for increased creative performance (e.g., Tønnessen et al., 2021). Abi Saad and Agogué (2023) argued that a combination of digital communication when working remotely and FTF interaction on-site should be the preferred option for creative collaboration. Similarly, Kratzer et al. (2005) suggested that group creativity may decrease if members are fully on-site or fully remote. Much of the literature on creative processes in hybrid work environments has been based on virtual teams, which can be understood as a group of dispersed employees working digitally on interdependent tasks with a common goal (Chai & Park, 2022). Nevertheless, previous findings may inform the investigation of group creative process phases in the post-pandemic hybrid context. Kristensson and Norlander (2003) demonstrated that virtual teams performed lower than co-located teams initially in the creative process, which they identified as the preparation phase. At the later stage of exchanging and developing ideas, they emphasized the advantages of digital communication tools. Similarly, Nemiro (2002) showed that a development and finalization phase may be successfully accomplished through digital means. However, Nemiro (2002) found that team members favored FTF interaction at the idea generation stage, which can be partly explained by lost synergy when the team worked virtually. On the contrary, Reiter-Palmon et al. (2021) suggested that

idea evaluation may be better conducted FTF, and that idea generation could be more appropriate in a hybrid setting. In contrast, Brucks and Levav (2022) claimed that digital communication 'curbs' the idea generation process. Finally, Aalbers and Whelan (2021) emphasized the advantages of shifting back and forth between digital and physical work environments in the idea evaluation and selection phase.

2.2 Psychological safety, knowledge sharing and creative processes

Psychological safety has been defined as a shared belief that it is safe to take interpersonal risks in a group (Edmondson, 1999). Risky behaviors may include asking questions, seeking knowledge, raising new ideas and receiving feedback (Kessel et al., 2012). Psychologically safe groups are characterized by interpersonal trust and supportive relationships (Kahn, 1990). Edmondson and Bransby (2023) stated that domains where psychological safety is particularly relevant include social interaction, knowledge sharing and creativity. Risk-taking is part of creativity processes (Shalley & Gilson, 2004), and a psychologically safe climate makes employees feel free to exchange their ideas and integrate different perspectives (Huang & Liu, 2022). Kessel et al. (2012) proved there is a positive relationship between psychological safety and group creative processes, as well as knowledge sharing, particularly the informal know-how type of knowledge. An essential social practice here is informal interaction, which is referred to as spontaneous conversations and unstructured knowledge exchanges that occur by chance when people encounter each other (Nguyen & Tan, 2011). Many scholars have found significant correlations between informal interaction and group creativity (e.g., Baumeister et al., 2016; McAlpine, 2018).

Knowledge sharing involves the dissemination of information, expertise, experience, and ideas through formal and informal interactions between individuals or groups (Lee, 2001; Wang & Noe, 2010). Researchers have demonstrated associations between psychological safety, social interaction, knowledge sharing and creative performance (Carmeli et al., 2013; Chen et al., 2020; Liu et al., 2021; Tang et al., 2020). In creative processes, knowledge sharing is pivotal to accessing required information and diverse viewpoints (Van Knippenberg et al., 2004). Knowledge-sharing behaviors may have a distinguished relationship with different process phases (e.g., He et al., 2013; Leone et al., 2023). Information sharing is fundamental for problem

identification and for combining diverse perspectives on facts and memories into a sense of shared context. Idea generation is fueled by knowledge donation, which, in turn, is supported by psychological safety (Kmieciak, 2021). With access to diverse expertise from multiple sources, employees are more likely to generate novel ideas (Sosa, 2011). In the evaluation phase, employees share knowledge by giving feedback to other's ideas, and in this case, solution-related knowledge may have a positive impact on idea selection and acceptance (Chen et al., 2022). Reduced social interaction during remote work may have negative consequences for knowledge sharing (Golden & Raghuram, 2010). However, digital platforms offer extended possibilities for employees to share knowledge, thoughts, and ideas (Tønnessen et al., 2021; Aalbers & Whelan, 2021). Hence, a well-balanced hybrid work model may enable efficient social interaction and knowledge sharing, subsequently promoting group creative processes (Abi Saad & Agogué, 2023).

3. Methodology

3.1 Research design

To explore creative processes in a hybrid work context, a single case study design was adopted. Exploratory case studies are suitable when investigating a contemporary phenomenon within its social real-life context and for answering 'how' and 'why' questions (Yin, 2009). Insufficient prior research and unclear boundaries between the context and social processes demonstrate the need for a holistic qualitative inquiry (Merriam & Tisdell, 2015). A single case study allows for rich contextual and in-depth understanding of the subject (Dyer & Wilkins, 1991), as well as an evaluation of interaction patterns and creative processes. The research design is underpinned by an interpretive approach, which assumes that understanding social processes involves "getting inside the world of those generating it" (Orlikowski & Baroudi, 1991, p. 15). Furthermore, the present study adopts an abductive methodology, which entails a parallel engagement with our empirical data and the literature (Timmermans & Tavory, 2012). The current case study deals with theoretical concepts, including social interaction, knowledge sharing and creative processes, in a new situational work context, thus constituting the utility of an abductive strategy with a continuous interplay between data and theory (Van Maanen et al., 2007). This flexibility and

redirection possibility of the abductive approach is viewed as a source of theoretical insight (Piekkari & Welch, 2018).

3.2 Research setting

The present study has been conducted in the context of a post-pandemic hybrid work environment. Social distancing measures imposed in 2020 by national governments because of the COVID-19 pandemic, including enforced or recommended work from home (Waizenegger et al., 2020), were lifted in most Western countries in 2022 (Aksoy et al., 2022). To balance the commonly perceived benefits of working from home with those of office work, numerous companies have recently introduced hybrid work arrangements (Bloom et al., 2022; Smite et al., 2023). The ongoing shift is experimental in terms of new preferences, different expectations and various strategic approaches to hybrid models (Smite et al., 2023). For our study, IT professionals were selected given their experience in using digital tools for collaboration tasks, as well as opportunities for remote and hybrid work practice (Kinsella et al., 2021).

The data were collected from one of the world's largest information and technology companies (hereafter referred to as “Company A”). Company A is an American-owned multinational corporation that provides hardware, software, and services in various domains including cloud computing, artificial intelligence, IoT, cybersecurity, and design solutions. In 2021, the company announced an adaptation to flexible hybrid work models for a majority of its workforce. Notably, Company A's hybrid practice involves consultants working from multiple locations, including their home office, the employer's office, and the customer's office. Company A has more than thousand employees in the Nordic region, and its country divisions in Denmark and Norway serve as the geographical context for this case study. Nordic work culture is characterized by low power distances as well as high levels of trust, openness and employee autonomy, which has been shown to promote creativity (Eriksen et al., 2006; Hofstede, 1984). Moreover, Denmark and Norway rank high in innovation (Global Innovation Index, 2022) and digital transformation (Digital Economy and Society Index, 2022), which corresponds to the purpose of studying creativity in a hybrid work setting. Accordingly, Company A constitutes a unique case (Yin, 2009) that enables the investigation of creative processes within

multidisciplinary hybrid groups comprising both local and international members.

3.3 Data collection

With our aim of exploring individuals' experiences in a distinct context, in-depth interviewing was chosen as the primary data collection method. A purposeful sampling technique was used to select the case study participants (Patton, 1990). Given our theoretical assumptions, we expected certain categories of employees to possess different and important perspectives on the research issues (Mason, 2017). The goal was to obtain a sample of heterogeneous participants currently practicing various forms of hybrid work with different but sufficient group creative process experience. Consequently, we used the knowledge of Company A's HR director in each country to help identify individuals with diverse expertise, roles, and experiences. Voluntary participation and informed consent were practiced, which is described in more detail below (3.5). We practiced inductive thematic saturation (Saunders et al., 2018) in that interviews were discontinued when the emergence of new codes and themes stopped. Accordingly, 31 individuals (N=31) across units, disciplines, roles, and hierarchical levels in Company A were interviewed. Table 1 provides further information about the study participants.

The interviews were conducted between October 2022 and January 2023. A semi-structured interview guide was carefully crafted and continually refined throughout the process. In addition, 27 interviews were conducted online using Zoom with audio recording. Four interviews with management and employee representatives were carried out FTF at Company A's head offices in Oslo and Copenhagen. The average duration of the interviews was 49 minutes, and observational notes were made throughout the entire process by both authors. The participants could choose the interview language, which led to the distribution of 17 in Norwegian, 11 in Danish and three in English. After each interview, the audio recordings were transcribed verbatim by the authors, assisted by the transcription feature in Microsoft Word with Azure AI technology. In the analysis process, Norwegian and Danish were manually translated into English by the authors. Additional data sources included nonparticipant observation and document review. Observations were conducted at the two head offices and provided a better understanding of the study context, office design, work

environment and premises for social interaction and knowledge sharing. A review of company documents, reports, websites, blogs, and social media posts allowed for useful insights into the company's operations, organization, culture, and values.

Table 1. Participant details

Category	Specification	Norway	Denmark	Total
Participants	Interview respondents	17	14	31
Gender	Male	9	7	16
	Female	8	7	15
Age	20-29	2	1	3
	30-39	4	6	10
	40-49	4	0	4
	50-59	5	4	9
	60-69	2	3	5
Education	Master level	9	9	18
	Bachelor level	5	1	6
	Other higher education	2	4	6
	No higher education	1	0	1
Company unit	Technology	8	5	13
	Consulting	6	5	11
	Support (HR, Marketing etc.)	3	4	7
Position	Country top-level management	2	2	4
	Mid-level department management / Team leader	8	8	16
	Operation level (Specialist, Architect, Developer etc.)	7	4	11

3.4 Data analysis

After completing the interview transcription, all raw data were imported into the qualitative analysis software HyperRESEARCH 4.5.4 and analyzed thematically. Thematic analysis involves searching across the dataset to explore the commonalities of participants' experiences and find meaning patterns (Braun & Clarke, 2006). In line with abductive research strategy, data analysis was inspired by an abductive thematic analysis procedure (Rambaree, 2018; Thompson, 2022). The process encompassed data familiarization, initial coding, searching for themes, theorizing, reviewing themes and defining themes and subthemes. The interview data were coded by both authors individually in the first round. Intercoder reliability was assessed in the first joint session to enhance the rigor and transparency of the coding frame and ensure that the data collected in three different languages were consistently coded (O'Connor & Joffe, 2020). The intercoder reliability reached a level of 87 percent, and four new codes emerged. Minor code deviations were discussed until agreement between the authors was reached. In further sessions, the authors collaboratively composed preliminary themes, incorporated the literature, developed a more comprehensive understanding, and defined and described the final themes. The theorizing phase is an abductive analytical attribute and involves returning to the literature and seeing to what extent knowledge could explain the relationship between the themes (Timmermans & Tavory, 2012). Thus, our main themes capture common patterns across the dataset organized around theoretical concepts, while the underlying subthemes have a more empirical character.

3.5 Ethical considerations

The ethical guidelines of voluntary participation and possibility of withdrawal at any point were followed. Written informed consent was sent to the individuals to clarify the purpose of the study, interview procedures, confidentiality and data storage and processing, and consent was signed by each participant. Additionally, a confidentiality agreement was reached between the case company and the researchers' affiliated university. All data were anonymized during the transcription process. The results are presented in a way that ensures the anonymity and integrity of the participants. Only the country code and numbering of the participants are linked to quotes, and the exact age, job title and

educational background of the participants are not included. The Norwegian Centre for Research Data approved the research project.

4. Results

The results mainly refer to findings from the in-depth interviews but are partly supplemented by observational data to better understand the role of the physical office environment in the creative process. The thematic analysis produced 53 codes, five main themes and 15 subthemes. In the current report, we consider evidence relevant to the research question only. The themes are described in Table 2 below, complemented by sample quotes from the interviews. In the following section, the findings are presented based on each main theme, with concepts linked to empirical data.

Table 2. Main themes and subthemes with descriptions and sample quotes from interviews

Main theme	Subtheme	Description	Sample quotes
Hybrid work environment	Meeting modes	Physical copresence in the same room, digital meeting with dispersed attendees or a combination (hybrid)	People who are physically present have more to say, are more engaged. The weight of input is naturally pulled towards people in the room and puts the digital participants in a secondary position. This is especially true if the quality of audio or video is bad. Hybrid meetings can work, but it takes a little extra. (DK13)
	Digital platforms	Digital collaboration tools including Webex, Slack, Mural, and Trello	Mural works very well. It is interactive and creative. But then it's more about the tool and not me working from home. (NO16)
	Individual hybrid work preferences	Factors such as work tasks, personality traits, family status, and commuting time	Two days at home and three days in office —that's what I try to achieve. I have experienced through the pandemic that the work pressure has been considerable. I feel that the work–

			life balance is easier to maintain now after they opened again. (NO12)
	Leadership	New requirements for leadership roles and practices in a hybrid work context	It takes more to be a manager in the new hybrid reality. I think it depends even more on how you communicate and how you include people. It's about being precise, but also involving. It is very important that you are good at letting go, delegating responsibility and authority so you don't become a bottleneck. (NO2)
Psychological safety	Trust	Emotional safety in relationships	I think trust is really important. If you work from home, I think you lose something—the interaction and relationship building, which is essential. Like 'What do you think of this idea?', I probably wouldn't have said that to anyone. After all, it will only be those I have a certain amount of trust in. (NO15)
	Interpersonal risk-taking	Perceived tolerance for uncertainty and support for speaking up and suggesting new ideas	I feel free to come up with new ideas. I think it depends on where you want to contribute, your supervisor relationship and how comfortable you are in your team. But I would say that in general, speaking up, giving input, and coming up with ideas—there is a lot of respect for that. (NO11)
Social interaction	Social relations	Social and professional connections between individuals	Relationships and trust are built on an informal level. This is where you get to know people. You don't do that when it's arranged. (DK7)

	Face-to-face interaction	In-person interaction including verbal communication and nonverbal communication such as facial expressions	You get some kind of interaction physically that video cannot provide. It provides a closer dimension, and you experience body language and gesticulation. It is much easier to interact, collaborate and have a shared understanding compared with digital. (NO6)
	Digitally mediated interaction	Interaction between two or more persons using digital platforms	I've never met my team. We use Slack and there's a good atmosphere. It's entirely possible. (NO13)
Knowledge sharing	Knowledge source	Different knowledge, perspectives, skills, experience, background, and networks	As they say, 'It's not what you know, but who you know that is most important'. You increase your knowledge a hundred times by having a proper network of people who are willing to help you when you make a request because they know you will do the same when they ask you. (NO4)
	Informal and spontaneous	Sharing of knowledge and ideas through real-time and unplanned interaction	It is through these short discussions at the coffee machine or during lunch that you really get the inputs and creative aspects. (DK12)
	Formal and planned	Sharing of knowledge and ideas through planned and structured interaction	I think it works best when we practice 'oversharing' and share everything written. When we go for complete transparency, it is easier to get the flow. (NO17)
Creative process phases	Problem identification	Defining the problem or task and identify goals	In the creative process, I believe that identification—to get a common understanding of what is to be developed, should be done physically. (NO10)

	Idea generation	Production of diverse ideas	You can digitize things from the start, for example, with Mural. I also think it works when you do a brainstorming. You can sit alone in your own room, be completely quiet and think for five minutes. Then, it's like people come up with some pretty good ideas. (DK5)
	Idea evaluation	Feedback on others' ideas, assessment, and idea selection	I feel that it's easier to specify the next step when you're digital. You don't have to set up additional meetings to review; you can just push it back and forth. (NO13)

4.1 Hybrid work environment

The preferences and practices for hybrid work vary a surprising amount among the study participants. Regardless of department and discipline, some work almost exclusively remotely, while others work from home only exceptionally and for specific practical reasons. Company A has a flexible approach to work arrangements, and there are no fixed procedures. This manifests in a recognized individual freedom of choice and a shared pragmatic understanding of diverse self-selected hybrid models related to work tasks and different life situations. Several employees experience the hybrid work environment as more efficient and easier for follow-up tasks. Working from home on average two days a week tends to be a widespread practice. It is also a frequent perception that a mixture of in-person and remote work is appropriate for creative processes. However, individual experiences vary widely, and many relate their preferences to creativity:

> I thought I would like a hybrid workplace, but I think it's best to go to the office. There are perhaps a few days in between where it's okay to sit at home, not for work-related reasons, more practical. I'm most comfortable in the office, whether it's here at (Company A's) office or at the client's location. That's not

> important. Working from home does not result in much creativity. (NO16)

The participants also emphasize the new role of the office in the hybrid work environment. In Denmark, Company A's impending move to a brand new ultra-modern office building is expected to significantly improve attraction, retention, inspiration, engagement, and creativity. Ninety percent of the office premises are dedicated to collaboration space, which places in-person group creativity at the forefront. A capacity limitation of 40 percent of the staff may seem low when managers simultaneously signal growth ambitions and have general preferences for employees to be present at the office more often, as justified by interaction and group creativity. However, full capacity is not the case at the new head office in Norway either, as explained by new ways of working, increased flexibility expectations and individual adaptation. Thus, new office design also requires widespread hybrid practice for group creative processes. Furthermore, the participants have diverse perceptions about joint office days. One of the employees addresses both informal communication and collective problem solving in her considerations:

> I think many appreciate the flexibility. Maybe physical presence should be mandatory sometimes, but not twice a week. It should be a strategic arena. Meeting at the coffee machine—I don't think that is valuable enough. When you gather people physically, you should have a common message in which everyone feels that they have something to contribute. Instead of saying that we are eating lunch together on Fridays, they should say that, now, we are going to solve this or that together. (NO17)

However, participants stress the challenges of hybrid meetings, described as a synchronous mixture of collocated attendees in a meeting room and remote workers joining the session via a digital platform (e.g., MS Teams) (Constantinides & Quercia, 2022). A middle manager states, 'It is the worst situation I can possibly find myself in, and I do everything to avoid it' (DK4). The inclusion of digital participants and creating a balanced interaction are perceived as difficult. To succeed, an extraordinarily skilled facilitator is required. Most respondents agree that either all-physical or all-virtual meetings

are preferable to achieve creative group dynamics and successful creative sessions. Nevertheless, this is hard to fully implement in a globally dispersed corporation where customers' varying preferences must be considered as well. Consequently, a further practice of hybrid creative sessions is expected where inclusion and quality depend on technology, adaptation, training, and facilitation.

4.2 Psychological safety

Several participants highlight interpersonal trust as being the most crucial factor for creative collaboration. In general, they perceive a trusting and respecting work environment with a low threshold for speaking up, giving input and feedback, and generating novel ideas. In other words, there is a high degree of psychological safety among the participating employees. One interviewee describes her 'two leaders up' approach, which implies that a close trusting relationship with her supervisor and a certain trust in the leader at the next hierarchical level is sufficient for promoting radical ideas and getting the necessary support. The third managerial level in a big organization is rather unattainable, 'but you actually don't need it to make a change' (DK4). Some have experienced a former 'no error' culture that has been eliminated by sharing fun facts about past failures, subsequently contributing to increased psychological safety. Furthermore, as Company A's operations are more multinational than ever, cultural differences may cause an individual perception of less safety because of different ways of communicating and collaborating across countries. Psychological safety can manifest itself quite differently in the US, UK or Eastern Europe compared with the Nordic countries. This can complicate creative processes if participants are not aware of the cultural differences or are used to cross-country collaboration.

Additionally, psychological safety is influenced by hybrid work modes, as perceived by a senior:

> For example, my relationship with my colleagues has been virtually only. In that sense, I don't build up full trust, so it will always lack this essential psychological safety, which I'm very concerned about. How do we create this environment? I think that young people find it easier to build trust virtually than I do. Anyhow, I think you must meet physically now and then. (DK7)

Another senior shares his experience of customer relationships based on an established ‘trust capital’, described here as a trust related to previous quality deliveries. With this premise, much of the process of creative problem solving can be carried out virtually. This also seems to apply to work groups within the organization:

> If you have a good social relationship, and you trust each other and you have worked together before, then you can have a lot of meetings virtually. Because you have that culture or sort of an agreement on what to do and a kind of shared responsibility for getting it done. (NO2)

4.3 Social interaction

The participants indicate that psychological safety and trust largely depend on social relationships and interaction with colleagues. This is also true the other way around in that a psychologically safe environment cultivates fluent social interaction, which is considered essential for certain phases in group creative processes. The spread of remote work has complicated this social dynamic because physical proximity and FTF interaction are seen by many as necessary for developing strong relationships at work. A hybrid work environment with the element of on-site presence may solve the problem. However, the wide range of individual hybrid models entails that the possibilities for FTF interaction vary greatly. Accordingly, some IT professionals put effort into building social ties digitally:

> When I meet a new colleague for the first time online, I start asking about some private things because we need to know each other personally to be able to work together. To understand each other as a whole person. I think it’s hard, but I’m really trying. (DK8)

Many participants problematize the lack of nonverbal cues in digital communication. Body language such as eye contact and facial expressions drives interaction, ensures inclusion, curbs misunderstandings, allows for constructive interruptions, solves problems more effectively and stimulates

dynamics, friction, and energy, which the respondents point out as conductive to creative processes. One interviewee even launches a business idea about a screen where the camera sits in the middle so that users have the feeling of looking into each other's eyes. On the other hand, the participants highlight the capability of current digital means to foster interpersonal relations by strengthening existing social ties and even building new ones:

> [Digitalization] brings the world closer together because it blurs distances and brings us close to those who are far away. It enables us to interact with people we might otherwise have forgotten. It opens the possibility of maintaining relationships with people from the past and perhaps creating new ones, too. (NO6)

4.4 Knowledge sharing

Further, the study participants point out that social interaction is a precondition for sharing knowledge and ideas, and likewise, a strong sharing culture will foster social relationships. Moreover, the IT professionals agree that knowledge sharing is critical in all phases of the creative process. The importance of bringing diverse knowledge into the process is also emphasized, that is, different expertise, skills, and perspectives. Functional diversity is a great advantage in many teams that work together on creative problem-solving tasks. However, the spontaneous sharing of knowledge, ideas, and feedback in informal settings, regardless of group affiliation, is frequently highlighted as being crucial:

> Without the coffee machine, you lose important information. You meet people at the coffee machine, and sometimes, you get an honest opinion and feedback, which you don't get when you're sitting around the table in the conference room. And for me, that's extremely important. (DK14)

The participants experience that sharing of knowledge and ideas is the easiest and most effective during FTF interaction. This is a motivation for some to work from the office more often than they work from home. The fruitful informal knowledge sharing is considered hard to achieve digitally. Consequently, one

participant argues that a digital culture change is needed, given the assumed persistent hybrid job reality:

> We need to create a more fluid space digitally, where it's less formalized. We can't do that without changing people's attitudes towards communicating digitally. (...) We need to make sure that we create a culture with behaviors and habits around being informal digitally. (DK13)

Following this, another employee shares an example of instant messaging as an effective digital tool to gain access to knowledge sources, particularly in a major multinational corporation:

> I send people a Slack message, wherever they are in the world. I say, 'Hi, my name is ... I work on this... I need that information. Are you the right person?' That's the beauty of working in a company with almost 300,000 people all over the world. There's always someone who has the info you need. (NO5)

Our data show that knowledge sharing, social interaction and psychological safety are mutually contributing factors for group creative processes in Company A's hybrid work environment. Based on the theoretical background (Chapter 2) and the abductive methodology employed in this study, we present a thematic map (Figure 1) to illustrate connections between the main themes within the context of a hybrid work environment. The visualization reflects empirical findings and relationships between the theoretical concepts (themes). The "innovative outcome" factor illustrates the main objective of the creative processes as emphasized by the participants. The positioning of this factor alludes to a traditional distinction in the literature, indicating that creative processes involve the generation of ideas and solutions, while innovation encompasses the implementation of those ideas and solutions (Anderson et al., 2014). In this study, innovative outcome refers to the application of novel ideas, products, and procedures (West & Farr, 1990). To clarify the scope of innovative outcome, it is placed outside the frame of the hybrid work environment since its implementation primarily applies to clients not included in the analysis.

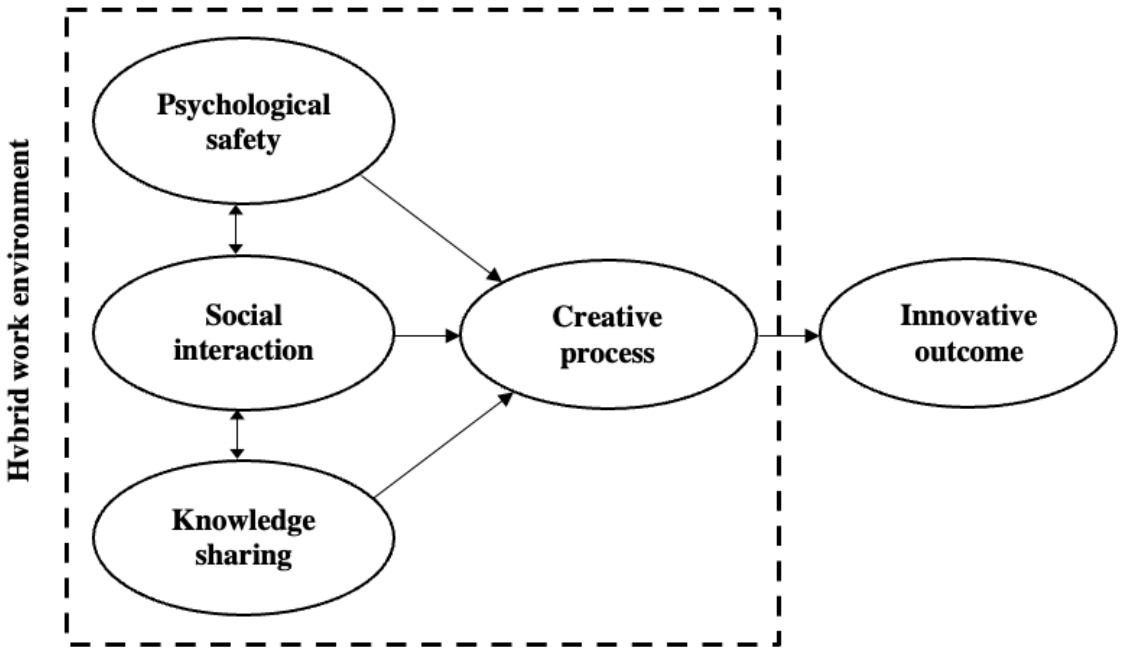

Figure 1: A thematic map for group creative processes in a hybrid work environment

4.5 Creative process phases

The final theme focuses on the participants' perceptions of the three distinct phases of creative processes in the hybrid work context. The initial problem identification is seen by the majority as the most important phase in prioritizing FTF interaction. It is perceived as more appropriate to define the problem and discover real issues when the group is co-present in the same room compared with online. Shared understanding and proper planning are also experienced as easier to achieve in a physical context:

> Identification is very important to do physically because misunderstandings are much easier to resolve face to face. In the first step—to define what is to be developed and decide on a plan—I think it is very good that you are in person. (NO10)

However, the findings vary considerably when it comes to idea generation. The perceptions of which work mode stimulates collective idea production the most are surprisingly diverse, regardless of work unit or role. Some participants point out that a superior feature of digital platforms is the possibility of including many more creative individuals who can contribute ideas without conflicts.

Furthermore, several denote the advantages of structuring ideas digitally from the start. There is also the assumption of an increased number of ideas in a digital process. In this regard, an employee states that ‘many good ideas may come out of bad ideas’ (NO15). Others experience that physical copresence provides fertile ground for an increased quality of ideas:

> I have seen examples of really good ideas coming out of these creative workshops when you spin on other people’s ideas (...) And then you come up with a much worse idea, but it triggers someone else to come up with an improved version of your idea. And that dynamic is difficult to achieve virtually. It is much easier to meet and look at each other in the eye. (NO16)

Some of the participants determine idea evaluation as the process phase most convenient to be carried out digitally. A prerequisite is that all group members agree on fully digital collaboration using the same tool. This can result in a more efficient process in which time-consuming physical meetings can be avoided. Additionally, the social relationships developed through the group process positively contribute to a virtual setting. Interestingly, idea evaluation is the only phase in the creative process in which some of the participants propose a hybrid format. In the example below, a distinct digital framework is utilized to present an idea for evaluation and feedback:

> When we’ve finished something, I present it, and then afterwards, it’s that formal talk. ‘OK, here’s the feedback: This was good. This was not so good’. Then, it’s fine if someone is working from home and others are in the office. (NO10)

Although the data reveal significant variations in experiences and preferences, the tendency is still that participants prefer FTF interaction for problem identification. The remaining creative process generally seems to work well, both physically and digitally, based on practical considerations and the preferences of the group or client.

5. Discussion

In the following section, we discuss the above results using an abductive approach to better understand the connections between our empirical findings and theory. Our starting point was to analyze creative processes conceptualized as a model of three phases. However, scholars have criticized linear models, arguing that creative processes are iterative and nonlinear (Pinkow, 2022; Runco & Chand, 1995). Moving from one distinct phase to the next is considered unrealistic in the real world. Creative processes should instead be described as interactive or recursive (Runco & Chand, 1995). These claims are partially confirmed by some of our study participants, who frequently use design thinking methods where the end user is actively involved in a dynamic creative process that constantly goes back and forth, evaluates, and alters. Nevertheless, our data suggest that creative processes often involve developing useful solutions to specific technologically related problems for clients. In contrast, scholars have emphasized engagement in creative actions, regardless of whether the outcomes are creative and useful (Drazin et al., 1999). Thus, the comprehensive literature on creative problem solving (CPS) comes into play, advocating for a more explicit view with distinct stage models and requirements for appropriate and useful process outcomes (Isaksen & Treffinger, 2004; Osborn, 1963; Wimmer, 2016). A distinct multiphase analytical approach can also be supported by prior research that suggests that certain critical success factors and facilitating elements are related to each phase of the creative problem-solving process (Shalley et al., 2004). From an information processing theory stance, creativity is claimed to be no more than normal problem solving given broad enough domain-based knowledge (Riquelme, 1994; Simon, 1977). However, because of the complex hybrid work environment as the social context in the current study, a broader theoretical understanding of group creative processes seems rational.

Our investigation uncovers a surprisingly wide range of individual preferences, practices and motivations across units and disciplines within the same company regarding remote and hybrid work. As a result, a multifaceted picture is painted of how creative processes unfold in a hybrid work environment. Nevertheless, there are indications that the participants prefer FTF interaction for problem identification and either fully digital or physical for idea generation. The only phase in which a true hybrid setting is proposed is during idea evaluation. One

explanation might be the need to receive quick feedback on an idea to effectively deliver a final solution. A more socially oriented and empirically supported reason is that, during the creative process, interpersonal relations—both internally within the group and with the external client—have been strengthened. Established psychological safety and trust can prepare the grounds for exchanging and making sense of social information across different interaction modes, thereby creating collective confidence during the evaluation process. Hybrid evaluation acceptance may be supported by social information processing (SIP) theory (Walther, 1992). SIP theory proposes that individuals adapt to the lack of FTF nonverbal social cues by relying on digitally mediated cues, for example, instant message content, language style and real-time video interaction (McGloin et al., 2022; Walther, 2015). Besides optimizing the use of digital platforms, Walther (1992) suggests that individuals are required to collect social information over extended periods, which correlates with hybrid acceptance in the final creative process phase. However, our findings contradict SIP theory by demonstrating that the use of cue-rich digital channels does not replace the distinct FTF conditions for informality and spontaneity (McGloin et al., 2022). Hence, our study favors the common argument that a lack of informal and unplanned interaction and knowledge sharing is among the most inhibiting disadvantages when working remotely during creative processes (Babapour Chafi et al., 2022; Nguyen & Tan, 2011). We also support this aspect empirically by emphasizing the absence of 'energy' and 'friction' during digital engagement in creative group work, including idea evaluation. Nevertheless, our results advance the literature by showing that cue-rich virtual informal interaction may still feed creative processes by constructing a sense of shared context and providing unique access to diverse knowledge (d'Ovidio & Gandini, 2019; Kohonen-Aho & Tiilikainen, 2017).

Considering the abovementioned complexity, our findings highlight the importance of balancing hybrid work practices. This involves creating a flexible work environment with combinations of digital and FTF work modes, hence fostering creativity and knowledge sharing. Regarding group creative processes, the study participants perceive distinct pros and cons of both remote and on-site predominance. This is supported by Abi Saad and Agogué (2023), who asserted a well-balanced combination of FTF interaction and digital communication to be more beneficial than choosing one work form over another. Similarly, Aalbers

and Whelan (2021) suggested that alternating between remote and office work nurtures idea generation, especially given the increased access to contextual information. However, designing sustainable hybrid work models involves rethinking the role and design of office environments. This challenge is highlighted by the study participants and the literature (Appel-Meulenbroek et al., 2022; Babapour Chafi et al., 2022; Hirsch, 2023). Dynamic social zones and collaborative spaces are among the new office trends being promoted to facilitate informal FTF interaction, shared culture, and group creative processes (Babapour Chafi et al., 2022; Yekanialibeiglou et al., 2021). Moreover, the study findings show that new skills, competences, and leadership styles are required in the era of hybrid work, especially to facilitate social interaction and creative collaboration. There is a consensus between our findings and the existing literature, highlighting the need for inclusive, supportive, adaptive, and trust-based leadership in hybrid workplaces (Babapour Chafi et al., 2022; Van Der Velden & Deprez, 2023; Yekanialibeiglou et al., 2021).

6. Conclusion

The present exploratory case study has addressed the research question of how creative processes unfold in a hybrid work environment. Qualitative data from a multinational IT corporation were collected and analyzed using an abductive thematic approach to answer the question. Psychological safety, social interaction and knowledge sharing were identified as key concepts linked to group creative processes in a hybrid work context. The study shows that the absence of informal interaction is a major disadvantage when working remotely during creative processes. Following this, the findings demonstrate that FTF interaction is most critical during the initial problem identification phase of the creative process. Idea generation is appropriate to conduct either fully digitally or fully FTF. Surprisingly, idea evaluation is the only phase in which the study participants propose a synchronous hybrid work mode. One reason for this is that established social relations and psychological safety may drive a positive hybrid work preference late in the creative process. However, the findings uncover an unexpectedly consistent negative experience of the real-time hybrid mode for creative collaboration, for example, hybrid workshops. Thus, the current study promotes well-balanced and task-oriented hybrid models, as well as a supportive trinity of leadership, digital tools, and office premises to foster group creative processes.

6.1 Theoretical contribution

The present study contributes to the creativity literature in numerous ways. First, by addressing the creative processes instead of the outcomes, we deepen the insights into critical preceding stages and elements that may lead to successful innovation. Second, we adopt and modify a multiphase creative process model, which we empirically confirm to be applicable in a post-pandemic hybrid work environment. The three-phase model, with its inherent distinct features, complements scholarly work on creative processes, as well as the creative problem-solving approach. Third, we expand the employee creativity literature by conceptualizing and linking psychological safety, social interaction and knowledge sharing to group creative processes. Thus, we confirm similar relations found in the psychological safety literature (Edmondson & Bransby, 2023). Fourth, through empirical exploration, we provide a deeper understanding of creative process phases in the novel context of a mixed physical and digital work environment.

Furthermore, our investigation contributes to the ongoing academic debate on flexible work, especially hybrid work arrangements. We contribute to the emerging scientific literature by offering empirical insights into a dynamic hybrid work environment that demonstrates the complexity of post-pandemic work configurations. Moreover, as a result of abductive reasoning, our research challenges the SIP theory (Walther, 1992). Despite hybrid workers' use of cue-rich digital platforms for social interaction, these tools are not sufficient for developing psychological safety and facilitating unplanned knowledge sharing. Thus, by highlighting the role of spontaneous FTF interaction during creative process phases in a hybrid context, we provide new understanding where existing knowledge falls short in explaining the phenomenon. However, we advance existing theory by demonstrating that digital platforms still feed creative processes by providing unique access to diverse knowledge, regardless of the strength of social relationships. Hence, we add to the literature by suggesting how the two distinct work modes may complement each other in a hybrid work environment. The observed complexity and nuances of social interaction and collaboration may pave the way for a new theoretical approach to hybrid work.

One methodological contribution is the use of abduction, where the literature has

been employed synchronically with the data to explain patterns. By using an unconventional exploration of multistage group creative processes utilizing abductive thematic analysis, we have discovered gaps in prior theoretical knowledge while providing a deeper understanding of the phenomenon.

6.2 Practical implications

Organizations face complex challenges in how to design and implement hybrid work models that consider individual, group and organizational needs in the post-pandemic era. Creativity and innovation are identified by practitioners as one of the biggest issues in hybrid work. Moreover, designing hybrid workplaces lacks prototypes and guidelines. In this endeavor, our study offers important insights for managers to support psychological safety, informal interaction, and knowledge sharing, subsequently fostering hybrid creative processes in the short and long terms. First, we propose which of the physical, digital and hybrid work modes is the most appropriate in each of the three creative process phases. These indications offer valuable information to those who lead hybrid groups or teams doing creative work. Thus, organizations should carefully consider individual and group preferences for creative collaboration when they engage with hybrid work strategies, implementation, and assessment. Developing vibrant physical and digital work environments becomes one of the most critical managerial challenges to successfully facilitate hybrid creative group work.

Second, managers should adjust and improve leadership skills including empathy, support, and adaptation. Our study implies that attention to employees' individual experiences and preferences will contribute to building psychological safety and trust, which subsequently nurtures creative performance. Moreover, in hybrid work environments, leaders are encouraged to rethink communication routines and behavioral practices when constantly balancing between remote and on-site interaction. As role models, managers should consider allocating time for FTF collaboration and informal interactions. Third, the findings suggest that facilitating creative processes in a hybrid work environment requires learning and training for everyone involved. Because hybrid creative sessions most likely will continue in the future—not least in multinational organizations—improving the skills and expertise of creative project managers and facilitators should be highly prioritized.

Finally, as part of developing a culture that supports creative processes in a hybrid work environment, organizations should embrace new technologies that allow for more spontaneous and informal interaction. This will require changes in attitudes and behaviors, as well as thorough training and comprehensive implementation. Furthermore, our findings suggest that a virtual extension of visual cues can provide additional layers of nonverbal interaction in hybrid work environments. Improving technological tools and digital work experiences may also overcome social asymmetries, thus increasing psychological safety and diverse knowledge sharing during creative processes.

6.3 Limitations and future research

Our study has some limitations that may provide opportunities for further research. The case study focuses on internal group processes within company boundaries. However, many participants highlight a typical active customer involvement in one or several of the creative process phases. This especially applies to processes where a design thinking methodology is employed. Close interaction with clients through the creative process can have a profound influence on the outcome, especially given the direct involvement of external experience, perspective, and preferences. Future research could investigate the interplay between businesses and clients in a hybrid work context and examine boundary-spanning creative collaboration, including weak social ties and external knowledge sharing. The case study was carried out in Norway and Denmark, and the language used in the interviews was either Norwegian, Danish, or English. In the translation and analysis process, some linguistic nuances and details may have been lost. Moreover, the geographical limitation means that our study findings are based on a Scandinavian working culture. The participants indicate that factors influencing creativity, such as leadership styles and psychological safety, vary widely among countries and continents. Because creative collaboration in hybrid work environments is a growing global phenomenon, multicounty studies and cross-cultural analyses should be considered in future work.

A methodological limitation of our study is the qualitative approach that has been used, which entails that the findings are not statistically generalizable. Scholars should supplement the results with quantitative research and examine the relationships between creative process variables and hybrid work factors.

Furthermore, the single case study addresses only one company with specific characteristics that are distinct from other organizations. An accessible research avenue is a multiple case study to analyze data across different situations, understand the similarities and differences between the cases, strengthen the reliability of the evidence and improve the possibilities for theory building. We also suggest in-depth longitudinal case studies because of the current evolution and experimental adoption of new hybrid working norms that might influence creative processes in diverse ways over time. The scant attention paid to the application and use of specific digital tools also constitutes a study limitation. Our data and the literature have shown that technological solutions strongly influence creative processes because they are used for different purposes, including synchronous and asynchronous communication. However, given the analytical scope of the current study, future research could focus on evaluating technological tools and their application during group creative processes in remote and hybrid work environments. Overall, considerable interdisciplinary research efforts are needed to better understand creativity in the interplay between offline and online worlds.

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